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1 A complete list, showing all individual contributions, appears in the final volume.
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Naval Operations;
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Neuralgia; Neurasthenia; Neuropathology.

Odaenathus.

Netherlands.

Numismatics.

Nahum.

Neuroptera.

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Nābīgha Dhūbyānī; Nawāwī; Nosairīs.

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PRINCIPAL UNSIGNED ARTICLES

Munich. Munich.
Murad. Murad.
Muratori. Muratori.
Mutilation. Mutilation.
Mysore. Mysore.
Narcissus. Narcissus.
Narcotics. Narcotics.
Nashville. Nashville.
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Nebraska. Nebraska.
Nevada. Nevada.
New Caledonia. New Caledonia.
Newcastle, Dukes of. Newcastle, Dukes of.
Newcastle-upon-Tyne. Newcastle-upon-Tyne.
New Jersey. New Jersey.
New Mexico. New Mexico.
New York City. New York City.
Ney. Ney.
Niam-Niam. Niam-Niam.
Nicaragua. Nicaragua.
Nice. Nice.
Norfolk, Earls and Dukes of. Norfolk, Earls and Dukes of.
Northumberland. Northumberland.
Northumberland. Northumberland.
North Dakota. North Dakota.
Nottingham. Nottingham.
Oak. Oak.

MUN, ADRIEN ALBERT MARIE DE, COUNT (1841- ), French politician, was born at Lumigny, in the department of Seine-et-Marne, on the 28th of February 1841. He entered the army, saw much service in Algeria (1862), and took part in the fighting around Metz in 1870. On the surrender of Metz, he was sent as a prisoner of war to Aix-la-Chapelle, whence he returned in time to assist at the capture of Paris from the Commune. A fervent Roman Catholic, he devoted himself to advocating a patriarch type of Christian Socialism. His eloquence made him the most prominent member of the Cercles Catholiques d'Ouvriers, and his attacks on Republican social policy at last evoked a prohibition from the minister of war. He thereupon resigned his commission (Nov. 1875), and in the following February stood as Royalist and Catholic candidate for Pontivy. The influence of the Church was exerted to secure his election, and the pope during his progress sent him the order of St Gregory. He was returned, but the election was declared invalid. He was re-elected, however, in the following August, and for many years was the most conspicuous leader of the anti-Republican party. "We form," he said on one occasion, "the irreconcilable Counter-Revolution." As far back as 1878 he had declared himself opposed to universal suffrage, a declaration that lost him his seat from 1879 to 1881. He spoke strongly against the expulsion of the French princes, and it was chiefly through his influence that the support of the Royalist party was given to General Boulanger. But as a faithful Catholic he obeyed the encyclical of 1892, and declared his readiness to rally to a Republican government, provided that it respected religion. In the following January he received from the pope a letter commending his action, and encouraging him in his social reforms. He was defeated at the general election of that year, but in 1894 was returned for Finistère (Morbihan). In 1897 he succeeded Jules Simon as a member of the French Academy. This honour he owed to the purity of style and remarkable eloquence of his speeches, which, with a few pamphlets, form the bulk of his published work. In Mémorial social (1908) he wrote an explanation and justification of his career.

MUN, THOMAS (1571-1641), English writer on economics, was the third son of John Mun, mercer, of London. He began by engaging in Mediterranean trade, and afterwards settled down in London, amassing a large fortune. He was a member of the committee of the East India Company and of the standing commission on trade appointed in 1622. In 1621 Mun published A Discourse of Trade from England unto the East Indies. But it is by his England's Treasure by Forraign Trade that he is remembered in his history of economics. Although written possibly about 1630, it was not given to the public until 1664, when it was "published for the Common good by his son John," and dedicated to Thomas, earl of Southampton, lord high treasurer. In it we find for the first time a clear statement of the theory of the balance of trade.

MUNCHAUSEN, BARON. This name is famous in literary history on account of the amusingly mendacious stories known as the Adventures of Baron Munchausen. In 1785 a little shilling book of 49 pages was published in London (as we know from the Critical Review for December 1785), called Baron Munchausen's Narrative of his Marvellous Travels and Campaigns in Russia. No copy is known to exist, but a second edition (apparently identical) was printed at Oxford early in 1786. The publisher of both these editions was a certain Smith, and he then sold it to another bookseller named Kearsley, who brought out in 1786 an enlarged edition (the additions to which were stated in the 7th edition not to be by the original author), with illustrations under the title of Gulliver Reviv'd: the Singular Travels, Campaigns, Voyages, and Sporting Adventures of Baron Munchausen, commonly pronounced Munchausen; as he relates them over a bottle when surrounded by his friends. Four editions rapidly succeeded, and a free German translation by the poet Gottfried August Bürger, from the fifth edition, was printed at Göttingen in 1786. The seventh English edition (1793), which is the usual text, has the moral sub-title, Or the Vice of Lying properly exposed, and had further new additions. In 1792 a Sequel appeared, dedicated to James Bruce, the African traveller, whose Travels to Discover the Nile (1790) had led to incredulity and ridicule. As time went on Munchausen increased in popularity and was translated into many languages. Continuations were published, and new illustrations provided (e.g. by T. Rowlandson, 1809; A. Crowquill, 1859; A. Cruikshank, 1869; the French artist Richard, 1878; Gustave Doré, 1862; W. Strang and J. B. Clark, 1893). The theme of Baron Munchausen, the "drawer of the long-bow " par excellence, has become part of the common stock of the world’s story-telling.

The original author was at first unknown, and until 1824 he was generally identified with Bürger, who made the German translation of 1796. But Bürger's biographer, Karl von Reinhard, in the Berlin Gesellschaft of November 1824, set the matter at rest by stating that the real author was Rudolf Erich Raspe (q.v.). Raspe had apparently become acquainted at Göttingen with Hieronymus Karl Friedrich, Freiherr von Münchhausen, of Bodenwerder in Hanover. This Freiherr von Münchhausen (1720-1797) had been in the Russian service and
served against the Turks, and on retiring in 1760 he lived on his estates at Bodenwerder and used to amuse himself and his friends, and puzzle the quiddities and the dull-witted, by relating extraordinary instances of his prowess as soldier and sportsman. His stories became a byword among his circle, and Raspe, when hard up for a living in London, utilized the suggestion for his little brochure. But his narrative owed much also to such sources, known to Raspe, as Heinrich Bebel's Facetiae bebelianae (1508), J. P. Lange's Deliciæ academicae (1665), a section of which is called Mendacia ridicula, Castiglione's Cortegiano (1528), the Travels of the Finkenritter, attributed to Lorenz von Lauterbach in the 16th century, and other works of this sort. Raspe can only be held responsible for the nucleus of the book; the additions were made by book-sellers' hacks, from such sources as Lucian's Vera historia, or the Voyages imaginaires (1757), while suggestions were taken from Baron de Tott's Memoirs (Eng. trans. 1785), the contemporary travelogues and other accounts of Montgolfier and Blanchard, and any topical "sensations" of the moment, such as Bruce's explorations in Africa. Münchhausen is thus a medley, as we have it, a classical instance of the fantastical mendacious literary genre.

See the introduction by T. Seccombe to Lawrence and Bullen's edition of 1895. Adolf Eilifsen, whose father visited Freiherr von Münchhausen in 1795 and found him very uncommunicative, brought out a text in 1890 which was considered the nearest to the original in general. There is useful material in Carl Muller-Fraureuth's Die deutschen Lügendichtungen auf Münchhausen (1881) and in Griesbach's edition of Bürger's translation (1890).

MÜNCH-BELLINGHAUSEN, ELIGIUS FRANZ JOSEPH, Freiherr von (1806-1871), Austrian poet and dramatist (who wrote under the pseudonym of Friedrich Halm), was born at Cracow on the 2nd of April 1806, the son of a district judge. Educated at first at a private school in Vienna, he afterwards attended lectures at the university, and in 1826, at the early age of twenty, married and entered the government service. In 1840 he became Regierungsrat, in 1845 Hofrat and custodian of the royal library, in 1861 life member of the Austrian Herrenhaus (upper chamber), and from 1869 to 1871 was intendant of the two court theatres in Vienna. He died at Hüttenfeld near Vienna on the 22nd of May 1871. Münch-Bellinghausen's dramas, among them notably Griseldis (1835; publ. 1837; 11th ed. 1860), Der Adept (1836; publ. 1838), Camespa (1838), Der Sohn der Wildnis (1842; 4th ed., 1869), and Der Pfleger von Rudolstadt (1869; 4th ed., 1875), were all distinguished by elegance of language, melodious versification and clever construction, and were for a time exceedingly popular.

His poems, Gedichte, were published in Stuttgart, 1850 (new ed. Vienna, 1877). His works, Sämtliche Werke, were published in eight volumes (1856-1864), to which four posthumous volumes were added in 1872. Ausgewählte Werke, ed. by A. Scholz, 4 vols. (1904). See F. Pachler, Jugend und Lehrjahre des Dichters F. Halm (1877); J. Simiani, Gedenkbücher an F. Halm (1873). Halm's correspondence with Enk von der Burg has been published by R. Schachinger (1890).

MUNCIE, a city and the county-seat of Delaware county, Indiana, U.S.A., on the West Fork of the White river, about 57 m. N.E. of Indianapolis. Pop. (1880), 5219; (1890), 11,345; (2000) 56,444. It was founded in 1825, but not incorporated until 1875. It is served by the Central Indiana, the Chicago, Cincinnati & Louisville, the Cleveland, Cincinnati, Chicago & St Louis, the Pittsburgh, Cincinnati, Chicago & St Louis, the Fort Wayne, Cincinnati & Louisville, and the Lake Erie & Western railways, and by the Indiana Union Traction, the Dayton & Muncie Traction, and the Muncie & Portland Traction (electric inter-urban) railways. The city is built on level ground (altitude 950 ft.), and has an attractive residential section. It is one of the principal manufacturing centres in Indiana, owing largely to its situation in the natural gas belt. In 1900 and in 1903 it was the largest producer of glass and glassware in the United States, the value of its product in 1900 being $5,544,000. Muncie (named after the Muscian Indians, one of the three principal divisions of the Delawareans) was settled about 1833 and was chartered as a city in 1865.

MUNDAS. The Mundā (Mundā) family is the least numerous of the linguistic families of India. It comprises several dialects spoken in the two Chota Nagpur plateaux, the adjoining districts of Madras and the Central Provinces, and in the Mahadeo hills. The number of speakers of the various dialects, according to the census of 1901, is as follows: Santalī, 1,795,113; Mundā, 460,744; Bhumij, 111,364; Birhār, 526; Kōdā, 23,733; Hō, 371,860; Tūrī, 388; Asurī, 4,894; Korvā, 16,442; Kōrī, 87,675; Kharī, 82,506; Juang, 10,833; Savara, 157,136; Gardā, 37,250; total, 3,164,036. Santālī, Mundāri, Bhumij, Birhār, Kōdā, Hō, Tūrī, Asurī and Korvā are only slightly differing forms of one and the same language, which can be called Kherwārī, a name borrowed from Santālī tradition. Kherwārī is the principal Mundā language, and quite 88% of all the speakers of Mundā tongues belong to it. The Körwā dialect, spoken in the western part of Chota Nagpur, connects Kherwārī with the remaining Mundā languages. Of these it is most closely related to the Kūkāri language of the Mahadeo hills in the Central Provinces. Kūkāri, in its turn, in important points agrees with Kharī and Juang, and Kharī roughly agrees to Savara and Gardā. The two last-mentioned forms of speech, which are spoken in the north-east of the Madras Presidency, have been much influenced by Dravidian languages.

The Mundā dialects are not in sole possession of the territory where they are spoken. They are, as a rule, only found in the hills and jungles, while the plains and valleys are inhabited by people speaking some Aryan language. When brought into close contact with Aryan tongues the Mundā forms of speech are apt to give way, and in the course of time they have been partly superseded by Aryan dialects. There are accordingly some Aryanized tribes in northern India who have formerly belonged to the Mundā stock. Such are the Cheros of Behar and Chota Nagpur, the Kherwars, who are found in the same localities, in Mirzapur and elsewhere, the Savaras, who formerly extended as far north as Shahabad, and others. It seems possible to trace an old Mundā element in some Tibeto-Burman dialects spoken in the Himalayas from Bashahr eastwards.

By race the Mundās are Dravidians, and their language was likewise long considered as a member of the Dravidian family. Max Müller was the first to distinguish the two families. He also coined the name Mundā for the smaller of them, which has later on often been spoken of under other denominations, such as Kolarian and Kherwarian. The Dravidian race is generally considered the oldest race in the Indo-Aryan tribe, and the Mundās, who do not appear to have extended much farther towards the south than at present, must have mixed with the Dravidians from very early times. The so-called Nahāl dialect of the Mahadeo hills seems to have been originally a Mundā form of speech which has come under Dravidian influence, and finally passed under the spell of Aryan tongues. The same is perhaps the case with the numerous dialects spoken by the Bhils. At all events, Mundā languages have apparently been spoken over a wide area in central and north India. They were then early superseded by Dravidian and Aryan dialects, and at the present day only scanty remnants are found in the hills and jungles of central and the Central Provinces.

Though the Mundā family is not connected with any other languages in India proper, it does not form an isolated group. It belongs to a widely spread family, which extends from India in the west to Easter Island in the eastern Pacific in the east. In the first place, we find a connected language spoken by the Khasis of the Khasi hills in Assam. Then follow the Mūn-Khāmr languages of Farther India, the dialects spoken by the aboriginal inhabitants of the Malay Peninsula, the Nancauy of the Nicobars, and, finally, the numerous dialects of Austro- nesia, viz. Indonesian, Melanesian, Polynesian, and so on. Among the various members of this vast group the Mundā languages are most closely related to the Mūn-Khāmr family. Farther India, Kūkāri, Kharī, Juang, Savara and Gardā are more closely related to that family than is Kherwārī, the principal Mundā form of speech. We do not know if the Mundās entered India from without.
The Mundā languages abound in vowels, and also possess a richly developed system of consonants. Like the Dravidian languages, they avoid beginning a word with a more than one consonant. While those last two or three letters which are pronounced as short a at the end of words, the Mundās have the opposite tendency, viz. to shorten such sounds still more. The usual stopped consonants — viz. k, c (i.e. English ch), s and p — are formed by stopping the current of breath at different points in the mouth, and then letting it pass out with a kind of explosion. In the Mundā language this operation can be abruptly checked half-way, so that the breath does not touch the organs of speech in passing out. The result is a sound that marks in the expression of a thought and has been described as an abrupt tone. Such sounds are common in the Mundā languages. They are usually written k', c', s' and p'. Similar sounds are also found in the Môn-Khmer languages and in Indo-Chinese.

The vowels of consecutive syllables to a certain extent approach each other in sound. Thus in Kherwarī the open sounds ə (nearly English a in all) and a (the a in care) agrees with each other and not with the close sound ə (the a in cola) and a (the a in Tata). The Santālī passive suffix ək becomes ək' after ə or a; compare sán-ək', go, but dal-ək', to be struck.

Words are formed from monosyllabic bases by means of various additions. The simplest development (the addition of the suffix -a, placed in the close sound of the base and infixes which are inserted into the base itself). Suffixes play a great role in the inflexion of words, while prefixes and infixes are of greater importance as formative additions. Compare Kurku kā-ha, Savara ənə, son; Khāri ra-məng, Kherwarī mə house; Santālī bōr, to bear; bo-bōr, bear; dal, to strike; da-pəl, to strike each other.

The various cases of words are not clearly distinguished. The same base can often be used as a noun, an adjective or a verb. The words simply denote some being, object, quality, action or the like, but they do not tell us how they are conceived.

In their usual grammatical agglutinative way by means of additions which are "glued" or joined on to the unaltered base. In many respects, however, Mundā inflexion has struck out peculiar lines. Thus there is no grammatical distinction of gender. Nouns can be used both as those that denote beings and those that denote inanimate objects respectively. There are three numbers — the singular, the dual and the plural. On the other hand, there are no real cases, at least in most the typical Mundā languages. The direct and the indirect objects and adverbials are denoted by means of certain additions to the verb. Certain relations in time and space, however, are indicated by means of suffixes, which have probably from the beginning been separate words with a definite meaning, and which can therefore be regarded as adjectives preceding the governing word, is often derived from such forms denoting locality. Compare Santālī hār-rod, in a man; hā-rōd, of a man.

Higher numbers are counted in twenties, and not in tens as in the Dravidian languages.

The pronouns abound in different forms. Thus there are double sets of the dual and the plural of the pronoun of the first person, one for the direct and the other for the indirect object. A. Nottrott aptly illustrates the importance of this distinction by remarking how it is necessary to use the exclusive form if telling the servant that "we shall dine at seven." Otherwise the speaker will invite the servant to partake of the meal. In addition to the usual personal pronouns there are also short forms, used as suffixes and infixes, which denote a direct object, an indirect object, or a genitive. Thus the Mundā languages possess a number of demonstrative pronouns. Thus the pronoun that in Santālī has different forms to denote a living being, an immaterial object, something seen, something heard, and so on. On the other hand, there is no relative pronoun, the words which are used being formed by verbal bases, which can in this connexion be called relative participles.

The most characteristic feature of Mundā grammar is the verb, especially in Kherwarī. Every independent word can perform the functions of a verb, and the verbal suffix, is turned into a noun or an adjective. The bases of the different tenses can therefore be described as different words which can be used as a noun, as an adjective, and as a verb, but which are in reality none of them. Each set of participles is described by a verbal base, in Santālī the base dal-ket', struck, which is formed from the base dal, by adding the suffix ket' of the active past, can be used as a noun (connected with the tracers, those that struck), as an adjective (compare dal-ket-kār, struck man, the man that struck), and as a verb. In the last case it is necessary to add an a if the action really takes place; thus, dal-ket'a, somebody struck.

It has already been remarked that the cases of the direct and indirect objects are indicated by adding forms of the personal pronouns to the verb. Such phonetical affixes are inserted before the verb. This is a characteristic of the articulate part of speech. The third person singular is e, and by inserting it in dal-ket'a we arrive at a form dal-ket-e-a, somebody struck him. Similar affixes can be added to denote that the object or subject of an action belongs to another person. Thus Savara dal-kat-dha, that very man whom we struck-themselves, my son who belongs to me struck them.

In a sentence such as har kōr-e dal-ket-e-a, man boy-he struck him, the man struck the boy, the Santals first put together the ideas man boy, and a striking in the past. Then the e tells us that the striking affects the boy, and finally the -a indicates that the whole action really takes place. It will be seen that a single verbal form in this way often corresponds to a whole sentence or a series of sentences in other languages. If we add that the most odd-sounding Mundā languages possess different bases for the active, the middle and the passive, that there are different causal, intensive and reciprocal participles, which are conjugated in different bases, and that the person of the subject is often indicated in the verb, it will be understood that Mundā conjugation presents a somewhat bewildering aspect. It is, however, quite regular throughout, and once the mind becomes accustomed to these peculiarities, they do not present any difficulty to the understanding.


MUNDAY (or MONDAY), ANTHONY (c. 1553-1633), English dramatist and miscellaneous writer, son of Christopher Monday, a London draper, was born in 1553-1554. He had already appeared on the stage when in 1576 he bound himself apprentice for eight years to John Alke, the stationer, an engagement from which he was speedily released, for in 1578 he was in Rome. In the opening lines of his English Romayne Lyfe (1583) he avers that he is going abroad he is,"a nimble fox, spoiled by the fruit of learning, and taught to learn foreign languages; but he must be regarded, if not as a spy sent to report on the English Jesuit College in Rome, as a journalist who meant to make literary capital out of the designs of the English Catholic readers in France and Italy. He says that he and his companion, Thomas Nowell, were robbed of all they possessed on the road from Boulogne to Amiens, where they were kindly received by an English priest, who entrusted them with letters to be delivered in Reims. The transported to the English ambassador in Paris, where under a false name, as the son of a well-known English Catholic, Monday gained recommendations which secured his reception at the English College in Rome. He was treated with special kindness by the English College, and was received by the Jesuits, and the Jesuit, and was freed from all obligation by the Jesuits, and afterwards made a Jesuit. He was perhaps the first of a long line of Roman Catholic Jesuits who were to be the chief of the English College in Rome, and finally of the martyrdom of Richard Atkins (? 1559-1581). He returned to England in 1578-1579, and became an actor again, being a member of the Earl of Oxford's company between 1579 and 1584. In a Catholic tract entitled A True Report of the death of — M. Campion (1581), Munday is accused of having deceived his master Alke, a charge which he refuted by publishing Alke's signed declaration to the contrary, and he is also said to have been hissed off the stage. He was one of the chief witnesses against Edmund Campion and his associates, and wrote about this time five anti-papist pamphlets, among which the Savages and Beggars, and the Defended and Confessed. A Discovery of Edmund Campion and his Confessors—wherein is added the execution of Edmund Campion, Raph Shervin, and Alexander Brian, the first part of which was read aloud from the scaffold at Campion's death in December 1581. His political services against the Catholics were rewarded in 1584 by the post of messenger to her Majesty's chamber, and from this time he seems to have ceased to appear on the stage. In 1598-1599, when he travelled with the earl of Pembroke's men in the Low Countries, it was in the capacity of playwright to furnish up old plays. He devoted himself to writing for the booksellers and the theatres, compiling religious works, translating Amadis de Gaule and other French romances, and putting words to popular airs. He was the chief pageant-writer for the City from 1605.
to 1616, and it is likely that he supplied most of the pages between 1592 and 1605 of which no authentic record has been kept. It is by these entertainments of his, which raved in succession those of Ben Jonson and Middleton, that he won his greatest fame; but of all the achievements of his versatile talent the only one that was noted in his epigram in St Stephens, Coleman Street, London, where he was buried on the 10th of August 1633, was his enlarged edition (1618) of Stow's Survey of London. In some of his pages he signs himself "citizen and draper of London," and in his later years he is said to have followed his father's trade.

Of the eighteen plays between the dates of 1584 and 1602 which are assigned to him, Munday collaborated with Henry Chettle, Michael Drayton, Thomas Dekker and other dramatists, only four are extant. John a Kent and John a Camber, dated 1595, is supposed to be the same as Wiseeman of West Chester, produced by the Admiral's men at the Raye Theatre on the 2nd of December 1594. A ballad of British Sisamen, on which it may have been founded, was entered at Stationers' Hall in 1579. The Downfall of Robert Earl of Huntingdon, afterwards called Robin Hood of morrie Sherwoodes (acted in February 1590) was followed in the same month by a second part, The Death of Robert Earl of Huntingdon (printed 1601), in which he collaborated with Henry Chettle. Munday also had a share with Michael Drayton, Robert Wilson and Richard Hathway in the First Part of the history of the Caledonian War (1599) which was first printed in 1600, with the name of William Shakespeare, which was speedily withdrawn, on the title page. William Webbe (Discourse of English Poetrie, 1586) praised him for his pastoral, of which there remain but the few surviving Stanzas of Soley, and Amongst Shepherds and Nymphs; and Francis Meres ( Palladis Tamia, 1598) gives him among dramatic writers the exaggerated praise of being "our best poet." Munday is also mentioned as Antonio Balladino, pageant poet. Munday's works usually appeared under his own name, but he sometimes used the pseudonym of "Lazarus Plot." A. H. Bullen identifies him with the "Shepherd Torpe" (in his "Nature morte sat bathing by a spring") and six other lyrics to England's Helicon (ed. Bullen, 1890, p. 15).

The complete account of Anthony Munday is T. Seccombe's article in the Dict. Nat. Biog. A life and bibliography are prefixed to the Shakespeare Society's reprint of John the Kettle, John a Camber (ed. J. P. Collier, 1854). His two "Robin Hood" plays were edited by J. P. Collier in Old Plays (1828), and his English Romance Lyfe was printed in the Harleian Miscellany, vii. 156 seq. (ed. B. B.). In an account of his city pages see F. W. Fairholt, Lord Mayor's Pageants (Percy Soc., No. 38, 1843).

MUNDELLA, ANTHONY JOHN (1825-1897). English educational and industrial reformer, of Italian extraction, was born at Leicester in 1825. After a few years spent at an elementary school, he was apprenticed to a hosier at the age of eleven; he afterwards became successful in business in Nottingham, filled several civic offices, and was known for his philanthropy. He was sheriff of Nottingham in 1853, and in 1859 organized the first courts of arbitration for the settlement of disputes between masters and men. In November 1868 he was returned to parliament for Sheffield as an advanced Liberal. He represented that constituency until November 1885, when he was returned for the Brightside division of Sheffield, which he continued to represent until his death. In the Gladstone ministry of 1868 Mundella was vice-president of the council, and shortly afterwards was nominated fourth charity commissioner for England and Wales. In February 1886 he was appointed president of the board of trade, with a seat in the cabinet, and was sworn a member of the privy council. In August 1892, when the Liberals again came into power, Mundella was again appointed president of the board of trade, and he continued in this position until 1894, when he resigned office. His resignation was brought about by his connexion with a financial company which went into liquidation in circumstances calling for the official intervention of the board of trade. However innocent his connexion was with the company, the event excited unpleasant public discussion, and his position became untenable. Having made a close study of the educational systems of Germany and Switzerland, Mundella was an early advocate of compulsory education in England. He rendered valuable service in connexion with the Elementary Education Act of 1870, and the educational code of 1882, which became known as the "Mundella Code," marked a new departure in the regulation of public elementary schools and the conditions of the Government grants. To his initiative was chiefly due the Factory Act of 1875, which established a ten-hours day for women and children in textile factories; and the Children's Act of 1878 removed certain restrictions on trade unions. It was he also who established the labour department of the board of trade and founded the Labour Gazette. He introduced and passed bills for the better protection of women and children in brickyards and for the limitation of their labours in factories; and he effected substantial improvements in the Mines Regulation Bill, and was the author of much other useful legislation. In recognition of his efforts, a marble bust of himself, by Boehm, subscribed for by 80,000 factory workers, chiefly women and children, was presented to Mrs Mundella. He died in London on the 2nd of July 1897.

MUNDEN, JOSEPH SHEPHERD (1758-1832). English actor, was the son of a London poulterer, and ran away from home to join a strolling company. He had a long provincial experience as actor and manager. His first London appearance was in 1790 at Covent Garden, where he practically remained until 1811, becoming the leading comedian of his day. In 1813 he was at Drury Lane. He retired in 1824, and died on the 6th of February 1832.

MÜNĐEN, a town of Germany, in the Prussian province of Hanover, picturesquely situated at the confluence of the Fulda and the Werra, 21 m. N.E. of Cassel by rail. Pop. (1905), 19,755. It is an ancient place, municipal rights having been granted to it in 1247. A few ruins of its former walls still survive. The great Lutheran church of St Blasius (14th-17th centuries) contains the sarcophagus of Duke Eric of Brunswick-Calenberg (d. 1540). The 13th-century Church of St Aegidius was injured in the siege of 1625-26 but was subsequently restored. There is a new Roman Catholic church (1895). The town hall (1619), and the ducal castle, built by Duke Eric II. about 1570, and rebuilt in 1689, are the principal secular buildings. In the latter is the municipal museum. There are various small industries and a trade in timber. Münden, often called "Hannoversch-Münden" (i.e. Hanoverian Münden), to distinguish it from Prussian Münden, was founded by the landgraves of Thuringia, and passed in 1247 to the house of Brunswick. It was for a time the residence of the dukes of Brunswick-Lüneburg. In 1666 it was destroyed by Tilly.

See Willigerod, Geschichte von Münden (Göttingen, 1808); and Henze, Führer durch Münden und Umgebung (Münden, 1906).

MUNDRCUS, a tribe of South American Indians, one of the most powerful tribes on the Amazon. In 1788 they completely defeated their ancient enemies the Muras. After 1803 they lived at peace with the Brazilians, and many are civilized.

MUNDT, THEODOR (1858-1861), German author, was born at Potsdam on the 19th of September 1808. Having studied philology and philosophy at Berlin, he settled in 1812 at Leipzig, as a journalist, and was subjected to a rigorous police supervision. In 1839 he married Klara Müller (1814-1873), who under the name of Luise Mühlbach became a popular novelist, and he removed in the same year to Berlin. Here his intention of entering upon an academical career was for a time thwarted by his collision with the Prussian press laws. In 1842, however, he was permitted to establish himself as privatdocent. In 1848 he was appointed professor of literature and history in Breslau, and in 1850 ordinary professor and librarian in Berlin; there he died on the 30th of November 1861. Mundt wrote extensively on aesthetic subjects, and as a critic he had considerable influence in his time. Prominent among his works are Die Kunst der Architektonik (1847); Geschichte der Malerei der Kegengewaert (1840); Aesthetik; die Idee der Schönheit und des Kunstwerks im Lichte unserer Zeit (1845, new ed. 1868); Die Götterwelt der alten Völker (1846, new ed. 1854). He also wrote several historical novels; Thomas Müntzer (1841); Mendosa, der Vater der Schelmern (1847) and Die Metadore (1830). But perhaps Mundt's chief title to fame was his part in the emancipation of women, a theme which he elaborated in his Madonna, Unterhaltungen mit einer Heiligen (1835).
MUNICH (Ger. München), a city of Germany, capital of the kingdom of Bavaria, and the third largest town in the German Empire. It is situated on an elevated plain, on the river Isar, 25 m. N. of the foot-hills of the Alps, about midway between Strassburg and Vienna. Owing to its lofty site (1700 ft. above the sea) and the proximity of the Alps, the climate is changeable, and its mean annual temperature, 49° to 50° F., is little higher than that of many places much farther to the north. The annual rainfall is nearly 30 in. Munich lies at the centre of an important network of railways connecting it directly with Strassburg (for Paris), Cologne, Leipzig, Berlin, Rosenheim (for Vienna) and Innsbruck (for Italy via the Brenner pass), which converge in a central station.

Munich is divided into twenty-four municipal districts, nineteen of which, including the old town, lie on the left bank of the Isar, while the suburban districts of Au, Haidhausen, Giesing, Bogenhausen and Ramersdorf are on the opposite bank. The old town, containing many narrow and irregular streets, forms a semicircle with its diameter toward the river, while round its periphery has sprung up the greater part of modern Munich, including the handsome Maximilian and Ludwig districts. The walls with which Munich was formerly surrounded have been pulled down, but some of the gates have been left. The most interesting is the Isartor and the Karlstor, restored in 1835 and adorned with frescoes. The Siegestor (or gate of victory) is a modern imitation of the arch of Constantine at Rome, while the stately Propylæae, built in 1854-1862, is a reproduction of the gates of the Athenian Acropolis.

Munich owes its architectural magnificence largely to Louis I. of Bavaria, who founded the throne in 1825, and his successors; while its collections of art entitle it to rank with Dresden and Berlin. Most of the modern buildings have been erected after celebrated prototypes of other countries and eras, so that, as has been said by Moriz Carrière, a walk through Munich affords a picture of the architecture and art of two thousand years. In carrying out his plans Louis I. was seconded by the architect Leo von Klenze, while the external decorations of painting and sculpture were mainly designed by Peter von Cornelius, Wilhelm von Kaulbach and Schwanthaler. As opportunity offers, the narrow streets of the older city are converted into broad, straight boulevards, lined with palatial mansions and public buildings. The hygienic improvement effected by these changes, and by a new and excellent water supply, is shown by the mortality averages—40-4 per thousand in 1871-1875, 30-9 per thousand in 1881-1885, and 20-5 per thousand in 1903-1904. The architectural style which has been principally followed in the later public buildings, among them the law courts, finished in 1897, the German bank, St. Martin’s hospital, as well as in numerous private dwellings, is the Italian and French Rocco, or Renaissance, adapted to the traditions of Munich architecture in the 17th and 18th centuries. A large proportion of the most notable buildings in Munich are in two streets, the Ludwigstrasse and the Maximilianstrasse, the creations of the monarchs whose names they bear. The former, three-quarters of a mile long and 40 yds. wide, entirely contains buildings in the Renaissance style by Friedrich von Gartner. The most striking of these are the palaces of Duke Max and of Prince Luitpold; the Odeon, a large building for concerts, adorned with frescoes and marble busts; the war office; the royal library, in the Florentine palatial style; the Ludwigskirche, a successful reproduction of the Italian Romanesque style, built in 1829-1844, and containing a huge fresco of the Last Judgment by Cornelius; the blind asylum; and, lastly, the university. At one end this street is terminated by the Siegestor, while at the other is the Feldherrenhalle (or hall of the marshals), a copy of the Loggia del Lanzo at Florence; the exquisite statues of Willy and Wrede by Schwanthaler. Adjacent is the church of the Theatines, an imposing though somewhat over-ornamented example of the Italian Rococo style; it contains the royal burial vault. In the Max-}

Munichstrasse, which extends from Haidhausen on the right bank of the Isar to the Max-Joseph Platz, King Maximilian II. tried to introduce an entirely new style of domestic architecture, formed by the combination of older forms. At the east end it is closed by the Maximilianeum, an extensive and imposing edifice, adorned externally with large sculptural groups and internally with huge paintings representing the chief scenes in the history of the world. Descending the street, towards the west are passed in succession the old buildings of the Bavarian national museum, the government buildings in which the Composite style of Maximilian has been most consistently carried out, and the mint. On the north side of the Max-Joseph Platz lies the royal palace, consisting of the Alte Residenz, the Königsbau, and the Festsaalbau. The Alte Residenz dates from 1601 to 1616; its apartments are handsomely fitted up in the Rococo style, and the private chapel and the treasury contain several crowns and many other interesting and valuable objects. The Festsaalbau, erected by Klenze in the Italian Renaissance style, is adorned with mural paintings and sculptures, while the Königsbau, a reduced copy of the Pitti Palace at Florence, contains a series of admirable frescoes from the Niehstungenlily by Julius Schnorr von Carolsfeld. Adjoining the palace are two theatres, the Residenz or private theatre, and the handsome Hoftheater, accommodating 2500 spectators. The Allerheiligen-Hofkirche, or court-church, is in the Byzantine style, with a Romanesque façade.

The Ludwigstrasse and the Maximilianstrasse both end at no great distance from the Frauenplatz in the centre of the old town. On this square stands the Frauenkirche, the cathedral church of the archbishop of Munich-Freising, with its lofty cupola capped towers dominating the whole town. It is imposing from its size, and interesting as one of the few examples of indigenous Munich art. On the north side, adjacent Marienplatz are the old town-hall, dating from the 14th century and restored in 1865, and the new town-hall, the latter a magnificent modern Gothic erection, freely embellished with statues, frescoes, and stained-glass windows, and enlarged in 1900-1905. The column in the centre of the square was erected in 1638, to commemorate the defeat of the Protestants near Prague by the Bavarians during the Thirty Years’ War. Among the other churches of Munich the chief place is due to St Boniface’s, an admirable copy of an early Christian basilica. It is adorned with a cycle of religious paintings by Heinrich von Hess (1788-1863), and the dome is supported by sixty-four monoliths of grey Tyrolean marble. The parish church of Au, in the Early Gothic style, contains gigantic stained-glass windows and some excellent wood-carving; and the church of St John in Haidhausen is another fine Gothic structure. St Michael’s in the Renaissance style, erected for the Jesuits in 1538-1595, contains the monument of Eugène Beauharnais by Thorwaldsen. The façade is divided into storeys, and the general effect is by no means ecclesiastical. St Peter’s is interesting as the oldest church in Munich (11th century), though no trace of the original basilica remains. Among newer churches the most noticeable are the Evangelical church of St Luke, a Transitional building, with an imposing dome, finished in 1856, and the Gothic parish church of the Giesing suburb, with a tower 312 ft. high and rich interior decorations (1866-1884). The valuable collections of art are enshrined in handsome buildings, mostly in the Maximilian suburb on the north side of the town. The old Pinakothek, erected by Klenze in 1826-1836, and somewhat resembling the Vatican, is embellished externally with frescoes by Cornelius and with statues of twenty-four celebrated painters from sketches by Schwanthaler. It contains a valuable and extensive collection of pictures by the earlier masters, the chief treasures being the early German and Flemish works and the unusually numerous examples of Rubens. It also affords accommodation to more than 300,000 engravings, over 20,000 drawings, and a large collection of vases. Opposite stands the new Pinakothek, built 1846-1853, the frescoes on which, designed by Kaulbach, show the effects of wind and weather. It is devoted to works by painters of the last century, among which Karl Rottmann’s Greek landscapes are perhaps the most important. The Glyptothek, a building by Klenze in the Ionic style, and adorned with several groups and
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The Immense scientific collection in the Bavarian national museum, illustrative of the march of progress from the Roman period down to the present day, compares in completeness with the similar collections at South Kensington and the Musée de Cluny. The building which now houses this collection was erected in 1894–1900. On the walls is a series of well-executed frescoes of scenes from Bavarian history, occupying a space of 760 ft. The geographical museum, the cabinet of coins, and the collections of fossils, minerals, and physical and optical instruments, are also worthy of mention. The art union, the oldest and most extensive in Germany, possesses a good collection of modern works. The chief place among the scientific institutions is due to the academy of science, founded in 1755. The royal library contains over 1,300,000 printed volumes and 30,000 manuscripts. The observatory is equipped with instruments by the celebrated Josef Fraunhofer.

At the head of the educational institutions of Munich stands the university, founded at Ingolstadt in 1472, removed to Landshut in 1800, and transferred thence to Munich in 1826. In addition to the four usual faculties there is a fifth—of political economy. In connexion with the university are medical and other schools, a priests' seminary, and a library of 300,000 volumes. The polytechnic institute (Technische Hochschule) in 1899 acquired the privilege of conferring the degree of doctor of technical science. Munich contains several gymnasium or grammar-schools, a military academy, a veterinary college, an agricultural college, a school for architects and builders, and several other technical schools, and a conservatory of music. The general prison in the suburb of Au is considered a model of its kind; and there is also a large military prison. Among other public buildings, the crystal palace (Glas-palast), 705 ft. in length, erected for the great exhibition of 1854, is now used, as occasion requires, for temporary exhibitions. The Wittelsbach palace, built in 1843–1850, in the Early English Painted style, is one of the residences of the royal family. Among the numerous monuments with which the squares and streets are adorned, the most important are the colossal statue of Maximilian II. in the Maximilianstrasse, the equestrian statues of Louis I. and the elector Maximilian I., the obelisk erected to the 30,000 Bavarians who perished in Napoleon's expedition to Moscow, the Wittelsbach fountain (1895), the monument commemorative of the peace of 1871, and the marble statue of Justus Liebig, the chemist, set up in 1883.

The English garden (Englischer Garten), to the north-east of the town, is 600 acres in extent, and was laid out by Count Rumford in imitation of an English park. On the opposite bank of the Isar, above and below the Maximilianeum, extend the Gasteig promenades, commanding fine views of the town. To the south-west of the town is the Theresienwiese, a large common where the popular festival is celebrated in October. Here is situated the Ruhmeshalle or hall of fame, a Doric colonnade containing busts of eminent Bavarians. In front of it is a colossal bronze statue of Bavaria, 150 ft. high, designed by Schwanthaler. The botanical garden, with its large palm-house, contains frescoes of Greek landscapes by Rottmann, and the Maximilian park to the east of the Isar, complete the list of public parks.

The population of Munich in 1905 was 538,993. The permanent garrison numbers about 10,000 men. Of the population, 84% are Roman Catholic, 14% Protestants, and 2% Jews. Munich is the seat of the archbishop of Munich-Freising and of the general Protestant consistory for Bavaria. About twenty newspapers are published here, including the Allgemeine Zeitung. Some of the festivals of the Roman Church are celebrated with considerable pomp; and the people also cling to various national fêtes, such as the Metzgersprung, the Schäffler-ritt, and the great religious festival of Corpus Christi.

Munich has long been celebrated for its artistic handicrafts, such as bronze-foundling, glass-staining, silversmith's work, and wood-carving, while the astronomical instruments of Fraunhofer and the mathematical instruments of Traugott Liebervon Ertel (1778–1838) are also widely known. Lithography, which was invented at Munich at the end of the 18th century, is extensively practised here. The other industrial products include paper-wall, railway plant, machinery, gloves and artificial flowers. The most characteristic industry, however, is brewing. Four important markets are held at Munich annually. The city is served by an extensive electric tramway system.

History.—The Villa Municipen or Forum ad monachos, so called from the monkish owners of the ground on which it lay, was first called into prominence by Duke Henry the Lion, who established a mint here in 1158, and made it the emporium for the salt coming from Hal len and Reichenhall. The Bavarian dukes of the Wittelsbach house occasionally resided at Munich, and in 1255 Duke Louis made it his capital, having previously surrounded it with walls and a moat. The town was almost entirely destroyed by fire in 1337, after which the emperor Louis the Bavarian, in recognition of the loyalty of the citizens, rebuilt it very much on the scale it retained down to the beginning of the 19th century. Among the succeeding rulers those who did most for the town in the erection of handsome buildings and the foundation of schools and scientific institutions were Albert V., William V., Maximilian I., Max Joseph and Charles Theodore. In 1632 Munich was occupied by Gustavus Adolphus, and in 1705, and again in 1742, it was in possession of the Austrians. In 1791 the fortifications were razed.

Munich's importance in the history of art is entirely of modern growth, and may be dated from the acquisition of the Aeginitan marble by Louis I., then crown prince, in 1812. Among the eminent artists of this period whose names are more or less identified with Munich were Leo von Klenze (1784–1864), Joseph Daniel Ohmiller (1791–1839), Friedrich von Gartner (1792–1847), and Georg Friedrich Ziebland (1800–1873), the architects; Peter von Cornelius (1783–1869), Wilhelm von Kaulbach (1802–1874), Julius Schnorr von Carolsfeld (1794–1871), and Karl Rottmann, the painters; and Ludwig von Schwanthaler, the sculptor. Munich is still the leading school of painting in Germany, but the romanticism of the earlier masters has been abandoned for drawing and colouring of a realistic character. Karl von Piloty (1826–1886) and Wilhelm Diez (1839–1907) long stood at the head of this school.

See Mittheilungen des statistischen Bureau der Stadt München (vols. i., 1813; ii., 1824); Stadt München mit seinen historischen Wirkungen (1854), by Reber, Bautechnischer Führer durch die Stadt München (1876); Daniel, Handbuch der Geographie (new ed., 1895); Prantl, Geschichte der Ludwigs-Maximilians Universität (Munich, 1872); Goering, 30 Jahre München (Munich, 1894); von Ammon, Die Gegen von München geologisch geschildert (Munich, 1895); Kronegg, Illustrirte Geschichte der Stadt München (Munich, 1903); the Jahrbuch für Münchner Geschicthe, edited by Reinhardstötter and Trautmann (Munich, Aufsätzen von historischem und Literatur-Aufsätzen, 1885); Wort (Munich, 1895); Rohmayer, München als Handelsstadt (Munich, 1898); H. Tisch, Das Stadtrecht von München (Bamberg, 1891); F. Pecht, Geschichte der münchener Kunst im 19. Jahrhundert (Munich, 1888); and Trautwein, Führer durch München (20th ed., 1906). There is an English book on Munich by H. R. Wadeleigh (1910).
MUNICIPALITY—MUNICIPIUM

MUNICIPALITY, a modern term (derived from Lat. munici-pium; see below), now used both for a city or town which is organized for self-government under a municipal corporation, and also for the governing body itself. Such a corporation in Great Britain consists of a head or mayor or president, of a number of aldermen, and of councillors, together with the simple corporators, who are represented by the governing body; it acts as a person by its common seal, and has a perpetual succession, with power to hold lands subject to the restrictions of the Mortmain laws; and it can sue or be sued. Where necessary for its primary objects, every corporation has power to make by-laws and to enforce them by penalties, provided they are not unjust or unreasonable or otherwise inconsistent with the objects of the charter or other instrument of foundation.

See Borough, Commune, Corporation, Local Government, Finance, &c., and for details of the functions of the municipal government, 1 excepting the general headings of the different countries and the sections on the history of these countries.

MUNICIPIUM (Lat. munus, a duty or privilege, capere, to take), in ancient Rome, the term applied primarily to a status, a certain relation between individuals or communities and the Roman state; subsequently and in ordinary usage to a community, standing in such a relation to Rome. Whether the name signifies the taking up of burdens or the acceptance of privileges is a disputed point. But as ancient authorities are unanimous in giving munus in this connexion the sense of "duty" or "service," it is probable that the chief feature of municipalitas was the performance of certain services to Rome.1 This view is confirmed by all that we know about the towns to which the name was applied in republican times. The status had its origin in the conferment of citizenship upon Tusculum in 381 B.C. (Livy vi. 26; cf. Cic. pro Planc. 8, 19), and was widely extended in the settlement made by Rome at the close of the Latin War in 338 B.C. (see Rome, History). Italian towns were then divided into three classes: (1) Coloniae civium Romanorum, whose members had all the rights of citizenship; (2) munici-pia, which received partial citizenship; (3) foederatae civitates (including the so-called Latin colonies), which remained entirely separate from Rome, and stood in relations with her which were separately arranged by her for each state by treaty (foedus). The munici-pia stood in very different degrees of dependence on Rome. Some, such as Fundi (Livy viii. 14; cf. Cass. Dio 70, 19), were at first local communities with limited control of their own affairs. But after the close of the second Punic War, when Rome had become the chief power, not only in Italy, but in all the neighbouring lands round the Mediterranean, we can trace a growing tendency among the Italian cities to regard citizenship of this great state as a privilege, and to claim complete citizenship as a reward of their services in helping to build up the Roman power. During the 2nd century B.C. the jus suffragii and jus honorum were conferred upon numerous munici-pia (Livy xxxviii. 36, 37); whose citizens were then enrolled in the Roman tribes. They can have exercised their public rights but seldom, owing to their distance from Rome; but the consulsips of C. Marius,

1 For a contrary view, however, see Marquardt, Röm. Staatsverw. i. p. 26, n. 2 (2nd ed., Leipzig, 1881), and authorities there cited.
2 For a different view see Willems, Droit public romain, p. 381 (Louvain, 1874).

a municipium of Arpinum (between 107 and 100 B.C.), and the strength of the support given to Tiberius Gracchus in the assembly by the voters from Italian towns (133 B.C.) show what an important influence the members of these municipia could occasionally exercise over Roman politics. The cities thus privileged, however, though receiving complete Roman citizenship, were not, as the logic of public law might seem to demand, incorporated in Rome, but continued to exist as independent urban units; and this anomaly survived in the municipal system which was developed, on the basis of these grants of citizenship, after the Social War. That system recognized the municipia as at once a citizen of a self-governing city community, and a member of the city of Rome, his dual capacity being illustrated by his right of voting both in the election of Roman magistrates and in the election of magistrates for his own town.

The result of the Social War which broke out in 91 B.C. (see Rome: History) was the establishment of a new uniform municipalitas throughout Italy, and the obliteration of any important distinction between the three classes established after the Latin War. By the Lex Julia of 90 B.C. and the Lex Plautia Papiaria of 89 B.C. every town in Italy which made application in due form received the complete citizenship. The term munici-pium was no longer confined to a particular class of Italian towns but was adopted as a convenient name for all urban communities of Roman citizens in Italy. The organization of a municipal system, which should regulate the governments of all these towns on a uniform basis, and define their relation to the Roman government, was probably the work of Sulla, who certainly gave great impetus to the foundation in the provinces of citizen colonies, which were the earliest municipia outside Italy, and extended within the same year as the Italian towns. Julius Caesar extended the sphere of the Roman municipal system by his enfranchisement of Cisalpine Gaul, and the consequent inclusion of all the towns of that region in the category of municipio. He seems also to have given a more definite organization to the municipia as a whole. But, excepting those in Cisalpine Gaul, the municipal system still embraced no towns outside Italy other than the citizen colonies. Augustus and his successors adopted the practice of granting to existing towns in the provinces either the full citizenship, or a partial civitas known as the jus Latii. This partial civitas does not seem to have been entirely replaced, as in Italy, by the grant of full privileges, to urban communities possessing it, and the distinction between the two classes of municipia was maintained in the provinces. But, the uniform system of administration gradually adopted in all three classes rendered the distinction entirely unimportant, and the general term municipalitas is used of all alike. The incorporation of existing towns, hitherto non-Roman, in the uniform municipal system of the principate took place mainly in the eastern part of the Empire, where Greek civilization had long fostered urban life. In the west city communities rapidly sprung up under direct Roman influence. The development of towns of the municipal type on the sites where legions occupied permanent quarters can be traced in several of the provinces. The Roman government, however, had already before the end of the 1st century the principate municipia are numerous in the western as well as the eastern half of the Empire, and the towns are everywhere centres of Roman influence.

Of the internal life of the municipia very little is known before the Empire. For the period after Julius Caesar, however, we have two important sources of information. A series of municipal laws gives us a detailed knowledge of the constitution imposed, with slight variations, on all the municipia; and a host of municeps inscriptions gives particulars of their social life.

The municipal constitution of the 1st century of the municipia is based upon the type of government common to Greece and Rome from earliest times. The government of each town consists of magistrates, senate and assembly, and is entirely
MUNICIPIUM

independent of the Roman government except in certain cases of higher civil jurisdiction, which come under the direct cognisance of the praetor urbans at Rome. On the other hand, each community is bound to perform certain services to the Imperial government, such as the contribution of men and horses for military service, the maintenance of imperial post roads through its neighbourhood, and the occasional entertain-
ment of Roman officials or billeting of soldiers. The citizens were of two classes: (1) cives, whether by birth, naturalization or emancipation, (2) incolae, who enjoyed a partial citizenship based on domicile for a certain period. Both classes were liable to civic burdens, but the incolae had none of the privileges of citizenship except a limited right of voting. The citizens were grouped in either tribes or curiae, and accordingly the assembly sometimes bore the name of Comitia Tributa, sometimes that of Comitia Curiata. The theoretical powers of these comitia were extensive both in the election of magis-
trates and in legislation. But the growing influence of the senatorial party in the Senate over elections on the one hand, and on the other hand the increasing reluctance of leading citizens to become candidates for office (see below), gradually made popular election a mere form. The senatorial recommendation of the necessary number of candidates seems to have been merely ratified in the comitia; and a Spanish municipal law of the 1st century makes special provision for occasions on which an insufficient number of candidates are forthcoming. In Italy, however, the reality of popular elections seems to have survived to a later date. The inscriptions at Pompeii, for instance, give evidence of keenly contested elections in the 2nd century. The local senate, or curia, always exercised an important influence on municipal politics. Its members formed the leading nobility, and at an early date special privileges were granted by Rome to provincials who were senators in their native towns. For the composition, powers, and history of the provincial senate see DECURIO.

The magistrates were elected annually, and were six in number, forming three pairs of colleagues. The highest magistrates were the IIvirii (Duovirii) juri dicundo, who had charge, as their name implies, of all local jurisdiction, and presided over the assembly. Candidates for this office were required to be over 25 years of age, to have held one of the minor magistracies, and to possess all the qualifications required of members of the local senate (see DECURIO). Next in dignity were the IIvirii aediles, who had charge of the roads and public buildings, the games, and general maintenance of municipal public order. In some towns they appear to have been regarded as subordinate colleagues (collegae minores) of the IIvirii juri dicundo, and in some towns at least to have had the right to convene and preside over the comitia in the absence of the latter. Indeed many inscriptions speak of IVirii (Quattuovirii) consisting of two IIvirii juri dicundo and two IIvirii aediles; but in the majority of cases the former are regarded as distinct and superior magistrates. The two quaestores, who appear to have controlled finance in a large number of municipia, cannot be traced in others; and it is probable that in the municpia, as at Rome, the quaestorship was locally instituted, as need arose, to relieve the supreme magistrates. The business of the two junior municipal magistrates frequently referred to in the inscriptions are the quinquaremnales and praefecti. The quinquaremnales superseded the IIvirii or IVirii juri dicundo every five years, and differed from them only in possessing, in addition to their other powers, those exercised in Rome before the time of Sulla by the censors. Two classes of praefecti are found in the municipalities under the Empire, both of which are to be distinguished from the officials who bore that name in the municipia before the Social War. The first class consists of those praefecti who were nominated as temporary delegates by the IIvirii, when through illness or compulsory absence they were unable to discharge the duties of their office. The second class, referred to in inscriptions by the name of praefecti ab decurionibus creati legi Petronii, seem to have been appointed by the local senate in case of a complete absence of higher magistrates, such as would have led in Rome to the appointment of an interrex.

From a social point of view the municipia of the Roman Empire may be classified under three heads: (1) as religious centres, (2) as governmental centres, (3) as industrial centres. (1) The chief feature of the local government of the towns was the widespread activity of the municipal authorities in improving the general conditions of town life. The fund for maintenance of public buildings, or provision was made out of the public funds for feeding the poorest part of the population, and providing a supply of corn which could be bought by ordinary citizens at a moderate price. In Pliny's time there existed in many towns public wells, controlled by the municipal authorities, concerning which Pliny remarks that they were a source of considerable disturbance in the town at the times when the need was greatest to appease the gods. (2) Cities were generally assisted by large benefactions, either in money or in works, from individual citizens; but direct taxation for municipal purposes was hardly ever resorted to. The treasury was filled out of the proceeds of the landed possessions of the community, especially such fruitful sources of revenue as mines and quarries, and out of import and export duties. It was occasionally subsidized by the emperor on occasions of sudden and exceptional calamity. (3) The chief feature of the municipal towns was the important position they occupied as centres for the cult of the emperor. Caesar-worship as an organized cult developed spontaneously in many provincial towns during the reign of Augustus, and was later ordered by imperial edicts. The importance of the emperor in these centres of vigour and prosperity a strong loyalty to Rome and the emperor, which was one of the firmest supports of the latter's power. The order of Augustales, officials appointed to regulate the cult, and the offices of its superintendents, the empire, were prominent offices in civic life, and had a special importance in municipal society. It was composed of the leading and the wealthiest men among the lower classes of the popula-
tion. The organization of the order on these lines Augustus secured the double object of maintaining Caesar-worship in all the most vigorous centres of provincial life, and attracting and attracting to himself and his successors the special devotion of the industrial class which had been undermined in the days of Augustus. It was one of the greatest political forces in modern Europe.

The development of this free industrial class is the chief feature of the municipia considered as centres of industry and handicraft. The power of the municipia increased as the wealth and importance of the towns increased. By the late part of the 1st century the Roman government had to some extent modified the old Roman principle that trade and commerce were beneath the dignity of the governing class; but long after the fall of the Republic the artis-
tian and the working classes were an important element in the population. As the organization of the order on these lines Augustus secured the double object of maintaining Caesar-worship in all the towns, and the building of the emperors, families of buildings in the provinces where their names were most popular in the Roman Empire, and has become the greatest political force in modern Europe.

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partly to the general prosperity of the towns, which removed any acute discontent. The wealthy citizen seems always to have had to bear heavy financial burdens, and to have enjoyed in return a dignity and an actual political preponderance which made the general character of municipal constitutions distinctly tyrannical.

The policy adopted by the early emperors of encouraging, within the limits of a uniform system, the independence and civic patriotism of the towns, was superseded in the 3rd and 4th centuries by a deliberate effort to use the towns as instruments of the imperial government, under the direct control of the emperor or his representatives in the provinces. This policy was accompanied by a gradual decay of civic feeling and municipal enterprise, which showed itself mainly in the unwillingness of the townsfolk to become candidates for local magistracies, or to take up the burdens entailed in membership of the municipal senate. Popular control of the local government of the towns was ceasing to be a reality as early as the end of the 1st century of the Empire. Two centuries later local government was a mere form. And the self-governing communities of the middle ages were a restoration, rather than a development, of the flourishing and independent municipalities of the age of Augustus and his immediate successors.

AUTHORITIES.—C. BRUNS, Fontes juris roman i, c. III., No. 18, and c. IV. (Freiburg, 1893), for Municipal Laws and references to Mommsen's commentary in C.I.L.; E. KUHN, Stadtsche u. bürgerliche Verfassung des röm. Reichs (Leipzig, 1864); Marquardt, Römische Staatsverwaltung, l. i. (Leipzig, 1881); Toutain, in Darmberg-Saglio Dictionnaire des antiquités grecques et romaines, s.v. "Municipium"; S. DILL, Roman Society from Nero to Marcus Aurelius, c. 2 and 3 (London, 1903). For the guilds see Mommsen, De collegiis et sodaliciis Romanorum (Keil, 1843); Liebenam, Geschichte u. Organisation des röm. Vereinswesens (Leipzig, 1890). (A. M. CL.)

MUNIMENT, a word chiefly used in the plural, as a collective term for the documents, charters, title-deeds, &c. relating to the property, rights and privileges of a corporation, such as a college, a family or private person, and kept as "evidences" for defending the same. Hence the medieval usage of the word munimentum, in classical Latin, a defence, fortification, from munire, to defend.

MUNI RIVER SETTLEMENTS, or SPANISH GUINEA, a Spanish protectorate on the Guinea Coast, West Africa, rectangular in form, with an area of about 9800 sq. m. and an estimated population of 150,000. The protectorate extends inland about 135 miles and is bounded W. by the Atlantic, N. by the German colony of Cameroon, E. and S. by French Congo. The coastline, 75 m. long, stretches from the mouth of the Campo in 2° 16' N. to the mouth of the Muní in 3° 20' N., on the north arm of Corisco Bay. The small islands of Corisco (q.v.), Elobey Grande, Elobey Chico and Bana in Corisco Bay also belong to Spain.

From the estuary of the Campo the coast trends S.S.W. in a series of shallow indentations, until at the bold bluff of Cape San Juan it turns eastward and forms Corisco Bay. The coast plain, from 12 to 25 m. wide, is succeeded by the foot-hills of the Crystal Mountains, which traverse the country in a north to south direction. These are a table-land, from which rise granite hills 700 to 1200 ft. above the general level, which is about 250 ft. above the sea. The western thalweg of the Campo extends inland beyond the Spanish frontier, contains many narrow valleys and marshy depressions. The greater part of the country forms the basin of the river Benito, which, rising in French Congo a little east of the frontier, flows through the centre of the Spanish protectorate and enters the sea, after a course of 300 m., about midway between the Campo and Muní estuaries. The southern bank of the lower course of the Campo and the northern bank of the lower course of the Muní, form part of the protectorate. The mouths of the Campo and Benito are obstructed by sand bars, whereas the channel leading to the Muní is some 36 ft. deep and the river itself is more than double that depth. It is from this superiority of access that the country has been named after the Muní River. The course of all the rivers is obstructed by rapids in their descent from the table-land to the plain. The greater part of the country is covered with dense prismatic forest. This forest growth is due to the fertility of the soil and the great rainfall, Spanish Guinea with the neighbouring Cameroons country possessing one of the heaviest rain records of the world. The humidity of the climate joined to the excessive heat (the average temperature is 78° F.) makes the climate try. In the eastern parts of the protectorate the forest is succeeded by more open country. Among the most common trees are oil-palms, rubber-trees, ebony and mahogany. The forests are the home of monkeys and of innumerable birds and insects, often of gorgeous colouring. In the north-east of the country elephants are numerous.

The inhabitants are Bantu-Negroid, the largest tribe represented being the Fang (q.v.), called by the Spaniards Pammes. They are immigrants from the Congo basin and have pushed before them the tribes, such as the邦ga, which now occupy the coast-lands. The villages of the Fang are usually placed on the top of small hills. They cultivate the yam, banana and manioc, and are expert fishers and hunters. The European settlements are confined to the coast. There are trading stations at the mouths of the Campo, Benito and Muní rivers, at Bata, midway between the Campo and Benito, and at Elobey Chico. There are cocoa, coffee and other plantations, but the chief trade is in natural products, rubber, palm oil and palm kernels, and timber. Cotton goods and alcohol are the principal imports. Trade is largely in the hands of British and German firms. The annual value of the trade in 1903-1906 was about £3,000,000.

Spain became possessed of Fernando Po at the end of the 18th century, and Spanish traders somewhat later established "factories" on the neighbouring coast of the mainland, but no permanent occupation appears to have been contemplated. During the 19th century a number of treaties were concluded between Spanish naval officers and the chiefs of the lower Guinea coast, and when the partition of Africa was in progress Spain laid claim to the territory between the Campo river and the Gabun. Germany and France also claimed the territory, but in 1885 Germany withdrew in favour of France. After protracted negotiations between France and Spain a treaty was signed in June 1900 by which France acknowledged Spanish sovereignty over the coast region between the Campo and Muní rivers and the hinterland as far east as 11° 20' E. of Greenwich, receiving in return concessions from Spain in the Sahara (see Río de Oro), and the right of pre-emption over parts of the West African possessions. In 1901-1902 the eastern frontier was demarcated, being modified by concession to natural features. The newly acquired territories were placed under the superintendence of the governor-general of Fernando Po, sub-governors being stationed at Bata, Elobey Chico and Corisco.

See R. Beltrán y Rospide, La Guinea española (Madrid, 1901), and Guinea continental española (Madrid, 1903); H. Lorin, "Les colonies espagnoles du golfe de Guinée", in Quest. dip. ed. vol. xiv (1906); B. L. PERUZZI, "El Estado actual de los territorios espanoles de Guinea", in Revista de geogr. colon. y mercantil (Madrid, 1905); J. B. ROCHE, Au pays des Pahouins (Paris, 1904). A good map compiled by A. Ysart is contained on the opposite page of the map of Spain in Madrid in 1903. Consult also the works cited under FERNANDO PO.

MUNKÁCS, a town of Hungary, in the county of Berег, 220 m. E.-E. of Budapest by rail. Pop. (1900), 13,640. It is situated on the Latorcza river, and on the outskirts of the East Beskides mountains, where the hills touch the plains. Its most noteworthy buildings are the Greek Catholic cathedral and the beautiful castle of Count Schönborn. In the vicinity, on a steep hill 580 ft. high, stands the old fort of Munkács, which played an important part in Hungarian history, and was especially famous for its heroic defence by Helene Zrínyi, wife of Emerenc Tökől and mother of Francis Rákóczi II., for three years against the Austrians (1685-1688). It was afterwards used as a prison. Ypsilanti, the hero of Greek liberty, and Kazinczy, the regenerator of Hungarian letters, were confined in it. According to tradition, it was near Munkács that the Hungarians, towards the end of the 9th century, entered the country. In 1896 in the fort was built one of the "millennial
mony's " established at seven different points of the kingdom.

MUNKACSY, MICHAEL VON (1844-1900), Hungarian painter, whose real name was Michael (Miska) Leo Lieb, was the third son of Michael Lieb, a collector of salt-tax in Munkác, Hungary, and of Cécilia Röck. He was born in that town on the 20th of February 1844. In 1848 his father was arrested at Miskolce for complicity in the Hungarian revolution, and died shortly after his release; a little earlier he had also lost his mother, and became dependent upon the charity of relations, of whom an uncle, Röck, became mainly responsible for his maintenance and education. He was apprenticed to a carpenter, Langi, in 1855, but shortly afterwards made the acquaintance of the painters Fischer and Szamosy, whom he accompanied to Arad in 1858. From them he received his first real instruction in art. He worked mainly at Budapest during 1863–1865, and at this time first adopted, from patriotic motives, the name by which he is always known. In 1865 he visited Vienna, returning to Budapest in the following year, and went thence to Munich, where he contributed a few drawings to the Fliegende Blätter. About the end of 1867 he was working at Düsseldorf, where he was much influenced by Ludwig Knaus, and painted (1868–1869) his first picture of importance, "The Last Day of a Condemned Prisoner," which was exhibited in the Paris Salon in 1870, and obtained for him a médaille unique and a very considerable reputation. He had already paid a short visit to Paris in 1867, but on the 25th of January 1872 he took up his permanent abode in that city, and remained there during the rest of his life. Munckacsy's chief images of public men, which he often exhibited in the Russian £4 and which afterwards appeared in various publications—Herrmann, Beiträge zur russischen Geschichte, Staat, und Reich (Russischer Reiche (Leipzig, 1843). See Hempel, Leben Münchacs, (Bremen, 1874); Halem, Geschichte des F. M. Grafen Münchacs (Oldenburg, 1883; 2nd ed., 1838); Kostomarov, Feldmarschall Münchacs (Russische Geschichte in Biographien, v. 2).

MUNRO, SIR HECTOR (1776–1803), British general, son of Hugh Munro of Novar, in Crenarty, was born in 1776, and entered the army in 1740. He went to Bombay in 1761, in command of the 89th regiment, and in that year effected the surrender of Mahé from the French. Later, when in command of the Bengal army, he suppressed a mutiny of sepoys at Patna, and on the 23rd of October 1764 won the victory of Buxar against Shuja-ud-Dowlah, the nawab wazir of Oudh, and Mir Kasim, which ranks amongst the most decisive battles ever fought in India. Returning home, he became in 1768 M.P. for the Inverness Burghs, which he continued to represent in parliament for more than thirty years, though a considerable portion of this period was spent in India, whither he returned in 1779 to take command of the Madras army. In that year he took Pondicherry from the French, but in 1780 he was defeated by Hyder Ali near Conjeeveram, and forced to fall back on St. Thomas's Mount. There Sir Eyre Coote took over command of the army, and in 1781 won a signal victory against Hyder Ali at Porto Novo, where Munro was in command of the right division. Negapatam was taken by Munro in November of the same year; and in 1782 he returned to England. He died on the 27th of December 1805.

MUNRO, HUGH ANDREW JOHNSTONE (1810–1885), British scholar, was born at Elgin on the 19th of October 1819. He was educated at Shrewsbury school, where he was one of Kennedy's first pupils, and proceeded to Trinity College, Cam- bridge, and took his B.A. in 1836. He became a fellow of his college in 1840, second classic and first chancellor's medallist in 1842, and fellow of his college in 1843. He became classical lecturer at Trinity College, and in 1869 was elected to the newly-founded chair of Latin at Cambridge, but resigned it in 1872. The great work on which his reputation is mainly based is his edition of Lucretius, the fruit of the labour of many years (text only, v, 1860; text, commentary and translation, 2 vols., 1864). As a textual critic his knowledge was profound and his judgment unrivalled; and he made close archaeological studies by frequent travels in Italy and Greece. In 1867 he published an improved text of Aeneis with commentary, and in the following year a text of Horace with critical introduction, illustrated by specimens of ancient gems selected by C. W. King. His knowledge and taste are nowhere better shown than in his Criticisms and Eulogiums of Catullus (1878). He was a master of the art of Greek and Latin verse composition. His contributions to the famous volume of Shrewsbury verse, Sabrinas corolla, are among the most remarkable of a remarkable collection. His Translations into Latin and Greek Verse were privately printed in 1884. Like his translations into English, they are characterized by minute fidelity to the original, but never cease to be idiomatic. He died at Rome on the 30th of March 1885. See Memoir by J. D. Duff, prefixed to a re-issue of the trans. of Lucretius in "Bucoli's Classical Library." (1888)

MUNRO, MONRO or MONROE, ROBERT (d. c. 1688), Scots general, was a member of a well-known family in Ross-shire, the Munroes of Foulis. With several of his kinsmen he served in the continental wars under Gustavus Adolphus; and he
appears to have returned to Scotland about 1638, and to have taken some part in the early incidents of the Scottish rebellion against Charles I. In 1642 he went to Ireland, nominally as second in command under Alexander Leslie, but in fact in chief command of the Scottish contingent against the Catholic rebels. After the Battle of Benburb and plundering works in April 1642, and inef-
tually attempting to subdue Sir Phelip O'Neill, Munro succeeded in taking prisoner the earl of Antrim at Dunlucce. The arrival of Owen Roe O'Neill in Ireland strengthened the cause of the rebels (see O'NEILL), and Munro, who was poorly supplied with provisions and war materials, showed little activity. Moreover, the civil war in England was now creating confusion among parties in Ireland, and the king was anxious to come to terms with the Catholic rebels, and to enlist them on his own behalf against the parliament. The duke of Ormonde, Charles's lieutenant-gener- al in Ireland, acting on the king's orders, signed a cessation of hostilities with the Catholics on the 15th of September 1643, and exerted himself to despatch aid to Charles in England. Munro in Ulster, holding his commission from the Scottish parliament, did not recognize the armistice, and his troops accepted the solemn league and covenant, in which they were joined by many English soldiers who left Ormonde to join him. In April 1644 the English parliament entrusted Munro with the command of all the forces in Ulster, both English and Scots. He thereupon seized Belfast, made a raid into the Pale, and unsuccess- fully attempted to gain possession of Dundalk and Drogheda. His force was weakened by the necessity for sending troops to Scotland to withstand Montrose; while Owen Roe O'Neill was strengthened by receiving supplies from Spain and the pope. On the 5th of June 1646 was fought the battle of Benburb, whereafter the wide and viscous Montgomery was routed; and Munro, but suffered him to withdraw in safety to Carrickfergus. In 1647 Ormonde was compelled to come to terms with the English parliament, who sent commissioners to Dublin in June of that year. The Scots under Munro refused to surrender Carrick-
fergus and Belfast when ordered by the parliament to return to Scotland, and Munro was superseded by the appointment of Monk to the chief command in Ireland. In September 1648 Carrickfergus was delivered over to Monk by treachery, and Munro was taken prisoner. He was committed to the Tower of London, where he remained a prisoner for five years. In 1654 he was permitted by Cromwell to reside in Ireland, where he had estates in Ireland. He was then appointed to office under Lord Protector. Munro continued to live quietly at Comber, Co. Down, for many years, and probably died there about 1680. He was in part the original of Dugal Dalgetty in Sir Walter Scott's Legend of Montrose.


MUNRO, SIR THOMAS (1761-1827). Anglo-Indian soldier and statesman, was born at Glasgow on the 27th of May 1761, the son of a merchant. Educated at Glasgow University, he was at first intended to enter his father's business, but in 1789 he was appointed to an infantry cadetship in Madras. He served with his regiment during the hard-fought war against Hyder Ali (1780-83), and again in the first campaign against Tippoo (1790-92). He was then chosen as one of four military officers to administer the Baramahal, part of the territory acquired from Tippoo, where he remained for seven years, learning the principles of revenue survey and assessment which he afterwards applied throughout the presidency of Madras. After the final downfall of Tippoo in 1799, he spent a short time restoring order in Kanara; and then for another seven years (1800-1807) he was placed in charge of the norther districts "ceded" by the nizam of Hyderabad, where he introduced the ryotwari system of land revenue. After a long furlough in England, during which he gave valuable evidence upon matters connected with the renewal of the company's charter, he returned to Madras in 1814 with special instructions to reform the judicial and police systems. On the outbreak of the Pindari War in 1817, he was appointed as brigadier-general to command the reserve division formed to reduce the southern territories of the Peshwa. Of his signal services on this occasion Cantonment (see Cantonment) and Madras were cited in the House of Commons: "He went into the field with not more than five or six hundred men, of whom a very small proportion were Europeans... Nine forts were surrendered to him or taken by assault on his way; and at the end of a silent and scarcely observed progress he emerged... leaving everything secure and tranquil behind him." In 1820 he was appointed governor of Madras, where he remained for the systems of revenue assessment and general administration which substantially remain to the present day. His official minutes, published by Sir A. Arbuthnot, form a manual of experience and advice for the modern civilian. He died of cholera on the 6th of July 1827, while on tour in the "ceded" districts, where his name is preserved by more than one memorial. An equestrian statue of him, by Chantrey, stands in Madras city.

See biographies by G. R. Gleig (1830), Sir A. Arbuthnot (1881) and J. Bradshaw (1894).

MUNshi, or Moonoos, the Urdu name of a writer or secretary, used in India of the native language teachers or secretaries employed by Europeans.

MÜNSTER, GEORG, COUNT ZU (1776-1844), German palae-onologist, was born on the 17th of February 1776. He formed a famous collection of fossils, which was ultimately secured by the Bavarian state, and formed the nucleus of the palaeontological museum at Munich. Count Münster assisted Goldfuss in his great work Petrefacta Germaniae. He died at Bayreuth on the 23rd of December 1844.

MÜNSTER, SEBASTIAN (1489-1552), German geographer, mathematician and Hebraist, was born at Ingelheim in the Palatinate. After studying at Heidelberg and Tübingen, he entered the Franciscan order, but abandoned it for Lutheran-ism about 1529. Shortly afterwards he was appointed court preacher at Heidelberg, where he also lectured in Hebrew and Old Testament exegesis. From 1536 he taught at Basel, where he published his Cosmographia universalis in 1544, and where he died of the plague on the 23rd of May 1552. A disciple of Elias Levi, he was the first German to edit the Hebrew Bible (2 vols., fol., Basel, 1534-1535); this edition was accom-
pounded by a new Hebrew translation and a large number of annota-
tions. He published more than one Hebrew grammar, and was the first to prepare a Grammatica haldeaica (Basel, 1527). His lexicographical labours included a Dictionarium haldeaicum (1527), and a Dictionarium irlinique, of Latin, Greek and Hebrew (1530). But his most important work was his Cosmo-
graphia, which also appeared in German as a Beschreibung aller Länder, the first detailed, scientific and popular description of the world in Münster's native language, as well as a supreme effort of geographical study and literature in the Reformation period. In this Münster was assisted by more than one hundred and twenty collaborators.

The most valued edition of the Cosmographia or Beschreibung is that of 1550, enlarged for the portrait and its city and costume pictures. Besides the works mentioned above, we may notice Münster's Germaniae descriptio of 1530, his Nume oris of 1532, his Mapa Europae of 1536, his Rhetia of 1538, his editions of Strasburg, Mela and Ptolemy, his Historia of 1538-1540 and among non-geographical treatises his Horologographia, 1531, on dialling (see Dial), his Organum uranicum of 1536 on the planetary motions, and his Rudimenta mathematica of 1551. His published maps numbered 140.

See V. Hantzsch, Sebastian Münster (1898), in vol. xviii. of the Publications of the Royal Society of Sciences, Saxony, Historical-Philological Section).

MÜNSTER, a town of Germany, in the district of Upper Alsace, 16 m. from Colmar by rail, and at the foot of the Voges Mountains. Pop. (1905), 6078. Its principal industries are spinning, weaving and bleaching. The town owes its origin to a Benedictine abbey, which was founded in the 7th century, and at one time it was a free city of the empire. In its
neighbourhood is the ruin of Schwarzenberg. The Münstertal, or Gregorieland, is watered by the river Ficht, is famous for its cheese.


**MÜNSTER**, a town of Germany, capital of the Prussian province of Westphalia, and formerly the capital of an important bishopric. It lies in a sandy plain on the Dortmund-Emms canal, at the junction of several railways, 107 m. S.W. of Bremen on the line to Cologne. Pop. (1885), 44,460; (1905) 81,468. The town preserves its medieval character, especially in the "Prinzipal-Markt" and other squares, with their lofty gabled houses and arcades. The fortifications were dismantled during the 18th century, their place being taken by gardens and promenades. Of the many churches of Münster the most important is the cathedral, one of the most striking in Germany, although disfigured by modern decorations. It was rebuilt in the 13th and 14th centuries, and exhibits a combination of Romanesque and Gothic forms; its chapter-house is specially fine. The beautiful Gothic church of St Lambert (14th century) was largely rebuilt after 1868; on its tower, which is 312 ft. in height, hang three iron cages in which the bodies of John of Leiden and two of his followers were exposed in 1536. The church of St Ludger, erected in the Romanesque style about 1170, was extended in the Gothic style about 200 years later; it has a tower with a picturesque lantern. The church of St Maurice, founded about 1070, was rebuilt during the 13th century, and the Gothic church of Our Lady dates from the 14th century. Other noteworthy buildings are the town-hall, a fine Gothic building of the 14th century, and the Stadtkeller, which contains a collection of early German paintings. The room in the town-hall called the Friedens Saal, in which the peace of Westphalia was signed in October 1648, contains portraits of many ambassadors and princes who were present at the ceremony. The Schloss, built in 1767, was formerly the residence of bishops of Münster. The private houses, many of which were the winter residences of the nobility of Westphalia, are admirable examples of German domestic architecture in the 16th, 17th and 18th centuries. The university of Münster, founded after the Seven Years' War and closed at the beginning of the 19th century, was reopened as an academy in 1818, and again attained the rank of a university in 1902. It possesses faculties of theology, philosophy and law. In connexion with it are botanical and zoological gardens, several scientific collections, and a library of 120,000 volumes. Münster is the seat of a Roman Catholic bishop and of the administrative and judicial authorities of Westphalia, and is the headquarters of an army corps. The Westphalian society of antiquaries and several other learned bodies also have their headquarters here. Industries include weaving, dyeing, brewing and printing, and the manufacture of furniture and machines. There is a brisk trade in cattle, grain and other products of the neighbourhood.

**History.**—Münster is first mentioned about the year 800, when Charlemagne made it the residence of Ludger, the newly appointed bishop of the Saxons. Owing to its distant situation from any available river or important highway, the growth of the settlement round the monasterium was slow, and it was not until after 1186 that it received a charter, the name Münster having supplanted the original name of Minegardevoord about a century earlier. During the 13th and 14th centuries the town was one of the most prominent members of the Hanseatic League. At the time of the Reformation the citizens were inclined to adopt the Protestant doctrines, but the excesses of the Anabaptists led in 1535 to the armed intervention of the bishop and to the forcible suppression of all divergence from the older faith. The Thirty Years' War, during which Münster suffered much from the Protestant armies, was terminated by the peace of Westphalia, sometimes called the peace of Münster, because it was signed here on the 24th of October 1648. The authority of the bishops, who seldom resided at Münster, was usually somewhat limited, but in 1661 Bishop Christoph Bernhard von Galen took the place by force, built a citadel, and deprived the citizens of many of their privileges. During the Seven Years' War Münster was occupied both by the French and by their foes. Towards the close of the 18th century the town was recognized as one of the intellectual centres of Germany.

The bishopric of Münster embraced an area of about 2500 sq. m., and contained about 350,000 inhabitants. Its bishops, who resided generally at Ahaus, were princes of the empire. In the 17th century Bishop Galen, with his army of 20,000 men, was so powerful that his alliance was sought by Charles II. of England and other European sovereigns. The bishopric was secularized and its lands annexed to Prussia in 1803.

See Geibis, *Merkwürdigkeiten der Stadt Münster* (1877); Erhard, *Das heilige Stad Münster* (1837); A. Tibus, *Die Stadt Münster* (Münster, 1882); Hellinghaus, *Quellen und Forschungen zur Geschichte der Stadt Münster* (Münster, 1898); Pieper, *Die alte Universität Münster* 1771-1818 (Münster, 1902). See also Tübingen, *Geschichte des Stifts Münster unter C. B. von Galen* (Münster, 1865).

**MÜNSTER**, a province of Ireland occupying the S.W. part of the island. It includes the counties Clare, Tipperary, Limerick, Kerry, Cork and Louth, in part of Leinster, &c. Owing to the occupation of Ireland by the Milesians, Münster (Umbra) became nominally a provincial kingdom; but as the territory was divided between two families there was constant friction and it was not until 327 that Oiliol Ollum established himself as king over the whole. In 248 he divided his kingdom between his two sons, giving Desmond (q.v.) to Eoghan and Thomond (Tuadh-Mumha) or north Munster to Cormac. He also stipulated that the rank of king of Munster should belong in turn to their descendants. In this way the kingship of Munster survived until 1194; but there were kings of Desmond and Thomond down to the 16th century. Munster was originally divided into three parts, the present province, excepting that it included the district of Ely, which belonged to the O'Carrons and formed a part of the present King's County. During the 16th century, however, Thomond was for a time included in Connaught, being declared a county under the name of Clare (q.v.) by Sir Henry Sidney. Part of Munster had been included in the system of shiring generally attributed to King John. In 1570 a provincial presidency of Munster (as of Connaught) was established by Sidney, Sir John Perrot being the first president, and lasted until 1672. Under Perrot a practically new shiring was carried out.

**MÜNSTER AM STEIN**, a watering-place of Germany, in the Prussian Rhine province, on the Nahe, 23 m. S. of Kruenzech, on the motorway from Königswinter to Strassburg. Pop. (1905), 915. Above the village are the ruins of the castle of Stein-graffenstein (12th century), formerly a seat of the count palatine of the Rhine, which was destroyed by the French in 1689, and those of the castle of Ebernburg, the ancestral seat of the lords of Sickingen, and the birthplace of Franz von Sickingen, the famous landsknecht captain and protector of Ulrich von Hutten, to whom a monument was erected on the slope near the ruins in 1890. The spa (sulphate and carbonate springs), specific in cases of feminine disorders, is visited by about 5000 patients annually.

See Welsch, *Das Sol- und Thermalbad Münster am Stein* (Kreuznach, 1886) and Messerschmidt, *Führer durch Bad Kreuznach und Münster am Stein* (Kreuznach, 1905).

**MÜNSTERBERG, HUGO** (1863- ). German-American physiologist, was born at Danzig. Having been extraordinary professor at Freiburg-im-Breisgau, he became in 1892 professor of experimental psychology at Harvard University. Among his more important works are Beiträge zur experimentellen Psychologie (4 vols., Freiburg, 1889-1892); *Psychology and Life* (New York, 1899); *Grundzüge der Psychologie* (Leipzig, 1900); *American Traits from the Point of View of a German* (Boston, 1895); *Educational Psychology* (New York, 1901); *Science and Idealism* (New York, 1906); *Philsophie der Werte* (Leipzig, 1908); *Aus Deutsch-Amerika* (Berlin, 1908); *Psychology and Crime* (New York, 1908). He has been prominently identified with the modern developments of experimental psychology.
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(see Psychology), and his sociological writings display the acuteness of a German philosophic mind as applied to the study of American life and manners.

MÜNSTERBERG, a town of Germany, in the Prussian province of Silesia, on the Oblau, 36 m. by rail S. of Breslau. Pop. (1905), 8475. It is partly surrounded by medieval walls. It has drains of drain-pipes and fireproof bricks; there are also sulphur springs. Münsterberg was formerly the capital of the principality of the same name, which existed from the 14th century down to 1791, when it was purchased by the Prussian crown. Near the town is the former Cistercian abbey of Heinrichau.

MUNTÀNER, RAMON (1265-1337?), Catalan historian, was born at Peralada (Catalonia) in 1265. The chief events of his career are recorded in his chronicle. He accompanied Roger de Flor to Sicily in 1300, was present at the siege of Messina, served in the expedition of the Almogavares against Asia Minor, and became the first governor of Gallipoli. Later he was appointed governor of Jerba or Zerbi, an island in the Gulf of Gabes, and finally entered the service of the infante of Majorca. On the 17th of May 1325 (some editions give the year 1333) he began his Chronica, o descrizion de fetes, e hanzas del seny rey Don Jaume Primer, in obedience, as he says, to the express command of God who appeared to him in a vision. Muntaner's book, which was first printed at Valencia in 1538, is the chief authority for the events of his period, and his narrative, though occasionally perfunctory, uncritical and egotistical, is faithful and vivid. He is said to have died in 1336. His chronicle is most accessible in the edition published by Karl Lanz at Stuttgart in 1844.

MUNTJAC, the Indian name of a small deer typifying the genus Cervulus, all the members of which are indigenous to the southern and eastern parts of Asia and the adjacent islands, and are separated by marked characters from all their allies. For the distinctive features of the genus see Deer. As regards general characteristics, all muntjacs are small compared with the majority of deer, and have long bodies and rather short limbs and neck. The antlers of the bucks are small and simple; Muntjacs are solitary animals, even two being rarely seen together. They are fond of hilly ground covered with forests, in the dense thickets of which they pass most of their time, only coming to the skirts of the woods at morning and evening to graze. They carry the head and neck low and the hind-quarters high, their action in running being peculiar and not elegant, somewhat resembling the pace of a sheep. Though with no power of sustained speed or extensive leaping, they are remarkable for flexibility of body and facility of creeping through tangled underwood. A popular name with Indian sportsmen is "harking deer," on account of the alarm-cry—a kind of short shrill bark, like that of a fox, but louder. When attacked by dogs the males use their sharp canines, which inflict deep and even dangerous wounds.

In the Indian muntjac the height of the buck is from 20 to 22 in.; allied types, some of which have received distinct names, occur in Burma and the Malay Peninsula and Islands. Among these, the Burmese C. muntjac grandicornis is noteworthy on account of its large antlers. The Tibetan muntjac (C. lachrymans), from Moupin in eastern Tibet and Hangchow in China, is somewhat smaller than the Indian animal, with a bright reddish-brown coat. The smallest member of the genus (C. reevesi) occurs in southern China and has a reddish-brown coat, spotted with white, and a head and neck of white. The last-mentioned species, by its small rounded ears, general brown coloration, and minute antlers, connects the typical muntjacs with the small tufted deer or tufted muntjacs of the genus Euphaedra of eastern China and Tibet. These last have coarse bristly hair of a purplish-brown colour with light markings, very large head-tufts, almost concealing the minute antlers, of which the pedicles do not extend as ribs down the face. They include E. cephalophus of Tibet, E. michianus of Ningpo, and E. sanchensis of the mountains of Ichang.

MÜNZER, THOMAS (c. 1459—1523), German religious enthusiast, was born at Stolberg in the Harz near the end of the 15th century, and educated at Leipzig and Frankfort, graduating in theology. He held preaching appointments in various places, and his restless nature prevented him from remaining in one position for any length of time. In 1520 he became a preacher at the church of St Mary, Zwickau, and his rude eloquence, together with his attacks on the monks, soon raised him to influence. Aided by Nicholas Storch, he formed a society the principles of which were akin to those of the Taborites, and claimed that he was under the direct influence of the Holy Spirit. His zeal for the purification of the Church by casting out all unbelievers brought him into conflict with the governing body of the town, and he was compelled to leave Zwickau. He then went to Prague, where his preaching won numerous adherents, but his violent language brought about his expulsion from this city also. At Easter 1523 Münzner came to Allstedt, and was soon appointed preacher at the church of St John, where he made extensive alterations in the services. His violence, however, aroused the hostility of Luther, in retaliation for which Münzner denounced the Wittenberg teaching. His preaching soon produced an uproar in Allstedt, and after holding his own for some time he left the town and went to Mühlhausen, where Heinrich Pfeiffer was already preaching doctrines similar to his own. The union of Münzner and Pfeiffer caused a disturbance in this city and both were expelled. Münzner went to Nuremberg, where he issued a writing against Luther, who had been mainly instrumental in bringing about his expulsion from Saxony. About this time his teaching became still more violent. He despised established governments, and advocated the abdication of the monarchs of the Holy Roman Empire. After living in south Germany he returned to Mühlhausen, overthrew the governing body of the city, and established a communal theocracy. The Peasants' War had already broken out in various parts of Germany; and as the peasantry around Mühlhausen were imbued with MüNZER'S teaching, he collected a large body of men to plunder the surrounding country. He established his camp at Frankenhausen; but on the 15th of May 1525 the peasants were dispersed by Philipp, landgrave of Hesse, who captured MüNzer and executed him on the 27th at Mühlhausen. Before his
death he is said to have written a letter admitting the justice of his sentence.

His Aussergeärtliche Empfohlung des falschen Glaubens has been edited by R. Jordan (Mühlhausen, 1901), and a life of Müntzer, Die Geschichte des Münzingers der dörischizingen Uffir, has been attributed to Philip Melanchthon (Hagenau, 1525). See G. T. Strobel, Leben, Schriften und Lehren Thomä Münzers (Nuremberg, 1795); J. K. Seidemann, Thomas Müntzer (Leipzig, 1832); W. J. Thome, and Heinrich von Poerort (Göttingen, 1889); G. Wolfrau, Thomas Münzer in Allsiedt (Jena, 1852).

MUNZINGER, WERNER (1832-1875), Swiss linguist and traveller, was born at Olten in Switzerland, on the 21st of April 1832. After studying natural science, Oriental languages and history, at Bern, Munich and Paris, he went to Egypt in 1852 and spent a year in Cairo perfecting himself in Arabic. Entering a French mercantile house, he went as leader of a trading expedition to various parts of the Red Sea, fixing his quarters at Massawa, where he acted as French consul. In 1855 he removed to Keren, the chief town of the Bogos, in the north of Abyssinia, which country he explored during the next six years. In 1861 he joined the expedition under T. von Heuglin to Central Africa, but separated from him in November in northern Abyssinia, proceeding along the Gash and Athbara to Khartum. Thence, having meantime succeeded Heuglin as leader of the expedition, he travelled in 1862 to Kordofan, failing, however, in his attempt to reach Darfur and Wadai. After a short stay in Europe in 1865, Munzinger returned to the north and north-east border-lands of Abyssinia, and in 1865, the year of the annexation of Massawa by Egypt, was appointed British consul at that town. He rendered valuable aid to the Abyssinian expedition of 1867-68, among other things exploring the almost unknown Abar country. In acknowledgment of his services he received the C.B. In 1868 he was appointed French consul at Massawa, and in 1870, was named by the Khedive Ismail, governor of the 1875 Munzingers, started for Ankober with a force of 350 men, being accompanied by an envoy from Menelek. The desert country to be traversed was in the hands of hostile tribes, and on reaching Lake Aussa the expedition was attacked during the night by Gallas—Munzinger, with his wife and nearly all his companions, being killed.

Munzingers contributions to the knowledge of the country, people and languages of north-eastern Africa are of solid value. See Proc. R.G.S., vol. xiii.; Journ. R.G.S., vols. xxxi., xxxii., and xxxiii. (obituary notice); Potsmannen Mitteilungen für 1858, 1867, 1872 et seq.; Dietlicher and Weber, Werner Münzinger, ein Lebensbild (1875); J. v. Keller-Zschokke, Werner Münzinger Pasha (1860). Munzingers published the following works: Über die Sitten und das Recht der Bogos (1859); Ostafrikanische Studien (1864); 2nd ed., 1883; his most valuable book; Die deutsche Expedition in O斯塔frika (1855); Vocabulaire de la langue de Yépi (1865), besides papers in the geographical serials referred to, and a memoir on the northern borders of Abyssinia in the Zeitschrift für allgemeine Erdkunde, new series, vol. iii.

MURAD, OF AMURATH, the name of five Ottoman sultans.

Murad I., surnamed Khudavendigahar (1319-1389), was the son of Orhan and the Greek princess Nilofar, and succeeded his father in 1359. He was the first Turkish monarch to obtain a definite footing in Europe, and his main object throughout his career was to extend the European dominions of Turkey. The revolt of the prince of Caramania interfered with the realization of this plan, and trouble was caused from this quarter more than once during his reign until the decisive battle of Konia (1387), when the power of the prince of Caramania was broken.

The state of Europe facilitated Murad's projects: civil war and anarchy prevailed in most of the countries of Central Europe, where the feudal system was at its last gasp, and the small Balkan states were divided by mutual jealousies. The capture of Adrianople, followed by other conquests, brought about a coalition under the king of Hungary against Murad, but his able lieutenant Lalashahin, the first beylerbey of Rumelia, defeated the Hague forces in the battle of the Murata in 1563. In 1566 the king of Servia was defeated at Samokov, and the frontier was pushed forward to pay tribute. Kustendil, Philippiopolis and Nish fell into the hands of the Turks; a renewal of the war in 1581 led to the capture of Sofia two years later. Europe was now aroused; Lazar, king of Servia, formed an alliance with the Albanians, the Hungarians and the Moldavians against the Turks. Murad hastened back to Europe and met his enemies on the field of Kosovo (1389). Victory finally inclined to the side of the Turks. When the rout of the Christians was complete, a Servian named Milosh Kabilovich penetrated to Murad's tent on pretence of communicating an important secret to the sultan, and stabbed the conqueror. Murad was of independent character and remarkable intelligence. He was fond of pleasure and luxury, cruel and cunning. Long relegated to the command of a distant province in Asia, while his brother Suleiman occupied an enviable post in Europe, he became revengeful; thus he exercised great cruelty in the repression of the rebellion of his son Prince Sauji, the first instance of a sultan's son taking arms against his father. Murad transferred the Ottoman capital from Brusa to Adrianople, where he built a palace and added many embellishments to the town. The development of the feudal system of timars and ziamets and its extension to Europe was largely his work.

Murad II. (1405-1451) succeeded his father Mahommed I. in 1421. The attempt of his uncle Prince Mustafa to usurp the throne, supported as it was by the Greeks, gave trouble at the outset of his reign, and led to the unsuccessful siege of Constantinople in 1422. Murad maintained a long struggle against the Bosnians and Hungarians, in the course of which Turkey sustained many severe reverses through the valour of Janos Hunyadi. Accordingly in 1444 he concluded a treaty at Szegedin for ten years, by which he renounced all claim to Servia and recognized George Brancovich as its king. Shortly after this, being deeply affected by the death of his eldest son Prince Ala-ud-in, he abdicated in favour of Mahommed, his second son, then fourteen years of age. But the treacherous attack, in violation of treaty, by the Christian powers, imposing too hard a task on the inexperienced young sovereign, Murad returned from his expedition, enraged his unfortunate enemies at the battle of Varna (November 10, 1444), and again withdrew to Magnesia. A revolt of the janissaries induced him to return to power, and he spent the remaining six years of his life in warfare in Europe, defeating Hunyadi at Kossovo (October 17-19, 1448). He died at Adrianople in 1451, and was buried at Brusa. By some considered as a fanatical devotee, and by others as given up to mysticism, he is generally described as kind and gentle in disposition, and devoted to the interests of his country.

Murad III. (1496-1555), was the eldest son of Selim II, and ascended the throne in 1497. His accession marks the definite beginning of the decline of the Ottoman power, which had only been maintained under Selim II. by the genius of the all-powerful grand vizier Mahommed Sokollu. For, though Sokollu remained in office until his assassination in October 1578, his authority was undermined by the harem influences, which with Murad III. were supreme. Of these the most powerful was that of the sultan's chief wife, named Safi (the pure), a beautiful Venetian of the noble family of Baffo, whose father had been governor of Corfu, and who had been captured as a child by Turkish corsairs and sold into the harem. This lady, in spite of the sultan's sensuality and of the efforts, temporaril successul, to supplant her in his favour, retained her ascendancy over him to the last. Murad had none of the qualities of a ruler. He was good-natured, though cruel enough on occasion: his accession had been marked by the murder, according to the
custom then established, of his five brothers. His will-power had early been undermined by the opium habit, and was further weakened by the sensual excesses that ultimately killed him. Nor had he any taste for rule; his days were spent in the society of musicians, buffoons and poets, and he himself dabbled in verse-making of a mystic tendency.

His one attempt at reform, the order forbidding the sale of intoxicants so as to stop the growing intemperance of the janissaries, broke down on the opposition of the soldiery. He was the first sultan to share personally in the proceeds of the corruption which was undermining the state, realizing especially large sums by the sale of offices. This corruption was fatally apparent in the army, the feudal basis of which was sapped by the confiscation of fields for the benefit of nominees of favourites of the harem, and by the intrusion, through the same influences of foreigners and rayahs into the corps of janissaries, of which the discipline became more and more relaxed and the temper increasingly turbulent. In view of this general demoralization not even the victorious outcome of the campaigns in Georgia, the Crimea, Daghestan, Yemen and Persia (1578–1590) could prevent the decay of the Ottoman power; indeed, by weakening the Musulman states, they hastened the process, since they facilitated the advance of Russia to the Black Sea and the Caspian.

Murad, who had welcomed the Persian War as a good opportunity for ridding himself of the presence of the janissaries, whom he dreaded, had sooncause to fear their triumphant return. Incensed by the debasing of the coinage, which robbed them of part of their pay, they invaded the Divan clamouring for the heads of the sultan’s favourite, the beylerbey of Rumelia, and of the defterdar (finance minister), which were thrown to them (April 3, 1580). This was the first time that the janissaries had invaded the palace: a precedent to be too often followed. The outbreak of another European war in 1592 gave the sultan an opportunity of ridding himself of their presence. Murad died in 1595, leaving to his successor a legacy of war and anarchy.

It was under Murad III, that England’s relations with the Porte began. Negotiations were opened in 1570 with Queen Elizabeth through certain British merchants; in 1580 the first Capitulations with England were signed; in 1583 William Harebone, the first British ambassador to the Porte, arrived at Constantinople, and in 1593 commercial Capitulations were signed with England granting the same privileges as those enjoyed by the French. (See Capitulations.)

Murad IV. (1611–1640) was the son of Sultan Ahmed I., and succeeded his uncle Mustafa I. in 1623. For the first nine years of his reign his youth prevented him from taking more than an observer’s part in affairs. But the lessons thus learnt were sufficiently striking to mould his whole character and policy. The minority of the sultan gave full play to the anarchic elements in the state; the soldiery, spahis and janissaries, conscious of their power and reckless through impunity, rose in revolt whenever the whim seized them, demanding privileges and the heads of those who displeased them, not sparing even the sultan’s favourites. In 1631 the spahis of Asia Minor rose in reprisal for an act of protest against the deposition of the grand vizier Khosrev; their representatives crowded to Constantinople, stoned the new grand vizier, Hafiz, in the court of the palace, and pursued the sultan himself into the inner apartments, clamouring for seventeen heads of his advisers and favourites, on penalty of his own deposition. Hafiz was surrendered, a voluntary martyr; other ministers were deposed; Mustafa Pasha, agha of the janissaries, was saved by his own troops. But Mured was now beginning to assert himself. Khosrev was executed in Asia Minor by his orders; a plot of the spahis to depose him was frustrated by the loyalty of Koes Mahomed, agha of the janissaries, and of the spahi Rum Mahomed (Mahomed the Greek); and on the 20th of May 1632, by a successful personal appeal to the loyalty of the janissaries, Murad crushed the rebels, whom he surrounded in the Hippodrome. At the age of twenty he found himself possessed of effective autocratic power.

His severity has remained legendary. Death was the penalty for the least offence, and no past services—as Koes Mahomed was to find to his cost—were admitted in extenuation. The use of tobacco, coffee, opium and wine were forbidden on pain of death; eighteen persons are said to have been put to death in a single day for infringing this rule. During his whole reign, indeed, supposed offenders against the sultan’s authority were done to death, singly or in thousands. The tale of his victims is said to have exceeded 100,000.

But if he was the most cruel, Murad was also one of the most manly, of the later sultans. He was of gigantic strength, which he maintained by constant physical exercises. He was also fond of hunting, and for this reason usually lived at Adrianople. He broke through the alleged tradition, bequeathed by Suleiman the Magnificent to his successors, that the sultan should not command the troops in person, and took command in the Persian war which led to the capture of Bagdad (1638) and the conclusion of an honourable peace (May 7, 1639). Early in 1640 he died, barely twenty-nine years of age. The cause of his death was acute gout brought on by excessive drinking. In spite of his drunkenness, however, Murad was a bigoted Sunni, and the main cause of his campaign against Persia was his desire to extirpate the Shia heresy. In the intervals of his campaigns and cruelties the sultan would amuse his entourage by exhibiting feats of strength, or compose verses, some of which were published under the pseudonym of Muradi.

See, for details of the lives of the above, J. von Hammer-Purgstall, Geschichte des osmanischen Reiches (Fest, 1840), where further authorities are cited.

Murad V. (1840–1894), eldest son of Sultan Abd-ul-Mejid, was born on the 21st of September 1840. On the accession of his uncle Abd-ul-Aziz, Prince Mahomed Murad Effendi—as he was then called—was deprived of all share in public affairs and imprisoned, owing to his opposition to the sultan’s plan for altering the order of succession. On the deposition of Abd-ul-Aziz on the 30th of May 1876, Murad was haled from his prison by a mob of softas and soldiers of the “Young Turkey” party under Suleiman Pasha, and proclaimed “emperor by the grace of God and the will of the people.” Three months later, however, his health, undermined by his long confinement, gave way; and on the 31st of August he was deposed to make room for his younger brother, Abd-ul-Hamid II. He was kept in confinement in the Cheregan palace till his death on the 29th of August 1904.

See Kéfény, Mourad V., prince, sultan, prisonnier d’état 1840–1876 (Paris, 1878); Djemaleddin Bey, Sultan Murad V., the Turkish Dynasty Mystery, 1870–1895 (London, 1895).

MURAENA, the name of an eel common in the Mediterranean, and highly esteemed by the ancient Romans; it was afterwards applied to the whole genus of fishes to which the Mediterranean species belongs, and which is abundantly represented in tropical and sub-tropical seas, especially in rocky parts or on coral reefs. Some ninety species are known. In the majority a long fin runs from the head along the back, round the tail to the vent,
but all are destitute of pectoral and ventral fins. The skin is scaleless and smooth, in many species ornamented with varied and bright colours, so that these fishes are frequently mistaken for snakes. The mouth is wide, the jaws strong and armed with formidable, generally sharp-pointed, teeth, which enable the *Muraena* not only to seize its prey (which chiefly consists of other fishes) but also to inflict serious, and sometimes dangerous, wounds on its enemies. It attacks persons who approach its places of concealment in shallow water, and is feared by fishermen.

Some of the tropical *Muraenae* exceed a length of 10 ft., but most of the species, among them the Mediterranean species, attain to only half that length. The latter, the "morena" of the Italians and the *Muraena helena* of ichthyologists, was considered by the ancient Romans to be one of the greatest delicacies, and was kept in large ponds and aquaria. It is not confined to the coasts of Southern Europe, but is spread over the Indian Ocean, and is not uncommon on the coasts of Australia. Its body is generally of a rich brown, marked with large yellowish spots, each of which contains smaller brown spots.

**Mural Decoration**, a general term for the art of ornamenting wall surfaces. There is scarcely one of the numerous branches of decorative art which has not at some time or other been applied to this purpose. For what may be called the practical or furnishing point of view, see *Wall-coverings*. Here the subject is treated rather as part of the history of art.

1. *Reliefs sculptured in Marble or Stone.*—This is the oldest method of wall-decorations, of which numerous examples exist. The tombs and temples of Egypt are rich in this kind of mural ornament of various dates, extending over nearly 5000 years. These sculptures are, as a rule, carved in low relief; in many cases they are "counter-sunk," that is, the most projecting parts of the figures do not extend beyond the flat surface of the ground. Some unfinished reliefs discovered in the rock-cut tombs of Thebes show the manner in which the sculptor set to work. The plain surface of the stone was marked out by red lines into a number of squares of equal size. The use of this was probably twofold: first, as a guide in enlarging the design from a small drawing, a method still commonly practiced; second, to help the artist to draw his figures with just proportions, following the strict canons which were laid down by the Egyptians. No excessive realism or individuality of style arising from a careful study of the life-model was permitted. When the surface had been covered with these squares, the artist drew with a brush dipped in red the outlines of his relief, and then cut round them with his chisel.

When the relief was finished, it was, as a rule, entirely painted over with much minuteness and great variety of colours. More rarely the ground was left the natural tint of the stone or marble, and only the figures and hieroglyphs painted. In the case of sculpture in hard basalt or granite the painting appears often to have been omitted altogether. The absence of perspective effects and the severe self-restraint of the sculptors in the matter of composition show a sense of artistic fitness in this kind of decoration. That the rigidity of these sculptured pictures did not arise from want of skill or observation of nature on the part of the artists is apparent when we examine their representations of birds and animals; the special characteristics of each creature and species were unerringly caught by the ancient Egyptian, and reproduced in stone or colour, in a half-symbolic way, suggesting those peculiarities of form, plumage, or movement which are the "differentia" of each, other ideas bearing less directly on the point being eliminated.

The subjects of these mural sculptures are endless; almost every possible incident in man's life here or beyond the grave is rendered with the closest detail. The tomb of TIh at Sakkarah (about 4500 B.C.) has some of the finest and earliest specimens of these mural sculptures, especially rich in illustra-

1 See also *Ceramics; Mosaic; Painting; Sculpture; Tapestry; Tiles; also Egypt; Art and Archaeology; Greek Art; Roman Art; &c.*

During the earliest times—more than 4000 years before our era—there appear to have been exceptions to this rule.

Fig. 1.—Assyrian Relief, on a Marble Wall-slab from the Palace of Sardana-palus at Nineveh.

in long horizontal bands, and their reserved conventional treatment are somewhat similar to those of ancient Egypt, but they show a closer attention to anatomical truth and a greater love for dramatic effect than any of the Egyptian reliefs. As in the art of Egypt, birds and animals are treated with greater realism than human figures. A relief in the British Museum, representing a lioness wounded by an arrow in her spine and dragging helplessly her paralysed hind legs, affords an example of wonderful truth and pathos. Remarkable technical skill is shown in all these sculptures by the way in which the sculptors have obtained the utmost amount of effect with the smallest possible amount of relief, in this respect calling strongly to mind a similar peculiarity in the work of the Florentine Donatello.

ThesalipalacesatMashitaonthe bajjroadinMoab, built by the Sasanian Chosroes II. (A.D. 614-629), is ornamented on the exterior with beautiful surface sculpture in stone. The designs are of peculiar interest as forming a link between Assyrian and Byzantine art, and they are not remotely connected with the decoration on Moslem buildings of comparatively modern date.3

Especially in Italy during the middle ages a similar treatment 4 Among the Mashita carvings occurs that oldest and most widely spread of all forms of Aryan ornament—the sacred tree between two animals. The sculptured slab over the "lion-gate" at Mycenae has the other common variety of this motive—the fret-saw between the beasts. These designs, occasionally varied by figures of human worshippers instead of the beasts, survived long after their meaning had been forgotten; even down to the present day they frequently appear on carpets and other textiles of Oriental manufacture.
of marble in low relief was frequently used for wall-decoration. The most notable example is the beautiful series of reliefs on the west front of Orvieto Cathedral, the work of Giovanni Pisano and his pupils in the early part of the 14th century. These are small reliefs, illustrative of the Old and New Testaments, of graceful design and skillful execution. A growth of branching foliage serves to unite and frame the tiers of subjects.

Of a widely different class, but of considerable importance in the history of mural decoration, are the beautiful reliefs, sculptured in stone and marble, with which Moslem buildings in many parts of the world are ornamented. These are mostly geometrical patterns of great intricacy, which cover large surfaces, frequently broken up into panels by bands of more flowing ornament or Arabic inscriptions. The mosques of Cairo, India and Persia, and the domestic Moslem buildings of Spain are extremely rich in this method of decoration. In western Europe, especially during the 15th century, stone panelled-work with rich tracery formed a large part of the scheme of decoration in all the more splendid buildings. Akin to this, though without actual relief, is the stone tracery—inlaid flush into rough flint walls—which was a mode of ornament largely used for enrichment of the exteriors of churches in the Romanesque and Norman periods. It is almost peculiar to the district, and is an example of the skill and taste with which the medieval builders adapted their method of ornamentation to the materials in hand.

2. Marble Veneer.—Another widely used method of mural decoration has been the application of thin marble lineings to wall-surfaces, the decorative effect being produced by the natural beauty of the marble itself and not by sculptured reliefs. One of the oldest buildings in the world, the so-called "Temple of the Sphinx" among the Giza pyramids, is built of great blocks of granite, the inside of the rooms being lined with slabs of semi-transparent African alabaster about 3 in. thick. In the 1st century A.D. the veneers of richly coloured marbles were largely used by the Romans to decorate brick and stone walls. Pliny (H. N. xxxvi. 6) speaks of this practice as being a new and degenerate invention in his time. Many examples exist at Pompeii and in other Roman buildings. Numerous Byzantine churches, such as St. Saviour's at Constantinople, and St. George's, Thessalonica, have the lower part of the internal walls richly ornamented in this way. It was commonly used to form a dado, the upper part of the building being covered with mosaic. The cathedral of Monreale and other Siculo-Norman buildings owe a great deal of their splendour to these lineings of richly variegated marbles. In most cases the main surface is of light-coloured marble or alabaster, inlaid bands of darker tint or coloured mosaic being used to divide the surface into panels. The peculiar Italian-Gothic of northern and central Italy during the 14th and 15th centuries, and at Venice some centuries earlier, relied greatly for its effects on this treatment of marble. St Mark's at Venice and the cathedral of Florence are magnificent examples of this work used externally. Both inside and out most of the richest examples of Moslem architecture owe much to this method of decoration; the mosques and palaces of India and Persia are in many cases completely lined with the most brilliant sorts of marble of contrasting tints.

3. Wall-Lineings of Glazed Bricks or Tiles.—This is a very important class of decoration, and from its almost imperishable nature, its richness of colour, and its brilliance of surface is capable of producing a splendour of effect only rivalled by glass mosaics. In the less important form—that of bricks modelled or stamped in relief with figures and inscriptions, and then coated with a brilliant colour in siliceous enamel—it was largely used by the ancient Egyptians and Assyrians as well as by the later Sasanians of Persia. In the 11th and 12th centuries the Moslems of Persia brought this art to great perfection, and used it on a large scale, chiefly, though not invariably, for internal walls. The main surfaces were covered by thick earthenware tiles, overlaid with a white enamel. These were not rectangular, but of various shapes, mostly some form of a star, arranged so as to fit closely together. Delicate and minute patterns were then painted on the tiles, after the first firing, in a copper-like colour with strong metallic lustre, produced by the deoxidization of a metallic salt in the process of the second firing. Bands and friezes with Arabic inscriptions, modelled boldly in high relief, were used to break up the monotony of the surface. In these, as a rule, the projecting letters were painted blue, and the flat ground enriched with very minute patterns in the lustre-colour.

This combination of bold relief and delicate painting produces great vigour and richness of effect, equally telling whether viewed in the mass or closely examined tile by tile. In the 15th century lustre-colours, though still largely employed for plates, vases and other vessels, especially in Spain, were little used for tiles; and another class of ware, rich in the variety and brilliance of its colours, was extensively used by Moslem builders all over the Mahommedan world. The most sumptuous sorts of tiles used for wall-coverings are those of the so-called "Rhodian" and Damascene wares, the work of Persian potters at many places. Those made at Rhodes are coarsely executed in comparison with the produce of the older potteries at Isfahan and Damascus (see Ceramics). These are rectangular tiles of earthenware, covered with a white "slip," and painted in brilliant colours with slight conventionalized representations of various flowers, especially the rose, the hyacinth and the carnation. The red used is applied in considerable body, so as to stand out in slight relief. Another class of design is more geometrical, forming regular repeats; but the most beautiful compositions are those in which the natural growth of trees and flowers is imitated, the branches and blossoms spreading over a large surface covered by hundreds of tiles without any repetition. One of the finest examples is the "Mecca wall" in the mosque of Ibrahim Agha, Cairo; and other Egyptian mosques are adorned in the same way (fig. 2). Another variety, the special production of Damascus, has the design almost entirely executed in blue. It was about A.D. 1600, in the reign of Shah Abbas I., that this class of pottery was brought to greatest perfection, and it is in Persia that the most magnificent examples are found, dating from the 12th to the 17th centuries. The most remarkable examples for beauty and extent are the mosque at Tabriz, built by Ali Khoja in the 12th century, the ruined tomb of Sultan Khodabend (A.D. 1303-1316) at Sultaniyas, the palace of Shah Abbas I. and the tomb of Abbas II. (d. A.D. 1666) at Isfahan, all of which buildings are covered almost entirely inside and out.

Another important class of wall-tiles are those manufactured by the Spanish Moors, called "azulejos," especially during the 14th century. These are in a very different style, being designed.
to suggest or imitate mosaic. They have intricate interlacing geometrical patterns marked out by lines in slight relief; brilliant enamel colours were then burned into the tile, the projecting lines forming boundaries for the pigments. A rich effect is produced by this combination of relief and colour. They are mainly used for dadoes about 4 ft. high, often surmounted by a band of tiles with painted inscriptions. The Alhambra and Generalife Palaces at Granada, begun in the 13th century, but mainly built and decorated by Yūsuf I and Mahommed V. (A.D. 1313-1351), and the Alcazar at Seville have the most beautiful examples of these “azulejos.” The latter building chiefly owes its decorations to Pedro the Cruel (A.D. 1364), who employed Moorish workmen for its tile-coverings and other ornaments. Many other buildings in southern Spain are enriched in the same way, some as late as the 16th century.

Almost peculiar to Spain are a variety of wall-tile the work of Italians in the 16th and 17th centuries. These are effective, though rather coarsely painted, and have a rich yellow as the predominant colour. The Casa de Pilatos and Isabel’s Chapel in the Alcazar Palace, both at Seville, have the best specimens of these, dating about the year 1500. In other Western countries tiles have been used more for pavements than for wall-decoration.

4. Wall-Coverings of Hard Stucco, frequently enriched with Reliefs.—The Greeks and Romans possessed the secret of making a hard kind of stucco, creamy in colour, and capable of receiving a polish like that of marble; it would stand exposure to the weather. Those of the early Greek temples which were built, not of marble, but of stone, such as the Doric temples at Aegina, Phigaleia, Paestum and Agrigentum, were all entirely coated inside and out with this material, an admirable surface for the further polychromatic decoration with which all Greek buildings seem to have been ornamented. Another highly artistic use of stucco among the Greeks and Romans, for the interiors of buildings, consisted in covering the walls and vaults with a smooth coat, on which while still wet the outlines of figures, groups and other ornaments were sketched with a point; more stucco was then applied in lumps and rapidly modelled into delicate relief before it had time to set. Some tombs in Magna Graecia of the 4th century B.C. are decorated in this way with figures of nymphs, cupids, animals and wreaths, all of which are models of grace and elegance, and remarkable for the dexterous way in which a few rapid touches of the modelling tool or thumb have produced a work of the highest artistic beauty (fig. 3). Roman specimens of this sort of decoration are common, fine examples have been found in the baths of Titus and numerous tombs near Rome, as well as in many of the houses of Pompeii.

These are mostly executed with great skill and frequently with good taste, though in some cases, especially at Pompeii, elaborate architectural compositions with awkward attempts at effects of violent perspective, modelled in slight relief on flat wall-surfaces, produce an unpleasing effect. Other Pompeian examples, where the surface is divided into flat panels, each containing a figure or group, have great merit for their delicate richness, without offending against the canons of wall-decoration, one of the first conditions of which is that no attempt should be made to disguise the fact of its being a solid wall and a flat surface.

The Moslem architects of the middle ages made great use of stucco ornament both for external and internal walls. The stucco is modelled in high or low relief in great variety of geometrical patterns, alternating with bands of more flowing ornament or long Arabic inscriptions. Many of their buildings, such as the mosque of Tulūn at Cairo (A.D. 879), owe nearly all their beauty to this fine stucco work, the purely architectural shell of the structure being often simple and devoid of ornament. These stucco reliefs were, as a rule, further decorated with delicate painting in gold and colours. The Moorish tower at Segovia in Spain is a good example of this class of ornament used externally. With the exception of a few bands of brick and the stone quoins at the angles, the whole exterior of the tower is covered with a network of stucco reliefs in simple geometrical patterns. The Alhambra at Granada and the Alcazar at Seville have the richest examples of this work. The lower part of the walls is lined with marble or tiles to a height of about 4 ft. and above that in many cases the whole surface is encrusted with these reliefs, the varied surface of which, by producing endless gradations of shadow, takes away any possible harshness from the brilliance of the gold and colours (fig. 4).

During the 16th century, and even earlier, stucco wall-reliefs were used with considerable skill and decorative effect in Italy, England and other Western countries. Perhaps the most graceful
examples are the reliefs with which Vasari in the 16th century
encrusted pillars and other parts of the court in the Florentine
Palazzo Vecchio, built of plain stone by Michelozzo in 1454.
Some are of flowing vines and other plants winding spirally
round the columns. The English examples of this work are
effectively designed, though coarser in execution. The outside
of a half-timbered house in the market-place at Newark-upon-
Trent has high reliefs in stucco of canopied figures, dating from
the end of the 15th century. The counties of Essex and Suffolk
are rich in examples of this work used externally; and many
16th-century houses in England have fine internal stucco
decoration, especially Hardwicke Hall (Derbyshire), one of the
rooms of which has the upper part of the wall enriched with
life-sized stucco figures in high relief, forming a deep frieze all
round.

5. Sgraffito.—This is a variety of stucco work used chiefly in
Italy from the 16th century downwards, and employed only for
exteriors of buildings, especially the palaces of Tuscany and
northern Italy. The wall is covered with a coat of stucco made
black by an admixture of charcoal; over this a second thin coat
of white stucco is laid. When it is all hard the design is produced
by cutting and scratching away the white skin, so as to show the
black under-coat. Thus the drawing appears in black on a white
ground. This work is effective at a distance, as it requires a
bold style of handling, in which the shadows are indicated by
cross-hatched lines more or less near together.1 Flowing arabesques mixed with grotesque figures occur most frequently in
gsgrafito. In recent years the sgraffito method has been revived;
and the result of Mr Moody's experiments may be seen on the
east wall of the Royal College of Science in Exhibition Road,
London.

6. Stamped Leather.—This was a magnificent and expensive
form of wall-hanging, chiefly used during the 16th and 17th
centuries. Skins, generally of goats or calves, were well tanned
and cut into rectangular shapes. They were then covered with
silver leaf, which was varnished with a transparent yellow lacquer
making the silver look like gold. The skins were then stamped
or embossed with patterns in relief, formed by heavy pressure
from metal dies, one in relief and the other sunk. The reliefs
were then painted by hand in many colours, generally brilliant
1 A good description of the process is given by Vasari, Tre arti del
disegno, cap. xxvi.

silver leaf, which was varnished with a transparent yellow lacquer
making the silver look like gold. The skins were then stamped
or embossed with patterns in relief, formed by heavy pressure
from metal dies, one in relief and the other sunk. The reliefs
were then painted by hand in many colours, generally brilliant

in tone. Italy and Spain (especially Cordova) were important
seats of this manufacture; and in the 17th century a large
quantity was produced in France. Fig. 5 gives a good example
of Italian stamped leather of the 16th century. In England,
chiefly at Norwich, this manufacture was carried on in the
17th and 18th centuries. In durability and richness of effect
stamped leather surpasses most other forms of movable wall-
decoration.

7. Painted Cloth.—Another form of wall-hanging, used most
largely during the 15th and 16th centuries, and in a less extensive
way a good deal earlier, is canvas painted to imitate tapestry.
English medieval inventories both of ecclesiastical and domestic
goods frequently contain items such as these: "stayed cloths for
hangings," "painted cloths with stories and batailes," or
"painted cloths of beyond sea work," or "of Flanzer's work." Many
good artists working at Ghent and Bruges during the first
half of the 15th century produced fine work of this class, as well
as designs for real tapestry. Several of the great Italian artists
devoted their skill in composition and invention to the painting
of these wall-hangings. The most important existing example
is the series of paintings of the triumph of Julius Caesar executed
by Andrea Mantegna (1485-1492) for Ludovico Gonzaga, duke
of Mantua, and now at Hampton Court. These are usually,
but wrongly, called "cartoons," as if they were designs meant
for their original purpose of real tapestries; it is not in reality,
as the paintings themselves were used as wall-hangings. They are
the same in number as the compartments of the tapestry, and each,

Fig. 5.—Italian Stamped Leather; 16th century.

each compartment, 9 ft. square, was separated from the next
by a pilaster. They form a continuous procession, with life-
sized figures, remarkable for their composition, drawing and
delicate colouring—the latter unfortunately much disguised by
"restoration." Like most of these painted wall-hangings,
they are executed in tempera, and rather thinly painted, so
that the pigment might not crack off through the cloth falling
slightly into folds. Another remarkable series of painted cloth
hangings are those at Reims Cathedral. In some cases dyes
were used for this work. A MS. of the 15th century gives
receipts for "painted cloth," showing that sometimes they were
dyed in a manner similar to that of the painted stucco
indigo vat, as well as a receipt for removing or
"discharging" the colour from a cloth already dyed. Another
method employed was a sort of "encaustic" process; the cloth
was rubbed all over with wax, and then painted in tempera;
hot wax was then applied so that the colours sank into the melting
wax, and were thus firmly fixed upon the cloth.

8. Printed Hangings and Wall-Papers.—The printing of
various textiles with dye-colours and mordants is probably one of
the most ancient arts. Pliny (ii. N. xxxv.) describes a
dying process employed by the ancient Egyptians, in which
the pattern was probably formed by printing from blocks.
Various methods have been used for this work—wood blocks in
relief, engraved metal plates, stencil plates and even hand-
painting; frequently two or more of these methods have
been employed for the same pattern. The use of printed stuffs
is of great antiquity among the Hindus and Chinese, and
was certainly practised in western Europe in the 13th century,
and perhaps earlier. The Victoria and Albert Museum has
13th-century specimens of block-printed silk made in Sicily,
of beautiful design. Towards the end of the 14th century a
great deal of block-printed linen was made in Flanders,
and largely imported into England.

Wall-papers did not come into common use in Europe till the
18th century, though they appear to have been used much
earlier by the Chinese. A few rare examples exist in England
which may be as early as the 17th century; these are imitations,
generally in flock, of the fine old Florentine and Genoese cut
velvets, and hence the style of the design in no way shows the
date of the wall-paper, the same traditional patterns being
reproduced for many years with little or no change. Machinery
enabling paper to be made in long strips was not invented till
the end of the 18th century, and up to that time wall-papers were printed on small square pieces of hand-made paper, difficult to hang, disfigured by numerous joints, and comparatively costly; on these accounts wall-papers were slow in supersedng the older modes of mural decoration. A little work by Jackson of Battersea, printed in London in 1744, throws some light on the use of wall-papers at that time. He gives reduced copies of his designs, mostly taken from Italian pictures or antique sculpture during his residence in Venice. Instead of flowing patterns covering the wall, his designs are all pictures—landscapes, architectural scenes or statues—treated as panels, with plain paper or painting between. They are all printed in oil, with wooden blocks worked with a rolling press, apparently an invention of his own. They are all in the worst possible taste, and yet are offered as great improvements on the Chinese papers which he says were then in fashion. Fig. 6 is a good English example of 18th-century wall-paper printed on squares of stout hand-made paper 22 in. wide. The design is apparently copied from an Indian chintz.

In the 19th century in England, a great advance in the designing of wall-papers was made by William Morris and his school.

9. Painting.—This is naturally the most important and the most widely used of all forms of wall-decoraion, as well as perhaps the earliest.

Egypt (see Egypt: Art and Archaeology) is the chief storehouse of ancient specimens of this, as of almost all the arts.

Owing to the intimate connexion between the sculpture and painting of early times, the remarks above as to subjects and treatment under the head of Egyptian wall-sculpture will to a great extent apply also to the paintings. It is an important fact, which testifies to the antiquity of Egyptian civilization, that the earliest paintings, dating more than 4000 years before our era, are also the cleverest both in drawing and execution. In later times the influence of Egyptian art, especially in painting, was important even among distant nations. In the 6th century B.C. Egyptian colonists, introduced by Cambyses into Persepolis, influenced the painting and sculpture of the great Persian Empire and throughout the valley of the Euphrates. In a lesser degree the art of Babylon and Nineveh had felt considerable Egyptian influence several centuries earlier. The same influence affected the early art of the Greeks and the Etrurians, and it was not till the middle of the 5th century B.C. that the further development and perfecting of art in Greece obliterated the old traces of Egyptian mannerism. After the death of Alexander the Great, when Egypt came into the possession of the Lagidae (320 B.C.), the tide of influence flowed the other way, and Greek art modified though it did not seriously alter the characteristics of Egyptian painting and sculpture, which retained much of their early formalism and severity. Yet the increased sense of beauty, especially in the human face, derived from the Greeks was counterbalanced by loss of vigour; art under the Ptolemies became a dull copyism of earlier traditions.

The general scheme of mural painting in the buildings of ancient Egypt was complete and magnificent. Columns, mouldings and other architectural features were enriched with patterns in brilliant colours; the flat wall-spaces were covered with figures-subjects, generally in horizontal bands, and the ceilings were ornamented with sacred symbols, such as the vulture or painted blue and studded with gold stars to symbolize the sky. The wall-paintings are executed in tempera on a thin skin of fine lime, laid over the brick, stone or marble to form a smooth and slightly absorbent coat to receive the pigments, which were most brilliant in tone and of great variety of tint. Not employing fresco, the Egyptian artists were not restricted to "earth colours," but occasionally used purples, pinks and greens which would have been destroyed by fresh lime. The blue used is very beautiful, and is generally laid on in considerable body—it is frequently a "small" or deep-blue glass, coloured by copper oxide, finely powdered. Red and yellow ochre, carbon-black, and powdered chalk-white are most largely used. Though in the paintings of animals and birds considerable realism is often seen (fig. 7), yet for human figures certain conventional colours are employed, e.g. white for females' flesh, red for the males, or black to indicate people of negro race. Heads are painted in profile, and little or no shading is used. Considerable knowledge of harmony is shown in the arrangement of the colours; and otherwise harsh combinations of tints are softened and brought into keeping by thin separating lines of white or yellow. Though at first sight the general colouring, if seen in a museum, may appear crude, yet it should be remembered that the internal paintings were much softened by the dim light in Egyptian buildings, and those outside were subdued by contrast with the bright sunshine under which they were always seen.

The rock-cut sepulchres of the Etrurians supply the only existing specimens of their mural painting; and, unlike the tombs of Egypt, only a small proportion appear to have been decorated in this way. The actual dates of these paintings are very uncertain, but they range possibly from about the 8th century B.C. down to almost the Christian era. The tombs which possess these paintings are

Fig. 6.—Early 18th-century Wall-Paper. (22 in. wide.)

Fig. 7.—Egyptian Wall-Painting of the Ancient Empire in the Bulak Museum.
MURAL DECORATION

mostly square-shaped rooms, with slightly-arched or gabled roofs, excavated in soft sandstone or tufa hillside. The earlier ones show Egyptian influence in drawing and in composition: they are broadly designed with flat unshaded tints, the faces in profile, except the eyes, which are drawn as if seen in front. Colours, as in Egypt, are used conventionally—male flesh red, white or pale yellow for the females, black for demons. In one respect these paintings differ from those of the Egyptians; few colours are used—red, brown, and yellow ochres, carbon-black, lime or chalk-white, and occasionally blue are the only pigments. The rock-walls are prepared by being covered with a thin skin of lime stucco, and lime or chalk is mixed in small quantities with all the colours; hence the restriction to "earth pigments," made necessary by the dampness of these subterranean chambers. The process employed was in fact a kind of fresco, though the stucco ground was not applied in small patches only sufficient for the day's work; the dampness of the rock was enough to keep the stucco skin moist, and so allow the necessary infiltration of colour from the surface. Many of these paintings when first discovered were fresh in tint and uninjured by time, but they are soon dulled by exposure to light. In the course of centuries great changes of style naturally took place; the early Egyptian influence, probably brought to Etruria through the Phoenician traders, was succeeded by an even more strongly-marked Greek influence—at first archaic and stiff, then developing into great beauty of drawing, and finally yielding to the Roman spirit, as the technique became advanced under their powerful but inartistic Roman conquerors.

Throughout this succession of styles—Egyptian, Greek and Graeco-Roman—there runs a distinct undercurrent of individuality due to the Etruscans themselves. This appears not only in the drawing but also in the choice of subjects. In addition to pictures of banquets with musicians and dancers, hunting and racing scenes, the workshops of different craftsmen and other domestic subjects, all thoroughly Hellenic in sentiment, other paintings occur which are very un-Greek in feeling. These represent the judgment and punishment of souls in a future life. Mantus, Charun and other infernal deities of the Rasena, hideous in aspect and armed withhammers, or furies depicted as black-bearded demons winged and brandishing live snakes, terrify or torture shrinking human souls. Others, not the earliest in date, represent human sacrifices, such as those at the tomb of Patroclus—a class of subjects which, though Homeric, appears rarely to have been selected by Greek painters. The constant import into Etruria of large quantities of fine Greek painted vases appears to have contributed to keep up the supremacy of Hellenic influence during many centuries, and by their artistic superiority to have prevented the development of a more original and native school of art. Though we now know Etruscan painting only from the tombs, yet Pliny mentions (H. N. xxxv. 3) that fine wall-paintings existed in his time, with colours yet fresh, on the walls of ruined temples at Ardea and Lavinium, executed, he says, before the founding of Rome. As before mentioned, the actual dates of the existing paintings are uncertain. It cannot therefore be asserted that any existing specimens are much older than 600 B.C., though some, especially at Veii, certainly appear to have the characteristics of more remote antiquity. The most important of these paintings have been discovered in the cemeteries of Veii, Caere, Tarquinii, Vulci, Cervetri and other Etruscan cities.

Even in Egypt the use of colour does not appear to have been more universal than it was among the Greeks (see GREEK ART), who applied it freely to their marble statues and reliefs, the whole of their buildings inside and out, and who no doubt were the forerunners of the somberfaced Roman artists. They appear to have cared little for pure form, and not to have valued the delicate ivory-like tint and beautiful texture of their fine Pentelic and Parian marbles, except as a ground for coloured ornament. A whole class of artists, called ἀγαλματοφύλετοι ἐγγαματί, were occupied in colouring marble sculpture, and their services were very highly valued. ¹ In some cases, probably for the sake of

¹ This process, circumlito, is mentioned by Pliny (H. N. xxxv. 40).

hiding the joints and getting a more absorbent surface, the marble, however pure and fine in texture, was covered with a thin skin of stucco made of mixed lime and powdered marble. An alabaster sarcophagus, found in a tomb near Corneto, and now in the Etruscan museum at Florence, is decorated outside with beautiful purely Greek paintings, executed on a stucco skin as hard and smooth as the alabaster. The pictures represent combats of the Greeks and Amazons. The colouring, though rather brilliant, is simply treated, and the figures are kept strictly to one plane without any attempt at complicated perspective. Other valuable specimens of Greek art, found at Herculanenum and now in the Naples Museum, are some small paintings, one of girls playing with dice, another of Theseus and the Minotaur. These are painted with miniature-like delicacy on the bare surface of marble slabs; they are almost monochromatic, and are of the highest beauty both in drawing and in gradations of shadow—quite unlike any of the Greek vase-paintings. The first-mentioned painting is signed ΛΕΞΑΝΔΡΟΣ ΑΘΗΝΑΙΟΣ. It is probable that the strictly archaic paintings of the Greeks, such as those of Polygnotus in the 5th century B.C., executed with few and simple colours, had much resemblance to those on vases, but Pliny is wrong when he asserts that, till the time of Apelles (c. 350-310 B.C.), the Greek painters only used black, white, red and yellow.² Judging from the peculiar way in which the Greeks and their imitators the Romans used the names of colours, it appears that they paid more attention to tones and shades and to the colour they produced than to the actual names. Thus Greek painters used "alabaster green," "glaucus," "gold," and Latin colour-names are now untranslatable. Homer's "winelike sea" (ἀλβα), Sophocles's "wine-coloured ivy" (Οἰδ. Κάλ.), and Horace's "purpureus oler" probably refer less to what we should call colour than to the chromatic strength of the various objects and their more or less strong powers of reflecting light, either in motion or when at rest. Nor have we any word like Virgil's "flavirus," which could be applied both to a lady's hair and to the leaf of an olive-tree.³

During the best periods of Greek art the favourite classes of subjects were scenes from: poetry, especially Homer and contemporary history. The names ποιητικῆς καὶ στοάς αἰθήματα were given to many public buildings from their walls being covered with paintings. Additional interest was given to the historical subjects by the introduction of portraits; e.g. in the great picture of the battle of Marathon (490 B.C.), on the walls of the στοὰς αἰθήματα in Athens, portraits were given of the Greek generals Miltiades, Callimachus, and others. This picture was painted about forty years after the battle by Polycnemos and Micon. One of the earliest pictures recorded by Pliny (xxxv. 8) represented a battle of the Magnesians (c. 716 B.C.); it was painted by Bularchus, a Lydian artist, and bought at a high price by King Canaudles. Many other important Greek historical paintings are mentioned by Pausanias and earlier writers. The Pompeian mosaic of the defeat of the Persians by Alexander is probably a Romanized copy from some celebrated Greek painting; it obviously was not designed for mosaic work.

Landscape painting appears to have been unknown among the Greeks, even as a background to figure-subjects. The poems especially of Homer and Sophocles show that this was not through want of appreciation of the beauties of nature, but partly, probably, because the main object of Greek painting was to tell some definite story, and also from their just sense of artistic fitness, which prevented them from attempting in their mural decorations to disguise the flat solidity of the walls by delusive effects of aerial perspective and distance.

It is interesting to note that even in the time of Alexander the Greek taste for the somewhat archaic works of the earlier painters were still appreciated. In particular Aristotle praises Polygnotus.

² Pliny's remarks on subjects such as this should be received with caution. He was neither a trained artist nor a practising artist.

³ So also a meaning unlike ours is attached to Greek technical words—by τόνες they meant, not "tone," but the gradations of light and shade, and by ἀμφότηρι the relations of colour. See Pliny, H. N. xxxv. 5; and Ruskin, Mod. Painters, pt. iv. cap. 13.
both for his power of combining truth with idealization in his portraits and for his skill in depicting men's mental characteristics; on this account he calls him ὁ θεόγραφος. Lucian too praises Polygnotus alike for his grace, drawing and colouring. Later painters, such as Zeuxis and Apelles, appear to have produced easel pictures more than mural-paintings, and these, being easy to move, were mostly carried off to Rome by the early emperors. Hence Pausanias, who visited Greece in the time of Hadrian, mentions but few works of the later artists. Owing to the lack of existing specimens of Greek painting it would be idle to attempt an account of their technical methods, but no doubt those employed by the Romans described below were derived with the rest of their art from the Greeks. Speaking of their stucco, Pliny refers its superiority over that made by the Romans to the fact that it was always made of lime by plaster and pounded in a mortar before being laid on the wall; he is here speaking of the thick stucco in many coats, not of the thin skin mentioned above as being laid on marble. Greek mural painting, like their sculpture, was chiefly used to decorate temples and public buildings, and comparatively rarely either for tombs or private buildings—at least in the days of their early republican simplicity.

A large number of Roman mural paintings (see also Roman Art) now exist, of which many were discovered in the private houses and baths of Pompeii, nearly all dating between A.D. 62, when the city was ruined by an earthquake, and A.D. 79, when it was buried by Vesuvius. A catalogue of these and similar paintings from Herculaneum and Stabiae, compiled by Professor Helbig, comprises 1566 specimens. The excavations in the baths of Titus and other ancient buildings in Rome, made in the early part of the 16th century, excited the keenest interest and admiration among the painters of that time, and largely influenced the later art of the Renaissance. These paintings, especially the "grotesques" or fanciful patterns of scroll-work and pilasters mixed with semi-realistic foliage and figures of boys, animals, and birds, designed with great freedom of touch and inventive power, seem to have fascinated Raphael during his later period, and many of his pupils and contemporaries. The "loggic" of the Vatican and of the Farnesina palace are full of carefully studied 16th-century reproductions of these highly decorative paintings. The excavations in Rome have brought to light some mural paintings of the 1st century A.D., perhaps superior in execution even to the best of the Pompeian series (see Plate).

The range of subjects found in Roman mural paintings is large—mythological, legendary, religious, and human life and even landscape (the latter generally on a small scale, and treated in an artificial and purely decorative way), and lastly history. Pliny mentions several large and important historical paintings, such as those with which Valerius Maximus Messalla decorated the walls of the Curia Hostilia, to commemorate his own victory over Hiero II. and the Carthaginians in Sicily in the 3rd century B.C. The earliest Roman painting recorded by Pliny was by Fabius, surnamed Pictor, on the walls of the temple of Salus, executed about 300 B.C. (H.N. xxxv. 4).

Pliny (xxxv. 1) laments the fact that the wealthy Romans of his time preferred the costly splendours of marble and porphyry wall-linings to the more artistic decoration of paintings by good artists. Historical painting seems then to have gone out of fashion; among the numerous specimens now existing few from Pompeii represent historical subjects; one has the scene of Massinissa and Sophonisba before Scipio, and another of a riot between the people of Pompeii and Nocera, which happened 59 A.D.

Mythological scenes, chiefly from Greek sources, occur most frequently: the myths of Eros and Dionysus are especial favourites. Only five or six relate to purely Roman mythology. We have reason to think that some at least of the Pompeian pictures are copies, probably at third or fourth hand, from celebrated Greek originals. The frequently repeated subjects of Medea meditating the murder of her children and Iphigenia at the shrine of the Tauric Artemis suggest that the motive and composition were taken from the originals of these subjects by Titianes. Those of Io and Argus, the finest example of which is in the Palatine "villa of Livia" and of Andromeda and Perseus, often repeated on Pompeian walls, may be from the originals by Nicias.

In many cases these mural paintings are of high artistic merit, though they are probably not the work of the most distinguished painters of the time, but rather of a humbler class of decorators, who reproduced, without much original invention, stock designs out of some pattern-book. They are, however, all remarkable for the rapid skill and extreme "verve" and freedom of hand with which the designs are, as it were, flung on to the walls with few but effective touches. Though in some cases the motive and composition are superior to the execution, yet many of the paintings are remarkable both for their realistic truth and technical skill. The great number of copies, however, of the frescoes of Pompeii, now in the Naples Museum, is a work of the highest merit.

In the usual scheme of decoration the broad wall-surfaces are broken up into a series of panels by pilasters, columns, or other architectural forms. Some of the panels contain pictures with figure-subjects; others have conventional ornament, or hanging festoons of fruit and flowers. The lower part of the wall is painted one plain colour, forming a dado; the upper part sometimes has a well-designed frieze of flowing ornaments. In the better class of painted walls the whole is kept flat in treatment, and is free from too great subdivision, but in many cases great want of taste is shown by the introduction of violent effects of architectural perspective, and the space is broken up by column-like or pilaster-like designs, with pictures in varying scales which have little relation to their surroundings. The colouring is on the whole pleasant and harmonious—unlike the usual chromo-lithographic copies. Black, yellow, or a rich deep red are the favourite colours for the main ground of the walls, the pictures in the panels being treated separately, each with its own background.

An interesting series of early Christian mural paintings exists in various catacombs, especially those of Rome and Naples. They are of value both as an important link in the history of art and also as throwing light on the mental state of the early Christians, which was distinctively different from the Christian thought of both the earlier and later periods. The earliest paintings of about the 4th century we find Christ represented as a beardless youth, beautiful as the artist could make him, with a lingering tradition of Greek idealization, in no degree like the "Man of Sorrows" of medieval painters, but rather a kind of genius of Christianity in whose fair outward form the peace and purity of the new faith were visibly symbolized, just as certain distinct attributes were typified in the persons of the gods of ancient Greece. The favourite early subject, "Christ the Good Shepherd" (fig. 8), is represented as Orpheus playing on his lyre to a circle of beasts, the pagan origin of the picture being shown by the Phrygian cap and by the presence of lions, panthers and other incongruous animals among the listening sheep. In other cases Christ is depicted standing with a sheep borne on His shoulders like Hermes Criophoros or Hermes Psychopompos—favourite Greek subjects, especially the former, a statue of which Pausanias (ix. 22) mentions as existing at Tanagra in Boeotia. Here again the pagan origin of the type is shown by the presence in the catacomb paintings of the pan-pipes and pedum, special attributes of Hermes, but quite foreign to the notion of Christ. Though in a degraded form, a good deal survives in some of these paintings, especially in the earlier ones, of the old classical grace of composition and beauty of drawing, notably in the above-mentioned representations where old models were copied without any adaptation to their new meaning. Those of the 5th and 6th centuries follow the classical

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1 One instance only of a tomb-painting is mentioned by Pausanias (vii. 22). Some fine specimens have been discovered in the Crimea, but not of a very early date; see Stephan, Compie rendu, &c., (St Petersburg, 1878), &c.
A wall painting in the Museo Nazionale, at Rome, from a Roman villa discovered in 1878. Early Imperial style.
lines, though in a rapidly deteriorating style, until the introduction of a foreign—the Byzantine—element, which created a fresh starting-point on different lines. The old naturalism and survival of classical freedom of drawing is replaced by stiff, conventionally hieratic types, superior in dignity and strength to the feeble compositions produced by the degradation into which the native art of Rome had fallen. The designs of this second period of Christian art are similar to those of the mosaics,

such as many at Ravenna, and also to the magnificently illuminated MSS. For some centuries there was little change or development in this Byzantine style of art, so that it is impossible in most cases to be sure from internal evidence of the date of any painting. This to some extent applies also to the works of the earlier or pagan school, though, roughly speaking, it may be said that the least meritorious pictures are the latest in date.

These catacomb paintings range over a long space of time; some may possibly be of the 1st or 2nd century, e.g. those in the cemetery of Domitilla, Rome; others are as late as the 9th century, e.g. some full-length figures of St Cornelius and St Cyprian in the catacomb of St Callixtus, under which earlier paintings may be traced. In execution they somewhat resemble the Etruscan tomb-paintings; the walls of the catacomb passages and chambers, excavated in soft tufa, are covered with a thin skin of white stucco, and on that the mural and ceiling paintings are simply executed in earth colours. The favourite subjects of the earliest paintings are scenes from the Old Testament which were supposed to typify events in the life of Christ, such as the sacrifice of Isaac (Christ's death), Jonah and the whale (the Resurrection), Moses striking the rock, or pointing to the manna (Christ the water of life, and the Eucharist), and many others. The later paintings deal more with later subjects, either events in Christ's life or figures of saints and the miracles they performed. A fine series of these exists in the lower church of S. Clemente in Rome, apparently dating from the 6th to the 9th centuries; among these are representations of the passion and death of Christ—subjects never chosen by the earlier Christians, except as dimly foreshadowed by the Old Testament types. When Christ Himself is depicted in the early catacomb paintings it is in glory and power, not in His human weakness and suffering.

Other early Italian paintings exist on the walls of the church of the Tre Fontane near Rome, and in the Capella di S. Urbano alla Caffarella, executed in the early part of the 11th century. The atrium of S. Lorenzo fuori le mura, Rome, and the church of the Quattro Santi Incoronati have mural paintings of the first half of the 13th century, which show no artistic improvement over those at S. Clemente four or five centuries older.

It was not in fact till the second half of the 13th century that still traditional Byzantine forms and colouring began to be superseded by the revival of native art in Italy by the painters of Florence, Pisa and Siena. During the first centuries of the Christian era mural painting appears to have been for the most part confined to the representation of sacred subjects. It is remarkable that during the earlier centuries council after council of the Christian Church forbade the painting of figure-subjects, and especially those of any Person of the Trinity; but in vain. In spite of the zeal of bishops and others, who sometimes with their own hands defaced the pictures of Christ on the walls of the churches, in spite of threats of excommunication, the forbidden paintings by degrees became more numerous, till the walls of almost every church throughout Christendom were decorated with whole series of pictured stories. The useless prohibition was becoming obsolete when, towards the end of the 4th century, the learned Paulinus, bishop of Nola, ordered the two basilicas which he had built at Fondi and Nola to be adorned with wall-paintings of sacred subjects, with the special object, as he says, of instructing and refining the ignorant and drunken people. These painted histories were in fact the books of the unlearned, and we can now hardly realize their value as the chief mode of religious teaching in ages when none but the clergy could read or write.

During the middle ages, just as long before among the ancient Greeks, coloured decoration was used in the widest possible manner not only for the adornment of flat walls, but also for the enrichment of sculpture and all the fittings and architectural features of buildings, however, the material in be painted was plaster, stucco, marble or wood. It was only the damp and frost of northern climates that to some extent limited the external use of colour to the less exposed parts of the outsides of buildings. The varying tints and texture of smoothly worked stone appear to have given no pleasure to the medieval eye; and in the rare cases in which the poverty of some country church prevented its walls from being adorned with painted ornaments or pictures the whole surface of the stonework inside, mouldings and carving as well as flat wall-spaces, was covered with a thin coat of whitewash. Internal rough stonework was invariably concealed by stucco, forming a smooth ground for possible future paintings. Unhappily a great proportion of mural paintings have been destroyed which is so often the result of the modern taste, and still exist in England. It is difficult (and doubly so since the so-called "restoration" of most old buildings) to realize the splendour of effect once possessed by every important medieval church. From the tiled floor to the roof all was one mass of gold and colour. The brilliance of the mural paintings and richly coloured sculpture and mouldings was in harmony with the splendour of the oak-work—screens, stalls, and roofs—all decorated with gilding and painting, while the light, passing through stained glass, softened and helped to combine the whole into one mass of decorative effect. Colour was boldly applied everywhere, and thus the patchy effect was avoided which is so often the result of the modern taste. The partial use of painted ornament. Even the figure-sculpture was painted in a strong and realistic manner, sometimes by a wax encaustic process, probably the same as the circumstilio of classical times. In the accounts for expenses in decorating Orvieto cathedral wax is a frequent item among the materials used for painting. In one place it is mentioned that wax was supplied to Andrea Pisano (in 1345) for the decoration of the beautiful reliefs in white marble on the lower part of the west front.

From the 11th to the 16th century the lower part of the walls, generally 6 to 8 ft. from the floor, was painted with a dado—the favourite patterns till the 13th century being either a sort of sham masonry with a flower in each rectangular space (fig. 9), or a conventional representation of a curtain with
regular folds stiffly treated, pictures with figure-subjects

Above this dado ranges of were painted in tiers one above the other, each picture frequently surrounded by a painted frame with arch and gable of architectural design. Painted bands of chevron or other geometrical ornament till the 13th century, and flowing ornament afterwards, usually divide the tiers of pictures horizontally and form the top and bottom boundaries of the dado. In the case of a church, the end walls usually have figures to a larger scale.

On the east wall of the nave over the chancel arch there was generally a large painting of the "Doom" or Last Judgment. One of the commonest subjects is a colossal figure of St Christopher (fig. 10) usually on the nave wall opposite the principal entrance—selected because the sight of a picture of this saint was supposed to bring good luck for the rest of the day. Figures were also often painted on the jambs of the windows and on the piers and soffit of the arches, especially that opening into the chancel.

The little Norman church at Kempley in Gloucestershire (date about 1100) has perhaps the best-preserved specimen of the complete early decoration of a chancel.1 The north and south walls are occupied by figures of the twelve apostles in architectural niches, six on each side. The east wall had single figures of saints at the sides of the central window, and the stone barrel vault is covered with a representation of St John's apocalyptic vision—Christ in majesty surrounded by the evangelistic beasts, the seven candlesticks and other figures. The chancel arch itself and the jambs and mouldings of the windows have stiff geometrical designs, and over the arch, towards the nave, is a large picture of the "Doom." The whole scheme is very complete, no part of the internal plaster or stonework being undecorated with colour. Though the drawing is rude, the figures and their drapery are treated broadly and with dignity. Simple earth colours are used, painted in tempera on a plain white ground, which covers alike both the plaster of the rough walls and the smooth stone of the arches and jambs.

In the 13th century the painters of England reached a high point of artistic power and technical skill, so that paintings were produced by native artists equal, if not superior, to those of the same period anywhere on the Continent. The central paintings on the walls of the chapter-house and on the retable of the high altar of Westminster Abbey are not surpassed by any of the smaller works even of such men as Cimabue and Duccio di Buoninsegna, who were living when these Westminster paintings were executed. Unhappily, partly through the poverty and anarchy brought about by the French wars and the Wars of the Roses, the development of art in England made little progress after the beginning of the 14th century, and it

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1 See Archaeologia, vol. xlv. (1880).
chamber" from the rows of fine pictures with which its walls were covered. After the 15th century the "masonry pattern" was disused for the lower parts of walls, and the chevrony and other stiff patterns for the borders were replaced by more flowing designs. The character of the painted figures became less monumental in style; greater freedom of drawing and treatment was adopted, and they cease to recall the archaic majesty and grandeur of the Byzantine mosaics.

It may be noted that during the 14th century wall-spaces unoccupied by figure-subjects were often covered by graceful flowing patterns, drawn with great freedom and rather avoiding geometrical repetition. Fig. 12, from the church of Stanley St Leonard's, Gloucestershire, is a good characteristic specimen of 14th-century decoration; it is on the walls of the chancel, filling up the spaces between the painted figures; the flowers are blue, and the lines red on a white ground. In some cases the motive of the design is taken from encaustic tiles, as at Bengeo Church, Herts, where the wall is divided into squares, each containing an heraldic lion. This imitative notion occurs during all periods—masonry, hanging curtains, tiles and architectural features such as niches and canopies being very frequently represented, though always in a simple decorative fashion with no attempt at actual deception—not probably from any fixed principle that shams were wrong, but because the good taste of the medieval painters taught them that a flat unrealistic treatment gave the best and most decorative effect. Thus in the 15th and 16th centuries the commonest forms of unpictorial wall-decoration were various patterns taken from the beautiful damasks and cut velvets of Sicily, Florence, Genoa and other places in Italy, some form of the "pine-apple" or rather "artichoke" pattern being the favourite (fig. 13), a design which, developed partly from Oriental sources, and coming to perfection at the end of the 15th century, was copied and reproduced in textiles, printed stuffs and wall-papers with but little change down to the present century—a remarkable instance of survival in design. Fig. 14 is a specimen of 15th-century English decorative painting, copied from a 14th-century Sicilian silk damask. Diapers, powderings with flowers, sacred monograms and sprays of blossom were frequently used to ornament large surfaces in a simple way. Many of these are extremely beautiful (fig. 15).

Subjects of Medieval Wall-Paintings.—In churches and domestic buildings alike the usual subjects represented on the walls were specially selected for their moral and religious teaching; either stories from the Bible and Apocrypha, or from the lives of saints, or, lastly, symbolical representations setting forth some important theological truth, such as figures of virtues and vices, or the Scala humanae salvationis, showing the perils and temptations of the human soul in its struggle to escape hell and gain paradise—a rude foreshadowing of the great scheme worked out with such perfection by Dante in his Commedia. A fine example of this subject exists on the walls of Chaldon church, Surrey.1 In the collection of saints for paintings in England, those of English origin are naturally most frequently represented, and different districts had certain local favourites. St Thomas of Canterbury was one of the most widely popular; but few examples now remain, owing to Henry VIII's special dislike to this saint and the strict orders that were issued for all pictures of him to be Destroyed. For a similar reason most paintings of saintly popes were obliterated.

Methods of Execution.—Though Eraclius, who probably wrote before the 10th century, mentions the use of an oil-medium, yet till about the 15th century mural paintings appear to have been executed in the most simple way, in tempera mainly, with earth colours applied on dry stucco; even when a smooth stone surface was to be painted a thin coat of whitening or fine gesso was laid as a ground. In the 15th century, and perhaps earlier, oil was commonly used both as a medium for the pigments and also to make a varnish to cover and fix tempera paintings. The Van Eycks introduced the use of driers of a better kind than had yet been used, and so largely extended the application of oil-painting. Before their time it seems to have been the custom to dry wall-paintings laboriously by the use of charcoal braziers, if they were in a position where the sun could not shine upon them. This is

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1 See Collections of Surrey Archaeol. Soc. vol. v. pt. ii. (1871).
specially recorded in the valuable series of accounts for the expenses of wall-paintings in the royal palace of Westminster during the reign of Henry III., printed in *Vetusta Monumenta*, vol. vi. (1842). All the materials used, including charcoal to dry the paintings and the wages paid to the artists, are given. The materials mentioned are *plumbum album et rubrum*, viridus, vermilio, *syn dope*, *ocre*, *azu r*, *aurum*, *corn*, *collis*, *oleum*, *vernix*.

Two foreign painters were employed—Peter of Spain and William of Florence—at sixpence a day, but the English painters seem to being broken up by some such delicate reliefs as that shown in fig. 16, so its effect was never dazzling. (W. Mo.: J. H. M.)

Mural painting in England fell into disuse in the 16th century, until attempts to revive it were made in the 19th century. For domestic purposes wood panelling, stamped leather, and tapestry were chiefly used as wall-coverings. In the reign of Henry VIII., probably in part through Holbein's influence, a rather coarse tempera wall-painting, German in style, appears to have been common. A good example of arabequesque painting of this period in black and white, rudely though boldly drawn and Holbeinesque in character, was discovered in 1881 behind the panelling in one of the canons' houses at Westminster. Other examples exist at Haddon Hall (Derbyshire) and elsewhere.

Many efforts have been made in England to revive fresco painting. The Houses of Parliament bear witness to this, the principal works there being those of William Dyce and Daniel Maclise. That of G. F. Watts, whose easel work also is generally distinguished by its mural feeling, is full of serious purpose and dignity of conception. "Buono fresco" (the painting in tempera upon a freshly laid ground of plaster while wet), "spirit fresco" or Gambier-Parry method (the painting with a spirit medium upon a specially prepared plaster or canvas ground?), and "water-glass" painting (wherein the method is similar to water-colour painting on a prepared plastered wall, the painting when finished being covered with a chemical solution which hardens and protects the surface), have both been tried. Other methods are also in the experimental stage, such as that known as Keim's, which has been successfully tried by Mrs Merritt in a series of mural paintings in a church at Chilworth. Unless, however, some means can be found of enabling the actual painted wall to resist the natural dampness of the English climate, it does not seem likely that true fresco painting can ever be naturalized in Great Britain. Of two of the few modern artists entrusted with important mural work in England, Ford Madox Brown and Frederick J. Shields, the former distinguished especially for his fine series of mural paintings in the Manchester town-hall, in recent years; the latter there adopted the modern method of painting the design upon canvas in flat oil colour, using a wax medium, and afterwards affixing the canvas to the wall by means of white lead. This is a usual method with modern decorators. Mr Shields has painted the panels of his scheme of mural decoration in the chapel of the Ascension at Bayswater, London, also upon canvas in oils, and has adopted the method of fixing them to slabs of slate facing the wall so as to avoid the risk of damp from the wall itself. Friezes and frieze panels or ceilings in private houses are usually painted upon canvas in oil and affixed to the wall or inserted upon their strainers, like pictures in a frame. (Walter Crane has used fibrous plaster panels, painting in ordinary oil colours with turpentine as a medium, as in Redcross House.)

2 It was in this method that the lunette, or panel of tempera painting, and a group of painters are producing works on panel and canvas painted in tempera or fresco secco, with yolk of egg as a medium, according to the practice of the early Italian painters and the directions of Cennino Cennini. A pure luminous quality of colour is produced, valuable in mural decoration and also durable, especially under varnish. (W. C.)

**MURANO**

anc. *Amorariun*, an island in the Venetian lagoon about 1 m. north of Venice. It is 5 m. in circumference, and a large part of it is occupied by gardens. It contained 5436 inhabitants in 1901, but was once much more populous than it is at present, its inhabitants numbering 30,000. It was a favourite resort of the Venetian nobility before they began to build their villas on the mainland; and in the 15th and 16th centuries it is gardens and casinos, of which some traces remain, were famous. It was here that the literary clubs of the Venetians, the Studiosi and the Occulti, used to meet.


4 There are very pretty little drollery, or the story of the prodigal, or the German hunting in *waterwork*, is worth a thousand of these bed-hangings and these fly-bitten tapestries."

5 See *L'Anticuarios* by Lord Leighton at the Victoria and Albert Museum were painted on the plaster wall. The same painter produced a fresco at Lyndhurst Church, Hants.
The town is built upon one broad main canal, where the tidal current runs with great force, and upon several smaller ones. The cathedral, S. Donato, is a fine basilica, of the 12th century. The pavement (of 1111) is as richly inlaid as that of St Mark's, and the mosaics of the tribune are remarkable. The exterior of the tribune is beautiful, and has been successfully restored. The church of St Peter the Martyr (1306) contains a fine picture by Gentile Bellini and other works, and S. Maria degli Angeli also contains several interesting pictures. Murano has from ancient times been celebrated for its glass manufactories. When and how the art was introduced is obscure, but there are notices of it as early as the 11th century; and in 1290 Christo- foro Bariati attempted the imitation of agate and chalcedony. From the labours of his pupil Miotto sprang that branch of the glass trade which is concerned with the imitation of gems. In the 15th century the first crystals were made, and in the 17th the various gradations of colour and iridescent glass were invented, together with the composition called "avventurine"; the manufacture of beads is now a main branch of the trade. The art of the glass-workers was taken under the protection of the Government in 1275, and regulated by a special code of laws and privileges; two fairs were held annually, and the export of all materials, such as alum and sand, which enter into the composition of glass was absolutely forbidden. With the decay of Venice the importance of Murano, that of the Murano, has been diminished; but D. Salvati (1816-1890) rediscovered many of the old processes, and eight firms are engaged in the trade, the most renowned being the Venezia Murano Company and Salvati. The municipal museum contains a collection of glass illustrating the history and progress of the art.

The island of Murano was first populated by the inhabitants of Altino. It originally enjoyed independence under the rule of its tribunes and judges, and was one of the twelve confederate islands of the lagoons. In the 12th century the doge Vital Micheli II. incorporated Murano in Venice and attached it to the Sestiere of S. Croce. From that date it was governed by a Venetian nobleman with the title of podestà whose office lasted sixteen months. Murano, however, retained its local constitution of a greater and a lesser council for the transaction of municipal business, and also the right to coin gold and silver as well as its judicial powers. The interests of the town were watched at the ducal palace by a nuncio and a solicitor; and this constitution remained in force till the fall of the republic.

See Venezia e le sue Lagne; Paololetti, Il Fiore di Venezia; Bus- solin, Guida alle fabbriche vetrate di Murano; Romanin, Storia documentata di Venezia, i. 41.

MURAS, a tribe of South-American Indians living on the Amazon, from the Madeira to the Purus. Formerly a powerful people, they were defeated by their neighbours the Mundurucus in 1788. They are now partly civilized. Each village has a chief whose office is hereditary, but he has little power. The Muras are among the lowest of all Amazonian tribes.

MURAT, JOACHIM (1767-1815), king of Naples, younger son of an innkeeper at La Bastide-Fortunière in the department of Lot, France, was born on the 25th of March 1767. Destined for the priesthood, he obtained a bursary at the college of Cahors, proceeding afterwards to the university of Toulouse, where he studied canon law. His vocation, however, was certainly not sacral, and after dissipating his money he enlisted in a cavalry regiment. In 1789 he had attained the rank of maréchal des logis, but in 1790 he was dismissed the regiment for insubordination, after a period of idleness, he was enrolled through the good offices of J. B. Cavaignac, in the new Constitutional Guard of Louis XVI. (1791). In Paris he gained a reputation for his good looks, his swaggering attitude, and the violence of his revolutionary sentiments. On the 30th of May 1792, the guard having been disbanded, he was appointed sub-lieutenant in the 21st Chasseurs à cheval, with which regiment he served in the Aronne and the Pyrénées, obtaining in the latter campaign the command of a squadron. After the 9th Thermidor, however, and the proscription of the Jacobins, with whom he had conspicuously identified himself, he fell under suspicion and was recalled from the front.

Returning to Paris (1795), he made the acquaintance of Napoleon Bonaparte, another young officer out of employment, who soon gained a complete ascendancy over his vain, ambitious and unstable nature. On the 13th Vendémiaire, when Bonaparte, commissioned by Barras, beat down with cannon the armed insurrection of the Paris sections against the Convention, Murat was his most active and courageous lieutenant, and was rewarded by the lieutenant-colonelcy of the 21st Chasseurs and the appointment of first aide de camp to General Bonaparte in Italy. In the first battles of the famous campaign of 1796 Murat so distinguished himself that he was chosen to carry the captured flags to Paris. He was promoted to be general of brigade, and returned to Italy in time to be of essential service to Bonaparte at Bassano, Corona and Fort St Giorgio, where he was wounded. He was then sent on a diplomatic mission to Genoa, but returned in time to be present at Rivoli. In the advance into Tirol in the summer of 1797 he commanded the vanguard, and by his passage of the Tagliamento hurried on the preliminaries of Leoben. In 1798 he was for a short time commandant at Rome, and then accompanied Bonaparte to Egypt. At the battle of the Pyramids he led his first famous cavalry charge, and so distinguished himself in Syria that he was made general of cavalry on the 30th June 1799. He returned to France with Bonaparte, and on the 18th Brumaire led into the orangerie of Saint Cloud the sixty grenadiers whose appearance broke up the Council of Five Hundred. After the success of the coup d'état he was made commandant of the consular guard, and on the 20th of January 1800 he married Caroline Bonaparte, youngest sister of the first consul. He commanded the French cavalry at the battle of Marengo, and was afterwards made governor in the Cisalpine Republic. As commander of the army of observation in Tuscany he forced the Neapolitans to evacuate the Papal States and to accept the treaty of Florence (March 28, 1801). In January 1804 he was given the post of governor of Paris, and in this capacity appointed the military commission by which the d'Enghien was tried and shot (March 20); in May he was made marshal of the empire; in February 1805 he was made grand admiral, with the title of prince, and invested with the grand eagle of the Legion of Honour. He commanded the cavalry of the Grand Army in the German campaign of 1805, and was so conspicuous at Austerlitz that Napoleon made him grand duke of Berg and Cleves (March 15, 1806). He commanded the cavalry at Jena, Eylau, and Friedland, and in 1808 was made general-in-chief of the French armies in Spain. He entered Madrid on the 25th of March, and on the 2nd of May suppressed an insurrection in the city. He did much to prepare the events which ended in the abdication of Charles IV. and Ferdinand VII. at Bayonne; but the hopes he had cherished of himself receiving the crown of Spain were disappointed. When the 1st of August, however, he was appointed by Napoleon to the throne of Naples, vacated by the transference of Joseph Bonaparte to Spain.

King Joachim Napoleon, as he styled himself, entered Naples in September, his handsome presence and open manner gaining him instantaneous popularity. Almost his first act as king was to attack Capri, which he wrested from the British; but, this done, he returned to Naples and devoted himself to establishing his kingship according to his ideas, a characteristic blend of the vulgarity of a borghese with the essential principles of the Revolution. He dazzled the lazaroni with the extravagant splendour of his costumes; he set up a sumptuous court, created nobility, nominated marshals. With an eye to the overthrow of his legitimate rival in Sicily, he organized a large army and even a fleet; but he also swept away the last relics of the effete feudal system and took efficient measures for suppressing brigandage. From the first his relations with Napoleon were strained. The emperor upbraided him sarcastically for his "monkey tricks" (singeries); Murat ascribed to the deliberate ill-will of the French generals who served with him, and even to Napoleon, the failure of his attack on Sicily in 1810. He resented
his subordination to the emperor, and early began his pose as an Italian king by demanding the withdrawal of the French troops from Naples and naturalization as Neapolitans of all Frenchmen in the service of the state (1811). Napoleon, of course, met this demand with a curt refusal. A breach between the brothers-in-law was only averted by the Russian campaign of 1812 and Napoleon’s invitation to Murat to take command of the cavalry in the Grand Army. This was a call which appealed to all his strongest military instincts, and he obeyed it. During the disastrous retreat he showed his usual headstrong courage; but in the middle of December he suddenly threw up his command and returned to Naples. The reason of this was the suspicion which had been growing on him for two years past, that Napoleon was preparing for him the fate of the king of Holland, and that his own wife, Queen Caroline, was plotting with the emperor for his dethronement. To Marshal Davout, who pointed out to him that he was only king of Naples “by grace of the emperor and the blood of Frenchmen,” he replied that he was king of Naples as the emperor of Austria was emperor of Austria, and that he could do as he liked. He was, in fact, already dreaming of exchanging his position of a vassal king of the French Empire for that of a national Italian king. In the enthusiastic reception that awaited him on his return to Naples on the 4th of February there was nothing to dispel the belief that Italian patriots flocked round him, flattering and cajoling him: the patriots, because he seemed to them loyal and glorious enough to assume the task of Italian unification; the partisans of the dispossessed princes, because they looked upon him as a convenient instrument and as simple enough to be made an easy dupe.

From this moment dates the importance of Murat in the history of Europe during the next few years. He at once, without consulting his minister of foreign affairs, despatched Prince Carlati on a confidential mission to Vienna; if Austria would secure the renunciation of his rights by King Ferdinand and guarantee the possession of the kingdom of Naples to himself, he would place his army at her disposal and give up his claims to Sicily. Austria herself, however, had not as yet broken definitively with Napoleon, and before she openly joined the Grand Alliance, after the illusory congress of Prague, many things had happened to make Murat change his mind. He was offended by Napoleon’s bitter letters and by tales of his slighting comments on himself; he was alarmed by the emperor’s scarcely veiled threats; but after all he was a child of the Revolution and a born soldier, with all the soldier’s instinct of loyalty to a great leader, and he grasped eagerly at any excuse for believing that Napoleon, in the event of victory, would maintain him on his throne. Then came the emperor’s advance into Germany, supported as yet by his allies of the Rhénish Confederation. On the fatal field of Leipzig Murat’s troops were defeated on Napoleon’s side, leading the French squadrons with all his old valour and dash. But this crowning catastrophe was too much for his wavering faith. On the evening of the 16th of October, the first day of the battle, Metternich found means to open a separate negotiation with him: Great Britain and Austria would, in the event of Murat’s withdrawal from Napoleon’s army and refusal to send reinforcements to the viceroy of Italy, secure the cession to him of Naples by King Ferdinand, guarantee him in its possession, and obtain for him further advantages in Italy. To accept the Austrian advances seemed now his only chance of continuing to be a king. At Erfurt he asked and obtained the emperor’s leave to return to Naples; “our adieux,” he said, “were not over-cordial.”

He reached Naples on the 4th of November and at once informed the Austrian envoy of his wish to join the Allies, suggesting that the Papal States, with the exception of Rome and the surrounding district, should be made over to him as his reward. On the 31st of December Count Neipperg, afterwards the lover of the empress Marie Louise, arrived at Naples with powers to treat. The result was the signature, on the 10th of January 1814, of a treaty by which Austria guaranteed to Murat the throne of Naples and promised her good offices to secure the assent of the other Allies. Secret additional articles stipulated that Austria would use her good offices to secure the renunciation by Ferdinand of his rights to Naples, in return for an indemnity to hasten the conclusion of peace between Naples and Great Britain, and to augment the Neapolitan kingdom by territory embracing 400,000 souls at the expense of the states of the Church.

The project of the treaty having been communicated to Castlereagh, he replied by expressing the willingness of the British government to conclude an armistice with “the person exercising the government of Naples” (Jan. 22), and this was accordingly signed on the 3rd of February by Bentinck. It was clear that Great Britain had no intention of ultimately recognizing Murat’s right to reign. As for Austria, she would be certain that Murat’s own folly would, sooner or later, give her an opportunity for repudiating her engagements. For the present the Neapolitan alliance would be invaluable to the Allies for the purpose of putting an end to the French domination in Italy. The plot was all but spoiled by the prince royal of Sicily, who in an order of the day announced to his soldiers that their legitimate sovereign had not renounced his rights to the throne of Naples (Feb. 20); from the Austrian point of view it was compromised by a proclamation issued by Bentinck at Leghorn on the 14th of March, in which he called on the Italians to rise in support of the “great cause of their fatherland.” From Dijon Castlereagh promptly wrote to Bentinck (April 3) to say that the proclamation of the prince of Sicily must be disavowed, and that if King Ferdinand did not behave properly Great Britain would recognize Murat’s title. A letter from Metternich to Marshal Bellegarde, of the same place and date, insisted that Bentinck’s operations must be altered; the last thing that Austria desired was an Italian national rising.

It was, indeed, by this time clear to the allied powers that Murat’s ambition had o’erleaped the bounds set for them. “Murat, a true son of the Revolution,” wrote Metternich, in the same letter, “did not hesitate to form projects of conquest; he would have been limited in simple calculations as to how to preserve his throne... He dreamed of a partition of Italy between him and us... When we refused to annex all Italy north of the Po, he saw that his calculations were wrong, but refused to abandon his ambitions. His attitude is most suspicious.” “Press the restoration of the grand-duke in Tuscany,” wrote Castlereagh to Bentinck; “this is the true touchstone of Murat’s intentions. We must not suffer him to carry out his plan of extended dominion; but neither must we break with him and so abandon Austria to his augmented intrigues.”

Meanwhile, Murat had formally broken with Napoleon, and on the 16th of January the French envoy quit Naples. But the treason by which he hoped to save his throne was to make its loss inevitable. He had betrayed Napoleon, only to be made the cat’s-paw of the Allies. Great Britain, even when descending to negotiate with him, had never recognized his title; she could afford to humour Austria by holding out hopes of ultimate recognition, in order to detach him from Napoleon; for Austria alone of the Allies was committed to him, and Castlereagh well knew that, when occasion should arise, her obligations would not be suffered to hamper her interests. With the downfall of Napoleon Murat’s defection had served its turn; moreover, his equivocal conduct during the campaign in Italy had blunted the edge of whatever gratitude the powers may have been disposed to feel; his ambition to unite all Italy south of the Po under his crown was manifest, and the statesmen responsible for the re-establishment of European order were little likely to do violence to their legitimist principles in order to maintain on his throne a revolutionary sovereign who was proving himself so potent a centre of national unrest.

At the very opening of the congress of Vienna Talleyrand, with astounding effrontery, affected not to know “the man”

1 He had contributed to the defeats of the viceroy Prince Eugène in January and February 1814, but did not show any eagerness to press his victories to the advantage of the Allies, contenting himself with occupying the principality of Benevento.
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who had been casually referred to as "the king of Naples"; and he made it the prime object of his policy in the weeks that followed to secure the repudiation by the powers of Murat's title, and the restoration of the Bourbon king. The powers, indeed, were very ready to accept at least the principle of this policy. "Great Britain," wrote Castlereagh to Lord Liverpool on the 3rd of September from Geneva, "has no objection, but the reverse, to the restoration of the Bourbons in Naples."

Prussia saw in Murat the protector of the malcontents in Italy.\(^1\) Alexander I. of Russia had no sympathy for any champion of Liberalism in Austria save himself. Austria confessed "sub sigillo" that she shared "His Most Christian Majesty's views as to the restoration of a legitimate dynasty." \(^2\) The main difficulties in the way were Austria's treaty obligations and the means by which the desired result was to be obtained.

Talleyrand knew well that Austria, in the long run, would break faith with Murat and prefer a docile Bourbon on the throne of Naples to this incalculable child of the Revolution; but he had his private reasons for desiring to "score off" Metternich, the continuance of whose quasidiplomatic liaison with Caroline Murat he rightly suspected. He proposed boldly that, since Austria, in view of the treaty of Jan. 11, 1814, was naturally reluctant to undertake the task, the restored Bourbon king of France should be empowered to restore the Bourbon king of Naples by French arms, thus reviving once more the ancient Italo-French ties. This was a useful breach of the peace of Italy, and that it would be regarded as an attack on Austria and a rupture of the alliance. Murat's suspicions of Austrian sincerity were now confirmed;\(^3\) he realized that there was no question now of his obtaining any extension of territory at the expense of the states of the Church, and that in the Italy as reconstructed at Vienna his own position would be intolerable. Thus the very motives which had led him to betray Napoleon now led him to break with Austria. He would secure his throne by proclaiming the cause of united Italy, chasing the Austrians from the peninsula, and establishing himself as a national king.

To contemporary observers in the best position to judge the enterprise seemed by no means hopeless. Lord William Bentinck, the commander of the English forces in Italy, wrote to Castlereagh \(^7\) that, "having seen more of Italy," he doubted whether the whole force of Austria would be able to expel Murat; "he has said clearly that he will raise the whole of Italy; and there is not a doubt that under the standard of Italian independence the whole of Italy will rally." This feeling, continued Bentinck, was due to the foolish and illiberal conduct of the restored sovereigns; the inhabitants of the states occupied by the Austrian troops were "discontented to a man"; even in Tuscany "the same feeling and desire" universally prevailed. All the provinces, moreover, were full of unemployed officers and soldiers who, in spite of Murat's treason, would rally to his standard, especially as he would certainly first put himself into communication with Napoleon in Elba; while, so far as Bentinck could hear of the disposition of the French army, it would be "dangerous to assemble it anywhere or for any purpose." The urgency of the danger was, then, fully realized by the powers even before Napoleon's return from Elba; for they were well aware of Murat's correspondence with him. On the first news of Napoleon's landing in France, the British government wrote Wellington\(^4\) that this event together with "the proofs of Murat's treachery" had removed "all remaining scruples on their part, and that they were now "prepared to enter into a concert for his removal," adding that Murat should, in the event of his resigning peaceably, receive "a pension and all consideration." The rapid triumph of Napoleon, however, altered this tone. "Bonaparte's successes have altered the situation," wrote Castlereagh to Wellington on the 24th, adding that Great Britain would enter into a treaty with Murat, if he would give guarantees "by a certain redistribution of his forces" and the like, and that in spite of Napoleon's success he would be "true to Europe.

In a private letter enclosed Castlereagh suggested that Murat might send an auxiliary force to France, where "his personal presence would be useful and necessary."\(^8\)

Clearly, bad King Joachim played his cards well he had the game in his hands. But it was not in his nature to play them well. He should have made the most of the chastened temper of the Allies, either to secure favourable terms from them, or to hold them in play until Napoleon was ready to take the field. But his head had been turned by the flatteries of the "patriots"; he believed that all Italy would rally to his cause, and that alone he would be able to drive the "Germans" over the Alps, and thus, as king of united Italy, he in a position to treat on equal terms with Napoleon, should he prove victorious; and he determined to strike without delay. On the 23rd the news reached Metternich at Vienna that the Neapolitan troops were on the march to the frontier. The Allies at once decided to commission Austria to deal with Murat; in the event of whose defeat, Ferdinand IV. was to be restored to Naples, on promising a general amnesty and giving guarantees for a "reasonable system of government."

Meanwhile, in Naples itself there were signs enough that Murat's popularity had disappeared. In Calabria the indiscriminate severity of General Manhès in suppressing brigandage had made the government hated; in the capital the general disorder and the interior disaffection led to rigorous police, while conscripts had to be dragged in chains to join their regiments.\(^9\) In these circumstances an outburst of national enthusiasm for King Joachim was hardly to be expected; and the campaign in effect proved a complete fiasco. Rome and Bologna were indeed occupied without serious opposition; but on the 12th of April Murat's forces received a check from the advancing Austrians at Ferrara and on the 2nd of May were completely routed at Tolentino. The

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4. Sorel, viii. 411 seq.
5. Ci a "most secret" communication to be made to M. de Blacas (in Metternich to Bombelles, Vienna, Jan. 13, 1815). Murat's aggressive attitude, and the unrest in Italy, are largely due to the threatening attitude of France. ... H.I.M. is not prepared to risk a rising of Italy under the national flag. How will France coerce Naples? By sending an army into Italy across our states, which would thus become infected with revolutionary views? ... The emperor could not allow such an expedition. When Italy is settled—and we will not allow Murat to keep the Marches ... he will lose prestige, and then ... will be the time for Austria to give effect to the views which, all the time, she shares with His Most Christian Majesty." (In Castlereagh to Liverpool, "private," Jan. 11, 1815. F.O. Vienna Congress, xi.)
6. This they were fully convinced, clear from the following extract from a letter of Metternich to Bombelles at Paris (dated Vienna, Jan. 13, 1815). "Whether Joachim or a Bourbon reigns at Naples is for a very short time the question. When Europe is established on solid foundations the fate of Joachim will no longer be problematical, but do not let us risk destroying Austria and France and Europe, in order to solve this question at the worst moment it would be put on the table. ... This is no business of the Congress, but let the Bourbon Powers declare that they maintain their claims." (In Castlereagh's private letter to Lord Liverpool, Jan. 15, 1815, F.O. Vienna Congr. xi.)
Austrians advanced on Naples, when Ferdinand IV. was duly restored, while Queen Caroline and her children were deported to Trieste.

And that himself escaped to France, where his offer of service was contemptuously refused by Napoleon. He hid for a while near Toulon, with a price upon his head; then, after Waterloo, refusing an asylum in England, he set out for Corsica (August). Here he was joined by a few rash spirits who urged him to attempt to recover his kingdom. Though Metternich offered to allow him to join his wife at Trieste and to secure him a dignified position and a pension, he preferred to risk all on a final throw for power. On the 25th of September he sailed for Calabria with a flotilla of six vessels carrying some 250 armed men. Four of his ships were scattered by a storm; one deserted him at the last moment, and on the 8th of October he landed at Pizzo with only 30 companions. Of the popular enthusiasm for his cause which he had been led to expect there was less than no sign, and after a short and unequal contest he was taken prisoner by a captain named Trenta-Capilli, whose brother had been executed by General Manhes. He was imprisoned in the fort of Pizzo, and on the 13th of October 1815 was tried by court-martial, under a law of his own, for disturbing the public peace, and was sentenced to be shot in half an hour. After writing a touching letter of farewell to his wife and children, he bravely met his fate, and was buried at Pizzo.

Though much good may be said of Murat as a king sincerely anxious for the welfare of his adopted country, his most shining title to fame is that of the most dashingly cavalier leader of his age. As a man he was rash, hot-tempered and impetuously brave; he was adored by his troopers who followed their idol, the “golden eagle,” into the most terrible fire and against the most terrible odds. Napoleon lived to regret his refusal to accept his services during the Hundred Days, declaring that Murat’s presence at Waterloo would have given more concentrated power to the cavalry charges and might possibly have changed defeat into victory. By his wife Maria Annunciata Carolina Murat had two sons. The elder, NAPOLEON ACHILLE MURAT (1801–1847), during his father’s reign prince royal of the Two Sicilies, emigrated about 1821 to America, and settled near Tallahassee, Florida, where in 1826–1838 he was postmaster. In 1836 he married a great-niece of Washington. He published Lettres d’un citoyen des Etats-Unis à un de ses amis d’Europe (Paris, 1839); Esquisse morale et politique des Etats-Unis (ibid. 1832); and Exposition des principes du gouvernement républicain tol qu’il a été perfectionné en Amérique (ibid. 1833). He died in Florida on the 15th of April 1847.

The second son, NAPOLEON LUCIEN CHARLES MURAT (1803–1878), who was created prince of Ponte Corvo in 1813, lived with his mother in Austria after 1815, and in 1824 started to join his brother in America, but was shipwrecked on the coast of Spain and held for a while a prisoner. Arriving in 1825, two years later he married in Baltimore a rich American, Georgina Frazer (d. 1879); but her fortune was lost, and for some years his wife supported herself and him by keeping a girls’ school. After several abortive attempts to return to France, the revolution of 1848 at last gave him his opportunity. He was elected a member of the Constituent Assembly and of the Legislative Assembly (1849), was minister plenipotentiary at Turin from October 1849 to March 1850, and after the coup d’état of the 2nd of December 1851 was made a member of the consultative commission. On the proclamation of the Empire, he was recognized by Napoleon III. as a prince of the blood royal, with the title of Duke of Murat, and, in addition to the payment of 2,000,000 fr. of debts, was given an income.

As a member of the Senate he distinguished himself in 1861 by supporting the temporal power of the pope, but otherwise he played no conspicuous part. The fall of the Empire in September 1870 involved his retirement into private life. He died on the 10th of April 1878, leaving three sons and two daughters.

(1) Joachim, Prince Murat (1834–1901), in 1854 married Maley Berthier, daughter of the Prince de Wagram, who bore him a son, Joachim (b. 1856), who succeeded him as head of the family, and two daughters, of whom the younger, Anna (b. 1865), was married to Giuseppe Romano, a quiet but honest man who was given an income by the Austrian minister Count Goultchowski. (2) Achille (1847–1895), married Princess Daddian of Mingrella. (3) Louis (b. 1851), married in 1873 to the widowed Princess Eudoxia Orbeliani (née Somov), was for a time orderly officer to Charles XV. of Sweden. (4) Caroline (b. 1832), married in 1850 Baron Charles de Chassiron and in 1872 Mr John Garden (d. 1889). (5) Anna (b. 1841), married in 1865 Antoine de Noailles, duc de Mouchy.

AUTHORITIES.—See A. Sorel, L’Europe et la révolution française (8 vols., 1885–1892) paris, but especially vol. viii, for Murat’s political history. After life (1834–1901), Joachim Murat, son of Duke of Murat, has been the subject of two biographies, by Pichard (La Flamme Murat, mort et sa vie (Vienna, 1872)); G. Romano, Ricordi muratiani (Pavia, 1890); Correspondance de Joachim Murat, Juillet 1791–Juillet 1808, ed. A. Umberto Ricordi (Milan, 1899); Count Murat, Murat, lieutenant de l’empereur en Espagne (Paris, 1867); C. Giaconio, Girocinco Murat in Italia (Palermo, 1899); M. H. Weil, Prince Eugène et Murat (3 vols., Paris, 1901–1904); Chavenon and Saint-Yves, Joachim Murat (Paris, 1905); M. Lombroso, L’Adonza di un regno; Girocinco Murat al Pizzo (Milan, 1904). See also the bibliography to NAPOLEON I.

MURATORI, LUDOVICO ANTONIO (1672–1750), Italian scholar, historian and antiquary, was born of poor parents at Vignola in the duchy of Modena on the 21st of October 1672. While young he attracted the attention of Father Bacchini, the librarian of the ducal of Modena, by whom his literary tastes were turned toward historical and antiquarian research. Having taken minor orders in 1688, Muratori proceeded to his degree of doctor in utroque iure before 1694, was ordained priest in 1695 and appointed by Count Carlo Borromeo one of the doctors of the Ambrosian library at Milan. From manuscripts now placed under his charge he made a selection of materials for several volumes (Anedota), which he published with notes. The reputation he acquired was such that the duke of Modena offered him the situation of keeper of the public archives of the duchy. Muratori hesitated, until the offer of the additional post of librarian, on the resignation of Father Bacchini, determined him in 1700 to return to Modena. The preparation of numerous valuable tracts on the history of Italy during the middle ages, and of dissertations and discussions on obscure points of historical and antiquarian interest, as well as the publication of his various philosophical, theological, legal, poetical and other works absorbed the greater part of his time. These brought him into communication with the most distinguished scholars of Italy, France and Germany. But they also exposed him in his later years to envy. His enemies spread abroad the rumour that the pope, Benedict XIV., had discovered in his writings passages savouring of heresy, even of atheism. Muratori appealed to the pope, repudiating the accusation. His Holiness assured him of his protection, and, without expressing his approbation of the opinions in question of the learned antiquary, freed him from the imputations of his enemies. Muratori died on the 23rd of January 1750, and was buried with much pomp in the church of Santa Maria di Pomposa, in connexion with which he had laboured as parish priest for many years. His remains were removed in 1774 to the church of St Augustin.

Muratori is rightly regarded as the “father of Italian history.” This is due to his great collection, Rerum italicarum scriptores, to which he devoted about fifteen years’ work (1723–1738). The gathering together and editing some 25 huge folio volumes of texts was followed by a series of 75 dissertations on medieval Italy (Antiquitates italicæ medii ævi, 1738–1742, 6 vols. folio). To these he added a Novæ thesauri inscriptionum (4 vols., 1739–1743), which was of great importance in the development of epigraphy. Then, anticipating the action of the learned society, he set about a popular treatment of the historical sources he had published. These Annales d’Italia (1744–1749) reached 12 volumes, but were imperfect and are of little value. In addition to this national enterprise (the Scriptores were published by the aid of the Societá palatina di Milano) Muratori published Anecdota exAMBROSIANABIBLIOTHECAE CODD. (2 vols. 4to, Milan, 1697, 1698; Padua, 1713; Anecdota graeca (3 vols. 4to, Padua, 1700); Antichita Estens
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(a vola. fol., Modena, 1717); Vita e rime di F. Petrarca (1711), and Vita ed opere di L. Costelettro (1727).

In biblical scholarship Muratori is chiefly known as the discoverer of the so-called Muratorian Canon, the name given to a fragment (53 lines) of early Christian literature, which he found in 1740, embedded in an 8th-century codex which forms a compendium of theological tracts followed by the five early Christian creeds. The document contains a list of the books of the New Testament, a similar list concerning the Old Testament having apparently preceded it. It is in barbarous Latin which has probably been translated from original Greek—the language prevailing in Christian Rome until c. 200. There is little doubt that it was composed in Rome and we may date it about the year 190. Lightfoot inclined to Hippolytus as its author. It is the earliest document known which enumerates the books in order.

The first line of the fragment is broken and speaks of the Gospel of St Mark, but there is no doubt that its compiler knew also of St Matthew. Acts is ascribed to St Luke. He names thirteen letters of St Paul but says nothing of the Epistle to the Hebrews. The alleged letters of Paul to the Laodicceans and Alexandrians he rejects, "for gall must not be mixed with honey." The two Epistles of Peter and the Epistle of James are not referred to, but that of Jude and two of John are accepted. He includes the Apocalypse of John and also the Apocrypha of the Old Testament. The Shepherd of Hermas of February 21, 21 of Muratori, is dated February 21, 576, but its origin, but this test of canonicity is not consistently applied for he allows the "Wisdom written by the friends of Solomon in his honour." He rejects the writings of the Gnostics Valetinus and Basildes, and of Montanus.

The list is not an authoritative decree, but a private register of what the author considers the prevailing Christian sentiment in his neighbourhood. He notes certain differences among the Gospels, because not all the evangelists were eye-witnesses of the life of Jesus; yet Mark and Luke respectively have behind them the authority of Peter and of Paul, who is thus regarded as on a footing with the Twelve. The Fourth Gospel was written by John at the request of the bishops and the bishops on the basis of a revelation made to Andrew. The letters of Paul are written to four individuals and to seven different churches, like the seven letters in the Apocalypse of John.

It is interesting to notice the coincidence of his list with the evidence gained from Tertullian for Africa and from Irenaeus for Gaul and indirectly for Asia Minor. Before the year 200 there was widespread agreement in the sacred body of apostolic writings read in Christian churches on the Lord's Day along with the Old Testament.

Muratori's Letters, with a Life prefixed, were published by Lazzari, (2 vols., Venice, 1783). His nephew, F. G. Muratori, also wrote a Vita del celebre Ludov. Ant. Muratori (Venice, 1736). See also A. G. Spinelli "Bibliografia delle lettere stampa di L. A. Muratori" in Bollettino dell'istituto storico italiano (1888), and Carducci's preface to the new Scriptores. The Muratorian Canon is given in full with a translation in H. M. Guittin's Selections from Early Christian Writers. It is also published as No. 1 of H. Lietzmann's Kleine Texte für theologische Vorlesungen (Bonn, 1902). See also Journal of Theological Studies, vii. 537.

MURAVIEV, MICHAEL NIKOLAEVICH, Count (1845–1900), Russian statesman, was born on the 19th of April 1845. He was the son of General Count Nicholas Muraviev (governor of Grodno), and grandson of the Count Michael Muraviev, who became notorious for his drastic measures in stamping out the Polish insurrection of 1863 in the Lithuanian provinces. He was educated at a secondary school at Poltava, and was for a short time at Heidelberg University. In 1864 he entered the chancellery of the ministry for foreign affairs at St Petersburg, and was soon afterwards attached to the Russian legation at Stuttgart, where he attracted the notice of Queen Olga of Württemberg. He was transferred to Berlin, then to Stockholm, and back again to Berlin. In 1877 he was second secretary at the Hague. During the Russo-Turkish War of 1878 he was a delegate of the Red Cross Society in charge of an ambulance train provided by Queen Olga of Württemberg. After the war he was successively first secretary at Paris, chancellor of the embassy at Berlin, and then minister at Copenhagen. In Denmark he was brought much into contact with the imperial family, and on the death of Prince Lobanov in 1897 he was appointed by the Tsar Nicholas II. to be his minister of foreign affairs. The next three and a half years were a critical time for European diplomacy. The Chinese and Cretan questions were disturbing factors. As regards Crete, Count Muraviev's policy was vacillating; in China his hands were forced by Germany's action at Kiaochow. But he acted with singular lègéré with regard at all events to his assurances to Great Britain respecting the leases of Port Arthur and Talienwan from China; he told the British ambassador that these would be "open ports," and afterwards essentially modified his pledge. When the Tsar Nicholas inaugurated the Peace Conference at the Hague, Count Muraviev extricated his country from a situation of some embarrassment; but when, subsequently, Russian agents in Manchuria and at Peking connived at the agitation which culminated in the Boxer rising of 1900, the relations of the responsible foreign minister with the tsar became strained. Muraviev died suddenly on the 21st of June 1900, of apoplexy, brought on, it was said, by a stormy interview with the tsar.

MURCHISON, SIR RODERICK IMPEY (1752–1817), British geologist, was born at Tarradale, in eastern Ross, Scotland, on the 10th of February 1792. His father, Kenneth Murchison (d. 1796), came of an old Highland clan in west Ross-shire, and having been educated as a medical man, acquired a fortune in India; while still in the prime of life he returned to Scotland, where, marrying one of the Mackenzies of Fairburn, he purchased the estate of Tarradale and settled for a few years as a resident Highland landlord. Young Murchison left the Highlancls when three years old, and at the age of seven was sent to the grammar school of Durham, where he remained for six years. He was then placed at the military college, Great Marlow, to be trained for the army. With some difficulty he passed the examinations, and at the age of fifteen was gazetted ensign in the 36th regiment. A year later (1808) he landed with Wellesley in Gdacias, and was present at the actions of Rorica and Vimbiera. Subsequently under Sir John Moore he took part in the retreat to Corunna and the final battle there. This was his only active service. The defeat of Napoleon at Waterloo seeming to close the prospect of advancement in the military profession, Murchison, after eight years of service, quitted the army, and married the daughter of General Hugonin, of Nestred House, Hampshire. With her he then spent rather more than two years on the Continent, particularly in Italy, where her cultivated tastes were of signal influence in guiding his pursuits. He threw himself with all the enthusiasm of his character into the study of art and antiquities, and for the first time in his life tasted the pleasures of truly intellectual pursuits.

Returning to England in 1818, he sold his paternal property in Ross-shire and settled in England, where he took to field sports. He soon became one of the greatest fox-hunters in the midland counties; but at last, getting weary of such pursuits and meeting Sir Humphry Davy, who urged him to turn his energy to science, he was induced to attend lectures at the Royal Institution. This change in the current of his occupations was much helped by the sympathy of his wife, who, besides her artistic acquirements, took much interest in natural history. Eager and enthusiastic in whatever he undertook, he was fascinated by the young science of geology. He joined the Geological Society of London, and soon showed himself one of its most active members, having as his colleagues there such men as Sedgwick, W. D. Conybeare, W. Buckland, W. H. Fitton and Lyell. Exploring with his wife the geology of the south of England, he devoted special attention to the rocks of the north-west of Sussex and the adjoining parts of Hants and Surrey, on which, aided by Fitton, he wrote his first scientific paper, read to the society in 1825. Though he had reached the age of thirty-two before he took any interest in science, he developed his taste and increased his knowledge so rapidly that in the first
three years of his scientific career he had explored large parts of England and Scotland, had obtained materials for three important memoirs, as well as for two more written in conjunction with Sedgwick, and had risen to be a prominent member of the Geological Society and one of its two secretaries. Turning his attention for a little to Continental geology, he explored with Lyell the limestone region of Auvergne, parts of southern France, northern Italy, Tirol and Switzerland. A little later, with Sedgwick as his companion, he attacked the difficult problem, of the geological structure of the Alps, and their joint paper giving the results of their study will always be regarded as one of the classics in the literature of Alpine geology.

It was in the year 1831 that Murchison found the field in which the chief work of his life was to be accomplished. Acting on a suggestion made to him by Buckland he betook himself to the borders of Wales, with the view of endeavouring to discover whether the greywacke rocks underlying the Old Red Sandstone could be grouped into a definite order of succession, as the Secondary rocks of England had been made to tell their story by William Smith. For several years he continued to work vigorously in that region. The result was the establishment of the Silurian system—under which were grouped for the first time a remarkable series of formations, each replete with distinctive organic remains older than and very different from those of the other rocks of England. These researches, together with descriptions of the coal-fields and overlying formations in south Wales and the English border counties, were embodied in The Silurian System (London, 1839), a massive quarto in two parts, admirably illustrated with map, sections, pictorial views and plates of fossils. The full import of his discoveries was not at first perceived; but as years passed on the types of existence brought to light by him from the rocks of the border counties of England and Wales were ascertained to belong to a geological period of which there are recognizable traces in almost all parts of the globe. Thus the term “Silurian,” derived from the name of the old British tribe Silures, soon passed into the vocabulary of geologists in every country.

The establishment of the Silurian system was followed by that of the Devonian system, an investigation in which, aided by the palaeontological assistance of W. Lonsdale, Sedgwick and Murchison were fellow-labourers, both in the south-west of England and in the Rhineland. Soon afterwards Murchison projected an important geological campaign in Russia with the view of extending to that part of the Continent the classification he had succeeded in elaborating for the older rocks of western Europe. He was accompanied by P. E. P. de Verneuil (1805–1873) and Count A. F. M. L. A. von Keyserling (1815–1891), in conjunction with whom he produced a magnificent work on Russia and the Ural Mountains. The publication of this monograph in 1845 completes the first and most active half of Murchison’s scientific career. In 1846 he was knighted, and in the same year he presided over the meeting of the British Association at Southampton. During the later years of his life a large part of his time was devoted to the affairs of the Royal Geographical Society, of which he was in 1830 one of the founders, and he was president from 1834–1846. He was also consulted as to the appointment of explorers, and his views were always influential and constant and active were his exertions on behalf of geographical exploration that to a large section of the contemporary public he was known rather as a geographer than as a geologist. He particularly identified himself with the fortunes of David Livingstone in Africa, and did much to raise and keep alive the sympathy of his fellow-countrymen in the fate of that great explorer.

The chief geological investigation of the last decade of his life was devoted to the Highlands of Scotland, where he believed he had succeeded in showing that the vast masses of crystalline schists, previously supposed to be part of what used to be termed the Primitive formations, were really not older than the Silurian period. He was able to distinguish two groups of periods, the Silurian and the more easterly, and the ancient rocks of the Highlands now bear his name. At this time, however, he seems to have found it necessary to make a change in the system of classification, and he accordingly entered into a controversy with his fellow-geologist, the late Sir Roderick Murchison, as to the relative ages of strata in different parts of the British Isles. That the controversy was one of great importance, affecting as it did the foundations of geological science, needs no further illustration here.

MURCIA, a maritime province of south-eastern Spain, bounded on the E. by Alicante, S.E. and S. by the Mediterranean Sea, W. by Almería and Granada and N. by Albacete. Pop. (1900), 577,987; area, 4453 sq. m. The extent of coast is about 75 m.; from Cape Palos westwards to Villaricos Point (where Almeria begins) it is fringed by hills reaching their greatest elevation immediately east of Cartagena; northwards from Cape Palos to the Alicante boundary a low sandy tongue encloses the shallow lagoon called Mar Menor. Eastward from the Mar Menor and northward from Cartagena stretches the plain known as the Campo de Murcia, and the central part of the province is diversified by ranges of hills, belonging to the same system as the Sierra Nevada, which connect the mountains of Almeria and Granada with those of Alicante. The general direction of these ranges is from south-west to north-east; they reach their highest point (5150 ft.) on the Sierra de España, between the Mula and Sangonera valleys. They are rich in iron, copper, argentiferous lead, alum, sulphur, and saltpetre. Mineral springs occur at Mula, Archena (hot sulphur), and Alhama (hot chalybeate). The greater part of the province drains into the Mediterranean, chiefly by the Segura, which enters it in the north-west below Hellin in Albacete, and leaves it a little above Orihuela in Alicante; within the province it issues on the left the Arroyo del Jus, and on the right the Caravaca, Quipar, Mula, and Sangonera. The smaller streams of Nogalte and Albujon fall directly into the Mediterranean and the Mar Menor respectively. The climate is hot and dry, and
agriculture is largely dependent on irrigation, which, where practicable, has been carried on since the time of the Moors. Wheat, barley, maize, hemp, oil, and wine (the latter somewhat rough in quality) are produced; fruit, especially the orange, is abundant along the course of the Segura; mulberries for sericulture are extensively grown around the capital; and the number of bees kept is exceptionally large. Esparto grass is gathered on the sandy tracts. The live stock consists chiefly of asses, mules, goats and pigs; horses, cattle and sheep being relatively few. Apart from agriculture, the principal industry is mining, which has its centre near Cartagena. Large quantities of lead and esparto, as well as of zinc, iron and copper ores, and sulphur, are exported. The province is traversed by a railway which connects Murcia with Albacete and Valencia; from Alcantarilla there is a branch to Lorca and Baza. Near the capital and other large towns there are good roads, but the means of communication are defective in the remoter districts. This deficiency has somewhat retarded the development of mining, and, although it has been partly overcome by the construction of light railways, many rich deposits of ore remain unworked. The chief towns are Murcia, the capital, Cartagena, Lorca, Totana, Jumilla, and Cieza. The cathedral, built in 1651, is the seat of the bishoprics of Cartagena, Murcia, Totana, Cieza, Mula, Moratalla, and Cehegin. Other towns with more than 7,000 inhabitants are Alhama, Bullas, Fuente Álamo, Molina and Torre Pacheco.

The province of Murcia was the first Spanish possession of the Carthaginians, by whom Nova Cartagho was founded. The Romans included it in Hispania Tarraconensis. Under the Moors the province was known as Todmir, which included, according to Edrisi, the cities Murcia, Orihuela, Cartagena, Lorca, Mula and Chinchilla. The kingdom of Murcia, which came into independent existence after the fall of Omayyads (see CALIPHRATE) included the present Albacete as well as Murcia. It became subject to the crown of Castile in the 12th century. Until 1232 the province of Murcia also included Albacete.

MURCIA, the capital of the Spanish province of Murcia; on the river Segura, 25 m. W. of the Mediterranean Sea. Pop. (1900), 111,539. Murcia is connected by rail with all parts of Spain, and is an important industrial centre, sixth in respect of population among the cities of the kingdom. It has been an episcopal see since 1291. It is built nearly in the centre of a low-lying fertile plain, known as the huerta or garden of Murcia, which includes the valleys of the Segura and its right-hand tributary the Sangonera, and is surrounded by mountains. Despite the proximity of the sea, the climate is subject to great variations, the summer heat being severe, while frosts are common in winter. The city is built mainly on the left bank of the Segura, which curves north-eastward after receiving the Sangonera below Murcia, and falls into the Mediterranean about 30 m. N.E. A fine stone bridge of two arches gives access to the suburb of San Benito, which contains the bull-ring. As a rule the streets are broad, straight and planted with avenues of trees, but the Calle de Platería and Calle de la Trapería, which contain many of the principal shops, are more characteristically Spanish, being lined with old-fashioned balconied houses, and so narrow that wheeled traffic is in most parts impossible. In summer these thoroughfares are shaded by awnings. The Malecon, or embankment, is a fine promenade skirtling the left bank of the Segura; the river is here crossed by a weir and supplies power to several silk-mills. The principal square is the Arenal or Plaza de la Constitución, planted with orange trees and adjoining the Glorieta Park. The cathedral, dating from 1388-1467, is one of the works of many architects; in the main it is late Gothic, but a Renaissance dome and a tower 480 ft. high were added in 1531, while a Corinthian façade was erected in the 18th century. There are some good paintings and fine wood-carving in the interior. Other noteworthy buildings are the colleges of San Fulgencio and San Isidro, the bishops' palace, the hospital of San Juan de Dios, the Moorish Alhondiga, or grain warehouse, the buildings of the municipal and provincial councils and the Contraste, which is adorned with sculptured coats-of-arms, and was originally designed to contain standard weights and measures; it has become a picture-gallery. There are two training schools for teachers, a provincial institute and a museum. Since 1875 the industrial importance of Murcia has steadily increased. Mulberries (for silkworms), oranges and other fruits are largely cultivated in the huerta, and the silk industry, which dates from the period of Moorish rule, is still carried on. Manufacturers of woollen, linen and cotton goods, of salt petre, flor, leather and hats, have been established in more modern times, and Murcia is the chief market for the agricultural produce of a large district. A numerous colony of giparos has settled in the west of the city.

Murcia was an Iberian town before the Punic Wars, but its name then, and under Roman rule, is not known, though some have tried to identify it with the Roman Vergilia. To the Moors, who took possession early in the 8th century, it was known as Medina Murisia. Edrisi described it in the 12th century as populous and strongly fortified. After the fall of the caliphate of Cordova it passed successively under the rule of Almeria, Toledo and Seville. In 1171 it was taken by the Almohades, and from 1223 to 1243 it became the capital of an independent kingdom. The Castilians took it at the end of this period, and in 1248 it was recaptured by the Moors. In 1504 the region was added to the Spanish crown; the Catholic Monarchs by treaties with the Moors in 1517 gave to Murcia and the other provinces from the river Segura to the Mediterranean more than 4,500,000 ducats. Murcia and Province settled in the town; French and Catalan names are still not uncommon. Moorish princes continued to rule in name over this mixed population, but in 1269 a rising against the suzerain, Alphonso the Wise, led to the final incorporation of Murcia (which then included the present province of Albacete) into the kingdom of Castile. During the War of the Spanish Succession Bishop Luis de Belluga defended the city against the archducal army by flooding the huerta. In 1810 and 1812 it was attacked by the French under Marshal Soult. It suffered much from floods in 1631, 1679 and 1907, though the construction of the Malecon has done much to keep the Segura within its own channel. It is 1,829 years since the cathedral, one of the most ancient, received its present form. The cathedral, though built on the site of an earlier one erected by the Moors, has been much damaged and renovated. Its long history is marked by the frequent changes in its patron, the Moors, the Christians, and at one time a Moorish viceroy and Catholic bishop. It has been described as the most beautiful Gothic cathedral in Italy. It is surrounded by a strong and beautiful convent of nuns. The town has a fine promenade by the sea, and is a sorely needed resort. Murcia is a centre of manufacture, an export centre, and a railway junction. It has a university, founded in 1511, with 700 students, and an observatory. It has always been a centre of Spanish politics and literature. Several of the wealthier and most influential families have been prominent in the political and commercial life of the country. Among the cities of Murcia are Bullas, Fuente Álamo, Lorca, Mula, and Chinchilla. Murcia is an important centre of mining, of which the principal mines are those of the Huerta de la Negra in the province of Albacete. The principal minerals are lead, zinc, silver, copper, and traces of gold. The town is a great fairs and has considerable trade. There are a number of manufacturing establishments, especially in the silk trade. Murcia is the seat of the bishop of Murcia, who is also the bishop of Cartagena.

MURDOCK, WILLIAM (1754-1839), British inventor, was born near the village of Auchinleck in Ayrshire on the 21st of August 1754. His father, John Murdock (as the name is spelt in Scotland), was a millwright and miller, and William was brought up in the same occupation. In 1777 he entered the employment of Bouton & Watt in the Soho works at Birmingham, and about two years afterwards he was sent to Cornwall to superintend the fitting of Watt's engines. It is said that while staying at Redruth he carried a series of experiments in the distillation of coal so far that in 1792 he was able to light his cottage and offices with gas, but the evidence is not conclusive. However, after his return to Birmingham about 1799, he made such progress in the discovery of practical methods for making, storing and purifying gas that in 1802 a portion of the exterior of the Soho factory was lighted with it in celebration of the peace of Amiens, and in the following year it was brought into use for the interior. Murdock was also the inventor of important improvements in the steam-engine. He was the first to devise an oscillating engine, of which he made a model about 1784; in 1786 he was busy—somewhat to the annoyance of both Bouton and Watt—with a steam carriage or road locomotive; and in 1799 he invented the long D slide valve. He is also believed to have been the real deviser of the sun and planet motion patented by Watt in 1781. In addition his ingenuity was directed to the utilization of compressed air, and in 1803 he constructed a steam gun. He retired from business in 1830, and died at Soho on the 15th of November 1839.

At the celebration of the centenary of gas lighting in 1892, a bust of Murdock was unveiled by Lord Kelvin in the Wallace Monument.
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Stirling, and there is also a bust of him by Sir F. L. Chantrey at Handsworth Church, where he was buried. His "Account of the Application of Gas from Coal to Economical Purposes" appeared in the Phil. Trans. for 1808.

MURE, SIR WILLIAM (1594-1657), Scottish writer, son of Sir William Mure of Rowallan, was born in 1594. His mother was Elizabeth, sister of the poet Alexander Montgomerie (q.v.). He was a member of the Scottish parliament in 1643, and took part in the English campaign of 1644. He was wounded at Marston Moor, but a month later was commanding a regiment at Selby. In 1645 he became a member of the London university council, and in 1646 he wrote Dido and Aeneas, a translation (1652) of Boyd of Trogir's Latin Hecateum Christianum; The True Cruizise for True Catholics (1629), a paraphrase of the Psalms; the Historie and Descent of the House of Rowallan; A Counter-buff to Lysmachius Nicaron; The Cry of Blood and of a Broken Covenant (1659); besides much miscellaneous verse and many sonnets.

A complete edition of his works was edited by William Toug for the Scottish Text Society (2 vols., 1808). Mure's Late-Book, a musical and several other, is preserved in the Laid collection of MSS. in the library of the university of Edinburgh.

MURE, WILLIAM (1799-1860), Scottish classical scholar, was born at Calderd, Ayrshire, on the 9th of July 1799. He was educated at Westminster School and the universities of Edinburgh and Bnn. From 1846 to 1853 he represented the county of Renfrew in parliament in the Conservative interest, and was lord rector of Glasgow University in 1847-1848. For many years he devoted his leisure to Greek studies, and in 1850-1857 he published five volumes of a Critical History of the Language and Literature of Ancient Greece, which, though unfinished and somewhat antiquated, is still useful. He died in London on the 1st of April 1860.

MURENA, the name of a Roman plebeian family from Lanuvium, belonging to the Licinian gens, said to be derived from the fondness of one of the family for lampreys (murenae). The principal members of the family were Lucius Licinius Murena, who was defeated by Mithradates in Asia in 81 B.C., and his son Lucius Licinius Murena, who was defended by Cicero in 62 B.C. against a charge of bribery (Cic. Pro Murena). The son was for several years legate of Lucius Licinius Lucullus in the third Mithradatic War. In he was praetor and made himself popular by the magnificence of the games provided by him. As administrator of Transalpine Gaul after his praetorship he gained the goodwill of both provincials and Romans by his impartiality. In he was elected consul, but before entering upon office he was accused of bribery by Servius Sulpicius, an unsuccessful competitor, supported by Marcus Porcius Cato the younger and Servius Sulpicius Rufus, a famous jurist and son of the accuser. Murena was defended by Marcus Licinius Crassus (afterwards triumvir), Quintus Hortensius and Cicero, and acquitted, although it seems probable that he was guilty. During his consulship he passed a law (lex Junia Licinia) which reinforced more strictly the provision of the lex Aemilia that laws should be promulgated three undvinae before they were proposed to the comitia, and further enacted that, in order to prevent forgery, a copy of every proposed statute should be deposited before witnesses in the aedarium.

MURETUS, the Latinized name of MARC ANTOINE MURET (1526-1582), French humanist, who was born at Muret near Limoges on the 12th of April 1526. At the age of eighteen he attracted the notice of the elder Scaliger, and was invited to lecture in the archiepiscopal college at Auch. He afterwards taught Latin at Villeneuve, and then at Bordeaux. Some time before 1552 he delivered a course of lectures in the college of Carcassonne at Paris, which was largely attended, Henry II. and his queen being among his hearers. His success made him many enemies, and he was thrown into prison on a disgraceful charge, but released by the intervention of powerful friends. The same accusation was brought against him at Toulouse, and he only saved his life by timely flight. The records of the town show that he was burned in effigy as a Huguenot and as shamefully immolared (1554). After a wandering and insecure life of some years in Italy, he received and accepted the invitation of the Cardinal Ippolite d'Este to settle in Rome in 1559. In 1571 he revisited France as a member of the cardinal's suite at the conference between Roman Catholics and Protestants held at Poissy. He returned to Rome in 1565. His lectures gained him a European reputation, and in 1578 he received a tempting offer from the king of Poland to become teacher of jurisprudence in his new college at Cracow. Muretus, however, who about 1576 had taken holy orders, was induced by the liberality of Gregory XIII. to remain in Rome, where he died on the 4th of June 1585.

Complete editions of his works: eddito princeps, Verona (1727- 1730) by D. R. Poppo (1789), by C. H. Froschel (1834-1841); two volumes of Scripta selecta by F. Boyer (1871); Vincent Leissenu, by F. A. Wolf and J. H. Falsi (1791-1828). Muretus edited a number of classical authors with learned and scholarly notes. His other works include Juventia et poesae varia, epitomata, and epistolae. See monograph by C. Dejob (Paris, 1801); J. E. Sandus, Hist. Class. Schol., (2nd ed., 1802), ii. 148-152.

MUREXIDE (NH_2-C_6H_4N_2O_4-H_2O), the ammonium salt of purpuric acid. It may be prepared by heating allatonic in ammonium gas to 100°C, or by boiling uramil with mercuric oxide (J. v. Liebig, F. Wohler, Ann., 1838, 26, 319), 2CH_3OH+O = NH_2-C_6H_4N_2O_4+H_2O. W. N. Hartley (Jour. Chem. Soc., 1905, 87, 1791) found considerable difficulty in obtaining specimens of murexide sufficiently pure to give concordant results when examined by means of their absorption spectra, and consequently devised a new method of preparation for murexide. In this process allatonic is dissolved in a large excess of boiling absolute alcohol, and dry ammonium gas is passed into the solution for about three hours. The solution is then filtered from the precipitated murexide, which is washed with absolute alcohol and dried. The salt obtained in this way is in the anhydrase state. It may also be prepared by digesting allatonic with alcoholic ammonia at about 78°C; the purple solid so formed is easily soluble in water, and the solution produced is indistinguishable from one produced by this method.

On the constitution of murexide see also O. Ploidy (Ann., 1904, 333, 30); R. Mohlau (Ber., 1904, 37, 2686); and M. Stimmer and J. Stiglitz (Amer. Chem. Jour., 1904, 31, 661).

MURFREESBORO, a city and the county-seat of Rutherford county, Tennessee, U.S.A., near the Stone River, 32 m. S.E. of Nashville. Pop. (1850) 3739; (1900) 3999 (2248 negroes); (1910) 4679. It is served by the Nashville Chattanooga & St Louis railway. It is in an agricultural region where cotton is an important crop, and has a considerable trade in red cedar, hardwood, cotton, livestock and grain; it has also various manufactures. At Murfreesboro are Soule College for girls (Methodist Episcopal South; 1852), Tennessee College for girls (Baptist, 1906), Mooney School for boys (1901), and Bradley Academy for negroes. Murfreesboro was settled in 1811; was incorporated in 1817, and from 1819 to 1825 was the capital of the state. It was named in honour of Colonel Hardy Murflee (1732-1809), a native of North Carolina, who served as an officer of North Carolina troops in the War of Independence, and after 1807 lived in Tennessee. About 2 m. west of the city the battle that Murfreesboro, or Stone River (q.v.), was fought on the 31st of December 1862 and the 2nd of January 1863.

MURGER, HENRY (1822-1861), French man of letters, was born in Paris on the 24th of March 1822. His father was a German concierge and a tailor. At the age of fifteen Murger was sent into a lawyer's office, but the occupation was ungenial and his father's trade still more so; and he became secretary to Count Alexi Tolstoi. He published in 1843 a piece called Le dunkel, but it made no mark. He also tried journalism, and the paper Le Castor, which figures in his Vie de Bohème as having combined devotion to the interests of the hat trade with recondite philosophy and elegant literature, is said to have existed, though shortlived. In 1848 appeared the collected sketches called Scènes de la vie de Bohème. This book describes the fortunes and misfortunes, the loves, studies, amusements and sufferings of a group of impecunious students, artists and
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men of letters, of whom Rodolphe represents Murger himself, while the others have been more or less positively identified. Murger, in fact, belonged to a clique of so-called Bohemians, the most remarkable of whom, besides himself, were Privat d'Angle- mont and Champfleury. La Vie de Bohème, arranged for the stage in collaboration with Théodore Barrière, was produced at the Variétés on the 22nd of November 1849, and was a triumphant success; it afterwards formed the basis of Puccini's opera, La Bohème (1868). From this time it was easy for Murger to live by journalism and general literature. He was introduced in 1853 to the Revue des deux mondes. But he was a slow, fastidious and capricious worker, and his years of hardship and dissipation had impaired his health. He published among other works Claude et Marianne in 1851; a comedy, Le Bonhomme Jadis in 1852; Le Pays Lain in 1852; Adèle Protat (one of the most graceful and innocent if not the most original of his tales) in 1853; and Les Bouchers d'eau in 1855. This last, the most powerful of his books next to the Vie de Bohème, traces the fate of certain artists and students who, exaggerating their own powers and disdaining merely profitable work, come to an evil end. When Murger's death occurred, nearly ten years after his death, which took place in a maison de santé near Paris on the 28th of January 1861, Murger went to live at Marlottne, near Fontainebleau, and there he wrote an unequal book entitled Le Sabot rouge (1860), in which the character of the French peasant is uncomplimentarily treated.

See an article by A. de Pontmartin in the Revue des deux mondes (October 1861).

MURGHAB, a river of Afghanistan, which flows into Russian territory. It rises in the Firozkhoi highlands, the northern scarp of which is defined by the Band-i-Turkestan, and after traversing that plateau from east to west it turns north through deep defiles to Bala Murghab. Beyond this, in the neighbourhood of Maruchak, it forms for a space the boundary-line between Afghan and Russian Turkestan; then joining the Kusgh river at Pul-Khishi (Tash Kupir) it runs north to Merv, losing itself in the sands of the Merv desert after a course of about 450 m., its exact source being unknown. In the neighbourhood of Bala Murghab it is 50 yds. broad and some 3 ft. deep, with a rapid current. In the lower part of its course it is flanked by a remarkable network of canals. The ancient city of Merv, which was on its banks, was the great centre of medieval Arab trade, and Buddhist caves are found in the scarped cliffs of its right bank near Panjdeh.

MURI, a province of the British protectorate of Northern Nigeria. It lies approximately between 6° and 11° 40' E. and 7° 10' and 9° 40' N. The river Benue divides it through its length, and the portion on the southern bank of the river is watered by streams flowing from the Cameroon region to the Benue. The province is bounded S. by Southern Nigeria, S.E. by German territory (Cameroon), E. by the province of Yola, N. by Bauchi, W. by Nassarawa and Bassa. The district of Katsena-Allah extends south of the Benue, considerably west of 6° E., the approximate limit of the remainder of the province. Muri has an area of 25,500 sq. m. and an estimated population of about 328,000. The province is rich in forest products and the people own the district of Nasara, which extends on the right bank of the river. Cotton is grown, and spinning thread, weaving and dyeing afford occupation to many thousands. The valley of the Benue has a climate generally unhealthy to Europeans, but there are places in the northern part of the province, such as the Fulah settlement of Wase on a southern spur of the Murchison hills, where the higher altitude gives an excellent climate. Muri includes the ancient Jukon empire together with various small Fulah states and a number of pagan tribes, among whom the Munshi, who extend into the provinces of Nassarawa and Bassa, are among the most turbulent. The Munshi occupy about 4000 sq. m. in the Katsena-Allah district. The pagan tribes in the north of the province are lawless cannibals who by constant outrages and murders of traders long rendered the main trade route to Bauchi unsafe, and cut off the markets of the Benue valley and the Cameroon from the Hausa states. Only two routes, one via Wase and the other via Gatari, pass through this belt. In the south of the province a similar belt of hostile pagans closed the access to the Cameroon except by two routes, Takum and Beli. For Hausa traders to cross the Muri province was a work of such danger and expense that before the advent of British administration the attempt was seldom made.

Muri came nominally under British control in 1900. The principal effort of the administration has been to control and open the trade routes. In 1904 the expedition against the northern cannibals resulted in the capture of their principal fortresses and the settlement and opening to trade of a large district, the various routes to the Benue being rendered safe. In 1905 an expedition against the Munshi, rendered necessary by an unprovoked attack on the Niger Company's station at Abinsi, had a good effect in reducing the riverain portion of this tribe to submission. The absence of any central native authority delayed the process of bringing the province under administrative control. Its government has been organized on the same system as the rest of Northern Nigeria, and is under a British resident. It has been divided into three administrative divisions with their respective head quarters at Lau, Amar and Ibi. Provincial and native courts of justice have been established. The telegraph has been carried to the town of Muri. Muri is one of the provinces in which the slave trade was most active, and its position between German territory and the Hausa states rendered it in the early days of the British administration a favourite route for the smuggling of slaves.

MURILLO, BARTOLOMÉ ESTEBAN (1617-1682), Spanish painter, son of Gaspar Esteban Murillo and María Perez, was born at Seville in 1617, probably at the end of the year, as he was baptized on the first of January 1618. Esteban-Murillo appears to have been the compound surname of the father, but some inquirers consider that, in accordance with a frequent Andalusian custom, the painter assumed the surname of his maternal grandmother, Elvira Murillo, in addition to that of his father. His parents (the father an artisan of a humble class), having been struck with the sketches which the boy was accustomed to make, placed him under the care of their distant relative, Juan del Castillo, the painter. Juan, a correct draughtsman and dry colourist, taught him all the mechanical parts of his profession with extreme care, and Murillo proved himself an apt pupil. The artistic appliances of his master's studio were not abundant, and were often of the simplest kind. A few casts, some stray fragments of sculpture and a lay figure formed the principal aids available for the Sevillian student of art. A living model was a luxury generally beyond the means of the school, but on great occasions the youths would strip in turn and proffer an arm or a leg to be studied by their fellows. Objects of still life, however, were much studied by Murillo, and he early learnt to hit off the ragged urchins of Seville. Murillo in a few years painted as well as his master, and as still. His two pictures of the Virgin, executed during this period, show how thoroughly he had mastered the style, with all its defects. Castillo was a kind man, but his removal to Cádiz in 1639-1640 threw his favourite pupil upon his own resources. The boy then set up a small school of his own, only a hand or a head would be his model; his parents were either dead or too poor to help him, and he was compelled to earn his bread by painting rough pictures for the "feria" or public fair of Seville. The religious daubs exposed at that mart were generally of as low an order as the prices paid for them. A "pintura de la feria" (a picture for the fair) was a proverbial expression for an execrably bad one; yet the street painters who thronged the market-place with their "clumsy saints and unripe Madonnas" not unfrequently rose to be able and even famous artists. This rough-and-ready practice, partly for the market-place, partly for convicts in Mexico and Peru, for whom Madonnas and popular saints were produced and shipped off by the dozen, doubtless increased Murillo's manual dexterity; but, if we may judge from the picture of the "Virgin and Child" shown in the Murillo-room at Seville as belonging to this period, he made little improvement
in colouring or in general strength of design. Struck by the favourable change which travel had wrought upon the style of his brother artist Pedro de Moya, Murillo in 1642 resolved to make a journey to Flanders or Italy. Having bought a large quantity of canvas, he cut it into squares of different sizes, which he conveyed into pieces of a kind likely to sell. The Flemish traders bought up his pieces, and he found himself sufficiently rich to carry out his design. He placed his sister, who was dependent on him, under the care of some friends, and without divulging his plans to any one set out for Madrid. On reaching the capital he waited on Velazquez, his fellow-townsmen—then at the summit of his fortune—and asked for some introduction to friends in Rome. The master liked the youth, and offered him lodging in his own house, and proposed to procure him admission to the royal galleries of the capital. Murillo accepted the offer, and here enjoyed the masterpiece of Italy and Flanders without travelling beyond the walls of Madrid. The next two years were chiefly spent in copying from Ribera, Vandyck and Velazquez; and in 1644 he so astonished the latter with some of his efforts that they were submitted to the king and the court. His patron now urged him to go to Rome, and offered him letters to smooth his way; but Murillo preferred returning to his sister and his native Seville.

The friars of the convent of San Francisco in Seville had about this time determined to adorn the walls of their small cloister in a manner worthy of their patron saint. But the brotherhood had no money; and after endless begging they found themselves incapable of employing an artist of name to execute the task. Murillo was needy, and offered his services; after balancing their own poverty against his obscurity the friars bade him begin. Murillo covered the walls with seven large pictures of remarkable power and beauty—displaying by turns the strong colouring of Ribera, the lifelike truthfulness of Velazquez, and the sweetness of Vandyck. Among them were to be found representations of San Francisco, of San Diego, of Santa Clara and of San Gil. These pictures were executed in his earliest style, commonly called his frio or cold style. It was based chiefly on Ribera and Caravaggio, and was dark with a decided outline. This rich collection is no longer in Seville; Marshal Soult carried off ten of the works. The fame of these productions soon got abroad, and "El Claudio Chico" swarmed daily with artists and critics. Murillo was no longer friendless and unknown. The rich and the noble of Seville overwhelmed him with their commissions and their praises.

In 1648 Murillo married a wealthy lady of rank, Doña Beatriz de Cabrera y Sotomayor, of the neighbourhood of Seville, and his house soon became the favourite resort of artists and connoisseurs. About this time he was associated with the landscape-painter Yriarte—the two artists interchanging figures and landscapes for their respective works; but they did not finally agree, and the co-operation came to an end. Murillo now painted the well-known "Flight into Egypt," and shortly afterwards changed his earliest style of painting for his calido or warm style. His drawing was still well defined, but his outlines became softer and his figures rounder, and his colouring gained in warmth and transparency. His first picture of this style, according to Cean Bermudez, was a representation of "Our Lady of the Conception," and was painted in 1652 for the brotherhood of the True Cross; he received for it 2500 reals (£26). In 1655 he executed his two famous paintings of "San Lendro" and "San Isidoro" at the order of Don Juan Federigo, archdeacon of Carmona, which are now in the cathedral of Seville. These are two noble portraits, finished with great care and admirable effect, but the critics complain of the figures being rather short. His next picture, the "Nativity of the Virgin," painted for the chapter, is regarded as one of the most delightful specimens of his calido style. In the following year (1656) the same body gave him an order for a vast picture of San Antonio de Padua, for which he received 10,000 reals (£104). This is one of his most celebrated performances, and still hangs in the baptistery of the cathedral. It was "repaired" in 1833; the grandeur of the design, however, and the singular richness of the colouring may still be traced. The same year saw him engaged on four large semicircular pictures, designed by his friend and patron Don Justino Neve y Yevenes, to adorn the walls of the church of Santa Maria la Blanca. The first two (now in Madrid) were meant to illustrate the history of the Our Lady of the Snow, or the "Virgen de la Nieve," in the Roman basilica of Santa Maggiore. The one represents the wealthy but childless Roman senator and his lady asleep and dreaming; the other exhibits the devout pair relating their dream to Pope Liberius. Of these two noble paintings the Dream is the finer, and in it is to be noticed the commencement of Murillo's third and last style, known as the vaporoso or vapoury. It should be noted, however, that the three styles are not strictly separable into date-periods; for the painter alternated the styles accordingly to his subject-matter or the mood of his inspiration, the calido being the most frequent. In the vaporoso method the well-marked outlines and careful drawing of his former styles disappear, the outlines are lost in the misty blending of the light and shade, and the general finish betrays more haste than was usual with Murillo. After many changes of fortune, these two pictures now hang in the Academy at Madrid. The remaining pieces executed for this small church were a "Virgin of the Conception," and a figure of "Faith." Soult laid his hands on these also, and they have not been recovered.

In 1658 Murillo undertook and consummated a task which had hitherto baffled all the artists of Spain, and even royalty itself. This was the establishing of a public academy of art. By superior tact and good temper he overcame the vanity of Valdes Leal and the presumption of the younger Herrera, and secured their co-operation. The Academy of Seville was accordingly opened for the first time in January 1660, and Murillo and the second Herrera were chosen presidents. The former continued to direct it during the following year; but the calls of his studio inclined him to leave it in other hands. It was then flourishing, but not for long.

Passing over some half-length pictures of saints and a dark-haired Madonna, painted in 1668 for the chapter-room of the cathedral of his native city, we enter upon the most splendid period of Murillo's career. In 1661 Don Miguel Manana Vicen- telo de Leca, who had recently turned to a life of sanctity from one of the wildest profligacy, resolved to raise money for the restoration of the dilapidated Hospital de la Caridad, of whose pious gild he was himself a member. Manana commissioned his friend Murillo to paint eleven pictures for this edifice of San Jorge. Three of these pieces represented the "Annunciation," the "Infant Saviour," and the "Infant St John." The remaining eight are considered Murillo's masterpieces. They consist of "Moses striking the Rock," the "Return of the Prodigal," "Abraham receiving the Three Angels," the "Charity of St Juan de Dios," the "Miracle of the Loaves and Fishes," "Our Lord healing the Paralytic," "St Peter released from Prison by the Angel," and "St Elizabeth of Hungary." These works occupied the artist four years, and in 1674 he received for his eight great pictures 78,115 reals or about £900. The "Moses," "Vapors and Fishes," the "San Juan," and the three subjects which we have named first, are still at Seville; the French carried off the rest, but the "St Elizabeth" and the "Prodigal Son" are now back in Spain. For compass and vigour the "Moses" stands first; but the "Prodigal's Return" and the "St Elizabeth" were considered by Bermudez the most perfect of all as works of art. The front of this famous hospital was also indebted to the genius of Murillo; five large designs in blue glazed tiles were executed from his drawings. He had scarcely completed the undertakings for this edifice when his favourite Franciscans again solicited his aid. He accordingly executed some twenty paintings for the humble little church known as the Convent de los Capucinios. Seventeen of these Capuchin pictures are preserved in the Museum of Seville. Of these the "Charity of St Thomas of Villanueva" is reckoned the best. Murillo himself was wont to call it "su lieno" (his own picture). Another little piece of extraordinary
MURIMUTH—MURNER

merit, which once hung in this church, is the "Virgin of the Napkin," believed to have been painted on a "servilleta" and presented to the cook of the Capuchin brotherhood as a memorial of the artist's pen.

In 1670 Murillo is said to have declined an invitation to court, preferring to labour among the brown coats of Seville. Eight years afterwards his friend the canon Justino again employed him to paint three pieces for the Hospital de los Venerables: the "Mystery of the Immaculate Conception," "St Peter Weeping," and the "Blessed Virgin." As a mark of esteem, Murillo next painted a full-length portrait of the canon. The spaniel at the feet of the priest has been known to call forth a snarl from a living dog. His portraits generally, though, are of great beauty. Towards the close of his life Murillo executed a series of pictures illustrative of the life of "the glorious doctor" for the Augustinian convent at Seville. This brings us to the last work of the artist. Mounting a scaffolding one day at Cadiz (whither he had gone in 1681) to execute the higher parts of a large picture of the "Espousal of St Catherine," on which he was engaged for the Capuchins of that town, he stumbled, and fell so violently that he received a hurt from which he never recovered. The great picture was left unfinished, and the artist returned to Seville to die. He died as he had lived, a humble, pious, brave man, on the 3rd of April 1682 in the arms of the chevalier Pedro Nuñez de Villavicencio, an intimate friend and one of his best pupils.

Another of his numerous pupils was Sebastian Gomez, named "Murillo's Mulatto." Murillo left two sons (one of them at first an indifferent painter, afterwards a priest) and a daughter—his wife having died before him.

Murillo has always been one of the most popular of painters—not in Spain alone. His works show great technical attainment without much style, and a strong feeling for ordinary nature and for truthful or sentimental expression without lofty beauty or ideal elevation. His ecstasies of Madonnas and Saints are the themes of some of his most celebrated achievements. Take as an example the "Immaculate Conception" or "Assumption of the Virgin," (for the titles may, with reference to Murillo's treatments of this subject, almost be interchanged) in the Louvre, a picture for which, on its sale from the Soulit collection, one of the largest prices on record was given in 1832, some £24,600. His subjects may be divided into two great groups—the scenes from low life (which were a new experiment in Spanish art, so far as the subjects of children are concerned), and the Scriptural, legendary and religious works. The former, of which some salient specimens are in the Dulwich Gallery, are, although undoubtedly truthful, neither ingenious nor sympathetic; sordid unsightliness and repulsive squalor are their foundation. Works of this class belong mostly to the earlier years of Murillo's practice. The subjects in which the painter most excels are crowded compositions in which some act of sinlessness, involving the ascetic or self-mortifying element, is being performed—subjects which, while repulsive in some of their details, emphasize the broadly human and the expressly Catholic conceptions of life. A famous example is the picture, now in the Madrid Academy, St Elizabeth of Hungary washing patients afflicted with the scab or itch, and hence commonly named "El Tifoso." Technically considered, it unites his three styles of painting, more especially the cold and the warm. His painter of giving atmosphere to combined groups of figures is one of the marked characteristics of Murillo's art; and he may be said to have excelled in this respect all his predecessors or contemporaries of whatever school.

Seville must still be visited by persons who wish to study Murillo thoroughly. A large number of the works which used to adorn this city have, however, been transported elsewhere. In the Prado Museum at Madrid are forty-five specimens of Murillo—the "Infant Christ and the Baptist" (named "Los Niños della Concha"), "St Ildefonso vested with a Chasuble by the Madonna," &c.; in the Museo della Trinidad, "Christ and the Virgin appearing to St Francis in a Cavern" (an immense composition), and various others. In the National

Gallery, London, the chief example is the "Holy Family"; this was one of the master's latest works, painted in Cadiz. In public galleries in the United Kingdom there are altogether twenty-four examples by Murillo; in those of Spain, seventy-one.

Murillo, who was the last pre-eminent painter of Seville, was an indefatigable and prolific worker, hardly leaving his painting-room save for his devotions in church; he realized large prices, according to the standard of his time, and made a great fortune. His character is recorded as amiable and soft, yet independent, subject also to sudden impulses, not unmixed with passion.

See Stirling, Annals of the Artists of Spain (3 vols., London, 1849); Richard Ford, Handbook for Spain (London, 1855); Curtis, Catalogue of the Works of Velasquez and Murillo (1883); L. Alfonso, Murillo, el hombre, &c. (1886); C. Justi, Murillo (illustrated, 1892); P. Lotot, Murillo et ses élèves (1892); F. M. Tubino, Murillo, the Great (1864); and Dr. G. Allaben, Murillo (1902); C. S. Ricketts, The Prado (1903).

(W. M. R.)

MURIMUTH, ADAM (c. 1274-1347), English ecclesiastic and chronicler, was born in 1274 or 1275 and educated in the civil law at Oxford. Between 1312 and 1318 he practised in the papal curia at Avignon. Edward II. and Archbishop Winchelsey were among his clients, and his legal services secured for him canonnries at Hereford and St. Paul's, and the prebendaryship of Exeter Cathedral. In 1331 he retired to a country living (Wranborough, Bucks), and devoted himself to writing the history of his own times. His Continuatio chronicarum, begun not earlier than 1325, starts from the year 1303, and was carried up to 1347, the year of his death. Meagre at first, it becomes fuller after 1340 and is specially valuable for the history of the French wars. Murimuth has no merits of style, and gives a bald narrative of events. But he incorporates many documents in the latter part of his book. The annals of St. Paul's which have been edited by Bishop Stubbs, are closely related to the work of Murimuth, but probably not from his pen. The Continuatio was carried on, after his death, by an anonymous writer to the year 1380.


(H. W. C. D.)

MURNER, THOMAS (1475-1537 ??), German satirist, was born on the 24th of December 1475 at Obernheim near Strassburg. In 1490 he entered the order of Franciscan monks, and in 1495 began a wandering life, studying and then teaching and preaching in Freiburg-in-Breisgau, Paris, Cracow and Strassburg. The emperor Maximilian I. crowned him in 1505 poeta laureatus; in 1506, he was created doctor theologiae, and in 1513 was appointed custodian of the Franciscan monastery in Strassburg, an office which, on account of a scrurious publication, he was forced to vacate the following year. Late in life, in 1518, he began the study of jurisprudence at the university of Basel, and in 1519 took the degree of doctor juris. After journeys in Italy and England, he again settled in Strassburg, but, disturbed by the Reformation, sought an exile at Lucerne in Switzerland in 1526. In 1533 he was appointed priest of Oberenheim, where he died in 1537, or, according to some accounts, in 1536. Murner was an energetic and passionate character, who made enemies wherever he went. There is not a trace of human kindness in his satires, which were directed against the corruption of the times, the Reformation, and especially against Luther. His most powerful satire—and the most virulent German satire of the period—is Von dem grossen lutherischen Narren, wie ihn Dr. Murner beschworren hat. Among others may be mentioned Die Narrenbeschroebnung (1512); Die Schelmenzunft (1512); Die Gänzmatt, which treats of enamoured fools (1510), and a translation of Virgil's Aeneid (1519) dedicated to the emperor Maximilian I. Murner also wrote the humorous Chastiludium logicae (1527) and the Ludus studentum freiburgensis (1531), besides a translation of Justinian's Institutiones (1519).

All Murner's more important works have been republished in
critical editions; a selection was published by G. Balke in Kürschner's Deutsche Nationalliteratur (1890). Cf. W. Kawerau, Murner und die Kirche des Mittelalters (1890); and by the same writer, Murner und die deutsche Reformation (1891); also K. Ott, Über Murner's Kontroversen (1899).

MUROM, a town of Russia, in the government of Vladimir, on the craggy left bank of the Oka, close to its confluence with the Tesa, 105 m. by rail S.E. of the city of Vladimir. Pop. (1900), 12,874. Muron has an old cathedral. It is the chief entrepôt for grain from the basin of the River Oka, and carries on an active trade with Moscow and Nizhny-Novgorod. It is famed, as in ancient times, for kitchen-gardens, especially for its cucumbers and seed for canaries. Its once famous tanneries have lost their importance, but the manufacture of linen has increased; it has also steam flour-mills, distilleries, manufactories of soap and of iron implements.

MURPHY, ARTHUR (1777–1852), Irish actor and dramatist, son of a Dublin merchant, was born at Clonquin, Roscommon, on the 27th of December 1777. From 1738 to 1744, under the name of Arthur French, he was a student at the English college at St Omer. He entered the counting-house of a merchant at Cork on recommendation of his uncle, Jeffery French, in 1747. A refusal to go to Jamaica alienated French's interest, and Murphy exchanged his situation for one in London. By the autumn of 1752 he was publishing the Grey's Inn Journal, a periodical in the style of the Spectator. Two years later he became an actor, and appeared in the title-roles of Richard III. and Othello; as Biron in Southerne's Fatal Marriage; and as Osmyn in Congreve's Four Sons. His first attempt, The Age of Reason, given at Drury Lane on the 2nd of January 1756. It was followed, among other plays, by The Upholsterer (1757), The Orphan of China (1759), The Way to Keep Him (1760), All in the Wrong (1761), The Grecian Daughter (1772), and Know Your Own Mind (1777). These were almost all adaptations from the French, and were very successful, securing for their author both fame and wealth. Murphy edited a political periodical, called the Test, in support of Henry Fox, by whose influence he was called to the bar at Lincoln's Inn, although he had been refused at the Middle Temple in 1757 on account of his connexion with the stage. Murphy also wrote a biography of Fielding, an essay on the life and genius of Samuel Johnson and translations of Sallust and Tacitus. Towards the close of his life the office of a commissioner of bankrupts and a pension of £200 were conferred upon him by government. He died on the 18th of June 1805.

MURPHY, JOHN FRANCIS (1853– ), American landscape painter, was born at Oswego, New York, on the 11th of December 1853. He first exhibited at the National Academy of Design in 1876, and was made an associate in 1885 and a full academician two years later. He became a member of the Society of American Artists (1901) and of the American Water Color Society.

MURPHY, ROBERT (1806–1843), British mathematician, the son of a poor shoemaker, was born at Mallow, in Ireland, in 1806. At the age of thirteen, while working as an apprentice in his father's shop, he became known to certain gentlemen in the neighbourhood as a self-taught mathematician. Through their exertions, after attending a classical school in his native town, he was admitted to Caius College, Cambridge, in 1825. Third wrangler in 1829, he was elected in the same year a fellow of his college. A course of dissipation led him into debt; his fellowship was sequestrered for the benefit of his creditors, and he was obliged to leave Cambridge in December 1832. After living for some time with his relations in Ireland, he repaired to London in 1836, a penniless literary adventurer. In 1838 he became examiner in mathematics and physics at London University. He had already contributed several mathematical papers to the Cambridge Philosophical Transactions (1831–1836), Philosophical Magazine (1832–1842), and the Philosophical Transactions (1837), and had published Elementary Principles of the Theories of Electricity (1833). He now wrote for the "Library of Useful Knowledge" a Treatise on the Theory of Algebraical Equations (1839). He died on the 12th of March 1843.

MUROPSBO, a city and the county-seat of Jackson county, Illinois, U.S.A., in the south part of the state, on the Big Muddy River, about 57 m. N. of Cairo. Pop. (1890), 3880; (1900), 4643; including 557 foreign-born and 356 negroes; (1910), 4951; (1920), 4922; (1930), 5145. It is served by the Illinois Central, the Mobile & Ohio and the St Louis, Iron Mountain & Southern Railways. It is the centre for a farming region, in which there are deposits of coal, iron, lead and shale, and there are various manufactories in the city. Murphysboro was incorporated in 1867, and re-incorporated in 1875.

MURRIN (derived through O. Fr. marine, from Lat. mori, to die), a general term for various virulent diseases in domesticated animals, synonymous with plague or epizooty. The principal diseases are dealt with under KINDEREFEST; FLEURO-PNEUMONIA; ANTIRRHINUM; and FOOT AND MOUTH DISEASE. See also VETERINARY SCIENCE.

MURRAY (or Moray), EARLS OF. The earldom of Moray was one of the seven original earldoms of Scotland, its lands corresponding roughly to the modern counties of Inverness and Ross. Little is known of the earls until about 1314, when Sir Thomas Randolph, a nephew of King Robert Bruce, was created earl of Moray (q.v.), and the Randolphs held the earldom until 1346, when the childless John Randolph, 3rd earl of this line and a soldier of repute, was killed at the battle of Neville's Cross. According to some authorities the earldom was then held by John's sister Agnes (c. 1312-1369) and her husband, Patrick Dunbar, earl of March or Dunbar (c. 1285-1368). However this may be, in 1359 an English prince, Henry Plantagenet, duke of Bedford (d. 1361), was made earl of Moray by King David II.; but in 1372 John Dunbar (d. 1391), a grandson of Sir Thomas Randolph and a son-in-law of Robert II., obtained the earldom. The last of the Dunbar ears was James Dunbar, who was murdered in August 1429, and after this date his daughter Elizabeth and her husband, Archibald Douglas (d. 1455), called themselves earl and countess of Moray.

The next family to bear this title was an illegitimate branch of the royal house of Stuart, James IV. creating his natural son, James Stuart (c. 1499-1544), earl of Moray. James died without sons, and after the title had been borne for a short time by George Gordon, 4th earl of Huntly (c. 1514-1562), who was killed at Corrichie in 1562, it was bestowed in 1562 by Mary Queen of Scots upon her half-brother, an illegitimate son of James V. This was the famous regent, James Stuart, earl of Moray, or Murray (see below), who was murdered in January 1570; after this event a third James Stuart, who had married the regent's daughter Elizabeth (d. 1591), held the earldom. He, who was called the "bonny earl," was killed by his hereditary enemies, the Gordons, in February 1592, when his son James (d. 1638) succeeded to the title. The earldom of Moray has remained in the Stuart family since this date. Alexander, the 4th earl (d. 1701), was secretary of state for Scotland from 1680 to 1695, and in 1706 the 9th earl (1737-1810), was made a peer of the United Kingdom as Baron Stuart.


MURRAY, ALEXANDER STUART (1841–1904), British archaeologist, was born at Arbroath on the 8th of January 1841, and educated there, at Edinburgh high school and at the universities of Edinburgh and Berlin. In 1867 he entered the British Museum as an assistant in the department of Greek and Roman antiquities under Sir Charles Newton, whom he succeeded in 1886. His younger brother, George Robert Milne Murray (b. 1838), was made keeper of the botanical department in 1895, the only instance of two brothers becoming heads of different departments at the museum. In 1873 Dr Murray published a Manual of Mythology, and in the following year contributed to the Contemporary Review two articles—one on the Homeric question—which led to a friendship with Mr Gladstone, the other on Greek painters. In 1886–1883 he brought out his History of Greek Sculpture, which at once became a standard work. In 1886 he was selected by the Society of Antiquaries of Scotland to deliver the Rhind lectures on archaeology, out of
which grew his *Handbook of Greek Archaeology* (1862). In 1894–1896 Dr Murray directed some excavations in Cyprus undertaken by means of a bequest of £5000 from Miss Emma Tournour Turner. The objects obtained are described and illustrated in a new edition of *Cyprus*, published by the trustees of the museum in 1900. Among Dr Murray's other official publications are three folio volumes on *Terra-cotta Sarcophagi*, *While Athenian Vases* and *Designs from Greek Vases*. In 1886 he wrote for the *Portfolio* a monograph on Greek bronze, founded on lectures delivered at the Royal Academy in that year, and he contributed many articles on archaeology to standard publications. In recognition of his services to archaeology he was made LL.D. of Glasgow University in 1887 and elected a corresponding member of the Berlin Academy of Sciences in 1900. He died in March 1904.

**MURRAY, DAVID** (1840–1890), Scottish painter, was born in Glasgow, and spent some years in commercial pursuits before he practised as an artist. He was elected an associate of the Royal Academy in 1891 and academician in 1905; and also became an associate of the Royal Scottish Academy and of the Royal Society of Painters in Water Colours, and a member of the Royal Scottish Water Colour Society. He is a landscape painter of distinction, and two of his pictures, "My Love is gone a-sailing" (1884) and "In the Country of Constable" (1903), have been bought for the National Gallery of British Art. "Young Wheat," painted in 1890, is one of his most noteworthy works.

**MURRAY, JUStACE CLARE GRENVILLE** (1824–1881), English journalist, was born in 1824, the natural son of the 2nd duke of Buckingham. Educated at Magdalen Hall (Hertford College), Oxford, he entered the diplomatic service through the influence of Lord Palmerston, and in 1851 joined the British embassy at Vienna as attaché. At the same time he agreed to act as Vienna correspondent of a London daily paper, a breach of the conventions of the British Foreign Office which cost him his post. In 1853 he was transferred to Hanover, and thence to Constantinople, and finally, in 1855, was made consul-general at Odessa. In 1868 he returned to England, and devoted himself to journalism. He contributed to the early numbers of *Vanity Fair*, and in 1869 founded a clever but abusive society paper, the *Queen's Messenger*. For a libel published in this paper Lord Carrington horse-whipped him on the doorstep of a London club. Murray was subsequently charged with perjury for denying on oath his authorship of the article. Remanded on bail, he escaped to Paris, where he subsequently lived, acting as correspondent of various London papers. In 1874 he helped Edmund Yates to found the *World*. Murray died at Passy on the 20th of December 1881.

His score of books, several of which were translated into French and published in Paris, include *French Pictures in English Chats* (1876–1878); *The Roving Englishman in Turkey* (1854); *Men of the Second Empire* (1872); *Young Broads* (1874); *Sidelights on English Society* (1881); and *Under the Lens: Social Photographs* (1885).

**MURRAY, LORD GEORGE** (1694–1756), Scottish Jacobite general, fifth son of John, 1st duke of Atholl, by his first wife, Catherine, daughter of the 3rd duke of Hamilton, was born at Huntingtower, near Perth, on the 4th of October 1694. He joined the army in Flanders in June 1712; in 1715, contrary to their father's wishes, he and his brothers, the marquis of Tullibardine and Lord Charles Murray, joined the Jacobite rebels under the earl of Mar, each brother commanding a regiment of men of Atholl. Lord Charles was taken prisoner at Preston, but after the collapse of the rising Lord George escaped with Tullibardine to South Uist, and thence to France. In 1719 Murray took part in the Jacobite attempt in conjunction with the Spaniards in the western highlands, under the command of Tullibardine and the earl marshal, which terminated in "the affair of Glenshiel" on the 10th of June, when he was wounded while commanding the right wing of the Jacobites. After hiding for some months in the highlands he reached Rotterdam in May 1720. There is no evidence for the statement that Murray served in the Sardinian army, and little is known of his life on the continent till 1724, when he returned to Scotland, where in the following year he was granted a pardon. The duke of Atholl died in 1724 and was succeeded in the title by his second son James, owing to the attainder of Tullibardine; and Lord George leased from his brother the old family property of Tullibardine in Strathern, where he lived till 1745.

On the eve of the Jacobite rising of 1745 the duke of Perth made overtures to Lord George Murray on behalf of the Pretender; but even after the landing of Charles Edward in Scotland in July, accompanied by Tullibardine, Murray's attitude remained doubtful. He accompanied his brother the duke to Crieff on the 21st of August to pay his respects to Sir John Cope, the commander of the government troops, and he permitted the duke to appoint him deputy-sheriff of Perthshire. It has been suggested that Murray acted with duplicity, but his hesitation was natural and genuine; and it was not till early in September, when Charles Edward was at Blair Castle, which had been vacated by the duke of Atholl on the prince's approach, that Murray decided to espouse the Stuart cause. He then wrote to his brother explaining that he did so for conscientious reasons, while realizing the risk of ruin it involved. On joining the Jacobite army Lord George received a commission as lieutenant-general, though the prince ostentatiously treated him with want of confidence; and he was flouted by the Irish adventurers who were the Pretender's trusted advisers. At Perth Lord George exerted himself with success to introduce discipline and organization in the army he was to command, and he gained the confidence of the highland levies, with whose habits and methods of fighting he was familiar. He also used his influence to prevent both excesses and arbitrariness. As a result of his dealings with civil rights which Charles was too ready to sanction on the advice of others. At Prestonpans, on the 21st of September, Lord George, who led the Jacobite left wing in person, was practically commander-in-chief, and it was to his able generalship that the victory was mainly due. During the six weeks' occupation of Edinburgh he did useful work in the further organization and disciplining of the army. He opposed Charles's plan of invading England, and when his judgment was overruled he prevailed on the prince to march into Cumberland, which he knew to be favourable ground for highlander tactics, instead of advancing against General Wade, whose army was posted at Newcastle. He conducted the siege of Carlisle, but on the surrender of the town on the 14th of November he resigned his commission on the ground that his authority had been insufficiently upheld by the prince, and he obtained permission to serve as a volunteer in the ranks of the Atholl levies. The dissatisfaction, however, of the army with the appointment of the duke of Perth to succeed him compelled Charles to reinstate Murray, who accordingly commanded the Jacobites in the march to Derby. Here on the 5th of December a council was held at which Murray urged the necessity for retreat, owing to the failure of the English Jacobites to support the invasion and the absence of aid from France. As Murray was supported by the council the retreat was ordered, to the intense chagrin of Charles, who never forgave him; but the failure of the enterprise was mainly chargeable to Charles himself, and it was not without justice that Murray's aide de camp, the chevalier Johnstone, declared that "had Prince Charles slept during the whole of the expedition, and allowed Lord George Murray to act for him according to his own judgment, he would have found the crown of Great Britain on his head when he awoke." Lord George commanded the rear-guard during the retreat; and this task, rendered doubly dangerous by the proximity of Cumberland in the rear and Wade on the flank, was made still more difficult by the incapacity and petulance of the Pretender. By a skilfully fought rear-guard action at Clifton Moor, Lord George enabled the army to reach Carlisle safely and without loss of stores or war materials, and on the 3rd of January 1746 the force entered Stirling, where they were joined by reinforcements from Perth. The prince laid siege to Stirling Castle, while Murray defeated General Hawley near Falkirk; but the losses of the Jacobites by sickness and desertion, and the approach of Cumberland, made retreat
to the Highlands an immediate necessity, in which the prince was compelled to acquiesce; his resentment was such that he gave ear to groundless suggestions that Murray was a traitor, which the latter's failure to capture his brother's stronghold of Blair Castle did nothing to refute.

In 1760 Lord William Murray was in the neighbourhood of Inverness, and the prince decided to give battle to the duke of Cumberland. Charles took up a position on the left bank of the Nairn river at Culloden Moor, rejecting Lord George Murray's advice to select a much stronger position on the opposite bank. The battle of Culloden, where the Stuart cause was ruined, was fought on the 16th of April 1746. On the following day the duke of Cumberland intimated to his troops that "the public orders of the rebels yesterday was to give us no quarter"; Hanoverian news-sheets printed what purported to be copies of such an order, and the historian James Ray and other contemporary writers gave further currency to a calumny that has been repeated by modern authorities. Original copies of Lord George Murray's "orders at Culloden" are in existence, one of which is among Cumberland's own papers, while another was in the possession of Lord Hardwicke, the judge who tried the Jacobite peers in 1746, and they contain no injunction to refuse quarter. After the defeat Murray conducted a remnant of the Jacobite army to Ruthven, and prepared to organize further resistance. Prince Charles, however, had determined to abandon the enterprise, and at Ruthven Lord George received an order dismissing him from the prince's service, to which he replied in a letter upbraiding Charles for his distrust and mismanagement. Charles's belief in the general's treachery was shared by several leading Jacobites, but there appears no ground for the suspicion. From the moment he threw in his lot with the exiled prince's cause Lord George Murray never deviated in his loyalty and devotion, and his generalship was deserving of the highest praise; but the discipline he enforced and jealousy of his authority made enemies of some of those to whom Charles was more inclined to listen than to the general who gave him sound but unwelcome advice.

Murray escaped to the continent in December 1746, and was graciously received in Rome by the Old Pretender, who granted him a pension; but in the following year when he went to Paris Charles Edward refused to see him. Lord George lived at various places abroad until his death, which occurred at Medemblik in Holland on the 11th of October 1760. He married in 1728 Amelia, daughter and heiress of James Murray of Strowan and Glencarse, by whom he had three sons and two daughters. His eldest son John became 3rd duke of Atholl in 1764; the two younger sons became lieutenant-general and vice-admiral respectively in the British service.


Murray, James (c. 1719-1794), British governor of Canada, was a younger son of Alexander Murray, 4th Lord Elibank (d. 1736). Having entered the British army, he served with the 15th Foot in the West Indies, the Netherlands and Brittany, and became lieutenant-colonel of this regiment by purchase in 1751. In 1757 he led his men to North America to take part in the war against France. He commanded a brigade at the siege of Louisburg, was court-martialled by Wolfe's thrombute for his part in the mutiny against Quebec, and commanded the left wing of the army in the famous battle in September 1759. After the British victory and the capture of the city, Murray was left in command of Quebec; having strengthened its fortifications and taken measures to improve the morale of his men, he defended it in April and May 1760 against the attacks of the French, who were soon compelled to raise the siege. The British troops had been decimated by disease, and it was only a remnant that Murray now led to join General Amherst at Montreal, and to be present when the last batch of French troops in Canada surrendered. In October 1760 he was appointed governor of Quebec, and he became governor of Canada after this country had been formally ceded to Great Britain in 1763. In this year he quelled a dangerous mutiny, and soon afterwards his alleged partiality for the interests of the French Canadians gave offence to the British settlers; they asked for his recall, and in 1766 he retired from his post. After an inquiry in the House of Lords, he was exonerated from the charges which had been brought against him. In 1774 Murray was sent to Minorca as governor, and in 1781, while he was in charge of this island, he was besieged in Fort St Philip by a large force of French and Spaniards. After a stubborn resistance, which lasted nearly seven months, he was obliged to surrender the place; and on his return to England he was tried by a court-martial, at the instance of Sir William Draper, who had served under him in Minorca as lieutenant-governor. He was acquitted and he became a general in 1783. He died on the 18th of June 1794. Murray's only son was James Patrick Murray (1782-1834), a major-general and member of parliament.

Murray, Sir James Augustus Henry (1837—), British lexicographer, was born at Denholm, near Hawick, Roxburghshire, and after a local elementary education proceeded to Edinburgh, and thence to the university of London, where he graduated B.A. in 1873. Sir James Murray, who received honorary degrees from several universities, both British and foreign, was engaged in scholastic work for thirty years, from 1855 to 1885, chiefly at Hawick and Mill Hill. During this time his reputation as a philologist was increasing, and he was assistant examiner in English at the University of London from 1875 to 1879 and president of the Philological Society of London from 1878 to 1880, and again from 1882 to 1884. It was in connexion with this society that he undertook the chief work of his life, the editing of the New English Dictionary, based on materials collected by the society. These materials, which had accumulated since 1857, when the society first projected the publication of a dictionary on philological principles, amounted to an enormous quantity, of which an idea may be formed from the fact that Dr Furnivall sent in "some ton and three-quarters of materials which had accumulated under his roof." After negotiations extending over a considerable period, the contracts between the society, the delegates of the Clarendon Press, and the editor, were signed on the 1st of March 1879, and Murray began the examination and arrangement of the raw material, and the still more troublesome work of re-animating and maintaining the enthusiasm of "readers." In 1885 he removed from Mill Hill to Oxford, where his Scriptorium came to rank among the institutions of the University city. The first volume of the dictionary was printed at the Clarendon Press, Oxford, in 1888. A full account of its beginning and the manner of working on it will be found in Murray's presidential address to the Philological Society in 1879, while reports of its progress are given in the addresses by himself and other presidents in subsequent years. In addition to his work as a philologist, Murray was a frequent contributor to the transactions of the various antiquarian and archaeological societies of which he is a member; and he wrote the article on the English language for this Encyclopaedia. In 1885 he received the honorary degree of M.A. from Balliol College; he was an original fellow of the British Academy, and in 1908 he was knighted.

Murray (or Moray), James Stuart, Earl of (c. 1531-1570), regent of Scotland, was an illegitimate son of James V. of Scotland and Margaret Erskine, daughter of John Erskine, Earl of Mar. In 1566, at the age of 16, James Murrays, accompanied by Lord St Andrews in order that James V. might obtain possession of his funds. Educated at St Andrews University, he attacked, in September 1549, an English force which had made a descent on the Fife coast, and routed it with great slaughter. In addition to the priory of St Andrews, he received those also of Pittenweem and Mâcon in France, but manifested no vocation.
MURRAY, JOHN

for a monastic life. The discourses of Knox, which he heard at Calder, won his approval, and shortly after the return of the reformer to Scotland in 1559, James Stuart left the party of the queen regent and joined the lords of the congregation, who resolved forcibly to abolish the Roman service. After the return of Queen Mary in 1561, he became her chief adviser, and his cautious firmness was for a time effectual in inducing her to adopt a policy of moderation towards the reformers. At the beginning of 1562 he was created earl of Murray, a dignity also held by George Gordon, earl of Huntly, who, however, had lost the queen's favour. Only a few days later he was made earl of Mar, *but as this title was claimed by John, Lord Erskine, Stuart resigned it and received a second grant of the earldom of Murray, Huntly by this time having been killed in battle. Henceforward he was known as the earl of Moray, the alternative Murray being a more modern and less correct variant. About this time the earl married Anne (d. 1583), daughter of William Keith, 1st Earl Marischal.

After the defeat and death of Huntly, the leader of the Catholic party, the policy of Murray met for a time with no obstacle, but he awakened the displeasure of the queen by his efforts in behalf of Knox when the latter was accused of high treason; and as he was also opposed to her marriage with Darnley, he was after that event declared an outlaw and took refuge in England. Returning to Scotland after the murder of Rizzio, he was pardoned by the queen. He contrived, however, to be away at the time of Darnley's assassination, and avoided the tangles of the marriage with Bothwell by going to France. After the abdication of Queen Mary at Lochleven, in July 1567, he was appointed regent of Scotland. When Mary escaped from Lochleven (May 2, 1568), the duke of Châtelherault and other Catholic nobles rallied to her standard, but Murray and the Protestant lords gathered their adherents, defeated her forces at Langside, near Glasgow (May 13, 1568), and compelled her to flee to England. Murray displayed promptness in baffling Mary's schemes, suppressed the border thieves, and ruled firmly, resisting the temptation to place the crown on his own head. He observed the forms of personal piety; possibly he shared the zeal of the reformers, while he moderated their bigotry. But he reapèd the fruits of the conspiracies which led to the murders of Rizzio and Darnley. He had been a persecutor of his faith, and henceforth to be deemed a pure reformer of its abuses. He pursued his sister with a calculated animosity which would not have spared her life had this been necessary to his end or been favoured by Elizabeth. The mode of producing the casket letters and the false charges added by Buchanan, deprive Murray of any claim to have been an honest accuser. His reluctance to charge Mary with complicity in the murder of Darnley was feigned, and his object was gained when he was allowed to table the accusation without being forced to prove it. Mary remained a captive under suspicion of the gravest guilt, while Murray ruled Scotland in her stead, supported by nobles who had taken part in the steps which ended in Bothwell's death. During the year between his becoming regent and his death several events occurred for which he has been censured, but which were necessary for his security: the betrayal to Elizabeth of the duke of Norfolk and of the secret plot for the liberation of Mary; the imprisonment of the earl of Northumberland, who after the failure of his rising in the north of England had taken refuge in Scotland; and the charge brought against Maitland of Lethington of complicity in Darnley's murder. Lethington was committed to custody, but was rescued by Kirkaldy of Grange, who held the castle of Edinburgh, and while there "the chameleon," as Buchanan named Maitland in his famous invective, gained respite for hours in the castle, including Kirkaldy. Murray was afraid to proceed with the charge on the day of trial, while Kirkaldy and Maitland held the castle, which became the stronghold of the deposed queen's party. It has been suspected that Maitland and Kirkaldy were cognizant of the design of Hamilton of Bothwellhaugh to murder Murray, for he had been with them in the castle. This has been ascribed to private vengeance for the ill-treatment of his wife; but the feud of the Hamiltons with the regent is the most reasonable explanation.

As he rode through Linlithgow Murray was shot on the 21st of January 1570 from a window by Hamilton, who had made careful preparation for the murder and had gone to Edinburgh. He was buried in the south aisle of St. Giles Cathedral, Edinburgh, amid general mourning. Knox preached the sermon and Buchanan furnished the epitaph, both panegyrics. The elder of his two daughters, Elizabeth, married James Stuart (d. 1592), son of James, 1st Lord Doune, who succeeded to the earldom of Murray in right of his wife.

The materials for the life of Murray are found in the records and documents of the time, prominent among which are the various Collections of State Papers. Mention must also be made of the many books which treat of Mary, Queen of Scots, and of the histories of the time—especially J. A. Froude, History of England, and Andrew Lang, History of Scotland.

MURRAY, JOHN, the name for several generations of a great firm of London publishers, founded by John McMurray (1743-1793), a native of Edinburgh and a retired lieutenant of marines, who in 1768 bought the book business of William Sandby in Fleet Street, and, dropping the Scottish prefix, called himself John Murray. He was one of the twenty original proprietors of the Morning Chronicle, and started the monthly English Review (1783-1796). Among his publications were Mitford's Greece, Langhorne's Plutarch's Lives, and the first part of Isaac D'Israeli's Curiosities of Literature. He died on the 6th of November 1793.

JOHN MURRAY (2) (1778-1843), his son, was then fifteen. During his minority the business was conducted by Samuel Higlhey, who was admitted a partner, but in 1803 the partnership was dissolved. Murray soon began to show the courage in literary speculation which earned for him later the name given him by Lord Byron of "the Anak of publishers." In 1807 he took a share with Constable in publishing Marmion, and became part owner of the Edinburgh Review, although with the help of Canning he launched in opposition the Quarterly Review (Feb. 1809), with William Gifford as its editor, and Scott, Canning, Southey, Hookham Freer and John Wilson Croker among its earliest contributors. Murray was closely connected with Constable, but, to his distress, was compelled in 1813 to break this association on account of Constable's business methods, which, as he foresaw, led to disaster. In 1811 the first two cantos of Childe Harold were brought to Murray by R. C. Dallas, to whom Byron had presented them. Murray paid Dallas the full price for the copyright. In 1812 he bought the publishing business of William Miller (1769-1834), and migrated to 50, Albermarle Street. Literary London flocked to his house, and Murray became the centre of the publishing world. It was in his drawing-room that Scott and Byron first met, and here, in 1824, after the death of Lord Byron, the MS. of his memoirs, considered by Gifford unfit for publication, was destroyed. A close friendship existed between Byron and his publisher, but for political reasons business relations ceased after the publication of the 7th canto of Don Juan. Murray paid Byron some £50,000 for his various poems. To Thomas Moore he gave nearly £5000 for writing the life of Byron, and to Crabbe Lyric and Tales of the Hall. He died on the 27th of June 1843.

His son, John Murray (3) (1808-1892), inherited much of his business tact and judgment. "Murray's Handbooks" for travellers were issued under his editorship, and he himself wrote several volumes (see his article on the "Handbooks" in Murray's Magazine, November 1889). He published many books of travel; also Campbell's Lives of the Chancellors, The Speaker's Commentary, Smith's Dictionaries; and works by Hallam, Gladstone, Lyell, Layard, Dean Stanley, Borrow, Darwin, Livingstone and Samuel Smiles. He died on the 2nd of April 1892, and was succeeded by his eldest son, John Murray (4) (b. 1851), under whom, in association with his brother, A. H. Hallam Murray, the firm was continued.

See Samuel Smiles, A Publisher and his Friends, Memoirs and Correspondence of the late John Murray... (1861), for the second John Murray; a series of three articles by F. Espinasse on "The
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House of Murray,” in The Critic (Jan. 1860); and a paper by the same writer in Harper’s New Monthly Magazine (Sept. 1878). See the Letters and Journals of Byron (ed. Prothero, 1898-1901).

MURRAY, JOHN (1778-1820), Scottish chemist, was born at Edinburgh in 1778 and died there on the 22nd of July 1820. He graduated M.D. at St Andrews in 1814, and attained some reputation as a lecturer on chemistry and materia medica. He was an opponent of Sir Humphry Davy’s theory of chlorine, supporting the view that the substance contained oxygen, and it was in the course of experiments made to disprove his arguments that Dr John Davy discovered phosgene or carbonyl chloride. He was a diligent writer of textbooks, including Elements of Chemistry (1801); Elements of Materia Medica and Pharmacy (1804); A System of Chemistry (1806), and (anonymously) A Comparative View of the Huttonian and Neptunian Systems of Geology. He was sometimes confused with another John Murray (1786-1851), a popular lecturer at mechanics’ institutes. The two men carried on a dispute about the invention of a miners’ safety lamp in the Phil. Mag. for 1817.

MURRAY, SIR JOHN (1841-1880), British geographer and naturalist, was born at Coburg, Ontario, Canada, on the 3rd of March 1841, and after some years’ local schooling studied in Scotland and on the Continent. He was then engaged for some time as assistant editor at Bridge of Allan. In 1868 he visited Spitsbergen on a whaler, and in 1872, when the voyage of the “Challenger” was projected, he was appointed one of the naturalists to the expedition. At the conclusion of the voyage he was made principal assistant in drawing up the scientific results, and in 1882 he became editor of the Reports, which were completed in 1896. He compiled a summary of the results, and was part-author of the Narrative of the Cruise and of the Report on Deep-sea Deposits. He also published numerous important papers on oceanography and marine biology. In 1898 he made K.C.B., and the received many distinctions from the chief scientific societies of the world. Apart from his work the connection of the “Challenger” Reports were published in 1880 and 1882 on expeditions to explore the Eareoe Channel, and between 1882 and 1894 was the prime mover in various biological investigations in Scottish waters. In 1897, with the generous financial assistance of Mr Laurence Pullar and a staff of specialists, he began a bathymetrical survey of the fresh-water lochs of Scotland, the results of which, with a fine series of illustrations and maps, were published in 1910 in six volumes. He took a leading part in the expedition which started in April 1910 for the physiological and biological investigation of the North Atlantic Ocean on the Norwegian vessel “Michael Sars.”

MURRAY, LINDLEY (1745-1826), Anglo-American grammarian, was born at Swatara, Pennsylvania, on the 22nd of April 1745. His father, a Quaker, was a leading New York merchant. At the age of fourteen he was placed in his father’s office, but he ran away to a school in Burlington, New Jersey. He was brought back to New York, but his arguments against a commercial career prevailed, and he was allowed to study law. On being called to the bar he practised successfully in New York. In 1783 he was able to retire, and in 1784 he left America for England. Settling at Holgate, near York, he devoted the rest of his life to literary pursuits. His first book was Perus of Religion on the Mind (1787). In 1795 he issued his Grammar of the English Language. This was followed, among other analogous works, by English Exercises, and the English Reader. These books passed through several editions, and the Grammar was the standard textbook for fifty years throughout England and America. Lindley Murray died on the 16th of January 1826. See the Memoir of the Life and Writings of Lindley Murray (partly autobiographical) by Elizabeth of text, Murray, by W. H. Egle (New York, 1885).

MURRAY (or Moray), SIR ROBERT (c. 1660-1763), one of the founders of the Royal Society, was the son of Sir Robert Murray of Craigie, Ayrshire, and was born about the beginning of the 17th century. In early life he served in the French army, and, winning the favour of Richelieu, rose to the rank of colonel. On the outbreak of the Civil War he returned to Scotland and collected recruits for the royal cause. The triumph of Cromwell compelled him for a time to return to France, but he took part in the Scottish insurrection in favour of Charles II. in 1650, and was named lord justice clerk and a privy councillor. These appointments, which on account of the overthrow of the royal cause proved to be at the time only nominal, were confirmed at the Restoration in 1660. Soon after this Sir Robert Murray began to take a prominent part in the deliberations of a club instituted in London for the discussion of natural science, or, as it was then called, the “new philosophy.” When it was proposed to obtain a charter for the society he undertook to interest the king in the matter, the result being that on the 15th of July 1662 the club was incorporated by charter under the designation of the Royal Society. Murray was its first president. He died in June 1673.

MURRAY, the largest river in Australia. It rises in the Australian Alps in 36° 40’ S. and 147° E., and flowing north-west skirts the borders of New South Wales and Victoria until it passes into South Australia, shortly after which it bends southward into Lake Alexandrina, a shallow lagoon, whence it makes its way to the sea at Encounter Bay by a narrow opening at 35° 35’ S. and 138° 55’ E. Near its source the Murray Gates, precipitous rocks, tower above it to the height of 3000 ft.; and the earlier part of its course is tortuous and uneven. Farther on it loses so much by evaporation in some parts as to become a series of pools. Its length till it debouches into Lake Alexandrina is 1120 m., its average breadth in summer is 240 ft., its average depth about 16 ft.; and it drains an area of about 270,000 sq. m. For small steamers it is navigable as far as Albury. Periodically it overflows, causing wide inundations. The principal tributaries of the Murray and those from New South Wales, including the Edward River, the united streams of the Murrumbidgee and Lachlan, and the Darling or Callawatta. In 1829 Captain Sturt traced the Murrumbidgee River till it debouched into the Murray, which he followed down to Lake Alexandrina, but he was compelled, after great hardships, to return without discovering its mouth. In 1831 Captain Barker, while attempting to discover this, was murdered by the natives.

MURRAY COD (Oligorus macquariensis), one of the largest of the numerous fresh-water Perciform fishes of Australasia, and the most celebrated for its excellent flavour. It belongs to the family Serranidae. Its taxonomic affinities lie in the direction of the perch and not of the cod family. The shape of the body is that of a perch, and the dorsal fin consists of a spinous and rayed portion, the number of spines being eleven. The length of the spines varies with age, old individuals having shorter spines—that is, a lower dorsal fin. The form of the head and the dentition also resemble those of a perch, but none of the bones of the head has a serrated margin. The scales are small. The colour varies in different localities; it is generally brownish, with a greenish tinge and numerous small dark green spots. As implied by the name, this fish has its headquarters in the Murray River and its tributaries, but it occurs also in the northern parts of New South Wales. It is the most important food fish of these rivers, and is said to attain a length of more than 3 ft. and a weight of 170 lb.

MURREE, a town and sanatorium of British India, in the Rawalpindi district of the Punjab, 7577 ft. above the sea, about five hours’ journey by cart-road from Rawalpindi town, and the starting-point for Kashmir. The houses are built on the
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summit and sides of an irregular ridge, and command magnificent views over forest-clad hills and deep valleys, studded with villages and cultivated fields, with the snow-covered peaks of Kashmir in the background. The population in 1901 was 18,445; but these figures omit the summer visitors, who probably numbered 10,000. The garrison generally consists of three mountain batteries. Since 1877 the summer offices of the provincial government have been transferred to Simla. The Murree brewery, one of the largest in India, is the chief industrial establishment. The Lawrence Military Asylum for the children of European soldiers is situated here.

MURSHIDABAD, or MOORSHEEDEEABAD, a town and district of British India, in the Presidency division of Bengal. The administrative headquarters of the district are at Berhampur. The town of Murshidabad is on the left bank of the Bhagirathi or old sacred channel of the Ganges. Pop. (1901), 15,188. The city of Murshidabad was the latest Mahomedan capital of Bengal. In 1794 the nawab Murshid Kulia Khan changed the seat of government from Dacca to Murshidabad, which he called after his own name. The great family of Jagat Seth maintained their position as state bankers at Murshidabad from generation to generation. Even after the conquest of Bengal by the British, Murshidabad remained for some time the seat of administration. Warren Hastings removed the supreme civil and criminal courts to Calcutta in 1772, but in 1775 the latter court was brought back to Murshidabad again. In 1790, under Lord Cornwallis, the entire revenue and judicial staffs were fixed at Calcutta. The town is still the residence of the nawab, who ranks as the first nobleman of the province with the title of nawab bahadur of Murshidabad, instead of nawab nazim of Bengal. His palace, dating from 1837, is a magnificent building in Italian style. The city is crowded with other palaces, mosques, tombs, and gardens, and retains such industries as carving in ivory, gold and silver embroidery, and silk-weaving. A college is maintained for the education of the nawab's family.

The District of Murshidabad has an area of 2143 sq. m. It is divided into two nearly equal portions by the Bhagirathi, the ancient channel of the Ganges. The tract to the west, known as the Rarh, consists of hard clay and nodular limestone. The general level is high, but interspersed with marshes and swamps by hill torrents. The Bagri, the eastern half, belongs to alluvial plains of eastern Bengal. There are few permanent swamps; but the whole country is low-lying, and liable to annual inundation. In the north-west there are a few small detached hillocks, said to be of basaltic formation. Pop. (1901), 1,333,184, showing an increase of 6-6% in the decade. The principal industry is that of silk, formerly of much importance, and now revived with government assistance. A narrow-gauge railway crosses the district, from the East Indian line at Nathali to Azimganj near the Bhagirathi, the home of many rich Jain merchants; and a branch of the Eastern Bengal railway has been opened.

MUS, the name of a Roman family of the plebeian Decian gens. (1) Publius Decius Mus won his first laurels in the Samnite War, when in 343 B.C., while serving as tribune of the soldiers, he rescued the Roman main army from an apparently hopeless position (Liv. vii. 34). In 340, as consul with T. Manlius Torquatus as colleague, he commanded in the Latin War. The decisive battle was fought near Mt Vesuvius. The consuls, in consequence of a dream, had agreed that the general whose troops first gave way should devote himself to destruction, and so ensure victory. The left wing under Decius became disordered, whereupon, repeating after the chief priest the solemn formula of self-devotion he dashed into the ranks of the Latins, and met his death (Liv. viii. 9). (2) His son, also called Publius, consul for the fourth time in 318, followed the example of his father at the battle of Sentinum, when the left wing which he commanded was shaken by the Gauls (Liv. x. 28). The story of the elder Decius is regarded by Mommsen as an unhistorical "doublette" of what is related on better authority of the son.

MUSAEUS, the name of three Greek poets. (1) The first was a mythical seer and priest, the pupil or son of Orpheus, who was said to have been the founder of priestly poetry in Attica. According to Pausanias (i. 23) he was buried on the Museum hill, south-west of the Acropolis. He composed dedicatory and purificatory hymns and prose treatises, and oracular responses. These were collected and arranged in the time of Pelisstratus by Onomacritus, who added interpolations. The mystic and oracular verses and customs of Attica, especially of Eleusis, are connected with his name (Herod. vii. 6; viii. 96; ix. 43). A Titanomachia and Theogonia are also attributed to him (G. Kinkel, Epicurum greceorum fragmenta, 1878). (2) The second was an Ephesian attached to the court of the kings of Pergamum, who wrote a Perséis, and poems on Eumenes and Attalus (Suidas, s.v.). (3) The third (called Grammaticus in all the MSS.) is of uncertain date, but probably belongs to the beginning of the 4th century A.D. as his style and the British Army in India was evidently modelled after Numa. He must have lived before Agathias (530-582) and is possibly to be identified with the friend of Procopius whose poem (430 hexameter lines) on the story of Hero and Leander is by far the most beautiful of the age (editions by F. Passow, 1810; G. H. Schäfer, 1825; C. Dilthey, 1874). The little love-poem Alpheus and Arethusa (Anthol. pal. ix. 362) is also ascribed to Musaeus.

MUSA KHEL, a Pathan tribe on the Dera Ghazi Khan border of the Punjab province of India. They are of Kakar origin, numbering 4000 fighting men. They enter British territory by the Vihowa Pass, and carry on an extensive trade, but are not dependent on India for the necessities of life. They are a peaceful and law-abiding tribe, and have been friendly to the British, but at enmity with the Khetran and the Baluch tribes to the south of their country. In 1879 the Musa Khels and other Pathan tribes to the number of 5000 made a demonstration against Vihowa, but the town was reinforced and they dispersed. In 1884 they were punished, together with the Kakars, by the Zhob Valley Expedition.

MUSÄUS, JOHANN KARL AUGUST (1735-1827), German author, was born on the 29th of March 1735 at Jena, studied theology at the university, and would have become the pastor of a parish but for the resistance of some peasants, who objected that he had been known to dance. In 1760 to 1762 he published in three volumes his first work, Grandzonz des Zweiten, afterwards (in 1781-1782) rewritten and issued with a new title, Der deutsche Glandison. The object of this book was to satirize Samuel Richardson's hero, who had many sentimental admirers in Germany. In 1763 Musäus was made master of the court pages at Weimar, and in 1769 he became professor at the Weimar gymnasium. His second book—Physiognomische Reisen—did not appear until 1778-1779. It was directed against Lavater, and attracted much favourable attention. In 1782 to 1786 he published his best work Völkmärchen der Deutschen. Even in this series of tales, the substance of which Musäus collected among the people, he could not refrain from satire. The stories, therefore, lack the simplicity of genuine folk-lure. In 1785 was issued Freunde Heins Erscheinungen in Holbeins Manier by J. R. Schellenberg, with explanations in prose and verse by Musäus. A collection of stories entitled Strassseufzer, of which a volume appeared in 1787, Musäus was prevented from completing by his death on the 28th of October 1787.

The Volkmarhen have been frequently reprinted (Düsseldorf, 1903, &c.). They were translated into French in 1844, and three of the stories are included in Carlyle's German Romances (1827). Musäus's Nachgelassene Schilden were edited by his relative, A. von Kotzebue (1791). See M. Müller, J. K. A. Musäus (1867), and an essay by A. Stern in Beiträge zur Literaturgeschichte des 18. Jahrhunderts (1893).

MUSCAT, MUSKAT or MUSKAT, a town on the south-east coast of Arabia, capital of the province of Oman. Its value as a naval base is derived from its position, which commands the entrance to the Persian Gulf. The town of Gwadar, the chief port of Makran, belongs to Muscat, and by arrangement with the sultan the British occupy that port with a telegraph station of the Indo-Persian telegraph service. An Indian political residency is established at Muscat. In geographical
MUSCATINE—MUSCLE AND NERVE

position it is isolated from the interior of the continent. The mountains rise behind it in a rugged wall, across which no road exists. It is only from Matrah, a northern suburb shut off by an intervening spur which reaches to the sea, that land communication with the rest of Arabia can be maintained. Both Muscat and Matrah are defended from incursions on the landward side by a wall with towers at intervals. Muscat rose to importance with the Portuguese occupation of the Persian Gulf, and is noted for the extent of Portuguese ruins about it. Two lofty forts, of which the most easterly is called Jalâlî and the western Merâni, overlook the summits of hills on either side the cove overlooking the town; and beyond them on the seaward side are two smaller defensive works called Sirat. All these are ruinous. A low sandy isthmus connects the rock and fortress of Jalâlî with the mainland, and upon this isthmus stands the British residency. The sultan's palace is a three-storied building near the centre of the town, a relic of Portuguese occupation, called by the Arabs El Jereza, a corruption of Igrezia (church). This term is probably derived from the chapel once attached to the buildings which formed the Portuguese governor's residence and factory. The bazaar is insignificant, and its most considerable trade appears to be in a sweetmeat prepared from the gluten of maize. Large quantities of dates are also exported.

History.—The early history of Muscat is the history of Portuguese ascendancy in the Persian Gulf. When Albuquerque first burnt the place after destroying Kâyêt in 1508, Kalhat was the chief port of the coast and Muscat was comparatively unimportant. Kalhat was subsequently sacked and burnt, the great Arab mosque being destroyed, before Albuquerque returned to his ships, "giving many thanks to our Lord." From that date, through 114 years of Portuguese ascendancy, Muscat was held as a naval station and factory during a period of local revolts, Arab incursions, and Turkish invasion by sea; but it was not till 1622, when the Portuguese lost Hormuz, that Muscat became the headquarters of their fleet and the most important place held by them on the Arabian coast. In 1650 the Portuguese were finally expelled from Oman. Muscat had been reduced previously by the humiliating terms imposed upon the garrison by the imam of Oman after a siege in 1648. For five years the Persians occupied Oman, but they disappeared in 1765. Under the great ruler of Oman, Said ibn Sultan (1804—1865), the fortunes of Muscat attained their zenith; but on his death, when his kingdom was divided and the African possessions were parted from western Arabia, Muscat declined. In 1833—1884, when Turki was sultan, the town was unsuccessfully besieged by the Indabâyîn and Rehûyâîn tribes, led by Abdul Aziz, the brother of Turki. In 1885 Colonel Miles, resident at Muscat, made a tour through Oman, following the footsteps of Wellsted in 1835, and confirmed that traveller's report of the fertility and wealth of the province. In 1898 the French acquired the right to use Muscat as a coaling station.


T. H. H.*

MUSCATINE, a city and the county-seat of Muscatine county, Iowa, U.S.A., on the Mississippi river (here crossed by a wagon bridge), at the apex of the "great bend," in the south-east part of the state. Pop. (1890), 11,454; (1900), 14,073, of whom 7,932 were foreign-born; (1910 census) 16,178. It is served by the Chicago Milwaukee & Saint Paul, the Chicago Rock Island & Pacific, and the Muscatine North & South railways. It is built on high rocky bluffs, and is the centre of a pearl-button industry, introduced in 1891 by J. F. Bepple, a German, the buttons being made from the shells of the fresh-water mussel found in the neighbourhood; and there are other manufactures. Coal is mined in the vicinity, and near the city are large market-gardens, the water-melons growing on Muscatine Island (below the city) and sweet potatoes being their most important products. The municipality owns and operates the waterworks. Muscatine began as a trading-post in 1833. It was laid out in 1836, incorporated as a town under the name of Bloomington in 1839, and first chartered as a city, under its present name, in 1851.

MUSCHELKALK, in geology, the middle member of the German Trias. It consists of a series of calcareous, marly and dolomitic beds which lie conformably between the Bunter and Keuper formations. The name Muschelkalk (Fr., calcaire coquillier; conchylien, formation of D'Orbigny) indicates a characteristic feature in this series, viz. the frequent occurrence of lenticular banks composed of fossil shells, remarkable in the midst of a singularly barren group. In its typical form the Muschelkalk is practically restricted to the German region and its immediate neighbourhood; it is found in Thuringia, Harz, Franconia, Hesse, Swabia, and the Saar and Alsace districts. Northward it extends into Silesia, Poland and Heligoland. Representatives are found in the Alps, west and south of the Vosges, in Moravia, near Tonlon and Montpellier, in Spain and Sardinia; in Rumania, Bosnia, Dalmatia, and beyond this into Asia in the Himalayas, China, Australia, California, and in North Africa (Constantine). From the nature of the deposits, as well as from the impoverished fauna, the Muschelkalk of the type area was probably laid down within a land-locked sea which, in the earlier portion of its existence, had only imperfect communications with the more open waters of the period. The more remote representatives of the formation were of course deposited in diverse conditions, and are only to be correlated through the presence of some of the Muschelkalk fossils.

In the "German" area the Muschelkalk is from 250—350 ft. thick; it is readily divisible into three groups, of which the upper and lower are pale thin-bedded limestones with greenish-grey marls, the middle group being mainly composed of gypsiferous and saliniferous marls with dolomite. The Lower Muschelkalk consists, from below upwards, of the following rocks, the ochreous Wellen Dolomiet, lower Wellen Kalk, upper Wellen Kalk (so called on account of the wavy character of the bedding) with beds of "Schaumkalk" (a porous cellular limestone), and Oolite and the Orbicularis beds (with Myophoria orbicularis). In the Saar and Alsace districts and north Eifel, these beds take on a sandy aspect, the "Muschellandsstein." The Middle Muschelkalk or Anhydrite group, as already indicated, consists mainly of marls and dolomites with beds of anhydrite, gypsum and salt. The salt beds are worked at Hall, Friedröhsschal, Heilbronn, Stettin and Erfurt. It is from this division that many of the mineral springs of Thuringia and south Germany obtain their saline contents. The cellular nature of much of the dolomite has given rise to the term "Zellendolomit." The Upper Muschelkalk (Hauptmuschelkalk, Friedrichskalk; of von Alberti) consists of regular beds of shelly limestone alternating with beds of marl. The lower portion or "Truchitenkalk" is often composed entirely of the fragmentary stems of Encrinus illinoisii; higher up come the "Nodosus" beds with Ceratites compressus, C. nodosus, and C. semifortis in ascending order. In Swabia and Franconia the highest beds are platy dolomites with Tringonodus Sander- genesis and the crustacean Bairdia. Styloides are common in all the Muschelkalk limestones. The Alpine Muschelkalk differs in many respects from that of this type area, and shows a closer relationship with the Triassic Mediterranean sea; the more important local phases will be found tabulated in the article TRIAS.

In addition to the fossils mentioned above, the following are Muschelkalk forms: Verticinella, Meusea, Actinocystites, &c. Glauconites, and S. hirsuta, Myophoria vulgaris, Rhyolochites hierundo, Ceratites Münserti, Ptychites studerii, Balatolites balatonicus, Aspidura scutella, Duonella Lommelli, and in the Alpine region several rock-forming Algae, Bacillarium, Gyrocera species, Deipalea, &c. &c. &c.

J. A. H.*

MUSCLE AND NERVE (Physiology). Among the properties of living material there is one, widely though not universally present in it, which forms the pre-eminent characteristic of muscles.

1. The anatomy of the muscles is dealt with under MUSCULAR SYSTEM, and of the nerves under NERVE and NERVOUS SYSTEM.
Muscle. This property is the liberation of some of the energy contained in the chemical compounds of the cells in such a way as to give mechanical work. The mechanical work is obtained by movement resulting from a change, it is supposed, in the elastic tension of the framework of the living cell. In the fibrils existing in the cell a sudden alteration of elasticity occurs, resulting in increased tension on the points of attachment of the cell to the neighbouring elements of the tissue in which the cell is placed. These yield under the strain, and the cell shortens between those points of its attachment. This shortening is called contraction. But the volume of the cell is not appreciably altered, despite the change of its shape, for its one diameter increases in proportion as its other is diminished. The manifestations of contractility by muscle are various in mode. By tonic contraction is meant a prolonged and equable state of tension which yields under analysis no element of intermittent character. This is manifested by the muscular walls of the hollow visceras and of the heart, where it is the expression of a continuous liberation of energy in process in the muscular tissue, the outcome of the latter's own intrinsic life, and largely independent of any connexion with the nervous system. The muscular wall of the blood-vessels also exhibits tonic contraction, which, however, seems to be mainly traceable to a continual excitation of the muscle cells by nervous influence conveyed to them along their nerves, and originating in the great vas motor centre in the bulb. In the ordinary striped muscles of the skeletal musculature, e.g. gastrocnemius, tonic contraction obtains; but this, like the last mentioned, is not autocothonous in the muscles themselves; it is indirect and neural, and appears to be maintained reflexly. The receptive organs of the muscular sense and of the semi-circular canals are to be regarded as the sites of origin of this reflex tonus of the skeletal muscles. Stripped muscles possessing an autocothonous tonus appear to be the various sphincter muscles.

Another mode of manifestation of contractility by muscles is the rhythmic. A tendency to rhythmic contraction seems discoverable in almost all muscles. In some it is very marked, for example in some viscera, the spleen, the bladder, the ureter, the uterus, the intestine, and especially in the heart. In several of these it appears not unlikely that the recurrent explosive liberations of energy in the muscle tissue are not secondary to recurrent explosions in nerve cells, but are attributable to decompositions arising sua sponte in the chemical substances of the muscle cells themselves in the course of their living. Even small strips of the muscle of the heart, if taken immediately after the death of the animal, continue, when kept moist and warm and supplied with oxygen, to "beat" rhythmically for hours. Rhythmic contraction is also characteristic of certain groups of skeletal muscles, e.g. the respiratory. In these the rhythmic activity is, however, clearly secondary to rhythmic discharges of the nerve cells constituting the respiratory centre in the bulb. Such discharges descend the nerve fibres of the spinal cord, and through the intermediation of various spinal nerve cells excite the respiratory muscles through their motor nerves. A form of contraction intermediate in character between the tonic and the rhythmic is met in the auricle of the heart of the toad. There slowly successive phases of increased and of diminished tonus regularly alternate, and upon them are superposed the rhythmic "beats" of the pulsating heart. The "beat," i.e. the short-lasting explosive contraction of the heart muscle, can be elicited by a single, even momentary, application of a stimulus, e.g. by an induction shock. Similarly, such a single stimulus elicits from a skeletal muscle a single "beat," or, as it is termed, a "twist." In the heart muscle during an ordinary systole of cardiac rhythm the exciting stimulus is delivered at the end of the diastole, and it is a mistake to think of the heart as a muscle working in a series. The stimulus is repeated at the end of each succeeding systole, and the heart contracts between each pair of stimuli. The stimulus is increased each time, and thus small increments may produce a great alteration of the force of the heart. The heart muscle is therefore more excitable than the nervous system. It is capable of preparing itself for any change of condition and proportions in the excitability of the nervous system; and the heart, therefore, is more excitable than the nervous system. It is capable of preparing itself for any change of condition and proportions in the excitability of the nervous system; and the heart, therefore, is more excitable than the nervous system. It is capable of preparing itself for any change of condition and proportions in the excitability of the nervous system; and the heart, therefore, is more excitable than the nervous system. It is capable of preparing itself for any change of condition and proportions in the excitability of the nervous system; and the heart, therefore, is more excitable than the nervous system. It is capable of preparing itself for any change of condition and proportions in the excitability of the nervous system; and the heart, therefore, is more excitab.
muscle produces lactic acids during activity, it has been suggested that acids are among the "fatigue substances" with which muscle poisons itself when deprived of circulating blood. Muscles when active seem to pour into the circulation substances which, of unknown chemical composition, are physiologically recognizable by their stimulant action on the respiratory nervous centre in respect of the fatigue substances: the destruction of the tissue is manifest especially in the relaxation process. The contracted state, instead of rapidly subsiding after discontinuance of the stimulus, slowly and only partially wears off, the muscle remaining in a condition of physiological "contracture." The alkaloid veratrin has a similar effect upon the contraction of muscle; it enormously delays the recovery from the contracted state, as does epinephrin, an alkaloid extracted from the suprarenal gland.

Nervous System.—The work of Camillo Golgi (Pavia, 1885 and onwards) on the minute structure of the nervous system has led to great alteration of doctrine in neural physiology. It had been held that the branches of the nerve cells, that is to say, the fine nerve fibres—since all nerve fibres are nerve cell branches, and all nerve cell branches are nerve fibres—which form a close felt-work in the nervous centres, there combined into a network actually continuous throughout. This continuum was held to render possible conduction in all directions throughout the grey matter of the whole nervous system. The fact that conduction occurred preponderantly in certain directions was explained by appeal to a hypothetical resistance to conduction which, for reasons unascertained, lay less in some directions than in others. The intricate felt-work has by Golgi been ascertained to be a mere interlacement, not an actual anastomosis network; the branches springing from the various cells remain lifelong unattached and unjoined to any other than their own individual cell. Each neuron or nerve cell is a morphologically distinct and discrete unit connected functionally but not structurally with its neighbours, and leading its own life independently of the destiny of its neighbours. Among the properties of the neuron is conductivity in all directions. But when neurons are linked together it is found that nerve impulses will only pass from neuron A to neuron B, and not from neuron B to neuron A; that is, the transmission of the excited state or nervous impulse, although possible in each neuron both up and down its own cell branches, is possible from one nerve cell to another in one direction only. That direction is the direction in which the nerve impulses flow under the conditions of natural life. The synapse, therefore, as the place of meeting of one neuron with the next is called, is said to valve the nerve circuits. This determinate sense of the spread is called the law of forward direction. The synapse appears to be a weak spot in the chain of conduction, or rather to be a place which breaks down with comparative ease under stress, e.g. under effect of poisons. The axons of the motor neurons are, inasmuch as they are nerve fibres in nerve trunks, easily accessible to artificial stimuli. It can be demonstrated that they are practically indefatigable—repeatedly stimulated by electrical currents, even through many hours, they, unlike muscle, continue to respond with unimpaired reaction.

Peripheral Fatigue. Yet when the muscular contraction is taken as index of the response of the nerve, it is found that unmistakable signs of fatigue appear even very soon after commencement of the excitation of the nerve, and the muscle ceases to give any contraction in response to stimuli applied indirectly to it through its nerve. But the muscle will, when excited directly, e.g. by direct application of electric currents, contract vigorously after all response on its part to the stimuli (nerve impulses) applied to it indirectly through its nerve has failed. The inference is that the "fatigue substances" generated in the muscle fibres in the course of their prolonged contraction injure and paralyse the motor end plates, which are places of synapsis between nerve cell and muscle cell, even earlier than they harm the contractility of the muscle fibres themselves. The alkaloid curarin causes motor paralysis by attacking in a selective way this junction of motor nerve cell and striped muscular fibre. Non-myelinate nerve fibres are as resistant to fatigue as are the myelinate.

The neuron is described as having a cell body or perikaryon from which the cell branches—dendrites and axon—extend, and it is this perikaryon which, as its name implies, contains the nucleus. It forms the trophic centre of the cell, just as the hypophysis is the part of each lobe of the pituitary gland which is the trophic centre of the whole lobe. Any part of the cell cut off from the nucleus-containing part dies down; this is as true of nerve cells as of amoeba, and in regard to the neuron it constitutes what is known as the Wallerian degeneration. On the other hand, in some neurons, after severance of the axon from the rest of the cell (spinal motor cell), the whole nerve cell as well as the severed axon degenerates, and may eventually die and be removed. In the severed axon the degeneration is first evident in a breaking down of the naked nerve filaments of the motor end plate. A little later the breaking down of the whole axon, both axis cylinder and myelin sheath alike, seems to occur simultaneously throughout its entire length distal to the place of severance. The complex fat of the myelin becomes altered chemically, while the other components of the sheath break down. This death of the sheath as well as of the axis cylinder shows that it, like the axis cylinder, is a part of the nerve cell itself.

In addition to the trophic influence exerted by each part of the neuron on its other parts, notably by the perikaryon on the cell branches, one neuron also in many instances influences the nutrition of other neurons. When, for instance, the axons of the ganglion cells of the retina are severed by section of the optic nerve, and thus their influence upon the nerve cells of the visual cerebral centres is set aside, the nerve cells of those centres undergo secondary atrophy (Gudden's atrophy). They dwindle in size; they do not, however, die. Similarly, when the axons of the motor spinal cells are by severance of the nerve trunk of a muscle broken through, the muscle cells undergo "degeneration"—dwindle, become fatty, and alter almost beyond recognition. This trophic influence which one neuron exerts upon others, or upon the cells of an extrinsic tissue, such as muscle, is exerted in that direction which is the one normally taken by the natural nerve impulses. It seems, especially in the case of the neuron between certain nerves, that the influence, loss of which endangers nutrition, is associated with the occurrence of something more than merely the nervous impulses awakened from time to time in the leading nerve cell. The wave of change (nervous impulse) induced in a neuron by advent of a stimulus is after all only a sudden augmentation of an activity continuous within the neuron—a transient accentuation of one (the disintegrative) phase of the metabolism inherent in and inseparable from its life. The nervous impulse is, so to say, the sudden evanescent glow of an ember continuously black-hot. A continuous lesser "change" or stream of changes sets through the neuron, and is distributed by it to other neurons in the same direction and by the same synapses as are its nerve impulses. This gentle continuous activity of the neuron is called its tonus. In tracing the tonus of neurons to a source, one is always led by link against the current of nerve force—so to say, "up stream"—to the first beginnings of the chain of neurons in the sensaficient surfaces of the body. From these, as in the eye, ear, and other sense organs, tonus is constantly initiated. Hence, when cut off from these sources, the nutrition of the neurons of various central mechanisms suffers. Thus the tonus of the motor neurons of the spinal cord is much lessened by rupture of the great afferent root cells which normally play upon them, the prominent and practically important illustration of neural tonus is given by the skeletal muscles. These muscles exhibit a certain constant condition of slight contraction, which disappears on severance of the nerve that innervates the muscle. It is a muscular tonus of central source consequent on the continual glow of excitement in the spinal motor neuron, whose outgoing end plays upon the muscle cells, whose ingoing
end is played upon by other neurons—spinal, cerebral and cerebellar.

It is with the neural element of muscle tonus that tendon phenomena are intimately associated. The earliest-studied of these, the "knee-jerk," may serve as example of the class. It is a brief extension of the limb at the knee-joint, due to a simple contraction of the extensor muscle, elicited by a tap or other slight mechanical stimulation. The impulse is conducted along the fibres through the tendon of the muscle. The jerk is obtainable only from muscle fibres possessed of neural tonus. If the sensory nerves of the extensor muscle be severed, the "jerk" is lost. The brevity of the interval between the tap on the knee and the beginning of the resulting brief extension of the muscle seems such as to exclude the possibility of reflex development. A little experience in observations on the knee-jerk imparts a notion of the average strength of the "jerk." Wide departures from standard are not uncommon, both in health and in certain nervous conditions. Stretching of the muscles antagonistic to the extensors—namely, of the flexor muscles—reduces the jerk by inhibiting the extensor spinal nerve cells through the numerous impulses generated by the tense flexor muscles. Hence a favourable posture of the limb for eliciting the jerk is one ensuring relaxation of the hamstring muscles, as when the leg has been crossed upon the other. In sleep the jerk is diminished, in deep sleep quite abolished. Extreme bodily fatigue diminishes it. Conversely, a cold bath increases it. The turning of attention towards the knee interferes with the jerk; hence the device of directing the patient to perform some movement, which, it is a brief extension of the limb, is such as to involve the muscles of the lower extremity at the moment when the light blow is dealt upon the tendon. A slight degree of contraction of muscle seems the \textit{substratum} of all attention. The direction of attention towards the knee interferes with the jerk by causing that looseness and freedom from tension in the thigh muscles which is essential for the provocation of the jerk. The motor cells of the extensor muscles, when preoccupied by cerebral influence, appear unapproachable and it has noted excitation of the jerk to follow extirpation of a cortical centre.

Although the cell body or perikaryon of the neuron, with its contained nucleus, is essential for the maintenance of the life of the cell branches, it has become recognized that the actual process and function of "conduction" in many neurons can, and does, go on without the cell body being directly concerned in the conduction. S. Exner first showed, many years ago, that the nerve impulse travels through the spinal ganglion at the same speed as along the other parts of the nerve trunk—that is, that it suffers no delay in transit through the perikarya of the afferent root-neurons. Bethe has succeeded in isolating their perikarya from certain of the afferent neurons of the antennule of 	extit{Carcinus}. The giant axon of the amphitrochus continues unimpaired for many hours. This indicates that the conjunction between the conducting substance of the dendrons and that of the axon can be effected without the intermediation of the cell body. But the proper function of the conducting substance is indissolubly dependent on the cell branches being in continuity with the cell body and nucleus it contains. Evidence illustrating this nexus is found in the visible changes produced in the perikaryon by prolonged activity induced and maintained in the conducting branches of the cell. As a result the fatigued cells appear shrunken, and their reaction to staining reagents alters, thus showing chemical changes. Most marked is the decrease in the volume of the nucleus, amounting even to 44\% of the initial volume. In the myelinated cell branches of the neuron, that is, in the ordinary nerve fibres, no visible change has ever been demonstrated as the result of any normal activity, however great—a striking contrast to the observations obtained on the perikarya. The chemical changes that accompany activity in the nerve fibre must be very small, for the production of CO₂ is barely measurable, and no production of heat is observable as the result of the most forced tetanic activity.

The nerve cells of the higher vertebrata, unlike their blood cells, their connective tissue cells, and even their muscle cells, are, early and indeed in embryonic life, lose power of spontaneous growth. The number of the formed neurons is definitely closed at an early period of the individual life. Although, unlike so many other cells, thus early sterile for reproduction of their kind, they retain for longer than most cells a high power of individual growth. They continue to grow, and to thurst out new branches and to lengthen existing branches, for many years far into adult life. They similarly possess power to repair and to regenerate their cell branches where these are injured or destroyed by trauma or disease. This is the explanation of the repair of nerve trunks that have been severed, with consequent degeneration of the peripheral nerve fibres. As a rule, a longer time is required to restore the motor than the sensory functions of a nerve trunk.

Whether examined by functional or by structural features, the conducting paths of the nervous system, traced from beginning to end, never \textit{terminate} in the centres of that system, but pass through them. All ultimately emerge as efferent channels. Every efferent channel, after entrance in the central nervous system, subdivides; of its subdivisions some pass to efferent channels soon, others pass further and further within the cord and brain before they finally reach channels of outlet. All the longest routes thus formed traverse late in their course the cortex of the cerebral hemisphere. It is this relatively huge development of cortex cerebri which is the pre-eminent structural character of man. This means that the number of "longest routes" in man is, as compared with lower animals, disproportionately great. In the lower animal forms there is no such nervous structure at all as the cortex cerebri. In the frog, lizard, and even bird, it is thin and poorly developed. In the marsupials it is more evident, and its excitation by electric currents evokes movements in the musculature of the crossed side of the body. Larger and thicker in the rabbit, when excited it gives rise in that animal to movements of the eyes and of the fore-limbs and neck, but it is only in much heavier types, such as the dog, that the cortex yields, under experimental excitation, definitely localized foci, whence can be evoked movements of the fore-limb, hind-limb, neck, eyes, ears and face. In the monkey the proportions it assumes are still greater, and the number of foci, for distinct movements of this and that member, indeed for the individual joints of each limb, are much more numerous, and altogether occupy a more extensive surface, though relatively to the total surface of the brain a smaller one.

Experiment shows that in the manlike (anthropoid) apes the differentiation of the foci or "centres" of movement in the motor field of the cortex is even more minute. In them areas are found corresponding to the muscles in the human body. Ultimately, it is said, the area is complete, that is, it includes the area of the upper lip without the lower, of the tip only of the tongue, or of one upper eyelid by itself. The movement evoked from a point of cortex is not always the same; its character is determined by movements evoked from neighbouring points of cortex immediately antecedently. Thus a point A will, when excited soon subsequent to point B, which latter yields protrusion of lips, itself yield lip-protrusion, whereas if excited after C, which yields lip-retraction, it will itself yield lip-retraction. The movements obtained by point-to-point excitation of the cortex are often evidently imperfect as compared with natural movements—that is, are only portions of complete normal movements. Thus among the tongue movements evoked by stigmatic stimulation of the cortex undeviating protrusion or retraction of the organ is not found. Again, from different points of the cortex the assumption of the requisite positions of the tongue, lips, cheeks, palate and epiglottis, as components in the act of sucking, can be provoked singly. Rarely can the whole action be provoked, and then only gradually, by prolonged and strong excitation of one of the requisite points, e.g. that for the tongue, with which the other points are functionally connected. Again, no single point in the cortex evokes the act of ocular convergence and fixation. All this means that the execution of natural movements employs simultaneous co-operative activity of a number of points in the motor fields on both sides of the brain together.

The accompanying simple figure indicates better than any verbal description the topography of the main groups of foci in the motor field of a manlike ape (chimpanzee). It will be
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noted from it that there is no direct relation between the extent of a cortical area and the mass of muscles which it controls. The mass of muscles in the trunk is greater than in the leg, and in the leg is greater than in the arm, and in the arm is many times greater than in the face and head; yet for the last the cortical area is the most extensive of all, and for the first-named is the least extensive of all.

The motor field of the cortex is, taken altogether, relatively to the size of the lower parts of the brain, larger in the anthropoid than in the inferior monkey brains. But in the anthropoid brain still more increased even than the motor field are the great regions of the cortex outside that field, which yield no definite movements under electric excitation, and are for that reason known as "silent." The motor field, therefore, though absolutely larger, forms a smaller fraction of the whole cortex of the brain than in the lower forms. The statement that in the anthropoid (orang-outan) brain the groups of foci in the motor fields of the cortex are themselves separated one from another by surrounding inexcitable cortex, has been made and was one of great interest, but has not been confirmed by subsequent observation. That in man the excitable foci of the motor field are islanded in excitable surface similarly and even more extensively, was a natural inference, but it had its chief basis in the observations on the orang, now known to be erroneous.

In the diagram there is indicated the situation of the cortical centres for movement of the vocal cords. Their situation is at the lower end of the motor field. That they should lie there is interesting, because that place is close to one known in man to be associated with management of the movements concerned in speech. When that area in man is injured, the ability to utter words is impaired. Not that there is paralyzation of the muscles of speech, since these muscles can be used perfectly for all acts other than speech. The area in man is known as the motor centre for speech; in most persons it exists only in the left half of the brain and not in the right. In a similar way damage of a certain small portion of the temporal lobe of the brain produces loss of intellectual apprehension of words spoken, although there is no deafness and although words seen are perfectly apprehended. Another region, "the angular region," is similarly related to intellectual apprehension of words seen, though not of words heard.

When this differentiation of cortex, with its highest expression in man, is collated with the development of the cortex as studied in the successive phases of its growth and ripening in the human infant, a suggestive analogy is obvious. The nervous paths in the brain and cord, as they attain completion, come to be furnished more and more with fibres that are fully myelinated. At the beginning of its history each is unprovided with myelin sheath by any proceeding. The excitable foci of the cerebral cortex are well myelinated long before the unexcitable are so. The regions of the cortex, whose conduction paths are early completed, may be arranged in groups by their connexions with sense-organs: eye-region, ear-region, skin and somasraesthetic region, olfactory and taste region. The areas of intervening cortex, arriving at structural completion later than the above sence-spheres, are called by some association-spheres, to indicate the view that they contain the neural mechanisms of reactions (some have said "ideas") associated with the sense perceptions elaborated in the several sense-spheres.

The name "motor area" is given to that region of cortex whence, as D. Ferrier's investigations showed, motor reactions of the facial and limb muscles are regularly and easily evoked. This region is often called the Sensori-motor cortex, and the term somasraesthetic has also been used and seems appropriate. It has been found that disturbance of sensation, as well as disturbance of movement, is often incurred by its injury. Patients in whom, for purposes of diagnosis, it has been electrically excited, describe, as the initial effect of the stimulation, tingling and obscure but locally-limited sensations, referred to the part whose muscles a moment later are thrown into co-ordinate activity. The distinction, therefore, between the movement of the eyeballs, elicited from the occipital (visual) cortex, and that of the hand, elicited from the cortex in the region of the central sulcus (somasraesthetic), is not a difference between motor and sensory, for both are sensori-motor in the nature of their reactions; the difference is only a difference between the kind of sense and sense-organ in the two cases, the muscular apparatus in each case being an appanage of the sensual.

That the lower types of vertebrate, such as fish, e.g. carp, possess practically no cortex cerebri, and nevertheless execute 'volitional' acts involving high co-ordination and suggesting the possession by them of associative memory, shows that for the existence of these phenomena the cortex cerebri is in them not essential. In the dog it has been proved that after removal from the animal of every vestige of its cortex cerebri, it still executes habitual acts of great motor complexity requiring extraordinarily delicate adjustment of muscular contraction. It can walk, run and feed; such an animal, on wounding its foot, will run on three legs, as will a normal dog under similar mischance. But signs of associative memory are almost, if not entirely, wanting. Throughout three years such a dog failed to learn that the attendant's lifting it from the cage at a certain hour was the preliminary circumstance of the feeding-hour; yet it did exhibit hunger, and would refuse further food when a sufficiency had been taken. In man, actually gross sensory defects follow even slight lesions of the cortex. Thus the rabbit and the dog are not absolutely blinded by removal of the entire cortex, but in man destruction of the occipital cortex produces total blindness, even to the extent that the pupil of the eye does not respond when light is flashed into the eye.

Examination of the cerebellum by the method of Wallerian degeneration has shown that a large number of spinal and bulbar nerve cells send branches up into it. These seem to end, for the most part, in the gray cortex of the median lobe, some, though not the majority, of them decussating across the median line. The organ seems also to receive many fibres from the parietal region of the cerebral hemisphere. From the organ there emerge fibres which cross to the opposite red nucleus, and directly or indirectly reach the thalamic region of the crossed hemisphere. The pons or middle peduncle, which was regarded,
on the uncertain ground of naked-eye dissection of human anatomy, as commissural between the two lateral lobes of the cerebellum, is now known to constitute chiefly a cerebro-cerebellar decussating path. Certain cerebellar cells send processes down to the cell-group in the thalamus known as the nucleus of Darks, which latter projects fibres down the spinal cord. Whether there is any other or direct emergent path from the cerebellum into the spinal cord is a matter on which opinion is divided.

Injuries of the cerebellum, if large, derange the power of executing movements, without producing any detectable derangement of sensation. The derangement gradually disappears, unless the damage to the organ be very wide. A feeling gait, oscillations of the body which impart a zigzag direction to the walk, difficulty in standing, owing to unsteadiness of limb, are common in cerebellar disease. On the other hand, congenital defect amounting to absence of one cerebellar hemisphere has been found to occasion practically no symptoms whatsoever. Not a hundredth part of the cerebellum has remained, and yet there has existed ability to stand, to walk, to handle and lift objects in a fairly normal way, without any trace of impairment of cutaneous or muscular sensitivity. The damage to the cerebellum must, it would seem, occur abruptly or quickly in order to occasion marked derangement of function, and then the derangement falls on the execution of movements. One aspect of this derangement, named by Luciani astasia, is a tremor heightened by or only appearing when the muscles enter upon action—"intention tremor." Vertigo is a frequent result of cerebellar injury: animals indicate it by their actions; patients describe it. To interpret this vertigo, appeal must be made to disturbances, other than cerebellar, which likewise occasion vertigo. These include, besides ocular squint, many spatial positions and movements unwonted to the body: the looking from a height, the gliding over ice, sea-travel, to some persons even travelling by train, or the covering of one eye. Common to all these conditions is the synchronous rise of perceptions of spatial relations between the self and the environment which have not, or have rarely, before arisen in synchronous combination. The actual organs of the soles, and the muscular sense organs of limbs and trunk, are originating perceptions that indicate that the self is standing on the solid earth, yet the eyes are at the same time originating perceptions that indicate that the solid earth is far below the standing self. The combination is hard to harmonize at first; it is at least not given as innately harmonized. Perceptions regarding the "me" are notoriously highly charged with "feeling," and the conflict occasions the feeling insufficiently described as "giddiness." The cerebellum receives paths from most, if not from all, of the afferent roots. With certain of these it stands associated most closely, namely, with the vestibular, representing the sense organs which furnish data for appreciation of positions and movements of the head, and with the channels, conveying centripetal impressions from the apparatus of skeletal movement. Disorder of the cerebellum sets at variance, brings discord into, the pathways of perceptions contributory to the movement. The body's movement becomes thus imperfectly adjusted to the spatial requirements of the act it would perform.

In the physiological basis of sense exist many impressions which, apart from and devoid of psychical accompaniment, reflexly influence motor (muscular) innervation. It is with this sort of habitually apsychical reaction that the cerebellum is, it would seem, employed. That it is apparently devoid of psychical comitant need not imply that the impressions concerned in it are crude and inelaborate. The seeming want of control of sense which the cerebellum betrays under artificial stimulation and the complete relay system revealed in the histology of the cerebellum, suggest that the impressions are elaborate. Its reaction preponderantly helps to secure co-ordinate innervation of the skeletal musculature, both for maintenance of attitude and for execution of movements.

**Sleep.**—The more obvious of the characters of sleep (q.e.) are essentially nervous. In deep sleep the threshold-value of the stimuli for the various senses is very greatly raised, rising rapidly during the first hour and a half of sleep, and then declining with gradually decreasing decrements. The muscles become less tense than in their waking state: their tonus is diminished, the eyes close, the eyelids fall, and the knee-jerk is abolished. The respiratory rhythm is less frequent and the breathing less deep; the heart-beat is less frequent; the secretions are less copious; the pupil is narrow; in the brain there exists arterial anaemia with venous congestion, so that the blood-flow there is less than in the waking state.

It has been suggested that the gradual cumulative result of the activity of the nerve cells during the waking day is to load the brain tissue with "fatigue-substances" which clog the action of the cells, and thus periodically produce that loss of consciousness, &c., which is sleep. Such a drugging of tissue by its own excreta is known in muscular fatigue, but the fact that the depth of sleep progressively increases for an hour and more after its onset prevents complete explanation of sleep on similar lines. It has been urged that the neurons retract during sleep, and that thus at the synapses the gap between nerve cell and nerve cell becomes wider, or that the supporting cells expand between the nerve cells and tend to isolate the latter one from the other. Certain it is that in the course of the waking day a great number of stimuli play on the sense organs, and through these produce disintegration of the living molecules of the central nervous system. Hence during the day the assimilative processes of these cells are overbalanced by their wear and tear, and the end-result is that the nervous system is in a condition less favourable for further disintegration than to reintegration. That phase of cell life which we are accustomed to call "active" is accompanied always by disintegration. When in the cell the assimilative processes exceed dissipative, the external manifestations of energy are liable to cease or diminish. Sleep is not exhaustion of the neuron in the sense that prolonged activity has reduced its excitability to zero. The nerve cell just prior to sleep is still well capable of response to stimuli, although perhaps the threshold-value of the stimulus has become rather high, whereas after entrance upon sleep and continuance of sleep for several hours, and more, when all spur to the dissimilation process has been long withheld, the threshold-value of the sensory stimulus becomes enormously higher than before. The exciting cause of sleep is therefore no complete exhaustion of the available material of the cells, nor is it entirely any paralysing of them by their excreta. It is more probably abeyance of external function during a periodic internal assimilatory phase.

Two processes conjoin to initiate the assimilatory phase. There is especially connexity between the two, in that the sleep is due both to the dose of metabolic activity that in physiological theory constitute the chemical life of protoplasm, between dissimilation and assimilation. Herings has long insisted on a self-regulative adjustment of the cell metabolism, so that action involves reaction, increased catabolism necessitates after-increase of anabolism. The long-continued incitement to catabolism of the waking day thus of itself predisposes the nerve cells towards rebound into the opposite phase: the increased catabolism due to the day's stimuli induces increase of anabolism, and though recuperation goes on to a large extent during the day itself, the recuperative process is slower than, and lags behind, the dissipative process in its effect. This causes a cumulative effect, the energy being increasing from the opening till the closing hours. The second factor inducing the assimilative change is the withdrawal of the nervous system from sensational stimulation. The eyes are closed, the maintenance of posture by active contraction is replaced by the recumbent pose which can be maintained by static action and the mere mechanical consistence of the body, the ears are screened from noise in the quiet chamber, the skin from localized pressure and from the waving cover. The effect of thus reducing the excitant action of the environment is to give consciousness over more to mere survivals by memory, and gradually consciousness lapses. A remarkable case is well authenticated, where, owing to disease, a young man had lost the use of all the senses save of one eye and of one ear. If these last channels were sealed, in two or three minutes' time he invariably fell asleep.

If natural sleep is the expression of a phase of decreased excitability due to the setting in of a tide of anabolism in the cells of the nervous system, what is the action of narcotics? They lower the
external activities of the cells, but do they not at the same time lower the internal, reparative, assimilative activity of the cell that in natural sleep goes vigorously forward preparing the system for the next day's drain on energy? In most cases they seem not to lower both the internal and the external activity of the nerve cells, to lessen the cell's entire metabolism, to reduce the cell to a mere cell and air. Hence it is not surprising that often the refreshment, the recuperation obtained from and felt after sleep induced by a drug amounts to nothing, or to worse than nothing. But very often refreshment is obtained from the mere sleeping not from the sleep.

**Narcotics.**—But it is not only from the hypnotic process by the hypnotizer without subsequent attempt to open them by the hypnotized subject; the pupils, instead of being constricted, as for near vision, dilate, and there sets in a condition superficially resembling sleep. But in natural sleep the action of all parts of the nervous system is subdued, whereas in the hypnotic the reactions of the lower, and some even of the higher, parts are exalted. Moreover, the reactions seem to follow the sense impressions with such fatality, that, as an inference, absence of will-power to control them or suppress them is suggested. This reflex activity with "paralysis of will" is characteristic of the somnambulistic state. The threshold-value of the stimuli adequate for the various senses may be extraordinarily lowered. Print of microscopic size may be read; a watch ticking in another room can be heard. Judgment of weight and texture of surface is exalted; thus a card can in a dark room be felt and then re-selected from the re-shuffled pack. Akin to this condition is that in which the power of maintaining muscular effort is increased; the individual may lie stiff with merely head and feet supported on two chairs; the limbs can be held outstretched for hours at a time. This is the cataleptic state, the phase of hypnotism which the phenomena of so-called "animal hypnotism" resemble most. A frog or fowl or guinea-pig held in some unnatural position at rest will at the slightest disturbance become "set" in that pose, rather in a passive way, than as if the animal were trying to recover the normal posture. In this state it remains motionless for various periods. This condition is more than usually readily induced when the cerebral hemispheres have been removed. The decerebrate monkey exhibits "cataleptoid" reflexes. Father A. Kircher's *experimentum mirabile* with the fowl and the chalk line succeeds best with the decerebrate hen. The attitude may be described as described to prolonged, not very intense, discharge from reflex centres that regulate posture and are probably intimately connected with the cerebellum. A sudden intense sense stimulus usually suffices to end this tonic discharge. It completes the movement that has already set in but had been checked, as it were, half-way, though tonically maintained. Coincidently with the persistence of the tonic contraction, the higher and volitional centres seem to lie under a spell of inhibition; their action, which would complete or cut short the posture-spasm, rests in abeyance. Suspension of cerebral influence exists even more markedly, of course, when the cerebral hemispheres have been ablated.

But a potent—according to some, the most potent—factor in hypnotism, namely, *suggestion*, is unrepresented in the production of so-called animal hypnotism. We know that one idea suggests another, and that volitional movements are the outcome of the volitional state. If the latter is suggested and voluntary at the basis of ideation, we may take the analogy of the concomitance between a spinal reflex movement and a skin sensation. The physical "touch" that initiates the psychological "touch" initiates, through the very same nerve channels, a reflex movement responsive to the physical "touch," just as the psychological "touch" may be considered also a response to the same physical event. But in the decapitated animal we have good arguments for belief that we get the reflex movement alone as response; the psychological touch drops out. Could we assume that there is in the adult man reflex machinery which is of higher order than the merely spinal, which employs much more complex motor mechanisms than they, and is connected with a much wider range of sense organs; and could we assume that this machinery, if indirectly producing a modification of consciousness, would be a mediating link in the process, we might then wonder whether the memory may not be the result of such a modification of consciousness. We may suddenly remember dimly afterwards that we have done so, and we quite fail to recall the difference between the watch time and the clock time. In many instances hypnotism is established merely by such as usual result only from long and closely attentive practice. The sleeping mother rests undisturbed by the various noises of the house and all the movements that movies and dramas, or adventures which the ship's engineer, engaged in conversation with some visitor to the stateroom, tells apparently undisturbed by all the multifold noise and rattle of the machinery, yet let the noise alter in some item which, though unnoticeable to the visitor, betokens importance to the trained ear, and his passive attention is in a moment caught. The warders at an asylum have been hypnotized to sleep by the bedside of dangerous patients, and we suggested "to awaken the instant the patients attempt to get out of bed, sounds which had no import for them being inhibited by suggestion." Warders in this way worked all day and performed night duty also for months without showing fatigue. This is akin to the "repetition which, read by the schoolboy last thing overnight, is on waking "known by heart." Most of us can wake somewhere about a desired although unusually early, if overnight we desire much to do so.

Two theories of a physiological nature have been proposed to account for the separation of the complex reactions of these conditions of hypnotism from volition and from memory. R. P. H. Heidenhain's view is that the cortical centres of the hemisphere are inhibited by peculiar conditions attaching to sleeplike memory. It is based to a view is that the essential condition for initiation is fatigue of the will-power under a prolonged effort of undivided attention. Hypnotic somnambulism and hypnotic catalepsy are not the only or the most profound changes of nervous condition that hypnotism can induce. The physiological derangement which is the basis of the abeyance of volition may, if hypnotism be profound, pass into more widespread derangement, exhibiting itself as the *hypnotic lethargy*. This is associated not only with paralysis of will but with profound anaesthesia. Proposals have been made to employ hypnotism as a method of producing anaesthesia for surgical purposes, but there are two grave objections to such an object. First, the necessary degree of hypnotic lethargy the subject must be made extremely susceptible, and this can only be done by repeated hypnotization. It is necessary to hypnotize patients every day for several weeks before they can be got into a degree of stupor sufficient to allow of the safe execution of a surgical operation. But the state itself, when reached, is at least as dangerous to life as is that produced by inhalation of ether, and it is more difficult to recover from. Moreover, by the processes the subject has gone through he has had those physiological activities upon which his volitional power depends excessively deranged, and not improbably permanently enfeebled.

**C. S. S.**...
MUSCULAR SYSTEM

As the common white mica obtainable in thin, transparent cleavage sheets of large size it was formerly used in Russia for window panes and known as "Muscovy glass"; hence the name muscovite, proposed by J. D. Dana in 1850. It crystallizes in the monoclinic system; distinctly developed crystals, however, are rare and have the form of rough six-sided prisms or plates; thin scales without definite crystal outlines are more common.

The most prominent feature is the perfect cleavage parallel to the basal plane (c in the figure), on which the lustre is pearly in character. The hardness is 2, and the specific gravity 2.8-2.9. The plane of the optic axes is perpendicular to the plane of symmetry and the acute bisectrix nearly normal to the cleavage; the optic axial angle is 60°-70°, and double refraction is strong and negative in sign.

Muscovite frequently occurs as fine scaly to almost compact aggregates, especially when, as is often the case, it has resulted by the alteration of some other mineral, such as felsapar, topaz, cyanite, &c.; several varieties depending on differences in structure have been distinguished. Fine scaly varieties are damarouite, margarodite (from Gr. μαργαρίτης, a pearl), gilberite, sericite (from σέρικος, silky), &c. In sericite the fine scales are united in fibrous aggregates giving rise to a silky lustre; this variety is a common constituent of phyllites and sericite-schists.

Oncocine (from σώκος, intimateuse) is a compact variety forming rounded aggregates, which swell up when heated before the blowpipe. Closely related to oncocine are several compact minerals, included together under the name pinite, which have resulted by the alteration of ilolite, spodumene and other minerals. Other varieties depend on differences in chemical composition. Fuchsite or "chrome-mica" is a bright green muscovite containing chromium; it has been used as a decorative stone. Ocellacherite is a variety containing some barium. In phengite there is more silica than usual, the composition approximating to H₂KAl₃(SiO₆)₂.

Muscovite is of wide distribution and is the commonest of the micas. In igneous rocks it is found only in granite, never in volcanic rocks; but it is abundant in gneiss and mica-schist, and in phyllites and clay-slates, where it has been formed at the expense of alkali-felspar by dynamo-metamorphic processes. In pegmatite veins traversing granite, gneiss or mica-schist it occurs as large sheets of commercial value, and is mined in India, the United States and Brazil (see Mica), and to a limited extent together with felspar, in southern Norway and in the Uralas. Large sheets of muscovite were formerly obtained from Solovetsky Island, Archangel.

MUSCULAR SYSTEM (Anatomy). The muscular tissue (Lat. musculus, from a fancied resemblance of certain muscles to a little mouse) is of three kinds: (1) voluntary or striped muscle; (2) involuntary or unstriated muscle, found in the skin, walls of hollow viscera, coats of blood and lymphatic vessels, &c.; (3) heart muscle. The microscopical differences of these different kinds are discussed in the article on CONNECTIVE TISSUES. Here only the voluntary muscles, which are under the control of the will, are to be considered.

The voluntary muscles form the red flesh of an animal, and are the structures by which one part of the body is moved at will upon another. Each muscle is said to have an origin and an insertion, the former being that attachment which is usually more fixed, the latter that which is more movable. This distinction, however, although convenient, is an arbitrary one, and an example may make this clear. If we take the pectoralis major, which is attached to the front of the chest on the one hand and to the upper part of the arm bone on the other, the effect of its contraction will obviously be to draw the arm towards the chest, so that its origin under ordinary circumstances is said to be from the chest while its insertion is into the arm; but if, in climbing a tree, the hand grasps a branch above, the muscular contraction will draw the chest towards the arm, and the latter will then become the origin. Generally, but not always, a muscle is partly fleshy and partly tendinous; the fleshy contractile part is attached at one or both ends to cords or sheets of white fibrous tissue, which in some cases pass round pulleys and so change the direction of the muscle's action. The other end of these cords or tendons is usually attached to the periosteum of bone, with which it blends. In some cases, when a tendon passes round a bony pulley, a sesamoid bone is developed in it which diminishes the effects of friction. A good example of this is the patella in the tendon of the rectus femoris (fig. 1, P).

Every muscle is supplied with blood vessels and lymphatics (fig. 1, v, a, l), and also with one or more nerves. The nerve supply is very important both from a medical and a morphological point of view. The approximate attachments are also important, because unless they are realized the action of the muscle cannot be understood, but the exact attachments are perhaps laid too great stress on in the anatomical teaching of medical students. The study of the actions of muscles is, of course, a physiological one, but teaching the subject has been handed over to the anatomists, and the results have been in some respects unfortunate. Until very recently the anatomist studied only the dead body, and his one idea of demonstrating the action of a muscle was to expose and then to pull it, and whatever happened he said was the action of that muscle. It is now generally recognized that no movement is so simple that only one muscle is concerned in it, and that what a muscle may do and what it really does do are not necessarily the same thing. As far as the superficial muscles are concerned, we still have only the anatomical method to depend upon, but with the superficial muscles it should be checked by causing a living person to perform certain movements and then studying which muscles take part in them.

For a modern study of muscular actions, see C. E. Beevor's, Gronian Lectures for 1903 (London, 1904).

Muscles have various shapes: they may be fusiform, as in fig. 1, conical, riband-like, or flattened into triangular or quadrilateral sheets. They may also be attached to skin, cartilage or fascia, instead of to bone, while certain muscles surround openings, which they constrict and are called sphincters. The names of these muscles have gradually grown up, and a settled plan has been used in giving them. Sometimes, as in the coraco-brechialis and thyro-hyoid, the name describes the origin and insertion of the muscle, and, no doubt, for the student of human anatomy this is the most satisfactory plan, since by learning the name the approximate attachments are also learnt. Sometimes the name only indicates some peculiarity in the shape of the muscle and gives no clue to its position in the body or its attachments; examples of this are biceps, semitendinosus and pyiformis. Sometimes, as in the flexor carpi ulnaris and corrugator supercilii, the use of the muscle is shown. At other times the position in the body is indicated, but not the attachments, as in the tibialis, anterior and peroneus longus, while, at other times, as in the case of the pectineus, the name is only misleading. Fortunately the names of the describers themselves are very seldom applied to muscles; among the few examples are Horner's muscle and the.

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1 For physiology, see MUSCLE AND NERVE.
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muscular band of Treits. The German anatomists at the Basel conference lately proposed a uniform Latin and Greek nomenclature, which, though not altogether satisfactory, is gaining ground on the European continent. As there are some four hundred muscles on each side of the body it will be impossible here to attempt more than a mere sketch of them; for the details the anatomical textbooks must be consulted.

Muscles of the Head and Face (see fig. 2).—The scalp is moved by a large flat muscle called the occipito-frontalis, which has two muscular bellies, the occipitalis and frontalis, and an intervening epicranial aponeurosis; this muscle moves the scalp and causes the nose several muscles, the actions of which are indicated by their names; they are the compressor, two dilatates and the depressor alae nasi, while the levator labii superioris et alae nasi sometimes goes to the nose. Raising the upper lip, in addition to the last named, are the levator labii superioris proprius and the levator anguli oris, while the zygomaticus major draws the angle of the mouth outward. The lower lip is depressed by the depressor labii inferioris and depressor anguli oris, while the orbicularis oris acts as a sphincter to the mouth.

From A. M. Paterson, Cunningham's Text Book of Anatomy.

FIG. 2.—The Muscles of the Face and Scalp (muscles of expression).

From A. M. Paterson, Cunningham's Text Book of Anatomy.

FIG. 3.—Ptérygoid Region.
The *buccinator muscle* in the substance of the cheeks rises from the upper and lower jaws and runs forward to blend with the *orbicularis oris*. All the foregoing are known as muscles of expression and are supplied by the seventh or facial nerve. The *temporal muscle* at the side of the cranium (fig. 3) and the *masseter* (fig. 2), which rises from the zygoma, close the mouth, since both are inserted into the ramus of the mandible; while, rising from the pterygoid plates, are the *external and internal pterygoid muscles* (fig. 3), the former of which pulls forward the condyle, and so the whole mandible, while the latter helps to close the mouth by acting on the angle of the lower jaw. This group of muscles forms the masticatory set, all of which are supplied by the third division of the fifth nerve. For the muscles of the orbit, see *Eye*; for those of the soft palate and pharynx, see *Pharynx*; and for those of the tongue, see *Tongue*.

**MUSCLES OF THE NECK (fig. 4).**—Just below the mandible is the *digastric*, a double bellied muscle, whose name shows, has two bellies and a central tendon; the anterior belly, supplied by the fifth nerve, is attached to the mandible near the symphysis, the posterior supplied by the seventh of the mastoid process, while the central tendon is bound to the hyoid bone. Stretching across from the side of the lower jaw to the other and forming a floor to the mouth is the *myo-hyoid muscle*; posteriorly this reaches the hyoid bone, and in the mid-line has a tendinous raphe separating the two halves of the muscle. Rising from the manubrium sterni and inner part of the clavicle is the *sterno-cleido-mastoid*, which is inserted into the mastoid process and superior curved lines of the occipital bone; when it contracts it makes the face look over the opposite shoulder, and it is supplied by the spinal accessory nerve as well as by branches from the cervical plexus. It is an important surgical landmark, and forms a diagonal across the quadrilateral outline of the side of the neck, dividing it into an anterior triangle with its apex downward and a posterior with its apex upward. In the anterior triangle the relative positions of the hyoid bone, thyroid cartilage and sternum should be realized, and then the *hyo-glossus, thyro-hyoid, sternohyoid and sternothyroid muscles* are explained by their names. The *omohyoid* muscle rises from the upper border of the scapula and runs across both triangles to the hyoid bone. Where it passes deep to the *sterno-mastoid* it has a central tendon which is bound to the first rib by a loop of cervical fascia. Rising from the stylomastoid process are three muscles, the *stylo-glossus, stylo-hyoid* and *stylo-pharyngeus*, the names of which indicate their attachments. Covering these muscles of the anterior triangle is a thin sheet, close to the skin, called the platysma, the upper fibres of which run back from the mouth over the cheek and are named the *risorius* (fig. 2); this sheet is one of the few remnants in man of the skin musculature or *ponticus carnosus* of lower Mammals. With regard to the nerve supply of the anterior triangle muscles, all those which go to the tongue are supplied by the hypoglossal or twelfth cranial nerve while the muscles below the hyoid bone are apparently supplied from this nerve but really from the upper cervical nerves (see *Nerve, Cranial*; and *Nerve, Spinal*). The posterior triangle is formed by the *sterno-mastoid* in front, the *trapezius* behind, and the clavicle below; in its floor from above downward part of the following muscles are seen: *complexus, splenius, levator anguli scapulae, scalenus medius and scalenus anterior*. Sometimes a small piece of the *scalenus posterior* is caught sight of behind the *scalenus medius*. The *splenius* rotates the head to its own side, the *levator anguli scapulae* raises the upper angle of the scapula, while the three *scaleni* run from the transverse processes of the cervical vertebrae and fix or raise the upper ribs. The *trapezius* (fig. 5) arises from the spines of the thoracic vertebrae and the ligamentum nuchae, and is inserted into the outer third of the clavicle and the spine of the scapula; it is used in shrugging the shoulders and in drawing the upper part of the scapula toward the mid-dorsal line. Its nerve supply is the spinal accessory and third and fourth cervical nerves. When the superficial muscles and complexus are removed from the back of the neck, the *sub-occipital triangle* is seen beneath the occipital bone. Externally it is bounded by the *superior oblique*, running from the transverse process of the atlas to the lateral part of the occipital bone, internally by the *rectus capitis posterior major*, passing from the spine of the axis to the lateral part of the occipital bone, and inferiorly by the *inferior oblique* joining the spine of the axis to the transverse
process of the atlas. These muscles move the head on the atlas and the atlas on the axis. They are supplied by the posterior branch of the first cervical nerve.

MUSCLES OF THE TRUNK.—The trapezius has already been described as a superficial muscle of the upper part of the back; in the loin region the latissimus dorsi (fig. 5) is the superficial muscle, its origin being from the lower thoracic spines, lower ribs and lumbar fascia, and it is inserted into the upper part of the arm bone or humerus. When the trapezius is cut, the rhomboid muscles (major and minor) passing from the upper thoracic spines to the vertebral border of the scapula are seen, and deep to these is the serratus posticus superior passing from nearly the same spines to the upper ribs. On reflecting the latissimus dorsi the serratus posticus inferior is seen running from the lower thoracic spines to the lower ribs. When these muscles are removed the great mass of the erector spinae is exposed, familiar to every one as the upper cut of the sirloin or ribs of beef; it runs all the way up the dorsal side of the vertebral column from the pelvis to the occiput, the complexus already mentioned being its extension to the head. It is longitudinally segmented into many different bundles to which special names are given, and it is attached to the various vertebrae and ribs as it goes up, thus straightening the spinal column. Deep to the erector spinae are found shorter bundles passing from one vertebra to another and forming the semispinalis and multifidus spinae muscles. The latissimus dorsi and rhomboids are supplied by branches of the brachial plexus of nerves, while the deeper muscles get their nerves from the posterior primary divisions of the spinal nerves (see Nerve, Spinal). On the anterior part of the thoracic region the pectoralis major runs from the clavicle, sternum and ribs, to the humerus (fig. 6); deep to this is the pectoralis minor, passing from the upper ribs to

From A. M. Paterson, Cunningham’s Text Book of Anatomy.

Fig. 5.—Superficial Muscles of the Back.
is attached to the deep surfaces of the ribs, and its fibres run horizontally forward. Below, all these muscles are attached to the crest of the ilium and to Poupart's ligament, which is really the lower free edge of the external oblique, while, behind, the two deeper ones, at all events, blend with the fascia lumborum. As they approach the mid-ventral line they become aponeurotic and form the sheath of the rectus. The rectus abdominis (fig. 6) is a flat muscular band which runs up on each side of the linea alba or mid-ventral line of the abdomen from the pubis to the ribs and sternum. This muscle has certain tendinous intersections or linea transversae, the positions of which are noticed in the article Anatomy (Superficial and Artistic), and the morphology of which is referred to later. In front of the lowest part of the rectus is sometimes a small triangular muscle called the pyramidalis. The quadratus lumborum is a muscle at the back of the abdominal wall which runs between the last rib and the crest of the ilium. In front of the bodies of the vertebrae is a prevertebral or hypaxial musculature, of which the rectus capitis anterior major and minor muscles and longus colli in the neck and the psoas in the loins form the chief parts, the latter being familiar as the undercut of the sirloin of beef, while the pelvis is closed below by a muscular floor formed by the levator ani and coccygeus muscles. The diaphragm is explained in a separate article.

Muscles of the Upper Extremity.—The deltoïd (see figs. 7 and 8) is the muscle which forms the shoulder cap and is used in abducting the arm to a right angle with the trunk; it runs from the clavicle, acromial process and spine of the scapula, to the middle of the humerus, and is supplied by the circumflex nerve. Several short rotating muscles pass from the scapula to the upper end of the humerus; these are the subscapularis passing in front of the shoulder joint, the supraspinatus above the joint, and the infraspinatus and teres minor behind. The teres major (fig. 5) comes from near the lower angle of the scapula, and is inserted with the latissimus dorsi into the front of the surgical neck of the humerus. The coracobrachialis (fig. 7) passes from the coracoid process to the middle of the humerus in front of the shoulder joint, while the brachialis anterior passes in front of the elbow from the humerus to the coracoid process of the ulna. Passing in front of both shoulder and elbow is the biceps (fig. 7), the long head of which rises from the top of the glenoid cavity inside the joint, while the short head comes from the coracoid process. The insertion is into the tubercle of the radius. These three muscles are all supplied by the same (musculo-cutaneous) nerve. At the back of the arm is the triceps (fig. 8) which passes behind both shoulder and elbow joints and is the great extensor muscle of them; its long head rises from just below the glenoid cavity of the scapula, while the inner and outer heads come from the back of the humerus. It is inserted into the olecranon process of the ulna and is supplied by the musculo-spinal nerve. The muscles of the front of the forearm form superficial and deep sets (see fig. 7). Most of the superficial muscles come from the internal condyle of the humerus. From without inward they are the pronator radii teres going to the radius, the flexor carpi radialis to the base of the index metacarpal bone, the palmaris longus to the palmar fascia, the flexor sublimis digitorum to the middle phalanges of the fingers, and the flexor carpi ulnaris to the pisiform bone. The important
points of practical interest about these muscles are noticed in the article Anatomy (Superficial and Artistic). In addition to these the brachio-radialis is a flexor of the forearm, though it arises from the outer supracondylar ridge of the humerus. It is supplied by the musculo-spiral nerve, the flexor carpi ulnaris by the ulnar, the rest by the median. The deep muscles of the front of the forearm consist of the flexor longus pollicis running from the radius to the terminal phalanx of the thumb, the flexor profundus digitorum from the ulna to the terminal phalanges of the fingers, and the pronator quadratus.

From A. M. Paterson, Cunningham's Text Book of Anatomy. Fig. 7.—Superficial Muscles on the Front of the Arm and Forearm. passing across from the lower third of the ulna to the same amount of the radius. These three muscles are supplied by the anterior interosseous branch of the median nerve, but the flexor profundus digitorum has an extra twig from the ulnar. The extensor muscles at the back of the forearm are also divided into superficial and deep sets (see fig. 8). The former rise from the region of the external condyle of the humerus, and consist of the extensor carpi radialis longus and brevior inserted into the index and medius metacarpal bones, the extensor communis digitorum to the middle and distal phalanges of the fingers, the extensor minimi digiti, the extensor carpi ulnaris passing to the metatarsal bone of the minimus, and the supinator brevis wrapping round the neck of the radius to which it is inserted. The extensor which runs from the external condyle to the olecranon process is really a part of the triceps. The deep muscles rise from the posterior surfaces of the radius and ulna, and are the extensor ossis metacarpi pollicis, the name of which gives its insertion, the extensor brevis pollicis to the proximal phalanx, and the extensor longus pollicis to the distal phalanx of the thumb, while

From A. M. Paterson, Cunningham's Text Book of Anatomy. Fig. 8.—The Muscles on the Back of the Arm, Forearm and Hand. the extensor indicis joins the extensor communis slip to the index finger; all these posterior muscles are supplied by the posterior interosseous nerve. In front and behind the wrist the tendons are bound down by the anterior and posterior annular ligaments, while on the flexor surface of each finger is a strong fibrous sheath or theca for the flexor tendons. The ball of the thumb is occupied by short muscles called the thenar group, while hypothenar muscles are found in the ball of the little finger. The four lumbrical muscles (fig. 9, d) run from the flexor profundus digitorum tendons to those of the
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extensor communis between the heads of the metacarpal bones, while, rising from the shafts of these bones, are the three palmar and four dorsal interosseous muscles (fig. 9, c) which also are inserted into the extensor tendons. The two outer lumbricals and the thenar muscles are supplied by the median nerve; all the other hand muscles by the ulnar nerve.

Muscles of the Lower Extremity.—On the front of the thigh the quadriceps extensor muscles are the most important: there are four of them, the rectus femoris (fig. 1) with its straight and reflexed heads rising from just above the acetabulum, the sartorius, deep to this, from the front of the femur, and the vastus externus and internus wrapping tendons on each side on the linea aspera. All these are inserted into the patella, or rather the patella is a sesamoid bone developed where their common tendon passes round the lower end of the femur when the knee is bent. The distal part of this tendon, however, passes from the patella to the tubercle of the tibia, which is the ligamentum patellae. The sartorius is a long ribbon-like muscle running from the anterior superior spine of the ilium to the inner surface of the tibia, obliquely across the front of the thigh. It forms the outer boundary of Scarpa’s triangle, the inner limit of which is the adductor longus and the base Poupart’s ligament. The floor is formed by the iliacus from the iliac fossa of the pelvis, which joins the psoas, to be inserted into the lesser trochanter, and the iliobibial tractus running from the upper ramus of the pubis just below the insertion of the last muscles. The adductor muscles, longus, brevis and magnus, all rise from the subpubic arch, and are inserted into the linea aspera of the femur, so that they draw the femur to extend (the middle line. The gracilis (fig. 10) is part of the adductor mass, though its insertion is into the upper part of the tibia. The extensor muscles of the front of the thigh are supplied by the anterior crural nerve, but the adductor group on the inner side from the obturator. The pectineus is often supplied from both sources. On the back of the thigh the gluteus maximus (figs. 5 and 10) plays an important part in determining man’s outline (see Anatomy: Superficial and Artistic). It rises from the sacral region, and is inserted into the upper part of the femur and the deep fascia of the thigh, which is very thick and is known as the fascia lata; the muscle is a great extensor of the hip and raises the body from the supporting position. The gluteus medius rises from the ilium, above the hip joint, and passes to the great trochanter; it abducts the hip and enables the body to be balanced on one leg, as in taking a step forward. The gluteus minimus is covered by the last muscle, and passes from the ilium to the front of the great trochanter, thus rotating the hip joint inward. Some of its anterior fibres are sometimes separated from the rest, and are then called the sartorius (see JOINTS). When the gluteus maximus is removed, a number of short externally rotating muscles are seen, rising from the pelvis and inserted into the great trochanter (fig. 10); these are, from above downward, the pyroformis, gemellus superior, obturator internus, gemellus inferior and quadratus femoris. They are all supplied by special branches of the sacral plexus. On cutting the quadratus femoris a good deal of the obturator externus can be seen, coming from the outer surface of the obturator membrane and passing to the digital losses of the great trochanter. Unlike the rest of this group, it is supplied by the obturator nerve. Coming from the anterior part of the crest of the ilium is the tensor fasciae latae, which is inserted into the fascia lata, as is part of the gluteus maximus, and the thickened band of fascia which runs down the outer side of the thigh from the head of the tibia is known as the ilio tibial band. The tensor fasciae latae, gluteus medius and minimus, are supplied by the superior gluteal nerve, the gluteus maximus by the inferior gluteal. At the last, though the hamstrings rising from the ischium (fig. 10) are the semimembranosus and semitendinosus, passing to the inner part of the thigh and forming the internal hamstrings, and the biceps femoris or external hamstring, which as an extra head from the shaft of the femur and is inserted into the head of the fibula. These muscles are supplied by the great sciatic nerve and extend the hip joint while they flex the knee. In the leg, as distinguished from the thigh, are three groups of muscles, anterior, middle and posterior. The anterior group is formed from the front of the tibia and fibula, and consist of the extensor longus digitorum, extending the middle and distal phalanges of the four outer toes, the extensor proprius hallucis, extending the big toe, and the peroneus tertius, a purely human muscle inserted into the base of the fifth metatarsal bone. All these are supplied by the anterior tibial nerve.

The external group comprises the peroneus longus and brevis, rising from the outer surface of the fibula and inserted into the tarsus (fig. 11), the longus tendon passing across the sole to the base of the first metatarsal bone, the brevis to the base of the fifth metatarsal. These are supplied by the musculo-cutaneous nerve.
and the *flexor longus hallucis* from within outward. Their tendons all pass into the sole, that of the *flexor longus digitorum* being inserted into the terminal phalanges of the four outer toes, the *flexor longus hallucis* into the terminal phalanx of the big toe, while the tendinous portions pass outwards as the *tibialis posterior*. The nerve supply of this group is the posterior tibial. On the dorsum of the foot is the *extensor brevis digitorum* (fig. 11), which helps to extend the four inner toes, while in the sole are four layers of short muscles, the most superficial of which consists of the *abductor hallucis*, the *flexor brevis digitorum*, and the *abductor minimi digiti*, the names of which indicate their attachments. The second layer is formed by muscles which are attached to the *flexor longus digitorum* tendon: they are the *accessorius*, running forward to the tendon from the lower surface of the calcaneum, and the four *lumbricales*, which arise from the tendon after it has split for the four toes and pass between the toes to be inserted into the tendons of the extensor longus digitorum on the dorsum. The third layer comprises the *flexor brevis hallucis*, *adductor oblatus* and *adductor transversus hallucis* and the *flexor brevis minimi digiti*. The fourth layer contains the three *plantar* and four *dorsal interosseous muscles*, rising from the metatarsal bones and inserted into the proximal phalanges and extensor tendons in such a way that the plantar muscles draw the toes towards the line of the second toe while the dorsal draw them away from that line. Of these sole muscles the *flexor brevis digitorum*, *flexor brevis hallucis*, *abductor hallucis* and the innermost lumbrical are supplied by the internal plantar nerve, while all the rest are supplied by the external plantar.

**Muscular System**

The development of the muscular system is partly known from the results of direct observation, and partly inferred from the study of the part of the nervous system whence the innervation is derived. The unstriped muscle is formed from the mesenchyme cells of the somatic and splanchnic layers of the mesoderm (see Embryology), but never, as far as we know, from the mesodermic somites. The heart muscle is also developed from mesenchymal cells, though the changes producing its freely striped fibres are more complicated. The skeletal or real striped muscles are derived either from the mesodermic somites or from the branchial arches. As the mesodermic somites are placed on each side of the neural canal in the early embryo, it is obvious that the greater part of the trunk musculature spreads gradually round the body from the dorsal to the ventral side and consists of a series of plates called *myotomes* (fig. 12). The muscle fibres in these plates run in the long axis of the embryo, and are at first separated from those of the two neighbouring plates by thin fibrous intervals called *myocomma*. In some cases these myocomma persist and even become ossified, as in the ribs, but more usually they disappear early, and the myotomes then unite with another to form the rami tendinae. In the whole of the trunk a longitudinal cleavage at right angles to the surface occurs, splitting the musculature into a dorsal and ventral part, supplied respectively by the dorsal and ventral primary divisions of the spinal nerves. From the dorsal part the various muscles of the erector spinae series are derived by further longitudinal cleavages either tangential or at right angles to the surface, while the ventral part is again longitudinally split into mesial and lateral portions. A transverse section of the trunk at this stage, therefore, would show the cut ends of three longitudinal strips of muscle: (1) a mesial ventral, from which the rectus, pyramidalis sterno-hyoid, omohyoid and sterno-thyroid muscles are derived; (2) a lateral ventral, forming the flat muscles of the abdomen, intercostals and plates of the sternomastoid and trapezius; and (3) the dorsal portion already noticed. The mesial ventral part is remarkable for the persistence of remnants of myocomma in it, forming the linea transversa of the rectus and the central tendon of the omohyoid. The lateral part in the abdominal region splits tangentially into three layers,

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**FIG. 12.**—Scheme to Illustrate the Disposition of the Myotomes in the Embryo in Relation to the Head, Trunk and Limbs.

A, B, C, First three cephalic myotomes.

N, 1, 2, 3, 4, Last persisting cephalic myotomes.

C, T, L, S, Co., The myotomes of the cervical, thoracic, lumbar, sacral and caudal regions.

I., II., III., IV., V., VI., VII., VIII., IX., X., XI., XII., Refer to the cranial nerves and the structures with which they may be embryologically associated.

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From A. M. Paterson, Cunningham's *Text Book of Anatomy.*
the external and internal oblique and the transversalis, the fibres of which become differently directed. In the thoracic region, the intercostal nerves pass through a slit in the middle or internal oblique layer, because the external oblique is continued headward superficially to the ribs and the transversalis downwards. The inner layer is, however, continued along the ventral surface of the bodies of the vertebrae, and form the hypaxial muscles—such as the psoas, longus colli and recti capitis anterior. The nerve supply indicates that the lowest myotomes taking part in the formation of the abdominal walls are those of the first two lumbar nerves, and are represented by the cremaster muscle in the scrotum. In the perineum, however, the third and fourth sacral myotomes are represented, and these muscles and their cutaneous nerves are the terminations of the third and fourth intercostals.

The bundles of the rectus abdominis give off a medial or superficial division which supplies the rectus abdominis, and the division is directly connected with the deep layer of the rectus sheath. The lateral division supplies the external oblique, and is considered to represent the primitive transversalis muscle of the embryo, and the deep layer is not in continuity, as in the fetal state, with the muscles of the subcutaneous tissue of the body wall, but the intermuscular layers are still connective tissue. In the grown animal, a definite sphincter cloacae is formed round and claspers approach to the base of the oviparous insertion.

In mammals certain muscles vary in their attachments or presence and absence in different orders, sub-orders and families, so that, with the enormous amount of technical knowledge received in recognizing them, they might be useful from a classificatory point of view. There is, however, a greater gap between the musculature of Man and that of the other Primates than there is between many other mammalian orders, and this is probably either directly or indirectly to the assumption of the erect position.

The chief causes which produce changes of musculature are:

1. splitting, (2) fusion, (3) suppression, either partial or complete, (4) shifting or the base of the insertion, (5) new formation, (6) transformation of part of one muscle to another. In many of these cases the nerve supply gives an important clue to the change which has been effected. Splitting of a muscular mass is often the result of one part of a muscle being used separately, and a good example of this is the deep flexor mass of the forearm. In the lower mammals this mass rises from the flexor surface of the radius and ulna, and supplies the flexor muscles of the lower arm. When the thumb is used separately, and, in response to this, that part of the mass which goes to the thumb is completely split off into a separate muscle, the flexor longus pollicis. The process, however, is a gradual one, and not seen in one step. If a muscle is shifted alone for many purposes, and the index slip of the flexor profundus digitum in is used as almost a distinct muscle as the index slip of the flexor longus pollicis. Fusion may be either collateral or longitudinal. The former is seen in the case of the flexor carpi ulnaris. In many mammals (e.g. the dog), there are two muscles inserted separately into the pisiform bone, one rising from the internal condyle of the humerus, the other from the olecranon process, but in many others (e.g. capybara) they are united for a time, and then separated, or in the diaphragm, where the anterior belly is part of the (a) diaphragm and the posterior of the second or hyoid arch; in the quadriceps it is one we would expect, the anterior belly is supplied by the fifth nerve and the posterior by the third, etc. And, in the case of a muscle it is seen in the rhomboid sheet; in the lower mammals this rises from the head, neck and anterior (cervical) thoracic spines, and, in the same hand and most of the next (ischiocrural) is the same.

Complete suppression of a muscle is exemplified in the omo-trachelial, a muscle which runs from the cervical vertebrae to the aeronian process and fixes the scapula for the strong action of the triceps in pronograde mammals; in man this strong action of the triceps is no longer needed for projection, and the fixing muscle has disappeared. Shifting of origin is seen in the short head of the biceps femoris. This in many lower mammals (e.g. rabbit) is a well-marked case of shifting of origin, the short head of the muscle, which is supplied from the nerve of the thoracic wall, has been shifted to the femur, and in the great antecut is it evident that the agitator caudis has been used as a muscle side, because the short head of the biceps femoris is able to act on the long head, and the long head is a distinct muscle. Shifting of an insertion is not nearly as common as shifting of an origin; it is seen, however, in the peroneus tertius of man, in which part of the extensor longus digitorum has acquired a new insertion, and in the case of the hamstrings. The new formation of a muscle is seen in the stylo-hyoides alter, an occasional human muscle; but in this the stylo-hyoid ligament has been converted into a muscle. The insertion of part of one muscle to another is well shown by the humpmadductor magnus. Longitudinal fusion is seen pass from the tuber ischi to the condyle of the femur have a nerve supply from the great sciatic instead of the obturator, and in most low mammals are a separate part of the hamstrings known as the presemimembranosus.


MUSES, THE (Gr. Mōvou, the thinkers), in Greek mythology, originally nymphs of springs, then goddesses of song, and, later, of the different kinds of poetry and of the arts and sciences generally. In Homer, who says nothing definite as to their origin, they are represented either among the gods among the gods of Olympus, when they sing at their banquets under the leadership of Apollo Musagetes. According to Hesiod (Theog. 77), who first gives the usually accepted names and number, they were the daughters of Zeus and Mnemosyne, the personification of memory; others made them children of
Uranus and Gaea. Three older Muses (Mneme, Melete, Aoide) were sometimes distinguished, whose worship was said to have been introduced by the Aloidae on Mt Helicon (Pausanias ix. 29). It is probable that three was the original number of the Muses, which was increased to nine owing to their arrangement in three groups of three in the sacred choruses. Round the altar of Zeus they sang of the origin of the world, of gods and men, of their exploits, and of the ages successively; and celebrate the marriages of Cadmus and Perseus, and the death of Achilles. As goddesses of song they protect those who recognize their superiority, but punish the arrogant—such as Thamyris, the Thracian bard, who for having boasted himself their equal was deprived of sight and the power of song. From their connexion with Apollo and their original nature as inspiring nymphs of springs they also possess the gift of prophecy. They are closely related to Dionysus, to whose festivals dramatic poetry owed its origin and development. The worship of the Muses had two chief seats—on the northern slope of Mt Olympus in Pieria, and on the slopes of Mt Helicon near Ascora and Thepsia in Boeotia. Their favourite haunts were the springs of Castalia, Aganippe and Hippocrene. From Boeotia their cult gradually spread over Greece. As the goddesses who presided over the nine principal departments of letters, their names and attributes were: Calliope, epic poetry (wax tablet and pencil); Euterpe, lyric poetry (the double flute); Erato, erotic poetry (a small lyre); Melpomene, tragedy (tragic mask and ivy wreath); Thalassa, comedy (comic mask and ivy wreath); Polyhymnia (or Polyhymnia), sacred hymns (veiled, and in an attitude of thought); Terpsichore, choral song and the dance (the lyre); Clio, history (a scroll); Urania, astronomy (a celestial globe). To these Arethusa was added as the muse of pastoral poetry. The Roman poets identified the Greek Muses with the Italian Camenae (or Casmene), prophetic nymphs of springs and goddesses of birth, who possessed a grove near the Porta Capena at Rome. One of the most famous of these was Egeria, the counsellor of King Numa.

See H. Deiters, Ueber die Verehrung der Muser bei den Griechen (1868); P. Decharme, Les Muses (1869); J. H. Krause, Die Museen (1871); F. Rödiger, Die Museen (1875); O. Navarre in Darmberg and Saglio's Dictionnaire des antiquités, and A. Wie in Rovere's Lexicon der Mythologie, the latter chiefly for representations of the Muses in art.

MUSEUMS OF ART. The later 19th century was remarkable for the growth and development of museums, both in Great Britain and abroad. This growth, as Professor Stanley Jevons predicted, was symptomatic with the advancement of education. Public museums are now universally required; old institutions have been greatly improved, and many new ones have been founded. The British parliament has passed statutes conferring upon local authorities the power to levy rates for library and museum purposes, while on the continent of Europe the collection and exhibition of objects of antiquity and art has become a recognized duty of the state and municipality alike.

A sketch of the history of museums in general is given below, under MUSEUMS OF SCIENCE. The modern museum of art differs essentially from its earlier prototypes. The aimless collection of curiosities and bric-à-brac, brought together without method or system, was the feature of certain famous collections in bygone days, of which the Tradescant Museum, formed in the 17th century, was a good example. This museum was a miscellany without didactic value; it contributed nothing to the advancement of art; its arrangement was unscientific, and the public gained little or no advantage from its existence. The modern museum, on the other hand, should be organized for the public service, e.g. musical instruments: should they be included in art exhibits or in the ethnographical section to which they also pertain? Broadly speaking, objects must be classified according to the quality (apart from their nature) for which they are most remarkable. Thus a musket or bass viol of the 17th century, inlaid with ivory and highly decorated, would be properly included in the art section, whereas a common flute or weapon, noteworthy for nothing but its interest as an instrument of music or destruction, would be suitably classified as ethnographic. In England, at any rate, there is no uniformity of practice in this respect, and though it is to be hoped that the ruling desire to classify according to strict scientific rules may not become too prevalent, it would nevertheless be a distinct advantage if in the more of the British museums, some attempt were made to illustrate the growth of domestic arts and crafts according to classification by date. Examples of this classification in Munich, Amsterdam, Basel, Zürich and elsewhere afford excellent lessons of history and art, a series of rooms being fitted up to show in chronological order the home life of our ancestors. In the National Museum of Bavaria (Munich) there is a superb suite of rooms illustrating the progress of art from Merovingian times down to the 19th century. Thus classification, though studied, must not check the elasticity of art museums; it should not be allowed to interfere with the mobility of the exhibits—that is to say, it should always be possible to make the closer inspection of students, and also to send examples on loan to other museums and schools of art—an invaluable system long in vogue at the Victoria and Albert Museum, and one which should be still more widely adopted. An axiom of museum law
is that the exhibits shall be properly shown. "The value of a museum is to be tested by the treatment of its contents" (Flower, p. 24). But in many museums the chief hindrance to study and enjoyment is overcrowding of exhibits. Although a truism, it is necessary to state that each object should be properly seen, cleaned and safeguarded; but all over the world there is the trouble of an adequate collection of objects is one cause of overcrowding, but a faulty appreciation of the didactic purpose of the collection is more frequently responsible.

In Great Britain, museum progress is satisfactory. Visitors are numbered by millions, access is now permitted on Sundays and week-days alike, and entrance fees are being consistently reduced; in this the contrast between Great Britain and some foreign countries is singular. A generation or so ago the national collections of Italy used to be always open to the public. Pay-days, however, were gradually established, with the result that the chief collections are now only visible without payment on Sundays. In Dresden payment is obligatory five days a week. The British Museum never charges for admission. On the other hand, the increase in continental collections is more rapid than in Great Britain, where acquisitions are only made by gift, purchase or bequest. In other European countries enormous collections have been obtained by revolutions and conquest, by dynastic changes, and by secularizing religious foundations. Some of the chief treasures of provincial museums in France were spoils of the Napoleonic armies, though the great bulk of this loot was returned in 1815 to the original owners. In Italy the conversion of a monastery into a museum is a simple process, the Dominican house of San Marco in Florence offering a typical example. A further stimulus to the foundation of museums on the continent is the comparative ease with which old buildings are obtained and adapted for the collections. Thus the Germanisches Museum of Nuremberg is a secularized church and convent; the enormous collections belonging to the town of Ravenna are housed in an old Camaldulensian monastery. At Louvain and Florence municipal palaces of great beauty are used; at Nîmes a famous Roman temple; at Urbino the grand ducal palace, and so on. There are, however, certain disadvantages in securing both building and collection ready-made, and the special care devoted to museums in Great Britain can be traced to the fact that their cost to the community is considerable. Immense sums have been spent on the buildings (the total cost of the Victoria and Albert Museum alone being devoted to the new buildings for the Victoria and Albert Museum in London). Had it been possible to secure them without such an outlay the collections themselves would have been much increased, though in this increase itself there would have been a danger, prevalent but not yet fully realized in other countries, of crowding the vacant space with specimens of inferior quality. The result is that fine things are badly seen owing to the masses of second-rate examples; moreover, the ample space available induces the authorities to remove works of art from their original places, in order to add them to the museums. Thus the statue of St. George by Donatello has been taken from the church of Or San Michele at Florence (on the plea of danger from exposure), and is now placed in a museum where, being dwarfed and undervalued, its chief artistic value is lost. The desire to make financial profit from works of art is a direct cause of the modern museum movement in Italy. One result is to displace and thus depreciate many works of art, beautiful in their original places, but quite insignificant when put into a museum. Another result is that, owing to high entrance fees, the humbler class of Italians can rarely see the art treasures of their own country. There are other collections, akin to art museums, which would best be called biographical museums. They illustrate the life and work of great artists or authors. Of these the most notable are the museums commemorating Dürer at Nuremberg, Beethoven at Bonn, Thoreau at Concord, Shakespeare at Stratford and Michelangelo at Florence. The sacristies of cathedrals often contain ecclesiastical objects of great value, and are shown to the public as museums. Cologne, Aachen, Milan, Monza and Reims have famous treasuries. Many Italian cathedrals have small museums attached to them, usually known as "Opere del Duomo." United Kingdom.—The influence and reputation of the British Museum are so great that its original purpose, as stated in the preamble of the act by which it was founded (1753, c. 22), may be quoted: "Whereas all arts and sciences tend to the advancement with each other, and the progress of mankind; and whereas, in natural philosophy and other branches of speculative knowledge, for the advancement and improvement whereof the said museum or collection was intended, do, or may in many instances give help and success to the most useful experiments and undertakings . . ." The "said museum" above mentioned referred to the collection of Sir Hans Sloane, to be purchased under the act just quoted. Sir Hans Sloane is therein stated, "through the course of many years, with great labour and expense, to have gathered together whatever could be procured, either in our own or foreign countries, that was rare and curious." In order to buy his collections and found the museum a lottery of £35,000 was authorized, divided into 50,000 tickets, the prizes varying from £10 to £10,000. Provision was made for the adequate housing of Sir Robert Cotton's books, already bought in 1700 (12 and 13 Will. III. c. 7). This act secured for the nation the famous Cottonian manuscripts, "of great use and service for the knowledge and preservation of our constitution, both in church and state." Sir Robert's grandson had preserved the collection with great care, and was willing that it should not be disposed of or embezzeled," and that it should be preserved for public use and advantage. This act also sets forth the oath to be sworn by the keeper, and deals with the appointment of trustees. This is still the method of internal government at the British Museum, and additions to the Board of Trustees are made by statute, as in 1824, in acknowledgment of a bequest. The trustees are of three classes: (a) three principal trustees, namely the Primate, the Lord Chancellor and the Speaker; (b) general trustees, entitled ex officio to the position in virtue of ministerial office; (c) family, bequest and nominated trustees. A standing committee of the trustees meets regularly at the museum for the transaction of business. The great departments of the museum (apart from the scientific and zoological collections, now placed in the museum in Cromwell Road, South Kensington) are of printed books, MSS., Oriental books, prints and drawings, Egyptian and Assyrian antiquities, British and medieval sculpture, coins, medals and medals. Each of these eight departments is under a keeper, with an expert staff of subordinates, the head executive officer of the whole museum being styled director and chief librarian. The museum has been enriched by bequests of great importance, especially in the library. Recent legacies have included the porcelain bequeathed by Sir Wollaston Franks, and the valuable collection of works of art (chiefly enamels and goldsmithery) known as the Waddesdon bequest—a legacy of Baron F. de Rothschild. The most important group of acquisition by purchase in the history of the museum is the series of Greek sculptures known as the Elgin Marbles, bought by act of parliament (56 Geo. III. c. 90).

There are four national museums controlled by the Board of Education, until recently styled the Department of Science and Art. The chief of these is the Victoria and Albert Museum at South Kensington. This museum has a direct dependency at Bethnal Green, the Dublin and Edinburgh museums having been now removed from its direct charge. There is also a museum of practical geology in Jermyn Street, containing valuable specimens of pottery and majolica. The Victoria and Albert Museum owed its inception to the Exhibition of 1851, from the surplus funds of which 12 acres of land were bought in South Kensington. First known as the Department of Practical Art, the museum rapidly established itself on a broad basis. Acquisitions of whole collections and unique specimens were accumulated. In 1857 the Shepherds of pictures was presented; in 1879 the India Office transferred to the department the collection of Oriental art formerly belonging to the East India Company; in 1882 the Jones bequest of French furniture and decorative art (1740–1810) was received;
in 1884 the Patent Museum was handed over to the department. Books, prints, MSS. and drawings were bequeathed by the Rev. A. Dyce to Victorian ECM. Meanwhile, gifts and purchases had combined to make the collection one of the most important in Europe. The chief features may be summarized as consisting of pictures, including the Raphael cartoons lent by the king; textiles, silks and tapestry; ceramics and enamels; ivory and plastic art, metal, furniture and Oriental collections. The guiding principle of the museum is the illustration of art applied to industry. Beauty and decorative attraction is perhaps the chief characteristic of the exhibits here, whereas the British Museum is largely archaeological.

With this object in view, the museum possesses numerous reproductions of famous art treasures: casts, facsimiles and electrotypes, some of them so well contrived as to be almost indistinguishable from the originals. An art library with 75,000 volumes and 25,000 prints and photographs is at the disposal of students, and an art school is also attached to the museum. The museum does considerable work among provincial schools of art and museums, "circulation" being its function in this connexion. Works of art are sent on temporary loan to local museums, where they are exhibited for certain periods and on being withdrawn are replaced by fresh examples. The subordinate museum of the Board of Education at Bethnal Green and that at Edinburgh call for no comment, their contents being of a slender value. The Dublin Museum, though now controlled by the Irish Department, may be mentioned here as having been founded and worked by the Board of Education. Apart from the fact that it is one of the most suitably housed and organized museums in the British Isles, it is remarkable for its priceless collection of Celtic antiquities, belonging to the Royal Irish Academy, and transferred to the Kildare Street Museum in 1890. Among its most famous specimens of early Irish art may be mentioned the shrine and bell of St Patrick, the Tara brooch, the cross of Cong and the Ardagh chalice. The series of bronze and stone implements is most perfect, while the jewels, gold ornaments, torques, fibulae, diadems, and so forth are such that, were it possible again to extend the galleries (thus allowing further classification and exhibition space), the collection would surpass the Danish National Museum at Copenhagen, its chief rival in Europe.

The famous collections of Sir Richard Wallace (d. 1890) having been bequeathed to the British nation by his widow, the public has acquired a magnificent gallery of pictures, together with a quantity of works of art, so important as to make it necessary to include Hertford House among national museums. French art predominates, and the examples of bronze, furniture, and porcelain are as fine as those to be seen in the Louvre. Hertford House, however, also contains a most remarkable collection of armour, and the examples of Italian faience, enamels, bijouterie, &c., are of first-rate interest. The universities of Cambridge and Oxford have museums, the latter including the Ashmolean collection, a valuable bequest of majolica from D. Fortnum, and some important classical statuary, now in the Taylorian Gallery. Christ Church has a small museum and picture gallery. Trinity College, Dublin, has a miniature archaeological collection, containing some fine examples of early Irish art. The National Museum of Antiquities of Scotland, controlled by the Board of Manufactures, was formed by the Scottish Society of Antiquaries, and has a comprehensive collection of Scottish objects, lay and religious. The Tower of London contains armour of historic and artistic interest, and the Royal College of Music has an invaluable collection of musical instruments, presented by Mr George Donaldson. Art museums are also to be found in several public schools in the United Kingdom.

The Museums Act of 1825 enabled town councils to found municipal museums. This act was superseded by another passed in 1850, by Mr William Ewart, which in its turn has been replaced by amending statutes passed in 1855, 1866, 1868 and 1885. The Museums and Gymnasia Act of 1891 sanctioned the provision and maintenance of museums for the reception of local antiquities and other objects of interest, and allows a 0d. rate, irrespective of other acts. By this Act, councils have also been enabled to raise private municipal acts, Oldham affording a case in point. Civic museums must still be considered to be in their infancy. Although the movement is now firmly established in municipal enterprise, the collections, taken as a whole, are still somewhat nondescript. In many cases collections have been handed over by local societies, particularly in geology, zoology and other scientific departments. There are about twelve museums in which Roman antiquities are noticeable, among them being Leicester, and the Civic Museum of London, at the Guildhall. British and Anglo-Saxon relics are important features at Sheffield and Liverpool; in the former case owing to the Bateman collection acquired in 1876; while the Mayo collection presented to the latter town contains a highly important series of carved ivories. At Salford, Glasgow and Manchester industrial art is the chief feature of the collections. Birmingham, with perhaps the finest provincial collection of industrial art, is supported by the rates to the extent of £4,200 a year. Its collections (including here, as in the majority of great towns, an important gallery of paintings) are entirely derived from gifts and bequests. Birmingham has made a reputation for special exhibitions of works of art lent for a time to the corporation. These loan exhibitions, about which occasional lectures are given, and of which cheap illustrated catalogues are issued, have largely contributed to the great popularity and efficiency of the museum. Liverpool, Preston, Derby and Sheffield owe their fine museum buildings to private generosity. Other towns have museums which are chiefly supported by subscriptions, e.g. Chester and Newcastle, where there is a fine collection of work by Bewick the engraver. At Exeter the library, museum, and art gallery, together with schools of science and art, are combined in one building. Other towns may be noted as having art museums: Stockport, Nottingham (Wedgwood collection), Leeds, Bootle, Swansea, Bradford, Northampton (British archaeology), and Windsor. There are museums at Belfast, Larne, Killkenny and Armagh. The cost of the civic museum, being generally computed with the maintenance of the free library, is not easily obtained. In many cases the librarian is also curator of the museum; elsewhere no curator at all is appointed, his work being done by a caretaker. In some museums there is no classification or cataloguing and the value of existing collections is impaired both by careless treatment and by the too ready acceptance of worthless gifts; often enough the museums are governed by committees of the corporation whose interest and experience are not great.

Foreign Museums.—Art museums are far more numerous on the continent of Europe than in England. In Germany progress has been very striking, their educational aspect being closely studied. In Italy public collections, which are ten times more numerous than in England, are chiefly regarded as financial assets. The best examples of classification are to be found abroad, at Vienna, Amsterdam, Zürich, Munich and Gizeh in Egypt. The Musée Carnavalet, the historical collection of the city of Paris, is the most perfect civic museum in the world. The buildings in which the objects can be most easily studied are those of Naples, Berlin and Vienna. The value of the aggregate collections in any single country of the great powers, Russia excepted, probably exceeds the value of British collections. At the same time, it must be remembered that masses of foreign collections represent expropriations by the city and the state, together with the inheritance of royal and semi-royal collectors. In Germany and Italy, for instance, there are at least a dozen towns which at one time were capitals of principalities. In some countries the public holds over works of art the pre-emptive right of purchase. In Italy, under the law known as the Edito Pacca, it is illegal to export the more famous works of art. Speaking generally, the cost of maintaining municipal museums abroad is very small, many being without expert or highly-paid officials, while admission fees are often considerable. Nowhere in the United Kingdom are the collections neglected in a manner
through which certain towns in Italy and Spain have gained an unenviable name. Berlin and Vienna have collections of untold richness, and the public are freely admitted. Berlin, besides its picture gallery of antiquities and architectural museum, has a collection of Christian antiquities in the university. The old museum, a royal foundation, is renowned for its classical sculpture and a remarkable collection of medieval statuary, in which Italian art is well represented. The new museum is also noteworthy for Greek marbles, and contains bronzes and engravings, together with one of the most typical collections of Egyptian art. Schliemann’s discoveries are housed in the Ethnographic Museum. The Museum of Art and Industry, closely similar in object and arrangement to the Victoria and Albert Museum in London, contains a collection of the same character—enamels, furniture, ceramics, &c. Vienna also has one of these museums (Kunstgewerbe), in which the great value of the examples is enhanced by their judicious arrangement. The Historical Museum of this city is interesting, and the Imperial Museum (of which the structure corresponds almost exactly with a plan of an ideal museum designed by Sir William Flower) is one of the most comprehensive extent, containing armour of world-wide fame and the choicest specimens of industrial art. Prague, Innsbruck and Budapest are respectively the homes of the national museums of Bohemia, Tirol and Hungary. The National Museum of Bavaria (Munich) has been completed, and its exhibition rooms, too, show the most recent methods of classification, Nuremberg, with upwards of eighty rooms, being its only rival in southern Germany. Mainz and Trier have Roman antiquities. Hamburg, Leipzig and Breslau have good “Kunstgewerbe” collections. In Dresden there are four great museums—the Johanneum, the Albertium, the Zwinger and the Grüné Gewölbe—in which opulent art can best be appreciated; the porcelain of the Dresden galleries is superb, and few branches of art are unrepresented. Gotha is remarkable for its ceramics, Brunswick for enamels (in the ducal cabinet). Museums of minor importance exist at Hanover, Ulm, Würzburg, Danzig and Lübeck.

The central museum of France, the Louvre, was founded as a public institution during the Revolutionary period. It contains the collections of François I., Louis XIV., and the Napoleons. Many works of art have been added to it from royal palaces, and collections formed by distinguished connoisseurs (Campana, Sauvageot, La Caze) have been incorporated in it. The Greek sculpture, including the Venus of Melos and the Níke of Samothrace, is of pre-eminent fame. Other departments are well furnished, and from a technical point of view the manner in which the officials have overcome structural difficulties in adapting the palace to the needs of an art museum is most instructive. The Cluny Museum, bought by the city in 1842, and subsequently transferred to the state, supplements the medieval collections of the Louvre, being a storehouse of select works of art. It suffers, however, from being overcrowded, while for purposes of study it is badly lighted. At the same time the Mairie Cluny is a well-furnished house, decorated with admirable things, and as such has a special didactic value of its own, corresponding in this respect with Hertford House and the Poldi-Pezzoli Gallery at Milan—collections which are more than museums, since they show in the best manner the adaptation of artistic taste to domestic life. The French provincial museums are numerous and important. Twenty-two were established early in the 19th century, and more than 1,000 others have been added from the state, numbers of which were not returned in 1815 to the countries whence they were taken. The best of these museums are at Lyons; at Dijon, where the tombs of Jean sans Peur and Philip the Bold are preserved; at Amiens, where the capital Musée de Picardie was built in 1859; at Marseilles and at Bayeux, where the “Tapestry” is well exhibited. The collections of Lille, Bordeaux, Toulouse, and Avignon are also important. The objects shown in these museums are chiefly local gleanings, consisting largely of church plate, furniture, together with sculpture, carved wood, and pottery, nearly everything being French in origin. In many towns Roman antiquities and early Christian relics are preserved (e.g. Autun, Nîmes, Arles and Luxeuil). Other collections controlled by municipalities are kept at Rouen, Dourai, Montpellier, Chartres (14th-century sculptures), Grenoble, Toulon, Ajaccio, Épinal (Carolingian objects), Besançon, Bourges, Le Mans (with the remarkable enamel of Geoffrey of Anjou), Nancy, Aix and in many other towns. As a rule, the public is admitted free of charge, special courtesy being shown to foreigners. In many cases the collections are ill cared for and uncatalogued, and little money is provided for acquisitions in the civic museums; indeed, in this respect the great national institutions contrast unfavourably with British ones. The collections and exhibits will be treated in detail below.

The national, civic and papal museums of Italy are so numerous that a few only can be mentioned. The best arranged and best classified collection is the Museo Nazionale at Naples, containing many thousand examples of Roman art, chiefly obtained from the immediate neighbourhood. For historical importance it ranks as primus inter pares with the collections of Rome and the Vatican. It is, however, the only great Italian museum where scientific treatment is consistently adopted. Other museums of purely classical art are found at Syracuse, Cagliari and Palermo. Etruscan art is best displayed at Arezzo, Perugia (in the university), Cortona, Florence (Museo Archeologico), Volterra and the Vatican. The Florentine museums are of great importance, consisting of the archaeological museum of antique bronzes, Egyptian art, and a great number of tapestries. The Museo Nazionale, housed in the Bargello (A.D. 1260), is the central depository of Tuscan art. Numerous examples of Della Robbia ware have been gathered together, and are fixed to the walls in a manner and position which reduce their value to a minimum. The plastic arts of Tuscany are represented by Donatello, Verrocchio, Ghiberti, and Cellini, while the Carrand collection of ivories, pictures, and varied medieval specimens is of much interest. This museum, like so many others, is becoming seriously overcrowded, to the lasting detriment of churches, market-places, and streets, whence these works of art are being ruthlessly removed. The public is admitted free one day a week, and the receipts are devoted to art and antiquarian purposes ("tasse . . . destinat . . . alla conversazione dei monumenti, all’ ampliamento degli scavi, ed’ all’ incremento dei instituti . . . nella città."—Law of 1875, §3). The museums of Rome are numerous, the Vatican alone containing at least six—Museo Clementino, of classical art, with the Laocoon, the Apollo Belvedere, and other masterpieces; the Chiaramonti, also of classical sculpture; the Gallery of Inscriptions; the Egyptian, the Etruscan and the Christian museums. The last is an extensive collection corresponding with another papal museum in the Lateran Palace, also known as the Christian Museum (founded 1843), and remarkable for its sarcophagi and relics from the catacombs. The Lateran has also a second museum known as the Museo Profano. Museums belonging to the state are equally remarkable. The Kircher Museum deals with prehistoric art, and contains the “Preneste Hoard.” The Museo Nazionale (by the Baths of Diocletian), the Museo Capitolino, and the Palazzo dei Conservatori contain innumerable specimens of the finest classical art, vases, bronzes, mosaics, and statuary, Greek as well as Roman. Among provincial museums there are few which do not possess at least one or two objects of signal merit. Thus Brescia, besides a medieval collection, has a famous bronze Victory. Pesaro, Urbino, and the Museo Correr at Venice have admirable examples of majolica. Milan, Pisa and Genoa have general archaeology combined with a good proportion of mediocrity. The civic museum of Bologna is comprehensive and well arranged, having Egyptian, classical, and Etruscan collections, besides many things dating from the “Bella Epoca” of Italian art. At Ravenna alone can the Byzantine art of Italy be properly understood, and it is deplorable that the superb collections in its fine galleries should remain uncatalogued and neglected. Turin, Siena, Padua, and other towns have civic museums.
MUSEUMS OF SCIENCE

The Ryks Museum at Amsterdam, containing the national collections of Holland, is a modern building in which a series of historical rooms are furnished to show at a glance the artistic progress of the Dutch at any given period.

Belgium and Holland.

Nine rooms are also devoted to the chronological display of ecclesiastical art. Besides the famous paintings, this museum (the sole drawback of which is the number of rooms which have no top light) contains a library, many engravings, a comprehensive exhibit of armour, costume, metal-work, and a department of maritime craftsmanship. Arnhem and Haarlem have municipal collections. At Leiden the university maintains a scholarly collection of antiquities. The Hague and Rotterdam have also museums, but everything in Holland is subordinated to the development of the great central depository at Amsterdam, to which examples are sent from all parts of the country. In Belgium the chief museum, that of ancient industrial art, is at Brussels. It contains many pieces of medieval church furniture and decoration, but in this respect differs only in size from the civic museums of Ghent and Luxemburg and the Archbishop's Museum at Utrecht. In Brussels, however, there is a good show of Frankish and Carolingian objects. The city of Antwerp maintains the Musée Plantin, a printing establishment which has survived almost intact, and presents one of the most charming and instructive museums in the world. As a whole, the museums of Belgium are disappointing, though, per contra, the churches are of enhanced interest, not having been pillaged for the benefit of museums.

New museums are being founded in Russia every year. Kharkoff and Odessa (the university) have already large collections, and in the most remote parts of Siberia it is curious to find carefully chosen collections. Krasnoyarsk has 12,000 specimens, a storehouse of Burial art. Ikutsuk the capital, Tobolsk, Tomsk (university), Khabarovsky, and Yakutsk have new museums. In these Russian art naturally predominates. It is only at Moscow and St Petersburg that Western art is found. The Hermitage Palace in the latter city contains a selection of medieval objects of fabulous value, there being no less than forty early ivories. But from a national point of view these collections are insignificant when compared with the gold and silver objects illustrating the primitive arts and ornament of Scythia, Crimea and Caucasus, the high standard attained proving an advanced stage of manual skill. At Moscow (historical museum) the stone and metal relics are scarcely less interesting. There is also a museum of industrial art, the specimens of which are not of unusual value, but being analogous to the Kunstgewerbe movement in Germany, it exercises a wholesome influence upon the designers who study in its schools.

American museums are not committed to traditional systems, and scientific treatment is allowed its fullest scope. They exist in great numbers, and though in some cases their exhibits are chiefly ethnographic, a far wider range of art objects is rapidly being secured. The National Museum at Washington, a branch of the Smithsonian Institution (q.s.), while notable for its American historical and ethnological exhibits, has the National Gallery of Art. The Metropolitan Museum of Art (held by trustees for the benefit of the city of New York) has in the Censnola collection the most complete series of Cypriot art objects. It has also departments of coins, Greek sculpture and general examples of European and American art. The Museum of Fine Arts at Boston is very comprehensive, and has a remarkable collection of ceramics, together with good reproductions of antique art. There are museums at St Louis, Chicago, Pittsburgh, Brooklyn, Cincinnati, and Washington, as well as Montreal in Canada; and the universities of Harvard, Chicago, Pennsylvania and Yale have important collections.

The Swiss National Museum is situated at Zürich, and though of medium size (50 rooms), it is a model of arrangement and organization. Besides the special series of rooms illustrating the historical progress of art, its collection of stained glass is important. Basel also (historical museum) is but little inferior in contents or system to the Zürich establishment. Geneva has three collections. Lausanne holds the museum of the canton, and Bern has a municipal collection. All these institutions are well supported financially, and are much appreciated by the Swiss public. The art museums of Stockholm, Christiania and Copenhagen rank high for their intrinsic excellence, but still more for their scientific and didactic value. Stockholm has three museums: that of the Royal Palace, a collection of costume and armour; the Northern Museum, a large collection of domestic art; the National Museum, containing the prehistoric collections, gold ornaments, &c., classified in a brilliant manner. The National Museum of Denmark at Copenhagen is in this respect even more famous, being probably the second national collection in the world. The arrangement of this collection leaves little to be desired, and it is to be regretted that some British collections, in themselves of immense value, cannot be shown, as at Copenhagen, in a manner which would display their great merits to the fullest degree. There is also at Copenhagen a remarkable collection of antique busts (Gamle Glyptotek), and the Thorvaldsen Museum connected with the sculptor of that name. Norse antiquities are at Christiania (the university) and Bergen. Athens has three museums, all devoted to Greek art: that of the Acropolis, that of the Archaeological Society (vases and terracotta) and the National Museum of Antiquities. The state owns all discoveries and these are accumulated at the capital, so that local museums scarcely exist. The collections, which rapidly increase, are of extraordinary value. In the past forty years many, if not all, those objects which used to be spread over the aggregate in other European countries. The Museum of Egyptian Antiquities (Cairo), founded by Mariette Bey at Bulak, afterwards moved to the Giza palace and developed by Maspero, is housed in a large building erected in 1902, well classified, and liberally supported with money and fresh acquisitions. Minor museums exist at Carthage and Tunis. At Constantinople the Turkish Museum contains some good classical sculpture and a great deal of rubbish. The Musée du Prado and the Archaeological Museum at Madrid are the chief Spanish collections, containing numerous classical objects and many specimens of Moorish and early Spanish art. In Spain museums are badly kept, and their contents are of indifferent value. The museums of the chief provinces are situated at Barcelona, Valencia, Granada and Seville. Cadiz and Cordova have also sadly neglected civic collections. The National Museum of Portugal at Lisbon requires no special comment. The progress of Japan is noticeable in its museums as in its industrial enterprise. The National Museum(Weno Park, Tōkyō) is large and well arranged in a new building of Western architecture. Kōtō and Nara have excellent museums, exclusively of Oriental art, and two or three other towns have smaller establishments, including commercial museums. There are several museums in India, the chief one being at Calcutta, devoted to Indian antiquities.

The best history of museums can be found in the prefaces and introductions to their official catalogues, but the following works will be useful for reference: Annual Reports presented to Parliament (official) of British Museum and Board of Education; Civil Service Estimates, Class IV., annually presented to Parliament; Second Report of Select Committee of House of Commons on Museums of Science and Art Department (official); The English Museum and Exhibition of the Arts in England (London, 1840); Professor Stanley Jeovis, "Use and Abuse of Museums," printed in Methods of Social Reform (London, 1882); Report of Committee on Provincial Museums. British Association for the Advancement of Science, 1882 (London, 1883); Muses, Museums and Art Galleries (London, 1888); Professor Brown Goode, Museums of the Future, Report on the National Museum for 1889 (Washington, 1891); Principles of Museum Administration; Report of the committee appointed by the British Association for the Advancement of Science to inquire into the question of the encouragement of the arts in Belgium (Hague, 1892); Sir William Flower, Essays on Museums (London, 1845); Le Gallerie d'Art (Paris, 1863); Jules Sala (Nancy, 1889); P. B. Murray, Art Museums: Their History and Use, with Bibliography and List of Museums in the United Kingdom (3 vols., 1904).

MUSEUMS OF SCIENCE. The ideal museum should cover the whole field of human knowledge. It should teach the truths of all the sciences, including anthropology, the science which deals with man and all his works in every age. All the
sciences and all the arts are correlated. The wide separation of collections illustrative of the arts (see MUSEUMS OF ART above) from those illustrative of the sciences, and their treatment as if belonging to a wholly different sphere, is arbitrary. Such separation, which is to-day the rule rather than the exception, is due to the circumstances of the origin of many collections, or in other cases to the limitations imposed by poverty or lack of space. Many of the national museums of continental Europe had their beginnings in collections privately acquired by monarchs, who, at a time when the modern sciences were in their infancy, entertained themselves by assembling objects which appealed to their love of the beautiful and the curious. The pictures, marbles, bronzes and bric-a-brac of the palace became the nucleus of the museum of to-day, and in some notable cases the palace itself was converted into a museum. In a few instances these museums, in which works of art had the first place, have been enriched and supplemented by collections illustrative of the advancing sciences of a later date, but in a majority of cases these collections have remained what they were at the outset, mere exponents of human handicraft in one or the other, or all of its various departments. Some recent great foundations have copied the more or less defective models of the past, and museums devoted exclusively to the illustration of one or the other narrow segment of knowledge will no doubt continue to be multiplied, and in spite of their limited range, will do much good. A notable illustration of the influence of lack of space in bringing about a separation of anthropological collections from collections illustrative of other sciences is afforded by the national collection in London. For many years the collections of the British Museum, literary, artistic and scientific, were accommodated in ideal relations to one another, but at last the accumulation of treasure became so vast and the difficulties of administration were so pressing that a separation was decided upon, and the natural history collections were finally removed to the separate museum in Cromwell Road, South Kensington. But the student of museums can never fail to regret that the necessities of space and financial considerations compelled this separation, which in a measure destroyed the ideal relationship which had for so many years obtained.

The ancient world knew nothing of museums in the modern sense of the term. There were collections of paintings and statuary in the temples and palaces of Greece and Rome; the houses of private wealth were everywhere adorned by works of art; curious objects of natural history were often brought from afar, as the skins of the female gorillas, which Hanno after his voyage on the west coast of Africa hung up in the temple of Astarte at Carthage; Alexander the Great granted to his illustrious teacher, Aristotle, a large sum of money for use in his scientific researches, sent him natural history collections from conquered lands, and put at his service thousands of men to collect specimens, upon which he based his work on natural history; the museum of Alexandria, which included within its keeping the Alexandrian library, was a great university composed of a number of associated colleges; but there was nowhere in all the ancient world an institution which exactly corresponded in its scope and purpose to the modern museum. The term "museum," after the burning of the great institution of Alexandria, appears to have fallen into disuse from the 4th to the 17th century, and the idea which the word represented slipped from the minds of men.

The revival of learning in the 15th century was accompanied by an awakening of interest in classical antiquity, and many persons laboured eagerly upon the collection of memorials of the past. Statuaries, inscriptions, gems, coins, medals and manuscripts were assembled by the wealthy and the learned. The leaders in this movement were presently followed by others who devoted themselves to the search for minerals, plants and curious animals. Among the circumstances which early collectors of objects of natural history may be mentioned Georg Agricola (1494-1555), who has been styled "the father of mineralogy." By his labours the elector Augustus of Saxony was induced to establish the Kunst und Naturalien Kammer, which has since expanded into the various museums at Dresden. One of his contemporaries was Conrad Gesner of Zürich (1516-1565), "the German Pliny," whose writings are still resorted to by the curious. Others whose names are familiar were Pierre Bélon (1517-1564), professor at the Collège de France; Andrea Cesalpini (1519-1603), whose herbarium is still preserved at Florence; Ulissi Aldrovandi (1522-1605), remnants of whose collections still exist at Bologna; Ole Worm (1588-1654), a Danish physician, after whom the so-called "Wormian bones" of the skull are named, and who was one of the first to cultivate that now is known as the science of prehistoric archaeology. At a later date the collection of Albert Seba (1665-1736) of Amsterdam became famous, and was purchased by Peter the Great in 1716, and removed to St. Petersburg. In Great Britain among early collectors were the two Tradescants; Sir John Woodward (1665-1728), a portion of whose collections, bequeathed by him to Cambridge University is still preserved there in the Woodwardian or Geological Museum; Sir James Balfour (1600-1657), and Sir Andrew Balfour (1630-1694), whose work was continued in Art by Sir Robert Sibthorp (1641-1722). The first person to elaborate and present to modern minds the thought of an institution which should assemble within its walls the things which men wish to see and study was Bacon, who in his New Atlantis (1627) broadly sketched the outline of a great national museum of science and art.

The first surviving scientific museum established upon a substantial basis was the Ashmolean Museum at Oxford, founded by Elias Ashmole. The original collection had been made by the Tradescants, father and son, gardeners who were in the employment of the duke of Buckingham and later of King Charles I. and his queen; it consisted of "twelve cartloads of curiosities," principally from Virginia and Algiers, which the young Tradescant begged from his uncle, and which, after much litigation with Tradescant's widow, he gave to Oxford upon condition that a suitable building should be provided. This was done in 1682 after plans by Sir Christopher Wren. Ashmole in his diary makes record, on the 17th of February 1683, that "the last load of my rarities was sent to the barge, and this afternoon I relapsed into the gown."

The establishment of the German academy of Nature Curiosi in 1652, of the Royal Society of London in 1660, and of the Académie des Sciences of Paris in 1666, imparted a powerful impulse to scientific investigation, which was reflected not only in the labours of a multitude of persons who undertook the formation of private scientific collections, but in the initiation by crowned heads of movements looking toward the formation of national collections, many of which, having their beginnings in the latter half of the 17th century and the early years of the 18th century, survive to the present day.

The most famous of all English collectors in his time was Sir Hans Sloane (1660-1753), whose vast collection, acquired at a great outlay of money, and including the collections of Petiver, Courten, Merret, Plukenet, and Buddle—all of which he had purchased—was by his will bequeathed to the British nation on condition that parliament should pay to his heirs the sum of £20,000 a sum far less than that which he had expended upon it, and representing, it is said, only the value of the coins which it contained. Sloane was a man who might justly have said of himself "humani nihil a me alienum puto"; and his collection attested the catholicity of his tastes and the breadth of his scientific appetites. The bequest of Sloane was accepted upon the terms of his will, and, together with the library of George II., which had likewise been bequeathed to the nation, was thrown open to the public at Bloomsbury in 1759 as the British Museum. As showing the great advances which have occurred in the administration of museums since that day, the following extract taken from A Guide-Book to the General Contents of the British Museum, published in 1761, is interesting: "...fifteen persons are allowed to view it in one Company, the Time allotted is two Hours, and when any Number not exceeding fifteen are inclined to see it, they must send a List of their Christian and Surname, Additions, and Places of Abode, to the Porter's Lodge, in order to their being entered in the Book; in a few Days the respective Tickets will be made out, specifying..."
the Day and Hour in which they are to come, which, on being sent for, are delivered. If by any Accident some of the Parties are prevented from coming, it is proper they send their Ticket back to the Lodge, as nobody can be admitted with it but themselves. It is to be remarked that the fewer Names there are in a List, the sooner they are likely to be admitted to see it."

The establishment of the British Museum was coincident in time with the development of the systematic study of nature, of which Linnaeus was at that time the most distinguished exponent. The modern sciences, the wonderful triumphs of which have revolutionized the world, were just emerging from their infancy. Museums were speedily found to furnish the best agency for preserving the records of advancing knowledge, so far as these consisted of the materials upon which the investigator had laboured. In a short time it became customary for the student, either during his lifetime or at his death, to entrust to the permanent custody of museums the collections upon which he had based his studies and observations. Museums were thenceforth rapidly multiplied, and came to be universally regarded as proper repositories for scientific collections of all kinds. But the use of museums as repositories of the collections of the learned came presently to be associated with their use as seats of original investigation and research. Collections of new and rare objects which had not yet received attentive study came into their possession. Voyages of exploration into unknown lands, undertaken at public or private expense, added continually to their treasures. The comparison of never collections with older collections which had been already made the subject of study, was undertaken. New truths were thus ascertained. A body of students was attracted to the museums, who in a few years by their investigations began not only to add to the sum of human knowledge, but by their publications to shed lustre upon the institutions with which they were connected. The spirit of inquiry was wisely fostered by private and public munificence, and museums as centres for the diffusion of scientific truth came to hold a well-recognized position. Later still, about the middle of the 19th century, when the importance of popular education and the necessity of popularizing knowledge came to be more thoroughly recognized than it had heretofore been, museums were found to be peculiarly adapted in certain respects for the promotion of the culture of the masses. They became under the new impulse not merely repositories of scientific records and seats of original research, but powerful educational agencies, in which by object lessons the most important truths of science were capable of being pleasantly imparted to multitudes. The old narrow restrictions were thrown down. Their doors were freely opened to the people, and at the beginning of the 20th century the movement for the establishment of museums assumed a magnitude scarcely, if at all, less than the movement on behalf of the diffusion of popular knowledge through public libraries. While great national museums have been founded and all the large municipalities of the world through private or civic gifts have established museums within their limits, a multitude of lesser towns, and even in some cases villages, have established museums, and museums as adjuncts of universities, colleges and high schools have come to be recognized as almost indispensable. The movement, however, has been greatest in Great Britain and her colonies, Germany, and the United States of America, although in many other lands it has already advanced far.

There are now in existence the world, exclusive of museums of art, not less than 2000 scientific museums which possess in themselves elements of permanence, some of which are splendidly supported by public munificence, and a number of which have been richly endowed by private benefactions.

Great Britain and Ireland.—The greatest museum in London is the British Museum. The natural history department at South Kensington, with its wealth of types deposited there, constitutes the most important collection of the kind in the world. The Museum of Practical Geology in Jermyn Street contains a beautiful and well-arranged collection of minerals and a very complete series of specimens illustrative of the petrography and the invertebrate paleontology of the British Islands. The botanical collections at Kew are classic, and are as rich in types as are the zoological collections of the British Museum. The Hunterian Museum of the Royal College of Surgeons contains a notable assemblage of specimens illustrating anatomy, both human and comparative, as well as pathology. In London also a number of private owners possess large collections of natural history specimens, principally ornithological, entomological and conchological, in some instances destined to find a final resting place in the national collection. One of the most important of these great collections is that formed by F. Ducane Godman, whose work on the fauna of middle America, entitled Biologia centrali-americana, is an enduring monument to his learning and generosity. The Hon. Walter Rothschild has accumulated at Tring one of the largest and most important natural history collections which has ever been assembled by a single individual. It is particularly rich in rare species which are either already extinct or verging upon extinction, and the ornithological and entomological collections are vast in extent and of the finest types, the type collection of the late Sir Lionel Walter Tennyson, K.C.B., R.E., in the Natural History Museum, South Kensington, at the time of his death, became the property of the British Museum. The Victoria and Albert Museum, in the South Kensington district of the metropolis, contains the most comprehensive collection of the decorative arts in England, with especial reference to England and the British colonies. The national museums at Cambridge, Merton Hall, near Thetford, the largest and most perfect collection of the microlepidoptera of the world which is in existence.

The Ashmolean Museum and the University Museum at Oxford, and the Woodwardian Museum and the University Museum at Cambridge, are remarkable collections. The Free Public Museum at Liverpool is in some respects one of the finest and most successfully arranged museums in Great Britain. It contains a wealth of valuable scientific material, and is rich in types, particularly of birds. The Manchester Museum of Owens College and the museum in Sheffield have in recent years accomplished much for the cause of science and popular education. The Bristol Museum has very rapidly achieved considerable growth and has become a centre of much enlightened activity. The Royal Scottish Museum, the herbarium of the Royal Botanic Garden, and the collections of the Challenger Expedition Office in Edinburgh, are worthy of particular mention. The museum of the university of Glasgow and the Glasgow Museum contain valuable collections. The museum of St Andrews University is very rich in material illustrating marine zoology, and so also are the collections of University College at Dundee. The Science and Art Museum of Dublin and the Public Museum of Belfast, in addition to the works of art which they contain, possess scientific collections of importance.

India.—The Indian Museum, the Geological Survey of India, and the herbarium of the Royal Botanic Garden in Calcutta, are richly endowed with collections illustrating the natural history of Hindostan and adjacent countries. The finest collection of the vertebrate fossils of the Sivalik Hills is that found in the Indian Museum. Lord W. The Victoria at Albert Museum, Merton Hall, near Thetford, the largest and most perfect collection of the microlepidoptera of the world which is in existence.

Museums of Science
Canada.—In connection with the Université Laval in Quebec, the McGill University in Montreal, and the university of Toronto in Ontario, beginnings of significance have been made. The Peter Redpath Museum of McGill College contains important collections in a number of subjects, and the university of Victoria, British Columbia, is growing in importance. A movement has been begun to establish at Ottawa a museum which shall in a sense be for the Dominion a national establishment.

France.—Paris abounds in institutions for the promotion of culture. In possession of many of the institutions of learning, such as the École Nationale Supérieure des Mines, the Institut National Agronomique, and the various learned societies, are collections of great value which must be consulted at times by specialists in the various sciences. The Muséum d'Histoire Naturelle in the Jardin des Plantes is the most comprehensive and important collection of its kind in French metropolis, and while not as rich in type of specimens as the British Museum, nevertheless contains a vast assemblage of classic specimens reflecting the labours of former generations of French naturalists. Unfortunately, much of the best material, containing the types of species, has been removed from the display of specimens with the purpose to preserve the records of science, a fact which French naturalists themselves universally admit. As in England, so also in France, there are a number of local historical societies which are more or less important. One of the very largest and finest of all the entomological collections of the world is that at Rennes, belonging to the brothers Oberthür, upon which they have expended princely sums. The Musée des Sciences Naturelles of Lyons is in some respects an important institution.

Belgium.—Brussels has been called "a city of museums." The Musée du Congo and the Musée Royal d'Histoire Naturelle du Belgique are rich in ethnological material. The former is rich in ethnographic and zoological material brought from the Congo Free State, and the latter contains very important paleontological collections.

Holland.—The national museums of the Koninklijk Zoologisch Genootschap, affiliated with the university at Amsterdam, is well known. The Royal museums connected with the University of Leiden are also scientific institutions.

Denmark.—The National Museum at Copenhagen is particularly rich in Scandinavian and Danish antiquities.

Sweden.—In Stockholm, the capital, the Nordiska Museet is deservedly one of the finest museums of natural history in the world. The museum is rich in paleontological, botanical and archaeological collections. Great scientific treasures are also contained in the museums connected with the university of Upsala.

Natural science and botany are the especial interests of the student of marine zoology are contained in the university of Christiania.

Germany.—Germany is rich in museums, some of which are of very great importance. The Museum für Naturkunde, the ethnographic museum in Berlin, the great zoological museum and the agricultural museum in Berlin are noble institutions, the first mentioned being particularly rich in classical collections. Hamburg boasts an excellent museum of mineralogy and zoology, and the universities at Munich, the Museum Godfried and the Museum Umlauf. There are a number of important private collections in Hamburg. The municipal museum in Bremen is important from the standpoint of the naturalist and ethnologist. The Roemer Museum at Hildesheim is one of the best provincial museums in Germany. Dresden even more justly than Brussels may be called "a city of museums," and the mineralogical, archaeological, zoological and anthropological museums are exceedingly important from the point of view of the naturalist. Here also in private hands is the greatest collection of palaearctic lepidoptera in Europe, belonging to the heirs of Dr Otto Saundinger. The ethnographical museum at Leipzig is rich in collections of arctic and south American material.

The natural history museum of Stuttgart is likewise noted for its important paleontological collections. The Senckenbergische Naturforschende Gesellschaft museum at Frankfurt-on-the-Main contains important geological and botanical collections. The museum of the university at Bonn, and more particularly the anatomical museum, are noteworthy. In connexion with almost all the German universities and in almost all the larger industrial towns, there are museums of which there are important assemblages illustrating not only the natural history of the immediate neighbourhood, but in a multitude of cases containing important material collected in foreign lands. One of the most interesting is that at Lübeck, a model in its way for a provincial museum.

Austria-Hungary.—The Imperial Natural History Museum in Vienna is one of the noblest institutions of its kind in Europe, and possesses one of the finest collections of ethnographical and anthropological collections. The natural history collections of the Bohemian national museum at Prague are well arranged, though not remarkably extensive.

Russia.—The Riumantsch Museum in Moscow possesses splendid botanical collections of over 50,000 species, in addition to splendid artistic treasures, and is rich in natural history specimens. It is one of the most magnificent foundations of its kind in Europe. There are a number of magnificent museums in St Petersburg which alone contain a wealth of excellent specimens. There are a number of provincial museums in the larger cities of Russia which are growing in importance.

Italy.—Italy is rich in museums of art, but natural history collections are not as strongly represented as in other lands. Connected with the various universities are collections which possess more or less importance from the standpoint of the specialist. The Museo Civico di Storia Naturale at Genoa, and the collections preserved at the marine biological station at Naples, have most interest for the zoologist.

Spain.—There are no natural history collections of first importance in Spain, though at all the universities there are minor collections, which are in some instances creditably cared for and arranged.

Portugal.—The national history museum at Lisbon contains important ornithological treasures.

Eastern Asia.—The awakening of the empire of Japan has resulted accumulating collections of important scientific and botanical specimens. There are a number of scientific students, mostly trained in European and American universities, who are doing excellent work in the biological and allied sciences. Very creditable beginnings have been made at the National University of Tokyo, and the establishment of a museum of natural history. At Shanghai there is a collection, gathered by the Chinese branch of the Royal Asiatic Society, which is in a decadent state, but contains much good material. Otherwise as yet the movement to establish museums has not laid strong hold upon the inhabitants of eastern Asia. At Batavia in Java, and at Manila in the Philipine Islands, there are found the nuclei of important collections.

United States.—The movement to establish museums in the United States is comparatively recent. One of the very earliest collections (1802), which, however, was soon dispersed, was made by Charles Willson Peale (q.v.). The Academy of Natural Sciences in Philadelphia, established in 1812, is the oldest society for the promotion of the natural sciences in the United States. It possesses a very important library and some most excellent collections, and is rich in ornithological, entomological and botanical types. The city of Philadelphia also points with pride to its museum of natural history, an institution founded by the University of Pennsylvania, and to the Philadelphia museums, the latter museums of commerce, but which incidentally do much to promote scientific knowledge, especially in the domain of ethnology, botany and mineralogy. The Wistar Institute of Anatomy is well endowed and organized. The zoological museum at Harvard University, Cambridge, Massachusetts, is associated with the names of Louis and Alexander Agassiz, the former of whom by his learning and activity as a collector, and the latter by his munificent gifts, as well as by his important researches, not only created the institution, but made it a potent agency for the advancement of science. The Peabody Museum of Archaeology and Ethnology, likewise connected with Harvard University, is one of the greatest institutions of its kind in the New World. The Essex Institute at Salem, Massachusetts, is noteworthy. The Butterfield Museum, Dartmouth College, Hanover, New Hampshire, and the Fairbanks Museum of Natural Science (1891) at St Johnsbury, Vermont, are important modern institutions. In the museum of Amherst College are preserved the types of the birds described by J. J. Audubon, the shells described by C. B. Adams, the mineralogical collections of Charles Upham Shepard, and the palaeontological collections of President Hitchcock. In Springfield (1858) and Worcester, Massachusetts, there are excellent museums. The Peabody Museum of Natural History at Yale University, New Haven, Connecticut, contains much of the palaeontological material described by Professor O. C. Marsh. The New York State Museum at Albany is important from a geological and palaeontological standpoint. The American Museum of Natural History in New York City, founded in 1869, provision for the growth and enlargement of which upon a scale of the
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utmost magnificence has been made, is liberally supported both by public and private munificence. The ethnographical, paleontological and archaeological material gathered within its walls is immense in extent and superbly displayed. The museum of the New York botanical garden in Bronx Park is a worthy rival to the museums at Kew. The Brooklyn Institute of Arts and Sciences combines with collections illustrative of the arts excellent collections of natural history, many of which are classic.

The United States National Museum at Washington, under the control of the Smithsonian Institution, of which it is a department, has been made the repository for many years past of the scientific and artistic collections coming into the possession of the government. The growth of the material entrusted to its keeping has, more particularly in recent years, been enormous, and the collections have wholly outgrown the space provided in the original building, built for it during the incumbency of Professor Spencer F. Baird as secretary of the Smithsonian Institution. The congress of the United States has in recent years made provision for the erection of a new building upon the Mall in Washington, to which the natural history collections are ultimately to be transferred, the buildings of the National Museum being retained for the display of a collection illustrative of the progress of the arts, until replaced by a building of better construction for the same purpose. The United States National Museum has published a great deal, and has become one of the most important agencies for the diffusion of scientific knowledge in the country. It is liberally supported by the government, and makes use of the scientific men connected with all the various departments of activity under government control as agents for research. The collections of the United States Geological Survey, as well as many of the more important scientific collections made by the Department of Agriculture, are deposited here.

As the result of the great Columbian International exposition, which took place in Chicago in 1893, a movement originated in the city of Chicago, where the exposition was held, to form a permanent collection of large proportions. The great building in which the international exposition of the fine arts was displayed was preserved as the temporary home for the new museum. Marshall Field contributed $1,000,000 to the furtherance of the enterprise, and in his honour the institution was called “The Field Columbian Museum.” The growth of this institution was very rapid, and Mr. Field, at his death, in 1906, bequeathed to the museum $8,000,000, half to be applied to the erection of a new building, the other half to constitute an endowment fund, in addition to the revenues derived from the endowment already existing. The city of Chicago provides liberally for the support of the museum, the name of which, in the spring of 1906, was changed to “The Field Museum of Natural History.” The city of St. Louis has taken steps, as the result of the international exposition of 1904, to emulate the example of Chicago, and the St. Louis Public Museum was founded under hopeful auspices in 1905.

Probably the most magnificent foundation for the advancement of science and art in America which has as yet been created is the Carnegie Institute in the city of Pittsburgh. The Carnegie Institute is a complex of institutions, consisting of a museum of art, a museum of science, and a school for the education of youth in the elements of technology. Affiliated with the museums of art and science, and under the same roof, is the Central Free Library of Pittsburgh. The buildings erected for the accommodation of the institute, at the entrance to Schenley Park, cost $8,000,000, and Mr Andrew Carnegie provided liberally for the endowment of the museums of art and science and the technical school, leaving to the city of Pittsburgh the maintenance of the general library. The natural history collections contained in the museum of science, although the institution was only founded in 1896, are large and important, and are particularly rich in mineralogy, geology, paleontology, botany and zoology. The entomological collections are among the most important in the new world. The conchological collections are vast, and the paleontological collections are among the most important in America. The great Bryant collection is the largest and most complete collection representing European paleontology in America. The Carnegie Museum contains natural history collections aggregating over 1,500,000 specimens, which cost approximately £125,000, and these are growing rapidly. The ethnological collections, particularly those illustrating the Indians of the plains, and the archaeological collections, representing the cultures more particularly of Costa Rica and of Colombia, are large.

In connexion with almost all the American colleges and universities there are museums of more or less importance. The Bernice Pauahi Bishop museum at Honolulu is an institution established by private munificence, which is doing excellent work in the field of Polynesian ethnology and zoology.

Other American Countries.—The national museum in the city of Mexico has in recent years been receiving intelligent encouragement and support both from the government and by private individuals, and is coming to be an institution of much importance. National museums have been established at the capitals of most of the Central American and South American states. Some of them represent considerable progress, but most of them are in a somewhat languishing condition. Notable exceptions are the national museum in Rio de Janeiro, the Museu Paraense (Museu Goeldi), at Pará, the Museu Paulista at Sao Paulo, and the national museum in Buenos Aires, which is particularly rich in prehistoric collections. There is an excellent museum at Valparaiso in Chile, which in recent years has been doing good work.

(W. J. H.)

MUSGRAVE, SAMUEL (1732—1780), English classical scholar and physician, was born at Washfield, in Devonshire, on the 29th of September 1732. Educated at Oxford and elected to a Radcliffe travelling fellowship, he spent several years abroad. In 1766 he settled at Exeter, but not meeting with professional success removed to Plymouth. He ruined his fortune, however, by the publication of a pamphlet in the form of an address to the people of Devonshire, in which he accused certain members of the English ministry of having been bribed by the French government to conclude the peace of 1763, and declared that the Chevalier d’Eon de Beaumont, French minister plenipotentiary to England, had in his possession documents which would prove the truth of his assertion. De Beaumont repudiated all knowledge of any such transaction and of Musgrave himself, and the House of Commons in 1770 decided that the charge was unsubstantiated. Thus discredited, Musgrave gained a precarious living in London by his pen until his death, in reduced circumstances, on the 5th of July 1780. Musgrave wrote several medical works, now forgotten; and his edition of Euripides (1778) was a considerable advance on those of Joshua Barnes.

See W. Munk, Roll of the Royal College of Physicians, ii. (1878).

MUSH, the chief town of a sanjak of the same name of the Bitlis vilayet of Asiatic Turkey, and an important military station. It is situated at the mouth of a gorge in the mountains on the south side of the plain, the surrounding hills being covered with vineyards and some oak scrub. There are few good houses; the streets are ill-paved and winding, while the place and its surroundings are extremely dirty. The castle, of which there are some remains, is said to have been built by Mushig, an Armenian king of the province Daron, who founded the town. A khán, with two stone lions (Arab or Seljuk) in bas-relief, deserves notice, but the bazaar is poor, although pretty embroidered caps, however, are produced. Good roads lead to Erzurum and Bitlis. There are 1,400 inhabitants, consisting of Kurds and Armenians, about equally divided. The climate is healthy but cold in winter, with a heavy snow fall. Mush is the seat of the Gregorian and Roman Catholic Armenian bishops and some American mission schools. Some miles to the west at the edge of the plain is the celebrated monastery of Surp Garabed or St John the Baptist, an important place of Armenian pilgrimage.

Mush plain, 35 m. long by 12 broad, is very fertile, growing wheat and tobacco, and is dotted with many thriving Armenian villages. The Murad or eastern Euphrates traverses the western end of the plain and disappears into a narrow mountain gorge there. Vineyards are numerous and a fair wine is produced.
MUSHROOM

Wood is scarce and the usual fuel is *tesek* or dried cow-dung. There are several sulphur springs, and earthquakes are frequent and sometimes severe. It was on the plain of Mush that Xenophon first made acquaintance with Armenian houses, which have little changed since his day.

MUSHROOM. There are few more useful, more easily recognized, or more delicious members of the vegetable kingdom than the common mushroom, known botanically as *Agaricus campestris* (or *Psalliota campestris*). It grows in short grass in the temperate regions of all parts of the world. Many edible fungi belong to a floccose and minute and often obscure botanical characters for their determination, and may readily be confused with worthless or poisonous species; but that is not the case with the common mushroom, for, although several other species of *Agaricus* somewhat closely approach it in form and colour, yet the true mushroom, if sound and freshly gathered, may be distinguished from all other fungi with great ease. It almost invariably grows in rich, open, breezy pastures, in places where the grass is kept short by the grazing of horses, herds and flocks. Although this plant is popularly termed the "meadow mushroom," it never as a rule grows in meadows. It never grows in well watered places, never in woods, or on or about stumps of trees. An exceptional specimen or an uncommon variety may sometimes be seen in the above-mentioned abnormal places, but the best, the true, and common variety of the table is the produce of short, upright, wind-swept pastures. A true mushroom is never large in size; its cap very seldom exceeds 4 in. at most in diameter. The large examples measuring from 6 to 9 or more in. across the cap belong to *Agaricus arvensis*, called from its large size and coarse texture the horse mushroom, which grows in meadows and damp shady places, and though generally wholesome is coarse and sometimes indigestible. The mushroom usually grows in gardens or hot-heds, in cellars, sheds, &c., is a distinct variety, and is generally described as *A. gallarius*. On being cut or broken the flesh of a true mushroom remains white or nearly so, the flesh of the coarser horse mushroom changes to buff or sometimes to dark brown. To summarize the characters of a true mushroom—it grows only in pastures; it is of small size, dry, and with unchangeable flesh; the cap has a frill; the gills are free from the stem, the spores brown-black or deep purple-black, and the stem solid or slightly pithy. When all these characters are taken together no other mushroom-like fungus—and nearly a thousand species grow in Britain—can be confounded with it.

A mushroom consists chiefly of stem and cap; the stem has a clothy ring round its middle, and the cap is furnished underneath with numerous radiating coloured gills. Fig. 1 (1) represents a section through an infant mushroom, (2) a mature example, and (3) a longitudinal section through a fully developed mushroom. The cap P, Q, R is fleshy, firm and white within, never thin and watery; externally it is pale brown, dry, often slightly silky or floccose, never viscid. The cuticle of a mushroom readily peels away from the flesh beneath, as shown at Q. The cap has a narrow dependent margin or frill, as shown at Q, and in section at H; this dependent frill originates in the rupture of a delicate continuous wrapper, which in the infancy of the mushroom entirely wraps the young plant; it is shown in its continuous state at J, and at the moment of rupture at K. The gills underneath the cap L, M, N are at first white, then rose-coloured, at length brown-black. A point of great interest is to be noted in the attachment of the gills near the stem at Q, P; the gills in the true mushroom are (as shown) usually more or less free from the stem, they never grow boldly against it or run down it; they may sometimes just touch the spot where the stem joins the bottom of the cap, but never more; there is usually a slight channel, as at P, all round the top of the stem. When a mushroom is perfectly ripe and the gills are brown-black in colour, they throw down a thick dusty deposit of fine brown-black or purple-black spores, which, if the mushroom be old, may make a white felted mat, more or less dense, of mycelium; this, when compacted with dry, half-decomposed dung, is the mushroom spawn of gardeners. The stem is firm, slightly pithy up the middle, but soft and hollow beneath; it bears a well-developed ring at Q; Q; this ring originates by the rupture of the thin general wrapper K of the infant plant.

Like all widely spread and much-cultivated plants, the edible mushroom has numerous varieties, and it differs in different places and under different modes of culture in much the same way as our kitchen-garden plants differ from the type they have been derived from, and from each other. In some instances these differences are so marked that they have led some botanists to regard as distinct species many forms usually esteemed by others as varieties only.

A small variety of the common mushroom found in pastures has been named *A. pratensis*; it differs from the type in having a pale reddish-brown cap, and the flesh on being cut or broken changes to pale rose-colour. A variety still more marked, with a darker brown cap and the flesh changing to a deeper rose, and sometimes blood-red, has been described as *A. rufescens*. The well-known compact variety of mushroom-growers, with its white cap and dull purplish clay-coloured gills, is *A. hortensis*. Two sub-varieties of this have been described under the names of *A. hortensis var. campestris* and *A. hortensis var. musseroun*; this can only be distinguished from the pasture mushroom by its elongated bulbous stem and its externally smooth cap. There is also a fungus well known to botanists and cultivators which appears to be intermediate between the pasture variety and the wood variety, named *A. vaporarius*. The large rank horse mushroom, now generally referred to as *A. arvensis*, is probably a variety of the pasture mushroom; it grows in rings in woody places and under trees and hedges in meadows; it has a large scaly round cap, and the flesh quickly changes to buff or brown when cut or broken; the stem too is hollow. An unusually scaly form of this has been described as *A. vitellinus* and another as *A. augustus*.

A species, described by Berkeley and Broome as distinct from both the pasture mushroom and horse mushroom, has been published under the name of *A. elenata*. This grows under oaks, in remote and most unusual situations for the mushroom, and is said to be excellent for the table. An allied fungus peculiar to woods, with a less fleshly cap than the true mushroom, with hollow stem, and strong odour, has been described as a close ally of the pasture mushroom under the name of *A. silicatoc*. Its qualities for the table have not been recorded.

Many instances are on record of symptoms of poisoning, and even death, having followed the consumption of plants which have passed as true mushrooms; these cases have probably arisen from the samples consumed being in a state of decay, or from some mistake as to the species eaten. It should always be specially noted whether the fungus to be consumed is in a fresh and wholesome condition, otherwise they act as a poison in precisely the same way as does any other semi-puritid vegetable. Many instances are on record where mushroom-beds have been invaded by a growth of strange fungi and the true mushrooms have been ousted to the advantage of the new-comers. When mushrooms are gathered for sale by persons unacquainted with the different species mistakes are of frequent occurrence. A very common spurious mushroom in markets is *A. telutinus*, a slender, ringless, hollow-stemmed, black-gilled fungus, common in gardens and about dung and stumps; it is about the size of a mushroom, but thinner in all its parts and far more brittle; it has a black hairy fringe hanging round the edge of the cap when fresh. Another spurious mushroom, and equally common in dealers' baskets, is *A. laevymarginatus*; this grows in the same positions as the last, and is somewhat fleshier and more like a true mushroom; it has a hollow stem, and a slight ring; the gills are black-brown mottled and generally studded with tear-like drops of moisture. In both these species the gills distinctly touch and grow on to the stem. Besides these there are numerous other black-gilled species which find a place in baskets—some species far too small to bear...
any resemblance to a mushroom, others large and deciduous, generally belonging to the stump- and dung-borne genus Coprinus. Because mushroom-beds are always liable to an invasion from other dung-borne forms. The spores of all fungi are constantly floating about in the air, and when the spores of dung-infesting species arrive at a mushroom-bed they find a nidus already prepared that exactly suits them; and if the spawn of the new-comer becomes more profuse than that of the mushroom the stranger takes up his position at the expense of the mushroom. There is also a fungus named Xylaria vororaria, which sometimes fixes itself on mushroom-beds and produces such an enormous quantity of string-like spawn that the entire destruction of the bed results. This spawn is sometimes turned out of the bed in enormous masses and carried away in barrows.

Sometimes cases of poisoning follow the consumption of what have really appeared to gardeners to be true bed-mushrooms, and to country folks as small horse-mushrooms. Even in such a case as the above mentioned, which is more complicated by the fact that these highly poisonous forms now and then appear upon mushroom-beds to the exclusion of the mushroom. This dangerous counterfeit is A. fastidiosum, or sometimes crustuliniformis, a close ally if not indeed a more varietal of the first. A description of one will do for both, A. fastidiosum being a little more slender of the two. Both have fleshy caps, whitish, moist and clammy to the touch; instead of a pleasant odour, they have a disagreeable one. The gills are pallid, whitish, and somewhat pithy. These two fungi usually grow in woods, but sometimes in hedges and in shady places in meadows, or even, as has been said, in abandoned old mushroom-beds. The pale clay-colored gills, offensive odour, and clammy or even viscid top are decisive characters. A reference to the accompanying illustration (fig. 2), which is about one-half natural size, will generally be sufficient. In determining fungi no single character must be relied upon as conclusively, but all the characters must be taken together. Sometimes a beautiful, somewhat slender, fungus peculiar to stumps in woods is mistaken for the mushroom in A. fastidiosum. It has a white, ringless stem and somewhat thin brown cap, furnished underneath with beautiful rose-colored gills, which are free from the stem as in the mushroom, and which never turn black. It is probably a poisonous plant, belonging, as it does, to a dangerous cohort. Many other species of A. fastidiosum more or less resemble A. campesi, notably some of the plants found under the sub-genus Lepiota, Volutaria, Pholiota and Psalliota; but when the characters are noted they may all with a little care be easily distinguished from each other. The better plan is to discard at once all fungi which have not been gathered from open pastures; by this act alone more than nine-tenths of worthless and poisonous fungi will be removed.

In cases of poisoning by mushrooms immediate medical advice should be secured. The dangerous principle is a narcotic, and the symptoms are usually great nausea, drowsiness, stupor and pains in the joints. A good palliative is sweet oil; this will allay any corrosive irritation of the throat and stomach, and at the same time cause vomiting.

Paris mushrooms are cultivated in enormous quantities in dark underground cellars at a depth of from 60 to 160 ft. from the surface. The stable manure is taken into the tortuous passages of these cellars, and the spawn introduced from masses of dry dung where it occurs naturally. In that it is mushroom-growers do not use the company blocks or bricks of spawn so familiar in England, but much smaller flakes of "leaves" of dry dung in which the spawn or mycelium can be seen to exist. Less manure is used in these cellars than we grow in England. For the purpose of mushrooming the bed is of each bed is covered with an inch of fine white stoney soil. The beds are kept artificially moist by the application of water brought from the surface, and the different galleries bear crops in succession. As one is exhausted another is in full bearing, so that by a systematic arrangement a single proprietor will send to the table around the year.

The common mushroom (Agaricus campestris) is propagated by spores, the fine black dust seen to be thrown off when a mature specimen of the fruit-bodies is split open and baked. These spores are periodical, and it is only in the months of July and August that the mushroom-planters are not allowed to reach the fully expanded condition, but are gathered in a large button state, the whole growth of the mushroom being removed and the hole left in the manure covered over by earth. A bed remains in production for eight months, and then the spent manure is taken to the surface again for garden and field purposes. The equable temperature of these cellars and the light through the ceiling is such that in order to this must be added the natural virgin spawn, by continually using spawn taken from mushroom-producing beds the potency for reproduction is weakened. The beds produce mushrooms all through the year.

FIG. 2.—Poisonous Mushroom (Agaricus fastidiosum).

The old method of growing mushrooms in ridges out of doors, or on prepared beds either level or sloping from a small hill or mound, is also still followed. The beds are formed of horse-droppings which have been slightly fermented and frequently turned, and may be made 2 or 3 ft. broad and of any length. A layer of fine earth is then placed on the whole, and well beaten down, and the surface is covered with a thick coat of straw. When the weather is temperate, mushrooms will appear in about a month after the bed has been made, but at other times a much longer period may be required. The prevention of insects is best carried out by a moderate state of moisture and a proper mild degree of warmth; and the treatment must vary according to the season.

These ordinary ridge beds furnish a good supply towards the end of winter, but in April, in addition, the crops from the old beds supply, however, at all seasons, the use of a mushroom-house will be found very convenient. The material employed in all cases is the droppings of horses. These should not be more than 8 or 10 in. thick at the first deposit, and covered with a light dryish earth to the depth of 2 in.; and two similar layers with similar coverings are added, the whole being made narrower as it advances in height. When the bed is finished, it is covered with a layer of straw, which is also 2 in. thick. In about ten days, when the mass is warm, the bed will be ready for spawning, which consists of inserting small pieces of spawn bricks into the sloping sides of the bed, about 6 in. asunder. A layer of fine earth is then placed over the whole, and well beaten down, and the surface is covered with a thick coat of straw. When the weather is temperate, mushrooms will appear in about a month after the bed has been made, but at other times a much longer period may be required. The prevention of insects is best carried out by a moderate state of moisture and a proper mild degree of warmth; and the treatment must vary according to the season.

The atmosphere should range from 60° to 65° till the mushrooms appear, and in the case of the older ones below that lower than 55°. If the beds require watering, water of about 80° should be used, and it is preferable to moisten the covering of litter thoroughly. The thermometer should be introduced as closely as possible, especially in the case of partially exhausted beds, to water with a dilute solution of nitre. For a winter supply the beds should be made towards the end of August, and the end of October. Sugs and other kinds of mushroom beds are described in the foregoing.

The Fairy-ring Champignon,—This fungus, Marasmius Oreades, is more universally used in France and Italy than in England, although it is well known and frequently used both in a fresh and in a dry state in England. It is totally different in appearance from the
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1. General Sketch

Introduction. As a mature and independent art, music is unknown except in the modern forms realized by Western civilization; ancient music, and the non-European music of the present day, being (with insignificant exceptions of a character which confirms the generalization) invariably an adjunct of poetry or dance, in so far as it is recognizably an art at all. The modern art of music is in a unique position; for, while its language has been wholly created by art, this language is yet so perfectly organized as to be in itself natural; so that though the music of one age or style may be at first unintelligible to a listener who is accustomed to another style, and though the listener may help himself by acquiring information as to the characteristics and meaning of the new style, he will best learn to understand it by merely divesting his mind of prejudices and allowing the music to make itself intelligible by its own self-sufficiency. The understanding obtained this way is the music itself, which finally depends neither upon technical knowledge nor upon convention, but upon the listener’s immediate and familiar experience of it; an experience which technical knowledge and custom can of course aid him to acquire more rapidly, as they strengthen his memory and enable him to fix impressions by naming them.

Beyond certain elementary facts of acoustics (see Sound), modern music shows no direct connexion with nature independently of art; indeed, it is already art that determines the selection of these elementary acoustic facts, just as in painting art determines the selection of those facts that come under the cognizance of optics. In music, however, the purely acoustic principles are incomparably fewer and simpler than the optical principles of painting; and their artistic interaction transforms them into something no less remote from the laboratory experiments of acoustic science than from the unorganized sounds of nature. The result is that while the ordinary non-artistic experiences of sight afford so much material for plastic art that the vulgar conception of good painting is that it is deceptively like nature, the ordinary non-artistic experience of sound has so little in common with music that musical realism is, with rare though popular exceptions, generally regarded as an eccentricity.

This contrast between music and plastic art may be partly explained by the mental work undergone, during the earliest infancy both of the race and of the individual, in interpreting sensations of space. When a baby learns the shape of objects by taking them in his hands, and gradually advances to the discovery that his toes belong to him, he goes through an amount of work that is quite forgotten by the adult, and its complexity and difficulty has perhaps only been fully realized through the experience of persons who have been born blind but have acquired sight at a mature age by an operation. Such work gives the facts of normal adult vision an amount of organic principle that makes them admirable raw material for art. The power of distinguishing sensations of sound is associated with no such mental skill, and is on no more complex than the power of distinguishing colours. On the other hand, sound is the principal medium by which most of the higher animals both express and excite emotion; and hence, though until

Thus Chinese and Japanese art has attained high organization without the aid of a veracious perspective; while, on the other hand, its carefully formulated decorative principles, though not realistic, certainly rest on an optical and physiological basis. Again, many modern impressionists justify their methods by an appeal to phenomena of complementary colour which earlier artists possibly did not perceive and certainly did not select as artistic materials.

Pasture mushroom, and, like it, its characters are so distinct that there is hardly a possibility of making a mistake when its peculiarities are once comprehended. It has more than one advantage over the meadow mushroom in its extreme commonness, its profuse growth, and the great season in which it may be gathered, the total absence of varietal forms, its adaptability for being dried and preserved for years, and its persistent delicious taste. It is by many esteemed as the best of the edible fungi found in Great Britain. Like the mushroom, it grows in short open pastures and amongst the short grass of open roadsides; sometimes it appears on lawns, but it never occurs in woods or in damp shady places. Its natural habit is to grow in rings, and the grassy fairy-rings so frequent amongst the short grass of downs and pastures are generally caused by the nutritious manure applied to the soil in the previous autumn by the decay of a circle of these fungi. Many other fungi in addition to the fairy-ring champignon grow in circles, so that this habit must merely be taken with its other characters in cases of doubt.

A glance at the illustration (fig. 3) will show how entirely the fairy-ring champignon differs from the mushroom. In the first place, it is about one-half the size of a mushroom, and whitish-buff in every part, the gills always retaining this colour and never becoming salmon-coloured, brown or black. The stem is solid and corky, much more so than the flesh of the cap, and perfectly smooth, never being furred with the slightest trace of a ring. The gills are far apart (v), and in this they greatly differ from the somewhat crowded gills of the mushroom; the junction of the gills with the stem (w) also differs in character from the similar junction in the mushroom. The mushroom is a semi-deliquescent fungus which rapidly falls into putridity in decay, whilst the champignon dries up into a leathery substance in the sun, but speedily revives and takes its original form again after the first shower. To this character the fungus owes its generic name (Marasmius) as well as one of its most valuable qualities for the table, for examples may be gathered from June to November, and if carefully dried may be hung on strings for culinary purposes and preserved without deterioration for several years; indeed, many persons assert that the rich flavour of these fungi increases with years. Champignons are highly esteemed (and especially is this the case abroad) for adding a most delicious flavour to stews, soups and rissoles.

A fungus which may carelessly be mistaken for the mushroom is M. perforatus, but this grows in woods amongst dead leaves, and has a hairy base to the stem and a somewhat acrid taste. Another is M. stesus; this also generally grows in woods, but the gills are not nearly so deep, they soon become brownish, the stem is downy, and the taste is acrid. An Agarius named A. dryophilus has sometimes been mistaken in mistake for the champignon, but this too grows in woods where the champignon never grows; it has a hollow instead of a solid stem, gills crowded together instead of far apart, and flesh very tender and brittle instead of tough. A small slender ally of the champignon, named M. scovolodium, is sometimes found in pastures in Great Britain; this is largely confounded with the C. colioba, and it is esteemed for its powerful flavour of garlic. In England, where, garlic is not used to a large extent, this fungus is not sought for. Another small and common species, M. allivaceus, is interspersed with garlic flavour to an equal extent with the last. A third species, M. allivaceus, is also strongly impregnated with the scent and taste of onions or garlic. Two species, M. impudicus and M. foetidus, are in a stage of growth highly intoxicating. The curious little edible Agarius cœstentus, although placed under the sub-genus Collybia, is allied by its structure to Marasmius. It is a small bitter species common in upland pastures and fir plantations early in the season. Although not wholly in the table in England, it is greatly prized in some parts of the Continent.

Music. The Greek μουσική (sc. τέχνη), from which this word is derived, was used very widely to embrace all those arts over which the Nine Muses (Μούσαι) were held to preside. Contrasted with γυμναστική (gymnastic) it included those branches of education concerned with the development of the mind as opposed to the body. Thus widely different arts and sciences as mathematics, astronomy, poetry and literature generally, and even reading and writing would all fall under μουσική, besides the singing and setting of lyric poetry. On the other hand, those physical and mechanical arts of development of character the philosophers laid chief stress, and this biased their aesthetic analysis. 'Μουσική (harmony), or ἀρμοσική (sc. τεχνῆ), rather than μουσική, was the name given by the Greeks to the art of arranging sounds for the purpose of creating a definite aesthetic impression, with which this article deals.
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codified into human speech it does not give any raw material for art, yet so powerful are its primitive effects that music (in the bird-song sense of sound indulged in for its own attractiveness) is as long prior to language as the brilliant colours of animals and flowers are prior to painting (see Song). Again, sound as a warning or a menace is eminently important in the history of the instinct of self-preservation; and, above all, its production is instantaneous and instinctive.

All these facts, while they tend to make musical expression an early phenomenon in the history of life, are extremely unfavourable to the early development of musical art. They invested the first musical attempts with a mysterious power over listener and musician, by re-awakening instincts more powerful, because more ancient and necessary, than any that could ever have been appealed to by so deliberate a process as that of drawing on a flat surface a series of lines calculated to remind the eye of the appearance of solid objects in space. It is hardly surprising that music long remained as imperfect as its legendary powers were portentous, even in the hands of so supremely artistic a race as that of classical Greece; and whatever wonder this backwardness might still arouse in us vanishes when we realize the difference of the process by which the principles of the modern art were established.

Non-harmonic and Greek Music.—Archaic music is of two kinds—the unwritten, or spontaneous, and the recorded, or scientific. The earliest musical art-problems were far too difficult for conscious analysis, but by no means always beyond the reach of a lucky hit from an inspired singer; and thus folk-music often shows real beauty where the more systematic music of the time is merely arbitrary. Moreover, folk-music and the present music of barbarous and civilized non-European races furnish the study of musical origins with material analogous to that given by the present manners and customs of different races in the study of social evolution and ancient history. We may mention as examples the accurate comparison of the musical scales of non-European races undertaken by A. J. Ellis (On the Musical Scales of Various Nations, 1883); the parallel researches and acute and cautious reasoning of his friend and collaborator, A. J. Hipkins (Oriental and Phrygian reconsidered from a Non-harmonic Point of View, 1902); and, perhaps most of all, the study of Japanese music, with its remarkable if uncertain signs of the beginning of a harmonic tendency, its logical coherence, and its affinity to Western scales, points in which it seems to show a great advance upon the Chinese music from which most of it is derived (Music and Musical Instruments of Japan, by J. F. Piggott, 1853). The reader will find detailed accounts of ancient Greek music in the article on that subject in Grove's Dictionary of Music and Musicians (new ed., ii. 293) and in Monro's Modes of Ancient Greek Music (Clarendon Press, 1894), while both the Greek music itself, and the steps by which it passed through Graeco-Roman and early Christian phases to become the foundation of the modern art, are traced as clearly as is consistent with accuracy in The Oxford History of Music, vol. i., by Professor Wooldridge.

Sir Hubert Parry's Evolution of the Art of Music ("International Scientific Series," originally published under the title Of the Art of Music) presents the main lines of the evolution of modern musical ideas in the clearest and most readable form yet attained.

Sir Hubert Parry illustrates in this work the artificiality of our modern musical conceptions by the word "cadence," which to a modern musician belies its etymology, since it normally means for him no "falling" close but a pair of final chords rising from dominant to tonic. Moreover, in consequence of our harmonic notions we think of scales as constructed from the bottom upwards; and even in the above-mentioned article in Grove's Dictionary all the Greek scales are, from sheer force of habit, written upwards. But the ancient and, almost universally, the primitive idea of music is like that of speech, in which most inflections are in fact cadences, while rising inflections express less usual sentiments, such as surprise or interrogation. Again, our modern musical idea of "high" and "low" is probably derived from a sense of greater and less vocal effort; and it has been much stimulated by our harmonic sense, which has necessitated a range of sounds incomparably greater than those employed in any non-harmonic system. The Greeks derived their use of the terms from the position of notes on their instruments; and the Greek kyphai was what we should call the lowest note of the mode, while neith was the highest. Sir George Macfarren has pointed out (Elocut. Brit., 1861, and "Music"") that both Monro's (c. A.D. 500) already fell into the trap and turned the Greek modes upside down. 1

Another radical though less grotesque misconception was also already well exploded by Macfarren; but it still frequently survives at the present day, since the study of non-harmonic scales is, with the best of intentions, apt rather to encourage than to dispel it. The more we realize the importance of differences in position of intervals of various sizes, as producing differences of character in scales, the more irresistible is the temptation to regard the ancient Greek modes as differing from each other in this way. And the temptation becomes greater instead of less when we have succeeded in thinking away our modern key-systems, and restoring the unison and the modes, as the only difference of modes which the melodic intervals are different, but it does this in a fashion that draws the attention almost entirely away from these differences of interval; and without harmony we find it extremely difficult to distinguish one mode from another, unless it be by this different arrangement of intervals. Nevertheless, all the evidence irresistibly tends to the conclusion that while the three Greek genera—diatonic, chromatic, and enharmonic—were scales differing in intervals, the Greek modes were a series of scales identical in arrangement of interval, and differing, like our modern keys, only in pitch. The three genera were applied to all these modes or keys, and we have no difficulty in understanding their modifying effects. The cause of what we have to the mental process by which in a preharmonic age different characteristics can be ascribed to scales identical in all but pitch, is to be found in the limited compass of Greek musical sounds, corresponding as it does to the evident sensiveness of the Greek ear to differences in vocal effort. We have only to observe the compass of the Greek scale to see that in the most esteemed modes it is much more the compass of speaking than of singing voices. Modern singing is normally at a much higher pitch than that of the speaking voice, but there is no natural reason, outside the peculiar nature of modern music, why this should be so. It is highly probable that all modern singing would strike a classical Greek ear as an outcry, and in any case such variations of pitch as are inconceivable in modern singing are extremely emphatic in the speaking voice, so that they might well make all the difference to an ear accustomed to organized sound beyond the speaking compass. Again, much that Aristoxenus and other ancient authorities say of the character of the modes (or keys) tends to confirm the view that the character depends upon the position of the mese or keynote within the general compass. Thus Aristotle (Politics, v. (viii.) 7, 1342 b. 20) states that certain low-pitched modes suit the voices of old men, and thus we may conjecture that even the position of tones and semitones might in the Phrygian, for example, have been on the higher portion of the scale in all three genera into the best regions of the average young voice, while the Ionian and Lydian might lead the voice to dwell more upon semitones and enharmonic intervals, and so account for the heroic character of the former and the sensual character of the latter (Plato, Republic, 398 to 400).

Of the Greek genera, the chromatic and enharmonic (especially

1 It is worth adding that in the 16th century the great contrapun
tal composer Costanzo Porta had been led by doubts on the subject to the wonderful conclusion that ancient Greek music was polyphonic, and so constructed as to be invertible; in illustration of which theory he and Vincentino composed four-part motets in each of the Greek genera (diatonic, chromatic and enharmonic), Porta's being constructed like the 12th and 13th fugues in Bach's Kunst der Fuge so as to be equally euphonious when sung upside down. (See Hawkins's History of Music, i. 112.)
the latter) show very clearly the origin of so many primitive scales in the interval of the downward fourth. That interval (e.g. from C to G) is believed to be the earliest melodic relationship which the ear learnt to fix; and most of the primitive scales were formed by the accretion of auxiliary notes at this distance of this interval, and the addition of similar accretions, below the former. In this way a pentatonic scale, like that of so many Scotch melodies, can easily be formed (thus, C, A, G, F, D, C); and though some primitive scales seem to have been on the nucleus of the rising fifth, while the Siamese now use two scales of which not a single note within the octave can be accounted for by any known principle, still we may consider that for general historic purposes the example above is typical. The Greeks divided their downward fourth into four notes, called a tetrachord; and by an elaborate system of linking tetrachords together they gave their scale a compass of two octaves. The enharmonic tetrachord, being the most ancient, gathered the lower three notes very closely to the bottom, leaving the second note no less than a major third from the top, thus—C, A, G, G; (where G’ stands for a note between A♭ and G). The chromatic tetrachord was C, B♭, A♭, G; and the diatonic tetrachord was C, B, A, G. It is this last that has become the foundation of modern music, and the Greeks themselves soon preferred it to the other genera and found a scientific basis for it. In the first place they noticed that its notes (and, less easily, the notes of the chromatic scale) could be connected by a series of those intervals which they recognized as concordant. These were, the fourth; its converse, or inversion, the fifth; and the octave. The notes of the enharmonic tetrachord could not be connected by any such series.

In the articles on Harmony and Sound account is given of the historic and scientific foundations of the modern conception of concord; and although this harmonic conception applies to simultaneous notes, while the Greeks concerned themselves only with successive notes, it is nevertheless permissible to regard the Greek sense of concord in successive notes as containing the germ of our harmonic sense. The stability of the diatonic scale was assured as early as the 6th century B.C. when Pythagoras discovered (if he did not learn from Egypt or India) the extremely simple mathematical proportions of its intervals. And this discovery was of unique importance, as fixing the intervals by a relation that could never be obscured by the changes of taste and custom otherwise inevitable in music that has no conscious harmonic principles to guide it. At the same time, the foundation of a music as yet immature and ancillary to drama, on an acoustic science ancillary to a priori mathematics, was not without disadvantage to the art; and it is arguable that the great difficulty with which during the medieval beginnings of modern harmony the concords of the third and sixth were rationalized may have been increased by the fact that the Pythagorean system left these intervals considerably out of tune. In preharmonic times mathematics could not direct even the most observant ear to the study of those phenomena of upper partials of which Helmholtz, in 1863, was the first to explain the significance; and thus though the Greeks knew the difference between a major and minor tone, on which half the question depended, they could not possibly arrive at the modern reasons for adding both kinds of tone in order to make the major third. (See Sound.) Here we must digress in order to illustrate what is implied by our modern harmonic sense; for the difference that this makes to our whole musical consciousness is by no means universally realized. Music, as we now understand it, expresses itself in the interaction of three elements—rhythm, melody and harmony. The first two are obviously as natural to human consciousness itself. Without the third a musical art of permanent value and intelligibility has not been known to attain independent existence. With harmony music assumes the existence of a kind of space in three dimensions, none of which can subsist without at least implying the others. When we hear an unaccompanied melody we cannot help interpreting it in the light of its most probable harmonies. Hence, when it does not imply consistent harmonies it seems to us quaint or strange; because, unless it is very remote from our harmonic conceptions, it at least implies at any given moment some simple harmony which in the next moment it contradicts. Thus our inferences as to the expression intended by music that has not come under European influence are unsafe, and the pleasure we take in such music is capricious. The effort of thinking away our harmonic preconceptions is probably the most violent piece of mental gymnastics in all artistic experience, and furnishes much excuse for a sceptical attitude as to the artistic value of preharmonic music, which has at all events never become even partially independent of poetry and dance. Thus the rhythm of classical Greek music seems to have been entirely identical with that of verse, and its beauty and expression appreciated in virtue of that identity. From the modern musical point of view the rhythm of words is limited to a merely monotonous uniformity of flow, with moderate undulations which are musically chaotic (see Rhythm). The example of Greek tragedy, with the reports of its all-pervading music (in many cases, as in that of Aeschylus, composed by the dramatist himself) could not fail to fire the imaginations of modern pioneers and reformers of opera; and Monteverde, Gluck and Wagner convinced themselves and their contemporaries that their work was, amongst other things, a revival of Greek tragedy. But all that is known of Greek music shows that it represents no such modern ideas, as far as their really musical aspect is concerned. It represents, rather, an organization of the rise and fall of the voice, no doubt as elaborate and artistic as the organization of verse, but no doubt powerful in heightening the emotional and dramatic effect of words and action, but in no way essential to the understanding or the organization of the works which it adorned. The classical Greek preference for the diatonic scale indicates a latent harmonic sense and also that temperance which is at the foundation of the general Greek sense of beauty; but, beyond this and similar generalities, all the research in the world will not enable us to understand the Greek musician's mind. Non-harmonic music is a world of two dimensions, and we must now inquire how men came to rise from this "flatland" to the solid world of sound in which Palestrina, Bach, Beethoven and Wagner live.

3. Harmonic Origins.—Although the simultaneous blending of different sounds was never seriously contemplated by the Greeks, yet in classical times they were fond of singing with high and low voices in octaves. This was called magadizing, from the name of an instrument on which playing in octaves was rendered easy by means of a bridge that divided the strings at two-thirds of their length. While the practice was esteemed for the beauty of the blending of different voices, it was tolerated only because of the peculiar effect of identity furnished by the different notes of the octave, and no other interval was so used by the Greeks. In the article on Harmony the degrees of identity-in-difference which characterize the simpler harmonic intervals are analysed, and the main steps are indicated by which the more complicated medieval magadizing uses of the fourth and fifth (the symphonia, diaphonia or organum of Hucbald) gave way (partly by their own interchange and partly through experiments in the introduction of ornaments and variety) to the modern conception of harmony as consisting of voices or parts that move independently to the exclusion of such parallel motion. In The Oxford History of Music, vols. i. and ii., will be found abundant examples of every stage of the process, which begins with the organum or diaphony that prevailed until the death of Guido of Arezzo (about 1050) and passes through the discei, or measured music, of the 13th century, to the invention of the procedure of contrapuntal composition, which enables voices to sing contrasted rhythms simultaneously, while the new harmonic criterion of the independence of parts more and more displaces and shows its opposition to the old criterion of parallelism.

The most extraordinary example of these conflicting principles is the famous rota "Sumer is icumen in," a 13th-century round in four parts on a canon called bass in two. Recent researches
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have brought to light a number of works in the forms of *motet*, *conductus*, *rondeil* (neither the later rondo nor the round, but a kind of triple counterpoint), which show that "Sumer is icumen in" contains no unique technical feature; but no trace of its fourteenth-century ancestors, which were nearly intelligible to modern ears. Its richness and firmness of harmony are such that the frequent use of consecutive fifths and octaves, in strict accordance with 13th-century principles, has to our ears all the effect of a series of grammatical blunders, so sharply does it contrast with the smooth counterpoint of the rest. In what light this smooth counterpoint struck contemporaries, or how its author (who may or may not be the writer of the Reading MS. John of Formsete) arrived at it, is not clear, though W. S. Rockstro's amusing article, "Sumer is icumen in," in Grove's Dictionary, is very plausible. All that we know is that music in England in the 13th century must have been at a comparatively high state of development; and we may also conjecture that the tuneful character of this wonderful rota has something in common with the unwritten but famous songs of the Aristocratic Troubadours, or *trouvères*, of the 12th and 13th centuries, who, while disdaining to practise the art of accompaniment or the art of scientific and written music, undoubtedly set the fashion in melody, and, being themselves poets as well as singers, formed the current notions as to the relations between musical and poetic rhythm. The music of Adam de la Hale, surnamed Le Bossu d'Arras (c. 1230-1288), shows the transformation of the troubadour into the learned musician; and, nearly a century later, the more ambitious efforts of a greater French poet (like his contemporary Petrarcha, one of Chaucer's models in poetic technique), Guillaume de Machault (fl. 1350), mark a further technical advance, though they are not appreciably more intelligible to the modern ear.

In the next century we find an Englishman, John Dunstable, who had as early as 1437 acquired a European reputation; while his works were so soon lost sight of that until recently he was almost a legendary character, sometimes revered as the "inventor" of counterpoint, and once or twice even identified with St Dunstan! Recently a great deal of his work has come to light, and it shows us (especially when taken in connexion with the fact that the early Netherlands master, G. Dufay, did not die until 1474, twenty-one years after Dunstable) that English counterpoint was fully capable of showing the composers of the Netherlands the path by which they were to reach the art of the "Golden age." In such examples of Dunstable's work as that appended to the article "Dunstable" in Grove's Dictionary (new ed., i. 744) we see music approaching a style more or less consistently intelligible to a modern ear; and in English Carols of the 15th Century (1891) several two-part compositions of the period, in a style resembling Dunstable's, have been made accessible to modern readers and filled out into four-part music by the editor in accordance with the rules of the time. And though it may be doubted whether Mr Rockstro's skill would not have been held in the 15th century to savour overmuch of the Black Art, still the success of his attempt shows that the musical conceptions he is dealing with are no longer radically different from those of our modern musical consciousness.

4. The Golden Age.—The struggle towards the realization of mature musical art seems incredibly slow when we do not realize its difficulty, and wonderfully rapid as soon as we attempt to imagine the effort of first forming those harmonic conceptions which are second nature to us. Even at the time of Dunstable and Dufay the development of the contrapuntal idea of independence of parts had not yet so transformed the harmonic conceptions of that the ancient parallelisms or consecutive fourths and fifths that were the backbone of discord could be seen in their true light as contradictory to the contrapuntal method. By the beginning of the 16th century, however, the laws of counterpoint were substantially fixed; practice was for a while imperfect, and aims still uncertain, but skill was increasing and soon became marvellous; and in 16th-century music we leave the archaic world altogether. Henceforth music may show various phenomena of crudeness, decadence and transition, but its transition-periods will always derive light from the past, whatever the darkness of the future.

In the 17th century we have no need of reference to mental gymnastics, beyond what is necessary in all art to secure intelligent presentation and attention. Its materials show us the "three dimensions" of music in their simplest state of perfect balance. Rhythm, emancipated from the tyranny of verse, is free to co-ordinate and contrast a multitude of melodies which by the very independence of their flow produce a mass of harmony that passes from concord to concord through ordered varieties of transitional discord. The criterion of discord is no longer that of mere harshness, but is modified by the conception of the simplicity or remoteness of the steps by which the flux of independent simultaneous melodies passes from one concord, or perfect repose, to another. When the music reaches a climax, or its final conclusion, the point of repose is, of course, greatly emphasized. It is accordingly the "cadences" or full closes of 16th-century music that show the greatest resemblance to the harmonic ideas of the present day; and it is also at these points that certain notes were most frequently raised so as to modify the ecclesiastical modes which are derived more or less directly from the melodic diatonic scale of the Greeks, and misnamed, according to inevitable medieval misconceptions, after the Greek modes. 1

In other passages our modern ears, when unaccustomed to the style, feel that the harmony is strange and lacking in definite direction; and we are apt to form the hasty conclusion that the contrapuntal art-forms are therefore aborted. At the first glance the art-forms appear with the art soon shows that its shifting and vague modulations are no mere survival of a scale inadequate for any but melodic purposes, but the natural result of a state of things in which only two species of chord are available as points of repose at all. If no successions of such chords were given prominence, except those that define key according to modern notions based upon a much greater variety of harmony, the resulting monotony and triviality would be intolerable. Moreover, there is in this music just as much and no more of formal antithesis and sequence as its harmony will suffice to hold together. Lastly, we shall find, on comparing the masterpieces of the period with works of inferior rank, that in the masterpieces the most archaic modal features are expressive, varied and beautiful; while in the inferior works they are often avoided in favour of ordinary modern ideas, and, when they occur, are always accidental and monotonous, although in strict conformity with the rules of the time. The consistent limitations of harmony, form and rhythm have the further consequence that the only artistic music possible within them is purely vocal. The use of instruments is little more than a necessary evil for the support of voices in case of insufficient opportunity for practice; and although the origins of instrumental music are already of some artistic interest in the 16th century, we must leave them out of our account if our object is to present mature artistic ideas in proper proportions.

The principles of 16th-century art-forms are discussed in more detail in the article on Contrapuntal Forms. Here we will treat the formal criteria on a general basis; especially as with art on such simple principles the distinction between one art-form and another is apt to be either too external or too subtle for stability. With music there is a stronger probability than in any other art that merely mechanical devices will be self-evident, and thus they may become either dangerous or effective. With the masters of the Netherlends they speedily became both. Two adjacent groups of illustrations in Burney's

1 The technical nature of the subject forbids us to discuss the origin and development of the great Ambrosian and Gregorian collections of melodic church music on which nearly all medieval and 16th-century polyphony was based, and from which the ecclesiastical modes were derived... Professor Woodbridge in The Oxford History of Music, p. 537: 16th-century music is a fusion of Christian music with the Graeco-Roman music, and the origin of its modes in the Pythagorean classification (c. A.D. 150) of the Greek diatonic scale; while a recent defence of the ecclesiastical tradition of a revision by St Gregory will be found in the article on "Gregorian music" in Grove's Dictionary (new ed.), ii. 235.
History of Music will show on the one hand the astonishing way in which early polyphonic composers learnt to "dance in fetters," and, on the other hand, the expressive power that they attained by that discipline. Burney quotes from the venerable 15th-century master Ockeghem, or Okenheim, some canons so designed as to be singable in all modes. They are by no means extreme cases of the ingenuity which Ockeghem and his pupils often employed; but though they are not very valuable artistically (and are not even correctly deciphered by Burney) they prove that mechanical principles may be a help rather than a hindrance to the attainment of a smooth and plastic style. Burney most appropriately follows them with Josquin Des Prez's wonderful Deploration de Jehan Ockeghem, in which the tenor sings the plain chant of the Requiem a degree below its proper pitch, while the other voices sing a pastoral dirge in French. The device of transposing the plain chant a note lower, and making the tenor sing it in that position throughout the whole piece, is obviously as mechanical as any form of acrostic: but it is happily calculated to impress our ears, even though, unlike Josquin's contemporaries, most of us are not familiar with the plain chant in its normal position; because it alters the position of all the semitones and gives it a plaintive minor character which is no less impressive in itself than as a contrast to the orthodox form. And that harmonically superstructure is as fine an instance of the expressive possibilities of the church modes at their apogee from modern tonality as could be found anywhere. A still nobler example, which we may perhaps acclaim as the earliest really sublime masterpiece in music, is Josquin's Misereor, which is accessible in a modern edition. In this monumental work one of the tenor parts is called Vagans, because it sings the burden Misereor mei Deus at regular intervals, in an almost monotonous wallowing figure, wandering through each successive degree of the scale throughout the composition. The effect, aided as it is by consummate rhetorical power in every detail of the surrounding mass of harmony and counterpoint, is extremely expressive; and the device lends itself to every shade of feeling in the works of the greatest of all Netherland masters, Orlando di Lasso, Palestrina is less fond of it. Like all more obvious formal devices it is crowded out of his Roman art by the exquisite subtlety of his sense of proportion, and the exalted spirituality of his style which, while it allows him to set the letters of the Hebrew alphabet in the Lamentations of Jeremiah in much the same spirit as that in which they would be treated in an illuminated Bible, forbids him to simulate a sense of form that might distract the mind from the sense of mystery and awe proper to objects of devout contemplation. Yet in one of his greatest motets, Tribulare si notis, the burden of Josquin's Misereor appears with the same treatment and purpose as in its prototype.

But with the lesser Flemish masters, and sometimes with the greatest, such mechanical principles often became not only inexpressive but absolutely destructive to musical effect. The ingenuity necessary to make the stubborn material of music plastic was not so easily attainable as the ingenuity necessary to turn music into a mathematical game; and when Palestrina was in his prime the inferior composers so outnumbered the masters to whom music was a devout language, and so degraded the art, not only by ousting genuine musical expression but by foisting secular tunes and words into the church services, that one of the minor questions with which the Council of Trent was concerned was whether polyphonic church music should be totally abolished with other abuses, or whether it was capable of reform. Legendary history relates that Palestrina submitted for judgment three masses of which the Missa papae Marcelli proved to be so sublime that it was henceforth accepted as the ideal church music (see Palestrina). This tale is difficult to reconcile with the chronology of Palestrina's works, but there is no doubt that Palestrina was officially recognized by the Church as a bulwark against bad taste. But we must not allow this to mislead us as to the value of church music before the 16th century. Not must we follow the example of Baini, who, in his detestation of what he is pleased to call fiammingo square, views with uncritical suspicion any work in which Palestrina does not confine himself to strictly Italian methods of expression. A notion still prevails that Josquin represents counterpart in an anatomical perfection into which Palestrina was the first to breathe life and soul. This gives an altogether inadequate idea of 16th-century music. Palestrina brought the century to a glorious close and is undoubtedly its greatest master, but he is primum inter pares; and in every part of Europe music was represented, even before the middle of the century, by masters who have every claim to immortality that sincerity of aim, originality of thought, and depth and range of feeling give. It has been rightly called the golden age of music, and our chronological table at the end of this article gives but an inadequate idea of the number of its masters whom no lover of music ought to neglect. It is not exclusively an age of church music. It is also the age of madrigals, both secular and spiritual; and, small as was its range of expression, there has been no period in musical art when the distinctions between secular and ecclesiastical style were more accurately maintained by the great masters, as is abundantly shown by the test cases in which masses of the best period have been based on secular themes. (See Madrigal.)

5. The Monodie Revolution and its Results.—Like all golden ages, that of music vanished at the first appearance of a knowledge beyond its limitations. The first and simplest realization of mature art is widespread and nourishes a veritable army of great men; its masterpieces are innumerable, and its organization is so complete that no narrowness or specialization can be felt in the nature of its limitations. Yet these are exceedingly close, and the most modest attempt to widen them may have disastrous results. Many experiments were tried before Palestrina's death and throughout the century, notably by the elder and younger Gabrieli. Perhaps Palestrina himself is the only great composer of the time who never violates the principles of his art. Orlando di Lasso, unlike Palestrina, wrote almost as much secular as sacred music, and in his youth indulged in many eccentricities in a chromatic style which he afterwards learnt to detest. But if experiments are to revolutionize art it is necessary that their novelty shall already embody some artistic principle of coherence. No such principle will avail to connect the Phrygian mode with a chord containing A♯; and, however proud the youthful Orlando di Lasso may be at being the first to write A♯, neither his early chromatic experiments nor those of Cipriano di Rore, which he admired so much, left a mark on musical history. They appealed to nothing deeper than a desire for sensational variety of harmony; and, while they carried the successions of chords far beyond the limits of the modes, they brought no new elements into the chords themselves.

By the beginning of the 17th century the true revolutionary principles were vigorously at work, and the powerful genius of Monteverde speedily made it impossible for men of impressive artistic temper to continue to work in the old style when such vast new regions of thought lay open to them. In the year of Palestrina's death, 1594, Monteverde published, in his third book of madrigals, works in which without going irrevocably beyond the letter of 16th-century law he showed far more zeal for emotional expression than sense of euphony. In 1599 he published madrigals in which his means of expression involve harmonic principles altogether incompatible with 16th-century ideas. But he soon ceased to place confidence in the madrigal as an adequate art-form for his new ideals of expression, and he found an unlimited field in musical drama. Dramatic music received its first stimulus from a group of Florentine dilettanti, who aspired amongst other things to revive the ideals of Greek tragedy. Under their auspices the first true opera ever performed in public, Jacopo Peri's Eurydice, appeared in 1600. Monteverde found the conditions of dramatic music more favourable to his experiments than those of choral music, in which both voices and ears are at their highest sensibility
to discord. Instruments do not blend like voices; and players, producing their notes by more mechanical means, have not the singer's facility in making combinations which the car do not readily understand.

The one difficulty of the new art was fatal: there were no limitations. When Monteverde introduced his unprepared discords, the effect upon musical style was like that of introducing modern metaphors into classical Greek. There were no harmonic principles to control the new material, except those which just sufficed to hold together the pure 16th-century style; and that style depended on an exquisite continuity of flow which was incompatible with any rigidity either of harmony or rhythm. Accordingly there were also no rhythmic principles to hold Monteverde's work together, except such as could be used by the old type of popular music that had hitherto been beneath serious attention. If the 17th century seems almost devoid of great musical names it is not for want of incessant musical activity. The task of organizing new resources into a consistent language was too gigantic to be accomplished within three generations. Its fascinating dramatic suggestiveness and incalculable range disqualified for those who first undertook it the fact that the new art was as difficult and elementary in its beginnings as the very beginning of harmony itself in the 13th and 14th centuries. And the most beautiful compositions at the beginning of the 17th century are rather those which show the decadence of 16th-century art than those in which the new principles were most consistently adopted. Thus the madrigals of Monteverde, though often dull and always rough, contain more music than his operas.

On the other hand, almost until the middle of the 17th century great men were not wanting who still carried on the pure polyphonic style. Their asceticism denotes a spirit less comprehensive than that of the great artists for whom the golden age was a natural environment; but in parts of the world where the new influences did not yet prevail even this is not the case, and a composer like Orlando Gibbons, who died in 1625, is well worthy to be ranked with the great Italian and Flemish masters of the preceding century.

But the main task of composers of the 17th century lay elsewhere; and if the result of their steady attention to it was trivial in comparison with the glories of the past, it at least led to the glories of the greater world organized by Bach and Handel. The early monodists, Monteverde and his fellows, directed attention to the right quarter in attempting to express emotion by means of single voices supported by instruments; but the formless declaration of their dramatic writings soon proved too monotonous for permanent interest, and such methods as it showed became permanent only by being codified into the formulas of recitative, which are, for the most part, very happy idealizations of speech-cadence, and which accordingly survive as dramatic elements in music at the present day, though, like all rhetorical figures, they have often lost meaning from carelessness. 1 It was all very well to revolutionize current conceptions of harmony, so that chords were no longer considered, as in the days of pure polyphony, to be the result of so many independent melodies. But in art, as elsewhere, new thought eventually shows itself as an addition to, not a substitute for, the wisdom of ages. Moreover, it is a mistake, though one endorsed by high authorities, to suppose that the 16th-century composers did not appreciate the beauty of successions of chords apart from polyphonic design. On the contrary, Palestrina and Orlando di Lasso themselves are the greatest masters the world has ever seen of style which depends wholly on the beauty of masses of harmony, without any regard for detail, and held together by a delicately balanced rhythm in which obvious symmetry is as carefully avoided as it is in the successions of chords themselves. Nevertheless, the monody of the 17th century is radically different in principle, not only because chords are used which were an outrage on 16th-

1 The "invention" of recitative is frequently ascribed to this or that monodist, with as little room for dispute as when we ascribe the invention of clothes to Adam and Eve. All monody was recitative, if only from inability to organize melodies. century ears, but because the fundamental idea is that of a solo voice declaring phrases of paramount emotional interest, and not that of making use of such chords as will heighten the poignancy of the voice. And the first advance made on this chaotic monody consisted, not in the reintroduction of vitality into the texture of the harmonies, but in giving formal symmetry and balance to the vocal surface. This involved the strengthening of the harmonic system, so that it could carry the new discords as parts of an intelligible scheme, and not merely as uncontrolable expressions of emotion. In other words, the chief energies of the successors of the monodists were devoted to the establishment of the modern key-system; a system in comparison with which the subtle variety of modal concord sounded vague and ill-balanced, until the new key-system itself was so safely established that Bach and Beethoven could once more appreciate and use essentially monodic successions of chords in their true meaning.

The second advance of the monodic movement was in the cultivation of the solo voice. This developed together with the cultivation of the violin, the most capable and expressive of the instruments used to support it. Monteverde already knew how to make interesting experiments with violins, such as directing them to play pizzicato, and accompanying an excited description of a duel by rapidly repeated strokes on a major chord, followed by sustained dying harmonies in the minor. By the middle of the century violin music is fairly common, and the distinction between Sonata da chiesa and Sonata da camera appears (see Sonata). But the cultivation of instrumental technique had also a great effect on that of the voice; and Italian vocal technique soon developed into a monstrosity that so corrupted musical taste as not only to blind the contemporaries of Bach and Handel to the greatness of their choral art, but, in Handel's case, actually to swamp a great deal of his best work. The balance between a solo voice and a group of instruments was, however, successfully cultivated together with the modern key-system and melodic form; with the result that the classical aria, a highly effective art-form, took shape. This, while it totally destroyed the dramatic character of opera for the next hundred years, yet did good service in furnishing a reasonably effective means of musical expression which could encourage composers and listeners to continue cultivating the art until the day of small things was past. The operatic aria, as matured by Alessandro Scarlatti, is at its worst a fine opportunity for a gorgeously dressed singer to display feats of vocal gymnastics, either on a concert platform, or in scenery worthy of the Drury Lane pantomime. At its best it is a beautiful means of expression for the devout fervour of Bach and Handel. At all times it paralyses dramatic action, and no more ironic revenge has ever overtaken iconoclastic reformers than the historic development by which the purely dramatic declamation of the monodists settled down into a series of about thirty expressive displays of vocalization, designed on rigidly musical conventions, and produced under spectacular conditions by artificial sopranos as the highest ideal of music-drama.

The principal new art-forms of the 17th century are then, firstly, the aria (not the opera, which was merely a spectacular condition under which people consented to listen to some thirty arias in succession); and, secondly, the polyphonic instrumental forms, of which those of the suite or sonata da camera were mainly derived from the necessity for ballet music in the opera (and hence greatly stimulated by the taste of the French court under Louis XIV.), while those of the sonata da chiesa were also inspired by a renaissance of interest in polyphonic texture. The sonata da chiesa soon settled into a conventionality only less inert than that of the aria because violin technique had less possibilities than the voice, and was therefore raised to a higher level of effect the operatic style suggested by Cambert, he brought with him just enough of the new instrumental polyphony to make his typical form of French overture (with its slow introduction in dotted rhythm, and its quasi-fugal allegro) worthy of the important place it occupies in Bach's and Handel's art.
Meanwhile great though subordinate activity was also shown in the evolution of a new choral music dependent upon an instrumental accompaniment of more complex function than that of mere support. This, in the hands of the Neapolitan masters, was destined to lead straight to the early choral music of Mozart and Haydn, both of whom, especially Mozart, subsequently learnt its greater possibilities from the study of Handel. But the modus vivendi of the recitative was, to the time became the despised thing; who never showed that thoughtless acquiescence in the easiest means of effect which was already the bane of Italian art. Consequently, while the German output of the 17th century fails to show that rapid attainment of modest maturity which gives much Italian music of the period a permanent if slight artistic value, there is, in spite of much harshness, a stream of noble polyphonic effort in both organ and choral music in Germany from the time of H. Schütz (who was born in 1585 and who was a great friend and admirer of Monteverde) to that of Bach and Handel just a century later. Nor was Germany inactive in the dramatic line, and the 17th-century Italian efforts in comic opera, which were so interesting and so unjustly neglected by historians, formed a parallel, before Handel's maturity, in the work of R. Keiser, and may be traced through him in Handel's first opera, Almira.

The best proof of the insufficiency of 17th-century resources is to be found in the almost tragic blending of genius and failure shown by our English church music of the Restoration. The works of Pelham Humfrey and Blow already show the qualities which with Purcell seem at almost any given moment to amount to those of the highest genius, while hardly a single work has any coherence as a whole. The patchiness of Purcell's music was, no doubt, increased by the influence of French taste then predominant at court. When Pelham Humfrey was sixteen, King Charles II., as Sir Hubert Parry remarks, "achieved the characteristic and subtle stroke of humour of sending him over to France to study the methods of the most celebrated composer of theatrical music of the time in order to learn how to compose English church music." Yet it is impossible to see how such ideas as Purcell's could have been presented in more than French continuity of flow by means of any designs less powerful than those of Bach and Handel. Purcell's ideas are, like those of all great artists, at least sixty years in advance of the normal intellect of the time. But they are unfortunately equally in advance of the only technical resources then conceivable; and Purcell, though one of the greatest contrapuntists that ever lived, is probably the only instance in music of a really high genius born out of due time. Musical talent was certainly as common in the 17th century as at any other time; and if we ask why, unless we are justified in counting Purcell as a tragic exception, the whole century shows not one name in the first artistic rank, the answer must be that, after all, artistic talent is far more common than the interaction of environment and character necessary to direct it to perfect artistic results.

6. Bach and Handel.—It was not until the 18th century had begun that two men of the highest genius could find in music a worthy expression of their grasp of life. Bach and Handel were born within a month of each other, in 1685, and in the same part of Germany. Bach inherited the tradition of polyphonic effort that the German organists and choral writers had steadily maintained throughout the 17th century; and both profited by the Italian methods that were penetrating Germany. In Bach's case it was the Italian art-forms that appealed to his sense of design. Their style did not affect him, but he saw every possibility which the forms contained, and studied them the more assiduously because they were not, like polyphonic texture, his birthright. In recitative his own distinctively German style attained an intensity and freedom of expression which is one of the most moving things in art. Nevertheless, if he handled recitative in his own way it was not for want of acquaintance with the Italian. Moreover, he is very clear as to where his ideas come from, and extremely careful to maintain every art-form in its integrity. Yet his style remains his own throughout, and the first impression of its resemblance to that of his German contemporaries diminishes the more the period is studied. Bach's art thus forms one of the most perfectly systematic and complete records a life's work has ever achieved. His art-forms might be arranged in a sort of biological scheme, and their interaction and genealogy has a clearness which might almost be an object of envy to men of science even if Bach had not demonstrated every detail of it by those wonderful rewritings of his own works which we have described elsewhere (see BACH).

Handel's methods were as different from Bach's as his circumstances. He soon left Germany and, while he never betrayed his birthright as a great choral writer, he quickly absorbed the Italian style so thoroughly as to become practically an Italian. He also adopted the Italian forms, but not, like Bach, from any profound sense of their possible place in artistic system. To him they were effective, and that was all. He did not trouble himself about the permanent idea that might underlie an art-form and typify its expression. He has no notion of a form as anything higher than a rough means of holding music together and maintaining its flow; but he and Bach, alone among their contemporaries, have an unerring sense of all that is necessary to secure this end. They worked from opposite points of view: Bach develops his art from within, until its detail, like that of Beethoven's last works, becomes dazzling with the glory of the whole design; Handel at his best is inspired by a magnificent scheme, in the execution of which he needs condescend to finish of detail only so long as his inspiration does not harden to the next design. Nevertheless it is to the immense sweep and breadth of Handel's choral style, and its emotional force, that all subsequent composers owe their first access to the larger and more mechanical resources of music. (See HANDEL.)

ii. The Symphonic Classes.—After the death of Bach and Handel another change of view, like that of Copernican revolution for which Kant spoke in philosophy, was necessary for the further development of music. Once again it consisted in an inversion of the relation between form and texture. But, whereas at the beginning of the 17th century the revolution consisted mainly in directing attention to chords as, so to speak, harmonic lumps, instead of moments in a flux of simultaneous melodies; in the later half of the 18th century the revolution concerned the larger musical outlines, and was not complicated by the discovery of new harmonic resources. On the contrary, it led to an extreme simplicity of harmony. The art of Bach and Handel had given perfect vitality to the forms developed in the 18th century, but chiefly by means of the reinforcement of polyphonic texture. The new revolution broke down all that (like the shapes of arioso and suite-movement and the balance and contrasts of such choruses as are not fugues) are, after all, of secondary importance; the real centre of Bach's and Handel's technical and intellectual activity is the polyphony; and the more the external shape occupies the foreground the more the work assumes the character of light music. In the article SONATA FORMS we show how this state of things was altered, and attention is there drawn to the dramatic power of a music in which the form is technically prior to the texture. And it is not difficult to understand that Gluck's reform of opera would have been a sheer impossibility if he had not dealt with music of a sonata style, which is capable of changing its character as it unfolds its design.

The new period of transition was neither so long nor so interesting as that of the 17th century. The contrast between the
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Squalid beginnings of the new art and the glories of Bach and Handel is almost as great as that between the monodists and Palestrina, but it appeals far less to our sympathies, because it seems like a contrast between noble sincerity and idle elegance. The new art seems so easy-going and empty that it conceals from us the necessity of the sympathetic historical insight for which the painful experiments of the monodists almost seem to cry aloud. And its boldest rhetorical experiments, such as the fantasias of Philipp Emanuel Bach, show a security of harmony which, together with the very vividness of their realization of modern ideas, must appear to a modern listener more like the hollow rhetoric of a decadent than the prophetic inspiration of a pioneer. And, just as in the 17th century, so in the time before Haydn and Mozart, the work that is most valuable artistically tends to be that which is of less importance historically. The cultivation of the shape of music at the expense of its texture was destined to lead to greater things than polyphonic art had ever dreamt of; but no living art could be achieved until the texture was brought once more into vital, if subordinate, relation to the shape. Thus, far more interesting artistically than the epoch-making earlier pianoforte works of Philipp Emanuel Bach is his historically less fruitful oratorios, and his symphonies, and the rich polyphonic modifications of the modern ideas which appear in the best works of his elder brother Friedemann. Yet the transition-period is hardly second in historic importance to that of the 17th century; and we may gather from it even more direct hints as to the meaning of the tendencies of our own day.

As in the 17th century, so in the 18th the composers and critics of Haydn's youth, not knowing what to make of the new tendencies, and conscious rather of the difference between new and old ideas than of the true nature of either, took refuge in speculations about the emotional and external expression of music; and when artistic power and balance fail it is very convenient to go outside the limits of the art and explain failure away by external ideas. Fortunately the external ideas were capable of serious organic function through the medium of opera, and in that art-form music was passing out of the hands of Italians and assuming artistic and dramatic life under Gluck. The metaphysical and literary speculation which overwhelmed musical criticism at this time, and which produced paper warfarces and musical party-feuds such as that between the Gluckists and the Piccinnists, at all events had this advantage over the Wagnerian and anti-Wagnerian controversies of the last generation and the disputes about the legitimate function of instrumental music at the present day—that it was speculation applied exclusively to an art-form in which literary questions were directly concerned, an art-form which moreover had up to that time been the ground of all the musical composers' chief principles, and which they could put into it. But as soon as music once more attained to consistent principles all these discussions became but a memory. If Gluck's music had not been more musical as well as more dramatic than Piccini's, all its foreshadowings of Wagnerian principles would have availed it no more than it availed Monteverde.

When the new art found symphonic expression in Haydn and Mozart, it became music pure and simple, and yet had no more difficulty than painting or poetry in dealing with external ideas, when these were naturally brought into it by the human voice or the conditions of dramatic action. It had once more become an art which need reject or accept nothing on artificial or extraneous grounds. Beethoven soon showed how gigantic the scale and range of the sonata style could be, and how tremendous was its effect on the possibilities of vocal music, both dramatic and choral. No revolution was needed to accomplish this. The style was perfectly formed, and for the first and so far the only time in musical history a mature art of small range opened out into an equally perfect one of gigantic range, without a moment of decadence or destruction. The chief glory of the art that culminates in Beethoven is, of course, the instrumental music, all of which comes under the head of the sonata-forms (q.v.).

Meanwhile Mozart raised comic opera, both Italian and German, to a height which has never since been approached within the classical limits, and from which the operas of Rossini and his successors show a decadence so deplorable that if "classical music" means "high art" we must say that classical opera buffa begins and ends in Mozart. But Gluck, finding his dramatic ideas encouraged by the eminent theatrical sensibilities of the French, had already given French opera a stimulus towards the expression of tragic emotion which made the classics of the French operatic school well worthy to inspire Beethoven to his one noble operatic effort and Weber to the greatest works of his life. Cherubini, though no more a Frenchman than Gluck, was Gluck's successor in the French classical school of dramatic music. His operas, like his church music, account for Beethoven's touching estimation of him as the greatest composer of the time. In them his melodies, elsewhere curiously cold and prosaic, glow with the warmth of a true classic; and his tact in developing, accelerating and suspending a dramatic climax is second only to Mozart's. Scarcely inferior to Cherubini in mastery and dignity, far more lovable in temperament, and weakened only by inequality of invention, Méhul deserves a far higher place in musical history than is generally accorded him. His most famous work, Joseph, is of more historical importance than his others, but it is by no means his best from a purely musical point of view. It is one of the finest of works to which its composer contributed in the best of his days. But Méhul to make extremely successful experiments in "local colour," which had probably considerable influence upon Weber, whose admiration of the work was boundless. One thing is certain, that the romantic opera of Weber owes much of its inspiration to the opéra comique of these masters.1

8. From Beethoven to Wagner.—After Beethoven comes what is commonly though vaguely described as the "romantic" movement. In its essentials it amounts to little more than this, that musicians found new and prouder titles for a very ancient and universal division of parties. The one party set up a convenient scheme of form based upon the average procedure of all the writers of sonatas except Haydn and Beethoven, which scheme they chose to call classical; while the other party devoted itself to the search for new materials and new means of expression. The classicists, if so they may be called, did not quite approve of Beethoven; and while there is much justification for the charge that has been brought against them of reducing the sonata-form to a kind of game, they have for that very reason no real claim to be considered inheritors of classical traditions. The true classical method is that in which matter and form are so united that it is impossible to say which is prior to the other. The pseudo-classics are the artists who set up a form conveniently like the average classical form, and fill it with something conveniently like the average classical matter, with just such difference as will make their music shine in brilliancy and range. The romanticists are the artists who realize such a difference between their matter and that of previous art as impels them to find new forms for it, or at all events to alter the old forms considerably. But if they are successful the difference between their work and that of the true classics becomes merely external; they are classics in a new art-form. As, however, this is as rare as true classical art is at the best of times, romanticism tends to mean little more than the difference between an unstable artist who cannot master his material and an artist who can, whether on the pseudo-classical or the true classical plane. The term "romantic opera" has helped us to regard Weber as a romanticist in that sphere, but when we call his instrumental works "romantic" the term ceases to have really valuable meaning. As applied to pieces like the Concertstuck, the Invitation à la danse, and other pieces of which the external subject is known either from Weber's letters or from the titles of the pieces themselves, the term means simply "programme-music" such as we have seen to be characteristic of any stage in which the art is imperfectly mastered. Weber's programme-music shows no advance on Beethoven in the illustrative resources of the art; and the application of the term "romantic"

1 We must remember in this connexion that the term opéra comique means simply opera with spoken dialogue, and has nothing to do with the comic idea.
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[GENERAL SKETCH]

to his interesting and in many places beautiful pianoforte sonatas has no definite ground except the brilliance of his pianoforte technique and the helplessness in matters of design (and occasionally even of harmony) that drives him to violent and operatic outbreaks.

Schubert also lends some colour to the opposition between romantic and classical by his weakness in large instrumental designs, but his sense of form was too vital for his defective training to warp his mind from the true classical spirit; and the new elements he introduced into instrumental music, though not ratified by concentration and unity of design, were almost always the fruits of true inspiration and never mere struggles to escape from a difficulty. His talent for purely instrumental music was incomparably higher than Weber's, while that for stage-drama, as shown in the most ambitious of his numerous operas, Fierrabras, was almost nil. But he is the first and perhaps the greatest classical song writer. It was Beethoven's work on a larger scale that so increased the possibilities of handling remote harmonic sequences and rich instrumental and rhythmic effects as to prepare for Schubert a world in which music, no less than literature, was full of suggestions for that concentrated expression of a single emotion which distinguishes true lyric art. And, whatever the defects of Schubert's treatment of larger forms, his songs and his small forms which can be compassed by a single melody or group of melodies is unsurpassable and is truly classical in spirit and result.

Schumann had neither Schubert's native talent for larger form nor the irresponsible spirit which allowed Schubert to handle it uncritically. Nor had he the astounding lightness of touch and perfect balance of style with which Chopin controlled the most wayward imagination that has ever found expression in the pianoforte lyric. But he had a deep sense of melodic beauty, a mastery of polyphonic expression which for all its unorthodox tendency was second only to that of the greatest classics, and an epigrammatic fancy which enabled him to devise highly artistic forms of music never since imitated with success though often unintelligently copied. In his songs and pianoforte lyrics his romantic ideas found perfectly mature expression. Throughout his life he was inspired by a deep reverence which, while it prevented him from attempting to handle classical forms with a technique which he felt to be inadequate, at the same time impelled him as he grew older to devise forms on a large scale externally resembling them. The German lyric poetry, which he so perfectly set to music, strengthened him in his tendency to present his materials in an epigrammatic and antithetic manner; and, when he took to writing orchestral and chamber music, the extension of the principles of this style to the designing of large spaces in rigid sequences of short movements of uniform structure and of uniform height of climax in a form which, though neither classical nor strictly natural, was at all events more true in its relationship to his matter than that of the pseudo-classics such as Hummel or even Spohr. Towards the end of his short life, before darkness settled upon his mind, he rose perhaps to his highest height as regards solemnity of inspiration, though none of his later works can compare with his early lyrics for artistic perfection. Be this as it may, his last choral works, especially the latter parts of Faust (which, unlike the first part, was written before his powers failed), show that the sense of beauty and polyphonic life with which he began his career was always increasing; and if he was led to substitute an artificial and ascetic for a natural and classical solution of the difficulties of the larger art-forms it was only because of his insight into artistic ideals which he felt to be beyond his attainment. He shared with Mendelssohn the inevitable misunderstanding of those contemporaries who grouped all music under one or other of the two heads, Classical and Romantic.

There is good reason to believe that Mendelssohn died before he had more than begun to show his power, though this may be denied by critics who have not thought of comparing Handel's career up to the age at which Mendelssohn's ceased. And his mastery, resting, like Handel's, on the experience of a boyhood comparable only to Mozart's, was far too easy to induce him as a critic to reconcile the idea of high talent with distressing intellectual and technical failure. This same mastery also tended to discredit his own work, both as performer and composer, in the estimation of those whose experience encouraged them to hope that imperfection and over-excitement were infallible signs of genius. And as his facility actually did co-operate with the tendencies of the times to deflect much of his work into pseudo-classical channels, while nevertheless his independence of form and style kept him at all times at a higher level of interest and variety than any mere pseudo-classic, it is not to be wondered that his reputation became a formidable object of sacrifice to those apostles of new ideas who felt that their own works were not likely to make way against academic opposition unless they called journalism to their aid.

Nothing has more confused, hindered and embittered the careers of Wagner and Liszt and their disciples than the paper warfare which they did everything in their power to encourage. No doubt it had a useful purpose, and, as nothing affords a greater field for intrigue than the production of operas, it is at least possible that the gigantic and unprecedentedly expensive works of Wagner might not even at the present day have obtained a hearing if Wagner himself had been a tactful and not an officious politician, as he was, and would have let his partisans and his admirers do the propagating. As to Wagner's achievement there is no more important difference of opinion. It has survived all attacks as the most monumental result music has achieved with the aid of other arts. Its antecedents must be sought in many very remote regions. The rediscovery, by Mendelssohn, of the choral works of Bach, after a century of oblivion, revealed the possibilities of polyphonic expression in a grandeur which even Handel rarely suggested; and inspired Mendelssohn with important ideas in the designing of oratorios as wholes. The complete fusion of polyphonic method with external and harmonic design had, under the same stimulus, been carried a step further than Beethoven by means of Schumann's more concentrated harmonic and lyric expression. That wildest of all romantists, Berlioz, though he had less polyphonic sense than any composer who ever before or since attained distinction, nevertheless revealed important new possibilities in his unique imagination in orchestral colour. The breaking down of the barriers that check continuity in classical opera was already indicated by Weber, in whose Euryanthe the movements frequently run one into the other, while at least twenty different themes are discoverable in the opera, recurring, like the Wagnerian leit-motif, in apt transformation and logical association with definite incidents and persons.

All things undreamed of by Weber were necessary to complete the breakdown of the classical barriers; for the whole pace of musical motion had to be emancipated from the influence of instrumental ideas. This was the most colossal reformation ever attempted by a man of real artistic balance; and even the undoubted, though unpolished, dramatic genius shown in Wagner's libretti (the first in which a great composer and dramatist are one) is but a small thing in comparison with the musical problems which Wagner overcomes with a success immeasurably outweighing any defects his less perfect literary mastery allowed to remain in his dramatic structure and poetic diction. Apart from the squabbles of Wagnerian and anti-Wagnerian journalism, the chief difficulty of his supporters and antagonists really lay in this question of the pace of the music and the consequent breadth of harmony and design. The opening of the Walküre, in which, before the curtain rises, the sound of driving rain is reproduced by very simple sequences that take sixteen long bars to move a single step, does not, as instrumental music, compare favourably for terseness and variety with the first twenty bars of the thunderstorm in Beethoven's Pastoral Symphony, where at least four different incidents faithfully portray not only the first drops of rain and the distant thunder, but all the feelings of depression and apprehension which they inspire, besides carrying the listener rapidly through three different keys in chromatic sequence. But Beethoven's storm
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in church their an many began. five Diaphonia Joachim's range. its development is of ordinary vant thing. the empty have his to also many mental GENERAL however, largeness Without the the things of Brahms's to his compositions was indisputable idea of poetism and the power of the performing art as the reason for the attention which Wagner's works had and their neglect by the critics who were influenced by the anti-Wagnerian movement of the time. Wagner's later works, however, have shown that his sense of harmony and key turns out on investigation to be the classical sense truly adapted to its new conditions. For this very reason it is in detail quite irrelevant to symphonic art; and there was nothing anti-Wagnerian in the reasons why Brahms had so little to do with it in his music, although every circumstance of the personal controversies and thinly disguised persecutions of Brahms's youth were enough to give any upholder of classical symphonic art a rooted prejudice to everything bearing the name of "romantic." Side by side with Wagner many enthusiasts place Liszt; and it is indisputable that Liszt had in mind a larger and slower flow of musical sequence closely akin to Wagner's, and, no doubt, partly independent of it; and moreover that one of Liszt's aims was to apply this to instrumental music. Also his mastery and poetic power as a pianoforte player were faithfully reflected in his later treatment of the orchestra, and ensured an extraordinary rhetorical plausibility for anything he chose to say. But neither the princely magnanimity of his personal character, which showed itself in his generosity alike to struggling artists and to his opponents, nor the great stimulus he gave (both by his compositions and his unceasing personal efforts and encouragement) to new musical ideas on romantic lines, ought at this time of day to blind us to the homeliness and essential vulgarity of his style. These unfortunate qualities did not secure for his compositions immediate popular acceptance; for they were outweighed by the true novelty of his aims. But recently they have given his symphonic poems an attractiveness which, while it has galvanized a belated interest in those works, has made many critics blind to their historical importance as the foundation of new forms which have undergone a development of sensational brilliance under Richard Strauss.

Meanwhile the party politics of modern music did much to distract public attention from the works of Brahms, who carried on the true classical method of the sonata-forms in his orchestral and chamber music, while he was no less great and original as a writer of songs and choral music of all kinds. He also developed the pianoforte lyric and widened its range. Without losing its characteristic unity it assumed a freedom and largeness of expression hitherto only attained in sonatas. Hence, however, Brahms's work, like Bach's, seemed, from its continuity with the classical forms, to look backward rather than forward. Indeed Brahms's reputation is in many quarters that of an academic reactionary; just as Bach's was, even at a time when the word "academic" was held to be rather a title of honour than of reproach. When the contemporary standpoints of criticism are established by the production of works of art in which the new elements shall no longer be at war with one another and with the whole, perhaps it will be recognized once more that the idea of progress has no value as a critical standard unless it is strictly applied to that principle by which every work of art must differ in every part of its form from every other work, precisely as far as its material differs and no further. Then, perhaps, as the conservative Bach after a hundred years of neglect revealed himself as the most profoundly modern force in the music of the 19th century, while that of his gifted and progressive sons became a forgotten fashion as soon as their goal was attained by greater masters, so may the musical epoch that seems now to have closed be remembered by posterity as the age, not of Wagner and the pioneer Liszt, but the age of Wagner and Brahms.

It will also in all probability be remembered as the age in which the performer ceased to be necessarily the intellectual inferior of the composer and musical scholar. With the exception of Wagner and Berlioz every great composer, since Palestrina sang in the papal choir, has paid his way as a performer; but Joseph Joachim was the first who threw the whole mind of a great composer into the career of an interpreter; and the example set by him, Bülow, Clara Schumann and Jenny Lind, though followed by very few other artists, sufficed to dispel for ever the old association of the musical performer with the mountebank.

Joachim's influence on Brahms was inestimable. The two composers met at the time when new musical tendencies were beginning to arouse violent controversy. At the age of twenty-one Joachim had produced in his Hungarian Concerto a work of high classical mastery and great nobility, and his technique in form and texture was then considerably in advance of Brahms's. For some years Joachim and Brahms interchanged contrapuntal exercises, and many of the greatest and most perfect of Brahms's earlier works owe much to Joachim's criticism. Yet it is impossible to regret that Joachim did not himself carry on as a composer the work he so nobly began, when we realize the enormous influence of his playing in the history of modern music. By it we have become familiar with a standard of truthfulness in performance which all the generous efforts of Wagner and Liszt could hardly have rendered independent of their own special propagandas. And by it the record of classical music has been made a matter of genuine public knowledge, with a unique freedom from those popularizing tendencies which invest vulgar error with the authority of academic truth.

In this respect there is a real change in the nature of modern musical culture. No serious composer at the present day would dedicate a great work to an artist who, like F. Clément, for whom Beethoven wrote his Violin Concerto, would perform the work in two portions and between them play a sonata for the violin on one string with the violin upside down. But it is hardly true that Wagner and Liszt produced a real alteration in the standard of general culture among musicians. Their work, especially Wagner's, appealed, like Gluck's, to many specific literary and philosophical interests, and they themselves were brilliant talkers; but music will always remain the most self-centred of the arts, and men of true culture will measure the depth and range of the musician's mind by the spontaneity and truthfulness of his musical expression rather than by his volubility on other subjects. The greatest musicians have not often been masters of more than one language; but they have always been men of true culture. Their humanity has been illuminated by the constant presence of ideals which their artistic mastery keeps in touch with reality.

CHRONOLOGICAL TABLE

Pythagoras, c. 582-500 B.C. Determines the ratios of the diatonic scale.

Aristoxenus, fl. 320 B.C. Our chief authority on classical Greek music.

Ptolemy, fl. A.D. 130. Astronomer, geographer, mathematician and writer on music. Reforms the Greek modes so as to prepare the way for the ecclesiastical modes.

St Ambrose. Arranges the Ambrosian tunes of church music, A.D. 354.

Hucbald, c. 840-930. Systematizer of Diaphonia or Organum (called by him Symphonie), and inventor of a simple and ingenious notation which did not survive him.
Guido of Arezzo, c. 990–1050. Theorist and systematizer of musical notation and solmization.

Franz Caspar Colonna, 15th-century author of treatises on musical rhythm. Works under the name of Franco appear at dates and places which have led to the assumption of the existence of three different authors, who, however, have been partly explained away again and the 16th century is sometimes called the Francoonian period of discant.

Discants positio vulgaris. An anonymous treatise written before 1130; is said to contain the earliest rules for "measured music," i.e., for music in which different voices can sing different rhythms.

The Reading MS., c. 1240 (British Museum, MS. Harl., 978, fol. 11 b.), contains the proem "Sumer is icumen in."


G. Duray, died 1474. 1514-1516. Proprietary composer.

(Thomas Morley was one of the principal founders of artistic counterpoint.)


MASTERS OF THE GOLDEN AGE

[In the following list when a name is not qualified as "church composer" or "madrigalist," the composer is equally great in both lines; but the qualification must not be taken as exclusive.]

Netherland Masters.


French Masters.

E. Genet, surnamed Carpentraso, fl. 1520. Church composer.

C. Goudem. Killed in the massacre of Lyons, 1572.

Italian Masters.

Palestrina, c. 1525–1594.

L. Marenzio, c. 1560; died 1599.


Spanish Masters.

C. Morales, 1512–1553.


T. L. de Victoria or Vittoria, fl. 1562.

English Masters.

T. Tallis, c. 1505; died 1585. Church composer.

W. Byrd, 1542 or 1543–1623. Greatest as church composer.

J. Willbye, fl. 1600. Madrigalist.


Orlando Gibbons, 1583–1625.

German Masters.

J. Handl, or Gallus, c. 1550–1591.

Hans Leo Hasler or Hassler, 1564–1612. Church composer.


The Monodists.

Cavallieri's La Rappresentazione di Anima e di Corpo, posthumously produced in 1600. The first oratorio, one of the first works dependent on instrumental accompaniment, and one of the first with a "figured bass" indicating by figures what chords are to be used.

Perl's Euridice, 1600. The first opera.


The Renaissance of Texture

H. Schütz, 1585–1672. Combines monodic and polyphonic principles in German church music and Italian madrigal.


Alessandro Scarlatti, 1659–1725. Founder of the aria-form of opera.


H. Purcell, c. 1658; died 1695.

A. Corelli, 1653–1713. First classic of the violin in the forms of suite (or sonata da camera), sonata da chiesa and concerto.

F. Couperin, 1668–1733. French composer of suites (ordre) and much addicted to giving fanciful titles to his pieces which are sometimes "programme music" in fact as well as name.


D. Buxtehude, 1637–1707.


G. F. Handel, 1685–1759.

The Sonata Epoch

Domenico Scarlatti, 1685–1757, son of Alessandro. Harpsichord virtuoso and master of a special early type of sonata.

K. Philipp Emanuel Bach, 1715–1788, third son of Sebastian Bach. The principal pioneer of the sonata style.


F. J. Haydn, 1732–1809.

W. A. Mozart, 1756–1791.

Beethoven, 1770–1827.


The Lyric and Dramatic or "Romantic" Period

[In this list the only lyric names given are those of which the complex conditions of modern art make definition easy as well as desirable; and, as throughout this table, the definitions must not be taken as exclusive. The choice of names is, however, guided by the adepts in modern development, thus accounting for glaring omissions and artistic disproportions.]


Schubert, 1797–1828. The classic of song.

Mendelssohn, 1809–1847. The "fifth" of the romantic composers.


 Liszt, 1811–1886. Pianoforte virtuoso and pioneer of the symphonic poem.

Bruckner, 1824–1896. The symphonist of the Wagnerian party.


Tchaikowsky, 1840–1893.


Development of the symphonic poem.

(D. F. T.)

II.—Recent Music

Under separate biographical headings, the work of the chief modern composers in different countries is dealt with; and here it will be sufficient to indicate the general current of the art, and to mention some of the more prominent among recent composers.

On the death of Brahms, the great German composers seemed, at the close of the 19th century, to have left no successor. Such merely epigonal figures as A. Burgert (b. 1846) and Cyril Kistler (1848–1907) could not be regarded as important; and E. Humperdinck's (b. 1854) striking success with Hansel and Gretel (1893) was a solitary triumph in a limited genre. The outstanding figure, at the opening of the 20th century, was Richard Strauss (q.v.); but it was not so much now in composition, as in the high excellence of his interpretative art kept to the highest level of the school of European music, by her schools, her great conductors and instrumentalists, and her devotion as a nation to the production of musical works.

France.—From the earliest days of their music, the French have had the enviable power of assimilating the great innovations which were originated in other countries, without losing their habit of Warzaw's Dissonances. That which happened with the Netherlandish composers of the 16th century, and with Lulli in the 17th, was repeated, more or less exactly, with Rossini in the early part of the 19th century and with Wagner at its close during the last quarter of the 19th century all that is represented by the once-adored name of Gounod was discarded in favour of a style as different as possible from his. The change was mainly due to the Belgian musicians, César Auguste Duparc (1845–1893), with its influence on the school of symphonic and orchestral composition, as opposed to the conventional methods pursued at the Paris Conservatoire. Massenet was left as almost the only representative of the older school, and from Edouard Lalo (1823–1892) to G. Charpentier (b. 1857) and the younger composers of France adopted the newer style. With these may be mentioned Alfred Bruneau (b. 1857), and Gabriel Fauré (b. 1854). Camille Saint-Saëns (b. 1835), however, remained the chief representative of the sound school of composition, if only by reason of his greater command of resources of every kind and his success in all forms of music. Among the newer school of composers the more original unquestionably was Debussy (q.v.), and among others may be mentioned Ernest Reyer (b. 1823), the author of some ambitious and stinging operas; F. L. V. de Joncières (b. 1853), an enthusiastic follower of Wagner, and a composer of modern value Daniel Carbonetti (1841–1904), a man of extraordinary gift, who wrote one of the finest opéras comiques of modern times, Le Roi malgré lui (1887); Charles Marie Widor (b. 1845), an earnest musician of great accomplishment; and Vincent d'Indy (b. 1851), a strongly original, even crass, but unlike in dramatic, orchestral and chamber compositions. In the class of lighter music, which yet lies above the level of opéra bouffe, mention must be made of Léo Delibes (1836–1891) and André Messager (b. 1855). In describing the state of French music in France it would be wrong to leave undone the great conductors of popular orchestral concerts, such as Jules E. Pasdeloup (1819–1897), Chas. Lamoureux (1834– 1899), and Judas [Edouard] Colonne (b. 1838).
solidity of style and impressiveness, from the time when he wrote his earlier operas. As Arrigo Boito's Mefistofele had an immense influence on modern Italian music. Among the writers of "absolutes" music the most illustrious are G. Spogambi (b. 1843) and G. Martucci (b. 1856), the latter's symphony in D minor being a fine example of this type, in which the influence of which the first production was the Flora mirabilis of Spiro Samara (b. 1861), given in 1886. Its culmination was in the Giuseppe Verdi, whose operas - for all, by the fact that he himself created them - had an interesting influence on the church music of Italy (see PALESTRINA). 

Russia.—The new Russian school of music originated with M. A. Balakirev (b. 1837), who was instrumental in founding the Free School of Music in 1862, and the Union of Russian Composers under his presidency. The names of Berlioz and Liszt entered into Russia; he instilled the principles of "advanced" music into A. P. Borodin (1834-1887), C. A. Cui (b. 1835), M. P. Moussorgsky (1839-1881), and N. A. Rimsky-Koroljow (1844-1908), whose works, though written in the eclectic and modernistic period, are still uncompleted. The followers of Liszt, in particular, are of the old school.
works, such as the oratorios, show some tendency to fall back into the conventionalities from which the renaissance movement was an effort to escape; but in The Coler's Saturday Night; The Story of Drury Lane Theatre; at the time it seemed as though English opera had a chance of getting permanently established, but the same spirit, whereas they failed to have a lasting effect upon the art of the country, and after the production of two operas by MacKenzie, two by Arthur Goring Thomas, one by F. Corder, two by Cowen and one by Stanford, the artistic as in the raising of the standard of orchestral playing, but in spite of the strong influence of French ideals and methods, the music of Arthur Goring Thomas was remarkable for individuality and charm; in any other country his beautiful opera Esmeralda would have formed part of the regular repertory; and his orchestral suites, cantatas and a multitude of graceful and original songs, remain as evidence that if his career had been prolonged, the art of England might have been enriched by some masterpiece it would have been a classic back for a year or two. The new operatic society, and a number of variously successful attempts in the more ambitious and more serious branches of the art, Cowen found his chief success in the treatment of fanciful or fairy subjects, which his own nature and circumstances led him to adopt. If his ideas are uniformly graceful, excellently treated and wonderfully effective. His second tenure of the post of conductor of the Philharmonic Society showed a high degree of tastefulness.

In regard to English opera two more undertakings deserve to be recorded. In 1891 the Royal English Opera House was opened with Sullivan's Ivanhoe, a work written especially for the occasion: the absence of anything like a repertory, and the retention of this one work in the bills for a period far longer than its attractions could warrant, brought the inevitable result, and shortly after the production of a charming French comic opera the theatre was closed. This was a case of the characteristic Shamus O'Brien of Stanford was successfully produced in 1896 at the Opéra Comique theatre. This work brought into public prominence the conductor Mr Henry J. Wood (b. 1870), who exercised a powerful influence on the art of the country by means of his orchestra, which was constantly to be heard at the Queen's Hall, and which attained, by continual performance together, a degree of perfection before unknown in England. It achieved an important work in bringing music within the reach of all classes at the Promenade Concerts given through each summer, as well as by means of the Symphony Concerts at other seasons. His training of the Queen's Hall Orchestra was characterized by a thoroughness and severity previously unknown in English orchestras. This was partly made possible by the fact that he carried the inquisitive spirit of Richard Wagner to London; and it was only after considerable meetings in the rooms of Hubert Parry brought about the institution of the Musical Club, which has borne fruit in many ways, though only in the direction of chamber-music. The Bach Choir, founded by Mr Arthur Duke Coleridge in 1875, and conducted for the first ten years of its existence by Mr Otto Goldschmidt and subsequently by Professor Stanford, worked on purely uncommercial lines and was of the greatest importance. The performance of the works of Bach, it brought forward most important compositions by Englishmen, and had a prominent share in the work of the renaissance. Parry's earlier compositions had a certain austerity in the extreme, and the introduction of them presented no difficulties, and prevented their obtaining wide popularity; and it was not until the date of his choral setting of Milton's Ode at a Solemn Musick that he found his true vein. In this and his many successors, probably the most of all in the improvement of the art of choir-singing in London, there was a nobility of utterance, a sobriety of concepcion, a mastery of resource, that far surpass anything accomplished in England since the days of Purell; while his "Symphonic Variations" for orchestra, and at least two of his symphonies, embarked in his command over the modern modifications of classical forms in great perfection. Like Parry, Stanford first caught the ear of the public at large with a choral work, the stirring ballad-setting of Fingal's Cave. This, like many other English compositions, which include compositions in every form, he shows himself a supreme master of effect; in dramatic or lyrical handling of voices, in symphonic treatment of the orchestra, and in the composition of concerted music, and while his ideas have real distinction, his treatment of them is nearly always the chief interest of his works. The work of the musical renaissance has been more beneficially fostered by these than any other, and that Mr Stanford is the most gifted of the Royal College of Music. In 1876 the National Training School of Music was opened with Sullivan as principal; he was succeeded by Sir John Stainer in 1881, and the circumstance that such a school was opened is a fact of importance. There is a strong foundation of their musical education is the only important fact connected with the institution, which in 1882 was succeeded by the Royal College of Music, under the directorship of Sir George Grove. This college, which was incorporated in 1883, has been a great encouragement to the cause of music in this country. In 1894 Parry succeeded to the directorship, and before and after this date work of the best educational kind was done in all branches of the art. The most important branch of composition, MacKenzie's place among the masters of the seventeenth century is assured by his romantic compositions for orchestra—such as La Belle dame sans merci and the two Scottish Rhapsodies; some of his choral
decided merit and individuality, and by being the composer of a symphony which attained greater and wider fame than any similar work by a British composer. In 1897, The Ecstasy of Beatrice (b. 1862) won great success as a writer of incidental music for plays, and in various lighter forms of music, for which his great skill in orchestration and his knowledge of effect stand him in good stead. The same year he was named a Companion of Honour.

Dr Arthur Somervell (b. 1863), who succeeded Stainer as musical adviser to the Board of Education, first came into prominence as a composer of a number of charming songs, and then wrote a series of orchestral pieces, for which his Royal College of Music, were received with acclamation; but his later work was not of equal value, though his operas Jessie Dow and Dauid were successful. Mr Granville Bantock (b. 1876) is another of our young composers who have written many fine things for orchestra, and Mr William Wallace (b. 1861), in various orchestral pieces played at the Crystal Palace and elsewhere, and in such things as his "Freebooter" songs, has shown of English traditional music. Mr Arthur Hinton (b. 1869) has produced things of fanciful beauty and quaint originality. Miss Ethel M. Smyth, whose Mass was given at the Royal Albert Hall in most favourable conditions, had her opera Fantasia performed by the Westminster Orpheus Chorus and a Band of Music at the Crystal Palace Garden. Miss Maud Valerie White's graceful and expressive songs brought her compositions into wide popularity; and Mme Liza Lehmann (b. 1870), a pupil of Paderewski, has been reclaimed from her retirement from the profession of a singer. The first part of Mr S. Coleridge-Taylor's (b. 1875) Hiawatha scenes was performed while he was still a student at the Royal College, and so great was its success that it was published, and became, what was later to be a war song, for performance by the Royal Choral Society. Mr Cyril Scott is a composer who aims high, though with a somewhat strained originality. Dr H. Walford Davies (b. 1869) and W. Y. Hurst (1876-1906) excelled in the serious kind of chamber-music and use the classic forms with notable skill; and Mr R. Vaughan Williams, in his songs and other works, has shown perhaps the most conspicuous talent among all the younger British composers.

British composers have suffered from foreign competition in the same degree as English composers, and the success of such as Miss Anna Williams, Miss Macintyre, Miss Marie Brema, Miss Clara Butt, Miss Agnes Nicholls, Messrs Santley, Edward Lloyd, Ben Davies, Plunket Greene and Franchinus Davies; or of such pianists as Miss Fanny Davies and Mr Leonard Borwick, is but a continuance of the tradition of British excellence. The British contribution to the art of the magazine - the musical monthly - has been decided upon its place as a branch of musical education; the learned writings of W. S. Rockstro (1832-1895), many of them made public first in the Encyclopaedia Britannica and Grove's Dictionary of Music and Musicians, have lit the way, like the many other 

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MUSICAL-BOX

MUSICAL NOTATION

The position no the perforated forestalled the ingenious Biographical manuscript the See This the complicated accomplished the

and the web or long sheet of paper passes over the instrument the perforated holes are brought in proper position and sequence under the influence of the suction or pressure of air from a bellows, and by the leverage of the pins that engage the teeth of the cylinders, the perforations act as reed instruments, or the opening and closing of valves set in motion levers or liberate springs which govern special notes. The United States are the original home of the instruments controlled by perforated paper known as perforators of organs, etc., and the

All these instruments are being gradually replaced in popular favour by the piano-players and the gramophone.

(M. S.)

MUSICAL NOTATION, a pictorial method of representing sounds to the ear through the medium of the eye. It is probable that the earliest attempts at notation were made by the Hindus and Chinese, from whom the legacy was transferred to Greece. The exact nature of the Greek notation is a subject of dispute, different explanations assigned to it, and plans for setting up their alphabetical method of delineation. To bothius we owe the certainty that the Greek notation was not adopted by the Latins, although it is not certain whether he was the first to apply the fifteen letters of the Roman alphabet to the scale of sounds included within the two octaves, or whether he was only the first to make record of that application. The reduction of the scale to the octave is ascribed to St Gregory, as also the naming of the seven notes, but it is not safe to assume that such an ascription is accurate or final. Indications of a scheme of notation based, not on the alphabet, but on the use of dashes, hooks, curves, dots and strokes are found to exist as early as the period of the hebrews, with the cards of the 15th century to the alphabetical method of delineation.

The origin of these signs, known as neumes (peliara, or notes), is the full stop (punctus), the comma (virgo), and the mound or undulating line (clivus), the first indicating a short sound, the second a long sound, and the third a group of notes. The musical intervals were suggested by the distance of these signals from the words of the text. The variety of neumes employed at different times, and the fluctuations due to handwriting, have made them extremely difficult to decipher. In the 10th century a marked advance is shown by the use of a red line traced horizontally above the text to give the singer a fixed note (feu fa), thus helping him to approximate the intervals. This was added a second line in yellow (for C=ut), and finally a staff arose from the further addition of two black lines over these. The difficulty of the subject is complicated for the student by the fact that an incredible variety of notations coexisted at one period, all more or less representing attempts in the direction of the modern system. A variety of experiments resulted in the assignment of the four-lined staff to sacred music and of the five-lined staff to secular music. The yellow and red colours were replaced by the use of the letters F and C (la and ut) on the lines. This use of letters to indicate clef is forestalled in a manuscript of Guido of Arezzo's Micrologus, dating from the 12th century, in which is the famous hymn to St John, printed with neumes on a staff of three lines (see Guido of Arezzo). The use of letters for indicating clefs has survived to the present day, our clef signatures being modified forms of the letters C, F and G, which have passed through a multitude of shapes. Before the 12th century there is no trace of a measured notation (i.e. of a numerical time division separating the component parts of a piece of music). It is at the time of Franco of Cologne3 that measured music takes its rise, together with the black notation in place of neumes, which disappeared altogether by the end of the 14th century.

Writing four hundred years after St Gregory, Cottonus complains bitterly of the defects in the system of neumes.4 "The same melody on which Master Trudo sang as thirds, were sung as fourths by Master Albinus; while Master Salomo asserts that sixths are the notes meant, so at last there were many methods of singing as teachers of the art." Possibly the recklessness multiplication of lines in the staff may have contributed to the obscurity of which Cottonus complains. In the black notation, which led to the modern system, the square note with a tail (♩) is the long sound; the square note

3 See S. de Caus, Les forces mouvantes; and article Barrel Organ.

4 The principles of Franco are found in the treatises of Walter Odington, a monk of Evesham who became archbishop of Canterbury in 1228.
without a tail (4) is the breve; and the lozenge shape (6) is the semibreve. In a later development there were added the double long (7) and the minutum (8). The breve, according to Franco of Cologne, was the unit of measure. The development of a fixed time division was further continued by Philippe de Vitry. It has been noted with well-founded astonishment that at this time the double time (i.e. two to the bar) was unknown, in spite of this being the time used in marching and also illustrated in the process of breathing. Triple time (i.e. three to the bar) was regarded as the most perfect because it was indivisible. It was as if there lay some mysterious enchantment in a number that could not be divided into equal portions without the fraction. "Triple time," says Jean de Muris, "is called perfect, according to Franco, a man of much skill in his art, because it hath its name from the Blessed Trinity which is pure and true perfection."

Vitry championed the rights of imperfect time and invented signs to distinguish the two. The perfect circle (6) represented the perfect or triple time; the half circle (7) the imperfect or double-time. This C has survived in modern notation to indicate four-time, which is twice double-time; when crossed it is double-time. The method of dividing into perfect and imperfect was described as prolaction. The addition of a point to the circle or semi-circle (6 6) indicated major prolaction; its absence, minor prolaction. The substitution of white for black notation began with the first year of the 14th century and was fully established in the 15th century.

It has already been shown how the earlier form of alphabetical notation was gradually superseded by one based on the attempt to represent the relative height and depth of sounds pictorially. The alphabetical nomenclature, however, became inextricably associated with the pictorial system. The two conceptions reinforced each other; and from the hexachordal scale, endowed with the solmization of ut, re, mi, fa, sol, la—which was a device for identifying notes by their names when talked of, rather than by their positions when seen on a page of music—arose the use of what are now known as accidentals. Of these it may here be said that the flat originated from the necessity of sinking the B of the scale in order to form a hexachord on the note F in such a way as to cause the semitone to fall in the right place—which in the case of all hexachords was between the third and fourth notes. This softened B was written in a rounded form thus: 8 (rotundum), while the original B remained square thus: B (quadratum). The original conception of the sharp was to cross or lattice the square B, by which it was shown that it was neither to be softened nor to remain unchanged. This flat, which originated in the 10th century, appears to have been of far earlier date than the sharp, the invention of which has been ascribed to Joquin Des Prés (1450-1521). The B-sharp was called B cancellatum, the cross being formed thus X. The use of key signatures constructed out of these signs of sharp and flat was of comparatively late introduction. The key signature states at the beginning of a piece of music the sharps and flats which it contains within the scale in which it is written. It is a device to avoid repeating the sign of sharp and flat with every fresh occasion of their occurring. The exact distinction between what were accidental sharps or flats, and what were sharps or flats in the key, was still undetermined in the time of Handel, who wrote the Suite in E containing the "Harmonious Blacksmith" with these sharps instead of four. The double b (sometimes written b or ) and the double sharp (sometimes written X, or ) were introduced as a result of the demand for music to be called into existence by the demands of modern music, while the sign of natural (7) is the outcome of the original B quadratum or square B B.

The systems known as Tonic Sol Fa and the Galin-Paris-Chevé methods do not belong to the subject of notation, as they are ingenious mechanical substitutes for the experimentally developed systems analysed above. The basis of these substitutes is the reference of all notes to key relationship and not to pitch.


MUSIC HALLS

The variety theatre or the "music-hall" of to-day developed out of the "saloon theatres," which existed in London about 1820—1840; they owed their form and existence to the restrictive action of the "patent" theatres at that time. These theatres had the exclusive right of representing what was broadly called the "legitimate drama," which ranged from Shakespeare to Monk Lewis, and from Sheridan and Goldsmith to Kotzebue and Alderman Birch of Cornhill, citizen and poet, and the founder of the turtle-soup trade. The patent houses defended their rights when they were attacked by the "minor" and "saloon" theatres, but they often acted in the spirit of the dog in the manger. While they pursued up to fine and even imprisonment the poachers on their dramatic preserves, they were often quite happy to neglect the "legitimate drama" for the supposed meretricious attractions offered by their illegitimate competitors. The British theatre gravitated naturally to the inn or tavern. The tavern was the source of life and heat, and warmed all social gatherings. The inn galleries offered rather rough stages, before the Shakespeare and Alcey playhouses were built. The inn yards were often made as comfortable as possible for the "groundlings" by layers of straw, but the tavern character of the auditorium was never concealed. Excisable liquor was always obtainable, and the superior members of the audience, who chose to pay for seats at the side of the stage or platform (like the "avant-scène" boxes at a Parisian theatre), were allowed to smoke Raleigh's Virginian weed, then a novel luxury. This was, of course, the first germ of a "smoking-theatre."

While the drama progressed as a recognized public entertainment in England, and was provided with its own buildings in the town, or certain booths at the fairs, the Crown exercised its patronage in favour of certain individuals, giving them power to set up playhouses at any time in any parts of London and Westminster. The first and most important grant was made by Charles II. to his "trusty and well-beloved" Thomas Killigrew "and Sir William Davenant." This was a personal grant, not connected with any particular sites or buildings, and is known chiefly Liturgical (Historical Music Loan Exhibition, Albert Hall, Killigrew was the author of several unsuccessful plays, and Sir William Davenant, said to be an illegitimate child of William Shakespeare, was a stage manager of great daring and genius. Charles II. had strong theatrical leanings, and had helped to arrange the court ballets at Versailles for Louis XIV. The Killigrew and Davenant patent in course of time descended, after a fashion, to the Theatres Royal, Covent Garden and Drury Lane, and was and still is the chief legal authority governing these theatres. The "minor" and outlying playhouses were carried on under the Music and Dancing Act of George II., and the annual licences were granted by the local magistrates. These are the prehistoric form of the inn or tavern, or, as it was called in the days from the inn or tavern, it was now the turn of the inn or tavern to develop into a place of amusement, and to lay the foundation of that enormous middle-class and lower middle-class institution of interest which we agree to term the music hall. It rose from the most modest, humble and obscure beginning—from the public-house bar-parlour, and its weekly "sing-songs," chiefly supported by voluntary talent from the "harmonic meetings" of the "long-room" upstairs, generally used as a Foresters' or Masonic club-room, where one or two professional singers were engaged and a regular chairman was appointed, to the "assembly-room" entertainments at certain hotels, where private balls and school festivals formed part of an irregular series.

The district "tea-garden" which was then an agreeable feature of suburban life—the suburbs being next door to the city and the country next door to the suburbs—was the first to show dramatic
ambition, and to erect in some portion of its limited but leafy grounds a latch-and-plaster stage large enough for about eight people to move upon without incurring the danger of falling off into the adjoining fish pond and fountain. A few classical statues in plaster, always slightly mutilated, gave an educational tone to the place, and with a few coloured oil-lamps hung amongst the bushes the proprietor felt he had gone as near the "Royal Vauxhall Gardens" as possible for the small charge of a sixpenny refreshment ticket. There were degrees of quality, of course, amongst these places, which answered to the German beer-gardens, though with inferior music. The Beulah Spa at Norwood, the White Conduit House at Pentonville, the Yorkshire Stingo in the Marylebone Road, the Monster at Finsico, the St Helena at Rotherhithe, the Globe at Mile End; the Red Cow at Dalston, the Highbury Barn at Highbury, the Manor House at Mare Street, Hackney, the Rosemary Branch at Hoxton, and other rus-in-urbe retreats, were up to the level of their time, if rarely beyond it.

The suspended animation of the law—the one Georgian act, which was mainly passed to check the singing of Jacobite songs in the tap-rooms and tea-gardens of the little London of 1730, when the population of the United Kingdom was about six millions—encouraged the growth eventually of a number of "saloon theatres" in various London districts, which were allowed under the head of "Music and Dancing" to go as far on the light dramatic road as the patent theatres thought proper to permit. The 25 Geo. II. c. 36, which in later days was still the only act under which the music halls of forty millions and more of people were licensed, was always liberally interpreted, as long as it kept clear of politics.

The "saloon theatres," always being taverns or attached to taverns, created a public who liked to mix its dramatic amusements with smoking and light refreshments. The principal "saloons" were the Effingham in the Whitechapel Road, the Bower in the Lower Marsh, Lambeth, the Albert at Islington, the Britannia at Hoxton, the Grecian in the City Road, the Union in Shoreditch, the Stingo at Paddington and several others of less importance. All these places had good companies, especially in the winter, and many of them nourished leading actors of exceptional merit. The dramas were chiefly rough adaptations from the contemporary French stage, occasionally flying as high as Alexandre Dumas the elder and Victor Hugo. Actors of real tragic power lived, worked and died in this confined area. Some went to America, and acquired fame and fortune; and among others, Frederick Robson, who was trained at the Grecian, first when it was the leading saloon, then a coffee house, and lastly a billiard hall (a distinction with little difference), fought his way to the front after the abolition of the "patent rights" and was accepted as the greatest tragi-comic actor of his time. The Grecian saloon theatre, better known perhaps, with its pleasure garden or yard, as the Eagle Tavern, City Road, which formed the material of one of Charles Dickens's Sketches by Boz, was a place managed with much taste, enterprise and discretion by its proprietor, Mr Rouse. It was the "saloon" where the one and only attempt, with limited means, was ever made to import almost all the original repertory of the Opéra Comique in Paris, with the result that many musical works were presented to a sixpenny audience that had never been heard before nor since in England. Aubé, Hérold, Adolphe Adam, Boieldieu, Grétry, Donizetti, Bellini, Rossini and a host of others gave some sort of advanced musical education, through the Grecian, to a rather depressing part of London, long before board schools were established. The saloon theatres rarely offended the patent houses, and when they did the law was soon put in motion to show that Shakespeare could not be represented with impunity. The Union Saloon in Shoreditch, then under the direction of Mr Samuel Lane, who afterwards, with his wife, Mrs Sara Lane, at the Britannia Saloon, became the leading local theatrical manager of his day, was tempted in 1834 to give a performance of Othello. It was "raided" by the then rather "new police," and all the actors, servants, audience, directors and musicians were taken into custody and marched off to Worship Street police station, confined for the remainder of the night, and fined and warned in the morning. The same and only law still exists for those who are helping to keep a "disorderly house," but there are no holders of exclusive dramatic patent rights to set it in motion. The abolition of this privileged monopoly was effected about this time by a combination of distinguished literary men and dramatists, who were convinced, from observation and experience, that the patent theatres had failed to nurse the higher drama, while interfering with the beneficial freedom of public amusements.

The effect of Covent Garden and Drury Lane on the art of acting had resulted chiefly in limiting the market for theatrical employment, with a consequent all-round reduction of salaries. They kept the Lyceum Theatre (or English Opera House) for years in the position of a music hall, giving sometimes two performances a night, like a "gaff" in the New Cut or Whitechapel. They had not destroyed the "star" system, and Edmund Kean and the boy Betty—the "Infant Roscius"—were able to command sensational rewards. In the end Charles Dickens, Sir Edward Bulwer-Lytton, Sir Thomas Noon Tailourd and others got the patents abolished, and the first step towards freedom in the theatre was accomplished. The patent theatres were under the control of a Crown officer, changing with ministries. This was the lord chamberlain for the time being. The lord chamberlain of this period drew a hard-and-fast line between theatres under his control, where no smoking and drinking were allowed "in front," and theatres or halls where the old habits and customs of the audience were not to be interfered with. These latter were to go under the jurisdiction of the local magistrates, or other licensing authorities, under the 25 Geo. II. c. 36—The Music and Dancing Act—and so far a divorce was decreed between the taverns and the playhouses. The lord chamberlain eventually made certain concessions. Refreshment bars were allowed at the lord chamberlain's theatres in unobtrusive positions, victualled under a special act of William IV., and private smoking-rooms were allowed at most theatres on application. All this implied that stage plays were to be kept free from open smoking and drinking, and miscellaneous entertainments were to enjoy their old social freedom. The position was accepted by those "saloon theatres" which were not tempted to become lord chamberlain houses, and the others, with many additions, formed the public saloons.

Amongst the first of these halls, and certainly the very first as far as intelligent management was concerned, was the Canterburry in the Lower Marsh, Lambeth, which was next door to the old Bower Saloon, then transformed into a "minor theatre." The Canterbury sprang from the usual tavern germ, its creator being Mr. Charles Morton, who honourably earned the name of the "dozen of the music halls." It justified its title by cultivating the best class of music, and exposed the prejudice and unfairness of Flanché's sarcasm in a Haymarket burlesque—"most music hall—most melanoly." Mr Charles Morton added pictorial art to his other attractions, and obtained the support of Punch, which stamped the Canterbury as the "Royal Academy over the water." At this time by a mere accident Gounod's great opera of Faust, through defective international registration, fell into the public domain in England and became common property. The Canterbury, not daring to present it with scenery, costumes and action, for fear of the Stage-play Act, gave what was called "An Operatic Selection," the singers standing in plain dresses in a row, like pupils at a school examination or a chorus in an oratorio at Exeter Hall. The music was well rendered by a thoroughly competent company, night after night, for a long period, so that by the time the opera attracted the tardy attention of the two principal opera managers at Her Majesty's Theatre in the Haymarket and Covent Garden Theatre, the tunes most popular were being
whistled by the "man in the street," the "boy in the gutter" and the tradesman waiting at the door for orders.

With the Canterbury Hall, and its brother the Oxford in Oxford Street—a converted inn and coaching yard—built and managed on the same lines by Mr Charles Morton, the music halls were well started. They had imitators in every direction—some large, some small, and several with architectural pretensions, but all anxious to attract the public by cheap prices and physical comforts not attainable at any of the regular theatres.

With the growth and improvement of these "Halls," the few old cellar "singing-rooms" gradually disappeared. Evans's in Covent Garden was the last to go. Rhodes's, or the Cyder Cellars in Maiden Lane, at the back of the Adelphi Theatre; the Coal Hole, in the Strand, which now forms the site of Terry's Theatre; the Doctor Johnson, in Fleet Street (oddly enough, within the precincts of the City of London) disappeared one by one, and with them the compound material for Thackeray's picture of "The Cave of Harmony." This "Cave," like Dickens's "Old Curiosity Shop," was drawn from the features of many places. To do the "cellars" a little justice, they represented the manners of a past time—heavy suppers and heavy drinks, and the freedom of their songs and recitations was partly due to the fact that the audience and the actors were always composed of men. Thackeray clung to Evans's to the last. It was his nightly "chapel of ease" to the adjoining Garrick Club. In its old age it became decent, and ladies were admitted to a private gallery, behind screens and a convenant grille. Before its death, and its revival in another form as a sporting club, it admitted ladies both on and off the stage, and became an ordinary music hall.

The rise and progress of the London music halls naturally excited a good deal of attention and jealousy on the part of the regular theatres, and this was increased when the first Great Variety Theatre was opened in Leicester Square. The building was the finest example of Moorish architecture on a large scale ever erected in England. It was burnt down in the 'eighties, and the present theatre was built in its place. Originally it was "The Panopticon," a palace of "recreative science," started under the most distinguished direction on the old polytechnic institution lines, and with ample capital. It was a commercial failure, and after being tried for "American Clubs," it was turned into a great variety theatre, the greatest of its kind in Europe, under the name of the Alhambra Palace. Its founder was Mr E.T. Smith, the energetic theatrical manager, and its developer was Mr Frederick Strange, who came full of spirit and money from the Crystal Palace. He produced in 1865 an ambitious ballet—the Dagger Ballet from Auber's Enfant prodigue, which had been seen at Drury Lane Theatre in 1851, translated as "Azazel."

The Alhambra was prosecuted in the superior courts for infringing the Stage-play Act—the 6 & 7 Vict. c. 68. The case is in the law reports—Wigan v. Strange; the ostensible plaintiffs being the well-known actors and managers Horace Wigan and Benjamin Webster, supported by J. B. Buckstone, and the London Alhambra Company. After a long trial before the eminent judges, with eminent counsel on both sides, produced a decision which was not very satisfactory, and far from final. It held that, as far as the entertainment went, according to the evidence tendered, it was not a ballet representing any distinct story or coherent action, but it might have been a "divertissement"—a term suggested in the course of the trial. A short time after this a pantomime scene was produced at the same theatre, called Where's the Policeman which had a clown, a pantaloone, a columbine and a harlequin, with other familiar characters, a mob, a street and even the traditional red-hot poker. This inspired proceedings by the same plaintiffs before a police magistrate at Marlborough Street, who inflicted the full penalties—£50 a performance for 12 performances, and costs. An appeal was made to the Westminster quarter sessions, supported by Serjeant Ballantyne and opposed by Mr Hardinge Giffard (afterwards Lord Chanceller Halsbury), and the conviction was confirmed. Being heard at quarter sessions, there is no record in the law reports.

These and other prosecutions suggested the institution of a parliamentary inquiry, and a House of Commons select committee was appointed in 1866, at the instigation of the music halls and variety theatres. The committee devoted much time to the inquiry and evidence amongst the rest Lord Sydney, the lord chamberlain, who had no personal objection to undertake the control of these comparatively young places of amusement and recreation. Much of the evidence was directed against the Stage-play Act, as the difficulty appeared to be to define what was not a stage play. Lord Denman, Mr Justice Byles, and other eminent judges seemed to think that any song, action or recitation that excited the emotions might be pinned as a stage-play, and that the old definition—"the representation of any action by a person (or persons) acting, and not in the form of narration"—could be supported in the then state of the law in any of the higher courts. The variety theatres on this occasion were encouraged by what had just occurred at the time in France. Napoleon III., acting under the advice of M. Michel Chevalier, passed a decree known as La Liberté des théatres, which fixed the status of the Parisian and other music halls. Operettas, ballets of action, ballets, vaudevilles, pantomimes and all light pieces were allowed, and the managers were no longer legally confined to songs and acrobatic performances. The report of the select committee of 1866, signed by the chairman, Mr (afterwards Viscount) Goschen, was in favour of granting the variety theatres and music halls the privileges they asked for, which were those enjoyed in France and other countries.

Parliamentary interference and the introduction of several private bills in the House of Commons which came to nothing, checked, if they did not altogether stop, the prosecutions. The variety theatres advanced in every direction in number and importance. Ballets grew in splendour and coherence. The lighting and ventilation, the comfort and decoration of the various "palaces" (as many of them were now called) improved, and the public, as usual, were the gainers. Population increased, and the six millions of 1750 became forty millions and more. The same and only act (25 Geo. II. c. 36), adequate or inadequate, still remained. London is defined as the "administrative county of London," and its area—the 16 boroughs—锐 across our The Metropolitan Board of Works retired or was disorganized, and the London County Council was created and has taken its place. The London County Council, with extended power over structures and structural alterations, acquired the licensing of variety theatres and music halls from the local magistrates (the Middlesex, Surrey, Tower Hamlets and other magistrates) within the administrative county of London. The L. C. C. examine and enforce their powers. They have been advised that they can separate a music from a dancing licence if they like, and that when they grant the united licence the dancing means the dancing of paid performers on a stage, and not the dancing of the audience on a platform or floor, as at the short-lived "divertissement"-type of the London County Council. They are also advised that they can withhold licences, unless the applicants agree not to apply for a drink licence to the local magistrates sitting in brevity sessions, who still retain their control over the liquor trade. Theatre licences are often withheld unless a similar promise is made—the drink authority in this case being the Excise, empowered by the Act of William IV. (5 & 6 Will. IV. c. 39, s. 7).

The spread of so-called "sketches"—a kind of condensed drama or farce—in the variety theatres, and the action of the London County Council in trying to check the extension of refreshment licences to these establishments, with other grounds of disquiet on the part of managers (individuals or "limited companies"), led to the appointment of a second select committee of the House of Commons in 1892 and the production of another blue-book. The same ground was gone over, and the same objections were raised against a licensing authority
which is elected by public votes, only exists for three years
before another election is due, and can give no guarantee for
the continuity of its judgments. The consensus of opinion
(as in 1866) was in favour of a state official, responsible to
parliament—like the Home Office or the Board of Trade—the
preference being given to the lord chamberlain and his staff,
who know much about theatres and theatrical business. The
chairman of the committee was Lord Rathmore, and the report in
spirit was at once as the one of 1866. Three forms of licence were suggested:
one for theatres proper, one for music halls, and one for concert
rooms.

Though the rise and progress of the music hall and variety theatre interest is one of the most extraordinary facts of the
last half of the 19th century, the business has little or no
corporate organization, and there is nothing like a complete
registration of the various properties throughout the United
Kingdom. In London the "London Entertainments Pro-
tection Association," which has the command of a weekly
called the Music Hall and Theatre Review, looks after its
interests. In London alone over five millions sterling of
capital is said to be invested in these enterprises, employing
80,000 persons of all grades, and entertaining during the year
about 25,000,000 people. The annual applications for music
licences in London alone are over 300.

MUSK (Med. Lat. muscUS, late Gr. iboxos, possibly Pers.
mushe, from Sansk. muska, the scrotum), the name originally
given to a perfume obtained from the strong-smelling substance
secreted in a gland by the musk-deer (q.v.), and hence applied to
other animals, and also to plants, possessing a similar odour.
The variety which appears in commerce is a secretion of the
musk-deer, but the odour is also emitted by the musk-ox and
musk-elk of India and Europe, by the musk-duck (Bistrula
lobata) of West Australia, the musk-shrew, the musk-beetle
(Callimora moschata), the alligator of Central America, and by
several other animals. In the vegetable kingdom it is present
in the common musk (Mimulus moschatus), the musk-wood
of the Guianas and West Indies (Guarea, spp.), and in the seeds of
Hibiscus Abelmoschus (musk-seeds). To obtain the perfume
of the musk-deer the animal is killed and the gland com-
pletely removed, and dried, either in the sun, on a hot stone,
or by immersion in hot oil. It appears in commerce as "musk
in pod," i.e. the glands are entire, or as "musk in grain," in
which the perfume has been extracted from its receptacle.
Three kinds are recognized: (1) Chinese or Tibetan, imported
from China, the most valued; (2) Assam or Nepal, less
valuable; and (3) Karbardin or Russian (Siberian), imported
from Central Asia by way of Russia, the least valuable and
hardly admitting of adulteration. The Tong-king musk is
exported in small, gaily decorated caddies with tin or lead
linings, wherein the perfume is sealed down; it is now usually
transmitted direct by parcel post to the merchant.

Good musk is of a dark purplish colour, dry, smooth and
unctuous to the touch, and bitter in taste. It dissolves in boiling
water to the extent of about one-half; alcohol takes up one-third
of the substance, and ether and chloroform dissolve still less.
A special method, practised by the Chinese, renders it soluble
in air without any appreciable loss of weight, and its scent is not
only more penetrating but more persistent than that of any
other known substance. In addition to its odoriferous principle,
it contains ammonia, cholesterol, fatty matter, a bitter resinous
substance, and other animal principles. As a material in
perfumery it is of the first importance, its powerful and enduring
odor giving strength and permanency to the vegetable essences,
so that it is an ingredient in many compounded perfumes.

Artificial musk is a synthetic product, having a similar odour to
natural musk. It was obtained by Baur in 1888 by condensing
toluene with isobutyl bromide in the presence of aluminium chloride,
and nitrating the product. It is a symtrinitro-β-butyl toluene.
Many modifications have been made, and it appears that the
odor depends upon the symmetry of the three nitro groups.

MUSK-DEER (Moschus moschiferus), an aberrant member of
the deer family constituting the sub-family Cervidae Moschinae
(see DEER). Both sexes are devoid of antler appendage;
but in this the musk-deer agrees with one genus of true deer
(Hyelaphus), and as in the latter, the upper canine teeth of
the males are long and sabre-like, projecting below the chin,
with the ends turned somewhat backwards. In size the musk-
deer is rather less than the European roe-deer, being about
20 in. high at the shoulder. Its limbs, especially the hinder
pair, are long; and the feet remarkable for the great develop-
ment of the lateral pair of hoofs and for the freedom of motion
they all present, which must be of assistance to the animal
in steadying it in its agile bounds among the crags of its native
haunts. The ears are large, and the tail rudimentary. The
hair covering the body is long, coarse, and of a peculiarly
brittle and pith-like character, breaking easily; it is generally
of a greyish-brown colour, sometimes inclined to yellowish-red,
and often variegated with lighter patches. The musk-deer
inhabits the forest districts in the Himalaya as far west as
Gilgit, always, however, at great elevations—being rarely
found in summer below 8000 ft. above the sea-level, and ranging
as high as the limits of the thickets of birch, rhododendron
and juniper, among which it mostly conceals itself in the day-
time. The range extends into Tibet, Siberia and north-
western China; but the musk-deer of Kansu has been separated
as a distinct species, under the name of M. sikinicus. Musk-
deer are hardy, solitary and retiring animals, chiefly nocturnal
in habits, and almost always found alone, rarely in pairs and
never in herds. They are exceedingly active and surefooted,
having perhaps no equal in traversing rocks and precipitous
ground; and they feed on moss, grass, and leaves of the plants
which grow on the mountains.

Most mammals have certain portions of the skin specially
modified and provided with glands secreting odorous and fatty
substances characteristic of the particular species. The special
gland of the musk-deer, which has made the animal so well
known, and has proved the cause of unremitting persecution
to its possessor, is found in the male only, and is a sac about
the size of a small orange, situated beneath the skin of the
abdomen, the orifice being immediately in front of the prepu
tial aperture. The secretion with which the sac is filled is
dark brown or chocolate in colour, and when fresh of the
consistence of "moist gingerbread," but becoming dry and granular
after keeping (see Musk). The Kansu (M. sikinicus) differs from
the typical species in having longer ears, which are black on
the outer surface.

MUSKEGON, a city and the county-seat of Muskegon
county, Michigan, U.S.A., on Muskegon lake, an expansion of
Muskegon river near its mouth, about 4 m. from Lake
Michigan and 38 m. N.W. of Grand Rapids. Pop. (1890),
22,702; (1900), 20,818, of whom 6236 were foreign-born;
(1910 census) 24,062. It is served by the Grand Trunk, the Père Marquette, the Grand Rapids & Indiana, and the Grand Rapids, Grand Haven & Muskegon (electric) railways, and by steamer lines to Chicago, Milwaukee and other lake ports. There are several summer resorts in the vicinity. As the gifts of Charles H. Hackley (1837-1905), a rich lumberman, the city has an endowment fund to the public schools of about $2,000,000; a manual training school, which has an endowment of $600,000, and is one of the few endowed public schools in the United States; a public library, with an endowment of $275,000; a public hospital with a $600,000 endowment; and a poor fund endowment of $300,000. In Hackley Park there are statues of Lincoln and Farragut, and at the Hackley School there is a statue of McKinley; all three are by C. H. Niehaus. The municipality owns and operates its water-works. Muskegon lake is 5.5 miles long and 1.5 miles, meaning "it has a depth of 30 to 40 ft., and is ice-free throughout the year. The channel from Muskegon lake to Lake Michigan has been improved to a depth of 20 ft., and a width of 300 ft. by the Federal government since 1857. From Muskegon are shipped large quantities of lumber and market-garden produce, besides the numerous manufactures of the city. The total value of all factory products in 1904 was $6,319,441 (39.6% more than in 1900), of which more than one-sixth was the value of lumber. A trading post was established here in 1812, but a permanent settlement was not established until 1834. Muskegon was laid out as a town in 1839, incorporated as a village in 1861, and chartered as a city in 1865. The name is probably derived from a Chippewa word for musker or musker, meaning "grassy bog," still used in that sense in north-western America.

MUSKET (Fr. mousquet, Ger. Muskete, &c.), the term generally applied to the infantry soldier from about 1550 up to and even beyond the universal adoption of rifled small arms about 1850-1860. The word originally signified a male sparrowhawk (Italian moscheto, derived perhaps ultimately from Latin musca, a fly) and its application to the weapon may be explained by the practice of naming firearms after birds and beasts (cf. falcon, basilisk). Strictly speaking, the word is inappplicable both to the early hand-guns and to the arquebuses and calivers that superseded the hand-guns. The "musket" proper, introduced into the Spanish army by the duke of Alva, was much heavier and more powerful than the arquebus. Its bullet retained sufficient striking energy to stop a horse at 300 and 600 yards from the muzzle. A writer in 1598 (quoted s.v. in the New English Dictionary) goes so far as to say that "One good musket may be accounted for two callivers." Unlike the arquebus, it was fired from a rest, which the "musketeer" stuck into the ground in front of him. But during the 17th century the musket in use was so far improved that the rest could be dispensed with (see Gun). The musket was a matchlock, weapons with other forms of lock being distinguished as wheel-locks, flrelocks, match-locks, &c., and soldiers were similarly distinguished as musketeers and foot-soldiers. On the disuse, about 1600-1615, of this form of firing mechanism, the term "muskete" was in France at least, for a time discontinued in favour of fusil, or flint-lock, which thenceforward reigned supreme up to the introduction of a practicable percussion lock about 1830-1840. But the term "musket" survived the thing it originally represented, and was currently used for the firelock (and afterwards for the percussion weapon). To-day it is generically used for military firearms anterior to the modern rifle. The original meaning of the word musketry has remained almost unaltered since 1600; it signifies the fire of infantry small arms (though for this "rifle fire" is now a far more usual term). It is distinguished from calivers and other arms (see Infantry and Rifle). Of the derivatives, the only one that is not self-explanatory is musketoon. This was a short, large-bore musket somewhat of the blunderbuss type, originally designed for the use of cavalry, but afterwards, in the 18th century, chiefly a domestic or coachman's weapon.

MUSKHOGEAN STOCK, a North American Indian stock. The name is from that of the chief tribe of the Creek confederacy, the Muskogee. It includes the Creeks, Choctaws, Chickasaws, Seminoles and other tribes. Its territory was almost the whole state of Mississippi, western Tennessee, eastern Kentucky, Alabama, most of Georgia, and later nearly all Florida. The Muskogean traditions assign the west and north-west as the original home of the stock. Its history begins in 1527, on the first landing of the Spaniards on the Gulf Coast. The Muskogean peoples were then settled agriculturists with an elaborate social organization, and living in villages, many of which were fortified (see Indians: North American).

MUSKOGEE, a city and a county-seat of Muskogee county, Oklahoma, U.S.A., about 3 m. W. by S. of the confluence of the Verdigris, Neosho (or Grand) and Arkansas rivers, and about 130 m. E.N.E. of Oklahoma City. Pop. (1900), 4154; (1907), 14,418, of whom 2498 were negroes and 353 Indians; (1910), 25,278. It is served by the St. Louis & San Francisco, the Missouri, the Missouri, Kansas & Texas, and the Missouri, Oklahoma & Gulf railways. Fort Gibson (pop. in 1910, 1344), about 5 m. N.E. on the Neosho, near its confluence with the Arkansas, is the head of steam-boat navigation of the Arkansas; if is the site of a former government fort and of a national cemetery. Muskogee is the seat of Spaulding Institute (M.E. Church, South) and Nazareth Institute (Roman Catholic), and at Bacon, about 2 m. north-east, is Indian University (Baptist, opened 1884). Muskogee is the commercial centre of an agricultural and stock-raising region, is surrounded by an oil and natural gas field of considerable extent producing a high grade of petrol, and a large oil refinery, railway workshops of the Midland Valley and the Missouri, Oklahoma & Gulf railways), cotton gins, cotton compresses, and cotton-seed oil and flour mills. The municipality owns and operates the water-works, the water supply being drawn from the Neosho river. Muskogee was founded about 1870, and became the chief town of the Creek Nation (Muskogee) and the metropolis and administrative centre of the former Indian Territory, being the headquarters of the Union Indian Agency to the Five Civilized Tribes, of the United States (Dawes) Commission to the Five Civilized Tribes, and of a Federal land office for the allotment of lands to the Creeks and Cherokees, and the seat of a Federal Court. The city was chartered in 1898; its area was enlarged in 1908, increasing its population.

MUSK-OX, also known as musk-buffalo and musk-sheep, an Arctic American ruminant of the family Bovidae (g.) now representing a genus and sub-family by itself. Apparently the musk-ox (Ovibos moschatus) has little or no near relationship to either the oxen or the sheep; and it is not improbable that its affinities are with the Asiatic takin (Budorcas) and the extinct European Criotherium of the Pliocene of Samos. The musky odour from which the animal takes its name does not appear to be due to the secretion of any gland.

In height a bull musk-ox stands about 5 ft. at the shoulder. The head is large and broad. The horns in old males have extremely broad bases, meeting in the middle line, and covering the brow and crown of the head. They are directed at first downwards by the side of the face, and then turn upwards and forwards, ending in the same plane as the eye. The basal half is dull white, oval in section and coarsely fibrous, the middle part smooth, shining and round, and the tip black. In females and young males the horns are smaller, and their bases separated by a space in the middle of the forehead. The ears are small, erect, pointed, and nearly concealed in the hair. The space between the nostrils and the upper lip is covered with short close hair, as in sheep and goats, without any trace of the bare muzzle of oxen. The greater part of the animal is covered with long, coarse woolly hair, thick, matted and curly on the shoulders, so as to give the appearance of a hump, but elsewhere straight and hanging down—that of the sides, back and haunches reaching as far as the middle of the legs and entirely concealing the very short tail. There is also a thick woolly under-fur, shed in summer, when the whole coat comes off in blanket-like masses. The hair on the lower jaw, throat and chest is long and straight, and hangs down like a beard or dewlap, though
there is no loose fold of skin in this situation. The limbs are stout and short, terminating in unsymmetrical hoofs, the external being rounded, the internal pointed, and the sole partially covered with hair.

Musk-oxen at the present day are confined to the most northern parts of North America, where they range over the rocky Barren Grounds between lat. 64° and the shores of the Arctic Sea. Its southern range is gradually contracting, and it appears that it is no longer met with west of the Mackenzie river, though formerly abundant as far as Eschscholtz Bay.

Northwards and eastwards it extends through the Parry Islands and Grinnell Land to north Greenland, reaching on the west coast as far south as Melville Bay; and it also occurs at Sabine Island on the east coast. The Greenland animal is a distinct race (O. m. wardi), distinguished by white hair on the forehead; and it is suggested that the one from Grinnell Land forms a third race. As proved by the discovery of fossil remains, musk-oxen ranged during the Pleistocene period over northern Siberia and the plains of Germany and France, their bones occurring in river-deposits along with those of the reindeer, mammoth, and woolly rhinoceros. They have also been found in Pleistocene gravels in several parts of England, as Maidenhead, Bromley, Freshfield near Bath, Barnwood near Gloucester, and in the brick-earth of the Thames valley at Crayford, Kent; while their remains also occur in Arctic America.

Musk-oxen are gregarious in habit, assembling in herds of twenty or thirty head, or sometimes eighty or a hundred, in which there are seldom more than two or three full-grown males. They run with considerable speed, notwithstanding the shortness of their legs. They feed chiefly on grass, but also on moss, lichens and tender shoots of the willow and pine. The female brings forth one young in the end of May or beginning of June, after a gestation of nine months. The Swedish expedition to Greenland in 1899 found musk-oxen in herds of varying size—some contained only a few individuals, and in one case there were sixty-seven. The peculiar musky odour was perceived from a distance of a hundred yards; but according to Professor Nathorst there was no musky taste or smell in the flesh if the carcase were cleaned immediately the animals were killed.

Of late years musk-oxen have been exhibited alive in Europe; and two examples, one of which lived from 1899 till 1903, have been brought to England. The somewhat imperfect skull of an extinct species of musk-ox from the gravels of the Klondike has enabled Mr. W. H. Osgood to make an important addition to our knowledge of this remarkable type of ruminant. The skull, which is probably that of a female, differs from the ordinary musk-ox by the much smaller and shorter horn-cores, which are widely separated in the middle line of the skull, where there is a groove-like depression running the whole length of the forehead. The sockets of the eyes are also much less prominent, and the whole fore-part of the skull is proportionately longer. On account of these and other differences (for which the reader may refer to the original paper, published in vol. xlviii. of the Smithsonian Miscellaneous Collections)

its describer refers the Klondike skull to a new genus, with the title Symbos tyrelli, the specific name being given in honour of its discoverer. This, however, is not all, for Mr. Osgood points out that a skull discovered many years ago in the vicinity of Fort Gibson, Oklahoma, and then named Onobos or Bootherium cavifrons, evidently belongs to the same genus. That skull indicates a bull, and the author suggests that it may possibly be the male of Symbos tyrelli, although the wide separation of the localities made him hesitate to accept this view. Perhaps it would have been better had he done so, and taken the name Symbos cavifrons for the species. A third type of musk-ox skull is, however, known from North America, namely one from the celebrated Big-Bone Lick, Kentucky, on which the genus and species Bootherium bombifrons was established, which differs from all the others by its small size, convex forehead and rounded horn-cores, the latter being very widely separated, and arising from the sides of the skull. This specimen has been regarded as the female of Symbos cavifrons; but this view, as pointed out by Mr. Osgood, is almost certainly incorrect, and it represents an entirely distinct form.

This, however, is not the whole of the past history of the musk-ox group; and in this connexion it may be mentioned that palaeontological discoveries are gradually making it evident that the poverty of America in species of horned ruminants is to a great extent a feature of the present day, and that in past times it possessed a considerable number of representatives of this group. One of the latest additions to the list is a large sheep-like animal from a cave in California, apparently representing a new generic type, which has been described by E. L. Forbush in the publications of the University of California, under the name of Preptoceras andali. It is represented by a nearly complete skeleton, and has doubly curved horns and sheep-like teeth. In common with an allied ruminant from the same district, previously described as Escuratortherium, it seems probable that Preptoceras is related on the one hand to the musk-ox, and on the other to the Asiatic takin, while it is also supposed to have affinities with the sheep. If these extinct forms really serve to connect the takin with the musk-ox, their systematic importance will be very great. From a geographical point of view nothing is more likely, for the takin forms a type confined to Eastern Asia (Tibet and Szechuan), and it would be reasonable to expect that, like so many other peculiar forms from the same region, they should have representatives on the American side of the Pacific.

MUSK-RAT, or Musquash, the name of a large North American rat-like rodent mammal, technically known as Fiber sibiricus, and belonging to the mouse-tribe (Muridae). Aquatic in habits, this animal is related to the English water-rat and therefore included in the sub-family Microstomine (see Vole). It is, however, of larger size, the head and body being about 12 in.

In length and the tail but little less. It is rather a heavily-built animal, with a broad head, no distinct neck, and short limbs, the ears are small, and the ears project very little from the fur. The fore-limbs have four toes and a rudimentary thumb, all with claws; the hind limbs are larger, with five distinct toes, united by short webs at their bases. The tail is laterally compressed, nearly naked, and scaly. The hair much resembles that of a beaver, but it is shorter, it consists of a thick soft under-fur, interspersed with longer stiff, glistening hairs, which overlie and conceal the former, on the upper surface and sides of the
body. The general colour is dark umber-brown, almost black on the back and grey below. The tail and naked parts of the feet are black. The musky odour from which it derives its name is due to the secretion of a large gland situated in the inguinal region, and present in both sexes.

The ordinary musk-rat is one of several species of a genus peculiar to America, where it is distributed in suitable localities in the northern part of the continent, extending from the Atlantic to the Pacific, and from the Rio Grande to the barren grounds bordering the Arctic seas. It lives on the shores of lakes and rivers, swimming and diving with facility, feeding on the roots, stems and leaves of water-plants, or on fruits and vegetables which grow near the margin of the streams it inhabits. Musk-rats are most active at night, spending the greater part of the day concealed in their burrows in the bank, which consist of a chamber with numerous passages, all of which open under the surface of the water. For winter quarters they build more elaborate houses of conical or dome-like form, composed of sedges, grasses and similar materials plastered together with mud. As their fur is an important article of commerce, large numbers are annually killed, being either trapped or speared at the mouths of their holes. (See also Rodentia.)

**MUSK-SHREW**

*MUSK-SHREW,* a name for any species of the genus *Crocidura* of the family *Soricidae* (see Insectivora). The term is generally used of the common grey musk-shrew (*C. coerulea*) of India. Dr Dobson believed this to be a semi-domesticated variety of the brown musk-shrew (*C. marina*), which he considered the original wild type. The head and body of a full-grown specimen measure about 5 in.; the tail is rather more than half that length; and both greys and the striped phases of the musk-shrew are distributed under the surface. Dr Blanford states that the story of wine or beer becoming impregnated with a musky taint of consequence of this shrew passing over the bottles, is less credited in India than formerly owing to the discovery that liquors bottled in Europe and exported to India are not liable to be thus tainted.

**MUSLIM IBN AL-HAJJĀJ,** the Imam, the author of one of the two books of Mahomedan tradition called *Ṣaḥīḥ,* "sound," was born at Nishapur at some uncertain date after A.D. 815 and died there in 875, i.e., after the death of his son. Like all-Bukhārī (q.v.), of whom he was a close and faithful friend, he gave himself to the collecting, sifting and arranging of traditions, travelling for the purpose as far as Egypt, where he was a plain that his sympathies were with the traditionalist, school or opposed to that to which sought to build up the system of canon law on a speculative basis (see Mahomedan Law). But though he was a student and friend of Ahmad ibn Hanbal (q.v.) he did not go in traditionalism to the length of some, and he defended al-Bukhārī when the latter was driven from Nishapur for refusing to admit that the utterance *laṣa* of the Koran by man was as uncreated as the Koran itself (see Mahomedan Religion; and Patton's *Ahmad ibn Hanbal*, 32 sqq.). His great collection of traditions is second in popularity only to that of al-Bukhārī, and is commonly regarded as more accurate and reliable in details, especially names. His object was more to weed out illegitimate accretions than to furnish a traditional basis for a system of law. Therefore, though he arranged his material according to such a system, he did not add guiding rubrics, and he regularly brought together in one place the different parallel versions of the same tradition. His book is thus historically more useful, but legally less suggestive. His biographers give almost no details as to his life, and its early part was probably very obscure. One gives a list of as many as twenty works, but only his *Ṣaḥīḥ* seems to have reached us.


**MUSLIM** (through Fr. *mousseline* from It. *mussolino*, diminutive of *Mussolo*, i.e., the town Mosul in Kurdistān) a light cotton cloth said to have been first made at Mosul, a city of Mesopotamia. Muslins have been largely made in various parts of India, whence they were imported to England towards the end of the 17th century. Some of these Indian muslins were very fine and costly. Among the specialties are *Arni muslin,* made in the Madras presidency, and *Dacca muslin,* made at Dacca in Bengal. Muslins of many kinds are now made in Europe and America, and the name is applied to both plain and fancy cloths, and to printed calicos of light texture. *Swiss muslin* is a light variety, woven in stripes or figures, originally made in Switzerland. *Book muslin* is made in Scotland from very fine yarns. Musls, jacquets, lenos, and other cloths exported to the East and elsewhere are sometimes described as muslins. Muslim is used for dresses, blouses, curtains, &c.

**MUSONIUS RUFUS,** a Roman philosopher of the 1st century A.D., was born in Etruria about A.D. 20-30. He fell under the ban of Nero owing to his ethical teachings, and was exiled to the island of Cyarus on a trumped-up charge of participation in Piso’s conspiracy. He returned under Galba, and was the friend of Vitellius and Vespasian. It was he who dared to bring an accusation against P. Egnatius Celer (the Stoic philosopher whose evidence had condemned his patron and disciple Soranus) and who endeavoured to preach a doctrine of peace and goodwill among the soldiers of Vespasian when they were advancing upon Rome. So highly was he esteemed in Rome that Vespasian made an exception in his case when all other philosophers were expelled from the city. As to his death, we know only that he was not living in the reign of Trajan. His philosophy, which is in most respects identical with that of his pupil, Epictetus, is marked by its strong practical tendency. Though he did not altogether negate logic and physics, he maintained that virtue is the only real aim of life. This virtue is not a thing of practical activity, but a practical, living reality. It is identical with philosophy in the true sense of the word, and the truly good man is also the true philosopher.

Suidas attributes numerous works to him, amongst others a number of letters to Apollonius of Tyana. The letters are certainly unauthentic; about the others there is no evidence. His views were defended by Claudius (or Jesus) Pella, from whom Stobaeus obtained his information. See Ritter and Preller §§ 477, 488, 489; Tactius, *Annales*, xv, 71 and *Histories*, iii, 81, and compare articles Stoics and Epictetus.

**MUSPRATT, JAMES** (1793-1886), British chemical manufacturer, was born in Dublin on the 12th of August 1793, at the age of fourteen he was apprenticed to a wholesale draper, but his apprenticeship was terminated in 1810 by a quarrel with his master, and in 1812 he went to Spain to take part in the Peninsular War. Lack of influence prevented him from getting a commission in the cavalry, but he followed the British army on foot far into the interior, was laid up with fever at Madrid, and, narrowly escaping capture by the French, succeeded in making his way to Lisbon. There he joined the navy, but after taking part in the blockade of Brest he was led to desert, through the harshness of the discipline on the second of the two ships in which he served. Returning to Dublin about 1814, he began the manufacture of chemical products, such as hydrochloric and acetic acids and turpentine, adding prussiate of potash a few years later. He also had in view the manufacture of alkali from common salt by the Leblanc process, but on the one hand he could not command the capital for the plant, and on the other saw that Dublin was not well situated for the experiment. In 1822 he went to Liverpool, which was at once a good port and within easy reach of salt and coal, and took a lease of an abandoned glass-works on the bank of the canal in Vauxhall Road. At first he confined himself to the manufacture of sulphur, and in 1823, when the tax on sulphur was reduced from 15s, to 2s a bushel, his profits enabled him to erect lead-chambers for making the sulphuric acid necessary for the Leblanc process. In 1828 he built works at St. Helen's and in 1830 at Newton; at the latter place he was long harassed by litigation on account of the damage done by the hydrochloric acid emitted from his factory, and finally in 1850 he left it and started new works at Widnes and Flint. In 1834-1835, in conjunction with Charles Tennant, he purchased sulphur mines in Sicily, to provide the raw material for his sulphuric acid; but on the imposition of the Neapolitan
government of a prohibitive duty on sulphur. Musschenbroek found a substitute in iron pyrites, which was thus introduced as the raw material for the manufacture of sulphuric acid. He was always anxious to employ the best scientific advice available and to try every novelty that promised advantage. He was a close friend of Liebig, whose mineral manures were compounded at his works. He died at Seaforth Hall, near Liverpool, on the 4th May 1856. — After his retirement in 1857 his business was continued in the hands of four of his ten children.

His eldest son, James Sheridan Musschenbroek (1821–1871), studied chemistry under Thomas Graham at Glasgow and London and under Liebig at Giessen, and in 1848 founded the Liverpool College of Chemistry, an institution for training chemists, of which he also acted as director. From 1854 to 1860 he was occupied in preparing a dictionary of Chemistry, ... as applied and relating to the Arts and Manufactures, which was translated into German and Russian, and he published a translation of Plattner’s treatise on the blow-pipe in 1845, and Outlines of Analysis in 1849. His original work included a research on the sulphides (1845), and the preparation of toluidine and nitro-aniline in 1845–1846 with A. W. Hofmann.

Musschenbroek, Pieter van (1692–1761), Dutch natural philosopher, was born on the 14th of March 1692 at Leiden, where his father Johann Joosten van Musschenbroek (1660–1707) was a maker of physical apparatus. He studied at the university of his native city, where he was a pupil and friend of W. J. s'G. Gravesande. Graduating in 1715 with a dissertation, De aëris præsenta in humoribus animalium, Musschenbroek was appointed professor at Duisburg in 1719. In 1725 he was promoted to the chair of natural philosophy and mathematics at Utrecht. In 1731 he declined an invitation to Copenhagen, and was promoted in consequence to the chair of astronomy at Utrecht in 1732. The attempt of George II. of England in 1737 to attract him to the newly-established university of Göttingen was also unsuccessful. At length, however, the claims of his native city overcame his resolution to remain at Utrecht, and he accepted the mathematical chair at Leiden in 1739, where, declining all offers from abroad, he remained till his death on the 9th of September 1761.

His first important production was Epitome elementorum physicomathematicorum (12mo, Leiden, 1726)—a work which was afterwards enlarged and re-issued in a larger folio edition, and which appeared at length (posthumously, ed. by Johann Lulofs, one of his colleagues as Leiden) in 1762, under the title of Introductio ad philosophiam naturalis. The Physicae experimentes et observationes philosophicae, which Musschenbroek had invented, and of several experiments which he had made on the expansion of bodies by heat. Musschenbroek was also the author of Elementa physica (8vo, 1729), and his name is associated with the invention of the Leyden jar (q.v.).

Musschenbroek—Mussel

MUSSEL (O. Eng. muscle, Lat. musculus, diminutive of mus, mouse, applied to small sea fish and mussels), a term applied in England to two families of Lamellibranchiatae— the marine Mytilacea, of which the edible mussel, Mytilus edulis, is the representative; and the fresh-water Unionidae, of which the river mussel, Unio pictorum, and the swan mussel, Anodonta cygnea, are the common British examples. It is not obvious why these fresh-water forms have been associated popularly with the Mytilacea under the name mussel, unless it be on account of the frequently very dark colour of their shells. They are somewhat remote from the sea mussels in structure, and have not even a common economic importance.

The sea mussel (Mytilus edulis) belongs to the second order of the class Lamellibranchiata (q.v.), namely the Filibranchia, distinguished by the comparatively free condition of the gill-filaments, which, whilst adhering to one another to form gill-plates, are yet not fused to one another by concrecence. It is also remarkable for the small size of its foot and the large development of two glands in the foot—the byssus-forming and the byssus-cementing glands. The byssus is a collection of horny threads by which the sea mussel (like many other Lamellibranchia or bivalve molluscs) fixes itself to stones, rocks or submerged wood, but is not a permanent means of attachment, since it can be discarded by the animal, which, after a certain amount of locomotion, again fixes itself by new secretion of byssus from the foot. Such movement is more frequent in young mussels than in the full-grown. Mytilus possesses no siphonal tube-like productions of the margin of the mantle, nor any notching of the same, representative of the siphons which are found in its fresh-water ally, the Dreissensa polymorpha.

Mytilus edulis is an exceedingly abundant and widely distributed form. It occurs on both sides of the northern Atlantic and in the Mediterranean basin. It presents varieties of form and colour according to the depth of water and other circumstances of its habitat. Usually it is found on the British coast encrusting rocks exposed at low tides, or on the flat surfaces formed by sandbanks overlying clay, the latter kind of colonies being known locally as "scallops." Under these conditions it forms continuous masses of individuals closely packed together, sometimes extending over many acres of surface and numbering millions. The readiness with which the young Mytilus attaches itself to wicker-work is the means of artificially cultivating and securing these mussels for the market both in the Bay of Kiel in North Germany and at the mouth of the Somme and other spots on the coast of France.

Natural scalps are subject to extreme vicissitudes: an area of many acres may be destroyed by a local change of current producing a deposit of sand or siltage over the scalp, or by exposure to frost at low tide in winter, or by accumulation of decomposing vegetable matter. The chief localities of natural scalps on the British coast are Morecambe Bay in Lancashire and the flat eastern shores, especially that of the Wash of Lincoln, and similar shallow bays. These scalps are in some cases in the hands of private owners, and the Fisheries Department has made arrangements by which some local authorities, e.g. the corporation of Boston, can lease layoffs to individuals for the purpose of artificial cultivation.

The sea mussel is scarcely inferior in commercial value to the oyster. In 1873 the value of mussels exported from Antwerp alone to Paris was used as human food was £36,000. In Britain the mussel fisheries are of considerable importance, and fisheries are held to be the most effective of all baits. Twenty-eight boats engaged in haddock-fishing at Eyemouth between October (1878) and May in 1879 in 35,000 bushels (47,000,000 individuals), costing nearly £100 to the fisherman, about one-third of which sum was expended on the carriage of the mussels. The quantity of mussels landed on Scottish coasts has decreased in recent years. In 1886 the total quantity landed was from 243,000 cwt., valued at £14,950; in 1902 it was only 95,663 cwt., valued at £5976. In the statistics for England and Wales mussels are not separately distinguished. Many thousand tons of mussels are wastefully employed as manure by the farmers on lands adjoining scalp-producing coasts, as in Lancashire and Norfolk, three half-pence a bushel being the price quoted in such cases. It is a curious fact, illustrative of the ignorant procedure and arbitrary fashions of fisher-folk, that on the Atlantic seaboard of the United States the sea mussel, Mytilus edulis, though common, is not used as bait nor as food. Instead, the soft clam, Mercenaria, a Lamellibranch not used by English or American fisher-men for bait or food, is used to the extent of 1 million bushels per annum, valued at £120,000. At the mouth of the river Conway in North Wales the sea mussel is crushed in large quantities (the density of the water of the North Sea being 1026). Experiments made by removing mussels from salt water to brackish, and finally to quite fresh water show that it is even more tolerant of fresh water than of salt. If the thirty mussels examined were alive after fifteen days. Mytilus edulis is occasionally poisonous, owing to conditions not satisfactorily determined.

The fresh-water Mussels, Anodonta cygnea, Unio pictorum,
and Unio margaritiferus belong to the order Lamellibranchia. Lamellibranchia, Unio differs in no important point from Anodonta. The shells of the family are the same size, shells being used at one time for holding water-colour paints as new shells of this species and of the sea mussel are used for holding gold and silver paint sold by artists' colourmen, but it has no other economic value. Unio margaritiferus, the pearl mussel, was at one time of considerable importance as a source of pearls, and the pearl mussel fishery is to this day carried on under peculiar state regulations in Sweden and Saxony, and other parts of the continent. In Scotland and Ireland the pearl mussel industry was also of importance, but has altogether dwindled to insignificance since the opening up of commercial intercourse with the East and with the islands of the Pacific Ocean, whence finer and more abundant pearls are obtained, than those of the oyster. In the last forty years of the 18th century pearls produced from the Scotch fisheries to Paris to the value of £100,000; round pearls, one inch in diameter, per dozen, were brought as high as £3 or £4. The pearl mussel was formerly used as bait in the Aberdeen cod fishery.

LITERATURE.—For an account of the anatomy of Mytilus edulis the reader is referred to the treatise by Sabatier on that subject (Paris, 1875). The essay by Charles Harding on Mollusca used for Food or Bait, published by the committee of the London International Fisheries Exhibition (1885), may be consulted as to the economic questions connected with the sea mussel. The internal structure of this species is described by Wilson in Fifth Ann. Rep. Scot. Fish. Board (1887).

MUSSELBURGH, a municipal and police burgh of Midlothian, Scotland, 53 m. E. of Edinburgh by the North British railway. Pop. (1901) 17,711. The burgh, which stretches for a mile along the south shore of the Firth of Forth, is intersected by the Esk and embraces the village of Fishersrow on the left bank of the river. Its original name is said to have been Eskmouth, its present one being derived from a bed of mussels at the mouth of the river. While preserving most of the ancient features of its High Street, the town has tended to become a suburb of the capital, its fine beach and golf course hastening this development. The public buildings include the town-hall (dating from 1762 and altered in 1876), the tolbooth (1590), and the grammar school. Loretto School, one of the foremost public schools in Scotland, occupies the site of the chapel of Our Lady of Loretto, which was founded in 1534 by Thomas Duthie, a hermit from Mt Sinai. This was the favourite shrine of Mary of Guise, who betook herself hither at momentous crises in her history. The 1st earl of Hertford destroyed it in 1544, and after it was rebuilt the Reformers demolished it again, some of its stones being used in erecting the tolbooth. In the west end of the town is Pinkie House, formerly a seat of the abbey of Dunfermline, but transformed in 1613 by Lord Seton. It is a fine example of a Jacobean mansion, with a beautiful fountain in the middle of the court-yard. The painted gallery, with an elaborate ceiling, 100 ft. long, was utilized as a hospital after the battle of Pinkie in 1567. Prince Charles Edward slept in it the night following the fight at Prestonpans (1745). Near the tolbooth stands the market cross, a stone column with a unicorn on the top supporting the burgh arms. At the west end of High Street is a statue of David Macbeth Moir ("Voltaire of Scotland"). Musset, Alfred de Musset's most famous son. The antiquity of the town is placed beyond doubt by the Roman bridge across the Esk and the Roman remains found in its vicinity. The chief bridge, which carries the high road from Edinburgh to Berwick, was built by John Rennie in 1807. The principal industries include paper-making, brewing, the making of nets and twine, bricks, tiles and pottery, tanning and oil-refining, besides saltworks and seed-crushing works. The fishery is confined to Fishersrow, where there is a good harbour. The Links are the scene every year of the Edinburgh race meetings and of those of the Royal Caledonian Hunt which are held every third year. Among the public buildings are also a municipal hall and the Caledonian Hotel, which was opened in 1830. The Caledonian Hotel is on the site of the old Tolbooth, which was burned in 1797.

MUSSET, LOUIS CHARLES ALFRED DE (1810-1857), French poet, play-writer and novelist, was born on the 11th of December 1810 in a house in the middle of old Paris, near the Hôtel Chiny. His father, Victor de Musset, who traced his descent back as far as 1140, held several ministerial posts of importance. He brought out an edition of J. J. Rousseau's works in 1821, and followed it soon after with a volume on the Genevan's life and writing. In Alfred de Musset's childhood there were various things which fostered his imaginative power. He and his brother Paul (born 1804, died 1886), who afterwards wrote a biography of Alfred, delighted in reading old romances together, and in assuming the characters of the heroes in those romances. But it was not until about 1826 that Musset gave any definite sign of the mental force which afterwards distinguished him. In the summer of 1827 he won the second prize (at the Collège Henri IV.) by an essay on "The Origin of our Feelings." In 1828, when Eugène Scribe, Joseph Duveyrier, who under the name of Mélesville, was a prolific playwriter and sometimes collaborator with Scribe, and others of note were in the habit of coming to Mme de Musset's house at Autueil, where drawing-room plays and charades were constantly given, Musset, excited by this companionship, wrote his first poem. This, to judge from the extracts preserved, was neither better nor worse than much other work of clever boys who may or may not afterwards turn out to be possessed of genius. He took up the study of law, threw it over for that of medicine, which he could not endure, and ended by adopting no set profession. Shortly after his first attempt in verse he was taken by Paul Fouché to Victor Hugo's house, where he met such men as Alfred de Vigny, Prosper Mérimée, Charles Nodier and Sainte-Beuve. It was under Hugo's influence, no doubt, that he composed a play. The scene was laid in Spain, and some lines, showing a marked advance upon his first effort, are preserved. In 1838, when the war between the classical and the romantic school of literature was growing daily more serious and exciting, Musset had published some verses in a country newspaper, and boldly recited some of his work to Sainte-Beuve, who wrote of it to a friend, "There is amongst us a boy full of genius." At eighteen years old Musset produced a translation, with additions of his own, of De Quincy's "Opium-Eater." This was published by Mame, attracted no attention, and has been long out of print. His first original volume was published in 1829 under the name of Contes d'Espagne et d'Italie, had an immediate and striking success, provoked bitter opposition, and produced many unworthy imitations. This volume contained, along with far better and more important things, a fantastic parody in verse on certain productions of the romantic school, which made a deal of noise at the time. This was the famous "Ballade à la lune," with its recurring comparison of the moon shining above a steeple to the dot over an i. It was sent to Musset's delight, taken quite seriously by many worthy folk.

In December 1830 Musset was just twenty years old, and was already conscious of that curious double existence within him so frequently symbolized in his plays—in Octave and Célio for instance (in Les Caprices de Marianne), who also stand for the two camps, the men of matter and the men of feeling—which he elsewhere described as characteristic of his
MUSSET, ALFRED DE

It is a mark of MUSSET's genius that he could write with equal ease and equal success in the French stage and in the romantic schools. Thus he was strong and keen to weld together the merits of both schools in a new method which, but for the fact that there has been no successor to grasp the wand which its originator wielded, might well be called the school of MUSSET. The serious effect produced upon MUSSET by the failure of his **Nuit vénitienne** is curiously illustrative of his character. A man of greater strength and with equal belief in his own genius might have gone on appealing to the public until he compelled them to hear him. MUSSET gave up the attempt in disgust, and waited until the public were eager to hear him without any invitation on his part. In the case of his finest plays, it was long before that he was fully recognized as a poet of the first rank and as an extraordinary master of character and language in prose writing.

In his complete disgust with the stage after the failure above referred to there was no doubt something of a not ignoble pride, but there was something also of weakness—of a kind of weakness out of which it must be said sprang some of his most exquisite work, some of the poems which could only have been written by a man who imagined himself the crushed victim of difficulties which were old enough in the experience of mankind, though for the moment new and strange to him.

MUSSET now belonged, in a not very whole-hearted fashion, to the "Cénacle," but the connection came to an end in 1832. In 1833 he published the volume called **Un Spectacle dans un fauteuil**. One of the most striking pieces in this—"Namouna"—was written at the publisher's request to fill up some empty space; and this fact is noteworthy when taken in conjunction with the horror which MUSSET afterwards so often expressed of doing anything like writing "to order"—of writing, indeed, in any way or at any moment except when the inspiration or the fancy happened to seize him. The success of the volume seemed to be small in comparison with that of his **Contes d'Espagne**, but it led indirectly to MUSSET's being engaged as a contributor to the **Revue des deux mondes**. In this he published, in April 1834, **André del Sarto**, and he followed this complete work later with **Les Caprices de Marianne**. This play afterwards took and holds rank as one of the classical pieces in the repertory of the **Théâtre Français**. After the retirement in 1837 from the stage of the brilliant actor Delaunay the piece dropped out of the Frangais repertory until it was replaced on the stage by M. Jules Clarétie, administrator-general of the **Comédie Française**, on the 10th of January 1906. **Les Caprices de Marianne** affords a fine illustration of the method referred to above, a method of which MUSSET gave something like a definite explanation five years later. This explanation was also published in the **Revue des deux mondes**, and it set forth that the way of the comic and the lyric comic schools could never end in a definite victory for either school, nor was it desirable that it should so end. "It was time," MUSSET said, "for a third school which should unite the merits of each." And in **Les Caprices de Marianne** these merits are most curiously and happily combined. It has perhaps more of the Shakespearean quality—the quality of artfully mingling the terrible, the grotesque, and the high comedy tones—which exists more or less in all MUSSET's long and more serious plays, than is found in any other of these. The piece is called a comedy, and it owes this title to its extraordinary brilliancy of dialogue, truth of characterization, and stiffness in action, under which there is ever latent a sense of impending doom. Many of the qualities indicated are found in others of MUSSET's dramatic works and notably in **On ne badine pas avec l'amour**, where the skill in insensibly preparing his hearers or readers through a succession of dazzling comedy scenes for the swift destruction of the end is very marked. But **Les Caprices de Marianne** is perhaps for this particular purpose of illustration the most compact and most typical of all.

The appearance of **Les Caprices de Marianne** in the **Revue** (1833) was followed by that of "Rolla," a symptom of the **maladie du siècle**. Rolla, for all the smack which is not to be denied of Wertherism, has yet a decided individuality.

The poem was written at the beginning of MUSSET's liaison with George Sand, and in December 1833 MUSSET started on the unfortunate journey to Italy. It was well known that the rupture of what was for a time a most passionate attachment had a disastrous effect upon MUSSET, and brought out the weakest side of his moral character.

He was at first absolutely and completely struck down by the blow. But it was not so well known until Paul de MUSSET pointed it out that the passion expressed in the **Nuit de décembre**, written about twelve months after the journey to Italy, referred not to George Sand but to another and quite a different woman. The story of the Italian journey and its results are told under the guise of MUSSET's relations with George Sand. The **Confession** is exceptionally interesting as exhibiting the poet's frame of mind at the time, and the approach to a revulsion from the Bonapartist ideas amid which he had been brought up in his childhood. To the supreme power of Napoleon he in this work attributed that moral sickness of the time which he described. "One man," he wrote, "absorbed the whole life of Europe; the rest of the human race struggled to fill their lungs with the air that he had breathed." When the emperor fell, "a ruined world was a resting-place for a generation weighted with care." The **Confession** is further important, apart from its high literary merit, as exhibiting in many passages the poet's tendency to shun or wildly protest against all that is disagreeable or difficult in human life—a tendency to which, however, much of his finest work is due. To 1836 belong the **Nuit d'août**, the **Lettre à Lamartine, les Stances à la Malibran**, the comedy **Il ne faut jurer de rien**, and the beginning of the brilliant letters of Dupuis and Cotonet on romanticism. **Il ne faut jurer de rien** is as typical of MUSSET's comedy work as is **Les Caprices de Marianne** of the work in which a terrible fatality underlies the brilliant dialogue and keen polished characterization. In 1837 was published **Un Caprice**, which afterwards found its way to the Paris stage by a curious road. Mme Allain-Despréaux, the actress, heard of it in St Petersburg as a Russian piece. On asking for a French translation of the play she received the volume **Comédies et dérangements** reprotted from the **Revue des deux mondes**. In 1837 appeared also some of the **Nouvelles**. In 1839 MUSSET began a romance called **Le Pêche d'épouvante**, of which the existing fragments are full of passion and insight. In 1840 he passed through a period of feeling that the public did not recognize his genius—as, indeed, they did not—and wrote a very short but very striking series of reflections headed with the words "À trente ans," which Paul de MUSSET published in his **Life**. In 1841 there came out in the **Revue de Paris** Musset's "Le Rhin allemand," an answer to Becker's poem which appeared in the **Revue des deux mondes**. This fine war-song made a great deal of noise, and brought to the poet quantities of challenges from German officers. Between this date and 1845 he wrote comparatively little. In the last named year the charming "proverb" *Il faut qu'une porte soit ouverte ou fermée* appeared. In 1847
Un Caprice was produced at the Théâtre Français, and the employment in it of such a word as "rebonsoir" shocked some of the old school. But the success of the piece was immediate and marked. It increased Musset's reputation with the public in a degree out of proportion to its intrinsic importance; and indeed freed him from the burden of depression caused by wild and excessive imagination. In 1828 Il ne faut jurer de rien was played at the Théâtre Français and the Chandelier at the Théâtre Historique. Between this date and 1857, Bettine was produced on the stage and Carmosine written; and between this time and the date of his death, from an affection of the heart, on the 2nd of May 1857, the poet produced no large work of importance.

Alfred de Musset now holds the place which Sainte-Beuve first accorded, then denied, and then again accorded to him—as a poet of the first rank. He had genius, though not genius of that strongest kind which its possessor can always keep in check. His own character worked both for and against his success as a writer. He inspired a strong personal affection in his contemporaries. His very weakness and his own consciousness of it produced such beautiful work as, to take one instance, the Nuit d'octobre. His Nouvelles are extraordinarily brilliant; his poems are charged with passion, fancy and fine satiric power; in his plays he hit upon a method of his own, in which no one has dared or availed to follow him with any closeness. He was one of the first, most original, and in the end most successful of the first-rate writers included in the phrase "the 1830 period." The wilder side of his life has probably been exaggerated; and his brother Paul de Musset has given in his Biographie a striking testimony to the finer side of his character. In the later years of his life Musset was elected, not for 

MUSTANG, the wild or semi-wild horse of the prairies of America, the descendant of the horses imported by the Spanish after the conquest in the 16th century (see Horse). The word appears to be due to two Spanish words, mestreno, or mesteñaco, defined by Minshew (1599) as "a strayer." Mestreno (now mesteno) means "wild, having no master," and appears to be derived from mesta, a grazer-association, which among other functions appropriated any wild cattle found with the herd.

MUSTARD. The varieties of mustard-seed of commerce are produced from several species of the genus Brassica (a member of the natural order Cruciferae). Of these the principal are the black or brown mustard, Brassica nigra (Sinapis nigra), the white mustard, Brassica alba, and the Sarepta mustard, B. juncea. Both the white and black mustards are cultivated to some extent in various parts of England. The white is to be found in every garden as a salad plant; but it has come into increasing favour as a forage crop for sheep, and as a green manure, for which purpose it is ploughed down when about to come into flower. The black mustard is grown solely for its seeds, which yield the well-known condiment. The name of the condiment was in French moutarde, mod. moutarde, as being made of the seeds of the plant pounded and mixed with must (Lat. mustum, i.e. unfermented wine). The word was thus transferred to the plant itself. When white mustard is cultivated for its herbage it is sown usually in July or August, after some early crop has been removed. The land being brought into a fine tilth, the seed, at the rate of 12 lb per acre, is sown broadcast, and covered in the way recommended for clover seeds. In about six weeks it is ready either for feeding off by sheep or for ploughing down as a preparative for wheat or barley. White mustard is not fastidious in regard to soil. When grown for a seed crop it is treated in the way about to be described for the other variety. For this purpose either kind requires a fertile soil, as it is an exhausting crop. The seed is sown in April, is once hoed in May, and requires no further culture. As soon as the pods have assumed a brown colour the crop is reaped and laid down in handfuls, which lie until dry enough for thrashing or stacking. In removing it from the ground it must be handled with great care, and carried to the threshing-floor or stack on cloths, to avoid the loss of seed. The price depends much on its being sown as described, and the quality suffers much otherwise. This great evil attends its general culture, for which are unavoidably shed in harvesting the crop remain in the soil, and stock it permanently with what proves a pestilent weed amongst future crops. White mustard is used as a small salad—generally accompanied by garden cress—while still in the seed leaf. To keep up a supply the seed should be sown every week or ten days. The sowings in the open ground may be made from March till October, earlier or later according to the season. The ground should be light and rich, and the situation warm and sheltered. Sow thickly in rows 6 in. apart, and slightly cover the seed, pressing the surface smooth with the back of the spade. When gathering the leaves cut the young plants off even with the ground, or pull

1 There were two kinds of mustum, one the best for keeping, produced after the first treading of the grapes, and called mustum lxicium; the other, mustum torivum, obtained from the mass of trodden grapes by the wine-press, was used for inferior purposes.
MUSTARD OILS—MUSURUS

The uses of mustard leaves in the treatment of local pains are well known. When a marked counter-irritant action is needed, a much too often performed practice, a thin paste of mustard, and in causing a less degree of vescication; but the cutaneous damage done by mustard usually takes longer to heal. A mustard sitz bath will often hasten and alleviate the initial stage of menstruation, and sometimes even to effect a simultaneous elimination in the nose or bronchial. The proportion of an ounce of mustard to a gallon of water is a fair one and easily remembered. But by far the most important therapeutic application of mustard is as a unique emetic.

MUSTARD OILS, organic chemical compounds of general formula R-NCS. They may be prepared by the action of carbon bisulphide on primary amines in alcoholic or ethereal solution, the alkyl dithio-carbamic compounds formed being then precipitated with mercuric chloride, and the mercuric salts heated in aqueous solution.

2-NH₂CS₂CNS₄H₈CH₃ \[ \rightarrow \] HS⁻⁺⁺HS⁻⁺⁺+2R-NCS;

or the isocyanic esters may be heated with phosphorus pentasulphide (A. Michael and G. Palmer, Amer. Chem. Jour., 1884, 6, 257). They are colourless liquids with a very pungent irritating odour. They are readily oxidized, with production of the corresponding amine. Nascent hydrogen converts them into the amine, with simultaneous formation of thio-formaldehyde, RNC⁺⁺⁺⁺H⁺⁺⁺⁺H₂CSH⁻++. When heated with acids to 100° C., they decompose with formation of the amine and liberation of carbon bisulphide and sulphurated hydrogen. They are used industrially in the manufacture of rubber, mercuric salts, and amine and aldehyde enamines.

Methyl mustard oil, CH₃NCS, melts at 35° C. and boils at 119° C. Alkyl mustard oil, CH₃NH₂C₄H₈O₄S, is the principal constituent of the ordinary mustard oil obtained on distilling black mustard seeds. These seeds contain potassium myroant (CH₃NH₂N₂O₄K) which in presence of water is convertible into the chief toxic substances of the seed. CH₃NH₂N₂O₄K = CH₃H₂0+C₂H₂O₅S+CH₃NCS. It may also be prepared by heating alkyl sulphide with potassium sulphocyanide. It is a colourless liquid boiling at 190° C. It combines directly with potassium bisulphide. Phenyl mustard oil, CH₃C₆H₅NCS, is obtained by boiling sulphocyanidate with concentrated hydrochloric acid, some triphenylguanidine being formed at the same time. It is a colourless liquid boiling at 228° C. When heated with copper powder it yields benzonitrile.

MUSTER (Med. Eng. muster, monstre, adapted from the similar O. Fr. forms; Lat. monstrare), originally an exhibition, show, parade, exhibition, was afterwards limited to the assembling of the ranks of a regiment, which in the hands of the commander was a new military discipline invented by Louis XIV. of France. It was not until the middle of the 18th century that the word was brought into the English language with no changing of the meaning. One of the meanings of this common Romance word, viz. pattern, sample, is only used in commercial usage in English (e.g. in the cutlery trade), but it has passed into Teutonic languages, Ger. Muster, Du. monder. The most general meaning is for the assembling of soldiers and sailors for inspection and review, and more particularly for the ascertainment and verification of the numbers on the roll. This use is seen in the Med. Lat. monstrare and monstratio, "recensio militum" (Du Cange, Gloss. s.v.). In the "enlisting" system of army organization during the 16th and 17th centuries, and later in certain special situations, each regiment was enlisted by its colonel and reviewed by the king, "monstrato" in the presence of the king and members on the pay roll of the regiment representing its actual strength. This was a necessary precaution in the days when it was in the power of the commander of a unit to fill the muster roll with the names of fictitious men, known in the military slang of France and England as passe-collants and "fagots" respectively. The chief officer at headquarters was the muster-master-general, later comissary general of musters. In the United States the term is still commonly used, and a soldier is "mustered out" when he is officially discharged from military service.

MUSURUS, MARCUS (c. 1470-1517), Greek scholar, was born in Rhithymna on the island of Crete. At an early age he became a pupil of John Lascaris at Venice. In 1505 he was made professor of Greek at Padua, but when the university was closed in 1509 during the war of the league of Cambrai he
MUTE—MUTILATION

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returned to Venice, where he filled a similar post. In 1516 he was summoned to Rome by Leo X., who appointed him archbishop of Monemvasia (Malvasia) in the Peloponnesse, but he died before he left Italy. Since 1493 Musurus had been associated with the famous printer Aldus Manutius, and belonged to the "conterfacentia," a society founded by Manutius and other learned men for the promotion of Greek studies. Many of the Aldine classics were brought out under Musurus' supervision, and he is credited with the first editions of the scholia of Aristophanes (1498), Atheneaus (1514), Hesychius (1514), Pausanias (1516).

See R. Menge's De M. Musuri vita studis ingenio, in vol. 5 of M. Schmidt's edition of Hesychius (1686).

MUTE (Lat. mutus, dumb), silent or incapable of speech. For the human physical incapacity see DEAF and DUMB. In phonetics (q.v.) a "mute" letter is one which (like p or g) represents no individual sound. The name of "mutters" is given, for obvious reasons, to the undertaker's assistants at a funeral. In music a "mute" (Ital. sordine, from Lat. sordus, deaf) is a device for deadening the sound in an instrument by checking its vibrations. Its use is marked by the sign c.s. (con sordine), and its cessation by s.s. (senza sordine). In the case of the violin and other stringed instruments this object is attained by the use of a piece of brass, wood or ivory, so shaped as to fit on the bridge without touching the strings and hold it so tightly as to deaden or muffle the vibrations. In the case of brass wind instruments a leather, wooden or papier mâché pad in the shape of a pear with a hole through it is placed in the bell of the instrument, by which the passage of the sound is impeded. The interference with the pitch of the instruments has led to the invention of elaborately constructed mutes. Players on the horn and trumpet frequently use the left hand as a mute. Drums are muted or "muffled" either by the pressure of the hand on the head, or by covering with cloth. In the side drum this is effected by the insertion of pieces of cloth between the membrane and the "snare," or by loosening the "snare." The muting of a pianoforte is obtained by the use of the soft-pedal.

MUTIAN, KONRAD (1471-1526), German humanist, was born in Honberg on the 15th of October 1471 of well-to-do parents named Mut, and was subsequently known as Konrad Mutianus Rutilus, from his red hair. At Deventer under Alexander Hegius he had Erasmus' school followed (1492) by that of the University of Erfurt, where he took the university's degree in 1492. From 1495 he travelled in Italy, taking the doctor's degree in canon law at Bologna. Returning in 1502, the landgraf of Hesse promoted him to high office. The post was not congenial; he resigned it (1503) for a small salary as canonicus in Gotha. Mutian was a man of great influence in a select circle especially connected with the university of Erfurt, and known as the Mutianischer Bund, which included Eoban Hess, Crotus Rubeanus, Justus Jonas and other leaders of independent thought. He had no public ambition; except in correspondence, and as an epigrammatist, he was no writer, but he furnished ideas to those who wrote. He may deserve the title which has been given him as "precursor of the Reformation," in so far as he desired the reform of the Church, but not the establishment of a rival. Like Erasmus, he was with Luther in his early stage, but deserted him in his later development. Though he had personally no hand in it, the Epistola obscurorum virorum (due especially to Crotus Rubeanus) was the outcome of the Reuchlinists in his Bund. He died at Gotha on the 30th of March (Good Friday) 1526.

See F. W. Kampsch Wolfe, Die Universität Erfurt (1858-1860); C. Krause, Eobanus Hessus (1879); L. Geiger, in Allgemeine Deutsche Biographie (1886); C. Krause, Der Briefwechsel des Mutianus Rutilus (1885); another collection by K. Gillert (1890). (A. Go.*).

MUTILATION (from Lat. mutilus, maimed). The wounding, maiming and disfiguring of the body is a practice common among savages and systematically pursued by many entire races. The varieties of mutilation are as numerous as the instances of it are widespread. Nearly every part of the body is the object of mutilation, and nearly every motive common to human beings—vanity, religion, affection, prudence—has acted in giving rise to what has been proved to be a custom of great antiquity. Some forms, such as tattooing and depilation, have stayed on as practices even after civilization has banished the more brutal types; and a curious fact is that analogous operations have been performed by different peoples at vast distances, and proved to have had no relations with one another, at any rate in historic times. Ethnical mutilations have in certain races a great sociological value. It is only after submission to some such operation that the youth is admitted to full tribal rights (see INITIATION). Tattooing, too, has a semi-religious importance, as when an individual bears a representation of his totem on his body; and many mutilations are tribe marks, or brands used to know slaves.

Mutilations may be divided into: (1) those of the skin; (2) of the head; (3) of the body and limbs; (4) of the teeth; (5) of the sexual organs. 1. The principal form of skin-mutilation is tattooing (q.v.), the ethical importance of which is very great. A practice almost as common is depilation, or removal of hair. This is either by means of the razor, e.g., in Japan, by depilatories, or by tearing out the hairs separately, as among most savage peoples. The parts thus mutilated are usually the eyebrows, the face, the scalp and the pubic regions. Many races have a native belief that the hair of the body or the head is impious (e.g., the Boungos) using special instruments. Depilation is common, too, in the South Sea Islands. The Andaman islanders and the Boto-

cudos of Brazil shave the body, using shell-edges and other primitive instruments.

2. Mutilations of the face and head are usually restricted to the lips, ears, nose and cheeks. The lips are simply perforated or distended to an extraordinary degree. The Botocudos insert disks of wood or bone with the lowest part sticking out. The Aleuts of America, too, on the Mackenzie river and among the Aleutians. In Africa they are frequently practised. The Mangana women pierce the upper lips and introduce small metal shields or rings. The Mittu women bore the lower lip and thrust a wooden peg through. In other tribes little sticks of rock crystal are pushed through, which jingle together as the wearer talks. The women of Senegal perforate their chin; the natives of the southern part of Japan, or the Boungos use special pins. The Boto-cudos of Brazil shave the body, using shell-edges and other primitive instruments.

3. Mutilations of the body and limbs are usually restricted to the ears, and sometimes to the nose. The ears are usually mutilated, from the ear-rings of the civilized West to the wooden disks of the Botocudos. In the north and south the practice is universal. Among the following peoples are the Andaman islanders, the Neddahs, the Bushmen, the Fouguens and certain tribes of Sumatra. Ear mutilation in its most exaggerated form is practised in Indo-China by the Mois of Annam and the Penangas of Cambodia, and in Bornoe by the Dyaks. They extend the lobe by the insertion of wooden disks, and metal rings, and weights, until it sometimes reaches the shoulder. In China and Asia earrings sometimes weigh nearly half a pound. Livingstone said that the Zulus extended the lobe in such a manner that the hand closed could be passed through. The Monbuttus thrust through a perforation in the side of the nose which is usually perforated; rings and jewelled pendants (as among Indian and Arabic women, the ancient Egyptians and Jews), or feathers, horns, wooden disks, or shells encircle the edge of this perforation in the lobe. The nose is usually perforated, and this is not always merely decorative. It may denote social position, as among the Ababdes, the Bonos in the Indian peninsula, or among the Moslems, the male Kulus of the Himalaya wear a large ring in the left nostril. Malays and Polynesians sometimes deform the nose by enlarging its base, effecting this by compression of the nasal bones of the nose, and disturbing their alignment.

The cheeks are not so frequently mutilated. The people of the Aleutian and Kurile Islands bore holes through their cheeks and place in them the long hairs from the muzzles of seals. The Guaranas of Brazil and people in the south of the Amazon have holes bored in the top of the head or the skin behind the ears of children is burnt to preserve them from sickness, traces of which mutilation are said to be discoverable on some neolithic skulls; while some small ornaments are cut out and thrust through the ear. Among the Tungus, peoples the deformation of the skull was anciently practised. Herodotus, Hiphocrates and Strabo mention such a custom among peoples of the Caspian and Crimea. Later similar practices were found existing among Chinese mendicant sects, some tribes of Turkестan, the Japanese priesthood, in Malaysia, Sumatra, Java and
the south seas. In Europe it was not unknown. But the discovery of this fact is not far removed from the art of skull-deformities. At the present day the custom is still observed by the Haidas and Chichooks, and by certain tribes of Peru and on the Amazon, by the Kurds of Armenia, by certain Malay primitive societies in the Moluccas and New Hebrides. The reasons for this type of mutilation are uncertain. Probably the idea of distinguishing themselves from lower races was predominant in most cases, as for example in that of the Chinook Indians, who distinguished themselves from the Klickitat by waxing their scalps. Or it may have been through a desire to give a ferocious appearance to their warriors. The deformation was always done at infancy, and often in the case of both sexes. It was, however, more usually reserved for boys, sometimes only for the eldest, on the ground that the boys would be engaged in battle and would have to protect themselves from their foes. Different methods prevailed: by bands, bandages, boards, combs, or saws, with or without grooves stamped on the edges, or even with a knife, applied to the head and held in position while the skull was deformed. There is no hard and fast rule, and it is possible that the method practised in one tribe was borrowed from another.

3. Mutilations of the body or limbs by maiming, lopping off or deforming, are far from rare. Certain races (Bushmen, Kaffirs and others) practised the cutting off of ears and noses for this purpose, especially for parents. The Tongas do the same, in the belief that the evil spirits which bring diseases into the body would escape by the wound. Diseased children are thus mutilated by them. Contempt for female timidity has caused a curious custom among the Gallas (Africa). They amputate the mammae of boys soon after birth, believing no warrior can possibly be brave who possesses them. The fashion of distort the feet of Chinese ladies of high rank, has been preserved to the present day. It is usual in the majority of primitive races to make alliances with themselves from their foes. The women of the Vayana are used to preying with a piece of metal the four lower incisors in children of both sexes. The women of certain tribes on the continent force the growth of the lower incisors by putting a piece of metal to make them project beyond the lower lips. Many of the aboriginal tribes of Australia extract teeth, and at puberty the Australian boys have a tooth knocked out. The Eskimos of the Mackenzie River cut down the crown of the upper incisors so as not to resemble dogs. Some Malay races, too, are said to blacken their teeth because dogs have white teeth. This desire to be unlike animals seems to be at the bottom of many dental mutilations. Another reason is the wish to be different from the Papuan tribes. The lower incisor and the other teeth in order to be unlike other Papuan tribes which they despise. In this way such practices become traditional. Finally, like many mutilations, those of the teeth are trials of endurance of physical pain, and take place at ceremonies of initiation and at puberty. Some Malay races, too, are said to blacken their teeth because dogs have white teeth. This desire to be unlike animals seems to be at the bottom of many dental mutilations. Another reason is the wish to be different from the Papuan tribes. The lower incisor and the other teeth in order to be unlike other Papuan tribes which they despise. In this way such practices become traditional. Finally, like many mutilations, those of the teeth are trials of endurance of physical pain, and take place at ceremonies of initiation and at puberty. The Mois (Scimages) of Cochin-China break the two upper middle incisors with a flint. This is always ceremoniously done at puberty to the accomplishment of fasting and prayers for those mutilated, who use it as a sign of manhood, and which is a part of the Mutsu, Munemitsu, Count (1842–1890), Japanese statesman, was born in 1842 in Wakayama. A vehement opponent of "dan government"—that is, usurpation of administrative posts by men of two or three fiefs, an abuse which threatened the country with internal dissension. Too young to be an advisor, he signed in March 1860, the Edicts of the first and second mutsu, Mutiny, Mutsu, Hitot, Emperor, of Japan (1852–1912), was born on the 31st January 1852, succeeded his father, Osabito, the former emperor, in January 1867, and was crowned at Osaka on the 31st October 1868. The country was then in a ferment owing to the concessions which had been granted to foreigners by the preceding shogun Iyemochi, who in 1854 concluded a treaty with Commodore Perry by which it was agreed that certain ports should be open to foreign trade. This convention gave great offence to the more conservative daimios, and on their initiative the mikado suddenly decided to abolish the shogunate. This resolution was not carried out without strong opposition. The reigning shogun, Keiki, yielded to the decree, but many of his followers were not so compliant, and it was only by force of arms that the new order of things was imposed on the country. The main object of those who had advocated the change was to lead to a reversion to the
primitive condition of affairs, when the will of the mikado was absolute and when the presence in Japan of the hated foreigner was unknown. But the reactionary party was not to be allowed to monopolize revolution. To their surprise and dissatisfaction, the powerful daimios of Satsuma and Choshu suddenly declared themselves to be in favour of opening the country to foreign intercourse, and of adopting many far-reaching reforms. With this movement Mutsu Hito was cordially in agreement, and of his own motion he invited the foreign representatives to an audience on the 23rd of March 1868. As Sir Harry Parkes, the British minister, was on his way to this assembly, he was attacked by a number of two-sworded samurai, who, but for his guard, would doubtless have succeeded in assassinating him. The outrage was regarded by the emperor and his ministers as a reflection on their honour, and they readily made all reparation within their power. While these agitation went on, the emperor, with his advisers, was maturing a political constitution which was to pave the way to the assumption by the emperor of direct personal rule. As a step in this direction, Mutsu Hito transferred his capital from Kioto to Yedo, the former seat of the shoguns' government, and marked the event by renaming the city Tokyo, or Eastern Capital. In 1869 the emperor paid a visit to his old capital, and there took as his imperial consort a princess of the house of Ichijo. In the same year Mutsu Hito bound himself by oath to institute certain reforms, the first of which was the establishment of a deliberative assembly. In this onward movement he was supported by the majority of the daimios, who in a supreme moment of patriotism surrendered their estates and privileges to their sovereign. This was the death-knell of the feudalism which had existed for so many centuries in Japan, and gave Mutsu Hito the free hand which he desired. A centralized bureaucracy took the place of the old system, and the nation moved rapidly along the road of progress. Everything European was eagerly adopted, even down to frock-coats and patent-leather boots for the officials. Torture was abolished (1873), and a judicial code, adapted from the Code Napoléon, was authorized. The first railway—that from Yokohama to Tokyo—was opened in 1872; the European calendar was adopted, and English was introduced into the curriculum of the common schools. In all these reforms Mutsu Hito took a leading part. But it was not to be expected that such far-reaching changes could be effected without opposition, and thrice during the period between 1876 and 1884 the emperor had to face serious rebellious movements in the provinces. These he succeeded in suppressing; and even amid these preoccupations he managed to inflict a check on his huge neighbour, the empire of China. As the government of this state declared that it was incapable of punishing certain Formosan pirates for outrages committed on Japanese ships (1874), Mutsu Hito landed a force on the island, and, having inflicted chastisement on the bandits, remained in possession of certain districts until the compensation demanded from Peking was paid. The unparalleled advances which had been made by the government were now held by the emperor and his advisers to justify a demand for the revision of the foreign treaties, and negotiations were opened with this object. They failed, however, and the consequent disappointment gave rise to a strong reaction against everything foreign throughout the country. Foreigners were assaulted on the roads, and even the Russian cesarevi, afterwards the tsar Nicholas II., was attacked by would-be assassins in the streets of Tokyo. A renewed attempt to revive the treaties in 1894 was more successful, and in that year Great Britain led the way by concluding a revised treaty with Japan. Other nations followed, and by 1901 all those obnoxious clauses suggestive of political inferiority had finally disappeared from the treaties. In the same year (1894) war broke out with China, and Mutsu Hito, in common with his subjects, showed the greatest zeal for the campaign. He reviewed the troops as they left the shores of Japan for Korea and Manchuria, and personally distributed rewards to those who had won distinction. In the war with Russia, 1904–5, the same was the case, and it was to the virtues of their emperor that his generals loyally ascribed the Japanese victories. In his wise patriotism, as in all matters, Mutsu Hito always placed himself in the van of his countrymen. He led them out of the trammels of feudalism; by his progressive rule he lived to see his country advanced to the first rank of nations; and he was the first Oriental sovereign to form an offensive and defensive alliance with a first-rate European power. In 1869 Mutsu Hito married Princess Haru, daughter of Ichiyo Tadaka, a noble of the first rank. He has one son and several daughters, his heir-apparent being Yoshi Hito, who was born on the 31st of August 1879, and married in 1900 Princess Sada, daughter of Prince Kujö, by whom he had three sons before 1909. Mutsu Hito adopted the epithet of Meiji, or "Enlightened Peace," as the nengō or title of his reign. Thus the year 1901, according to the Japanese calendar, was the 34th year of Meiji.

MUTTRA. For MATURA, a city and district of British India in the Agra division of the United Provinces. The city is on the right bank of the Jumna, 30 m. above Agra; it is an important railway junction. Pop. (1901), 60,042. It is an ancient town, mentioned by Fa Hien as a centre of Buddhism about A.D. 400; his successor Hsüan Tsang, about 650, states that it then contained twenty Buddhist monasteries and five Brahmanical temples. Muttra has suffered more from Mahomedan plunder than most towns of northern India. It was sacked by Mahmud of Ghazni in 1017–18; about 1500 Sultan Sikandar Lodi utterly destroyed all the Hindu shrines, temples and images; and in 1636 Shah Jahan appointed a governor expressly to "stamp out idolatry." In 1669–70 Aurangzeb visited the city and continued the work of destruction. Muttra was again captured and plundered by Ahmad Shah with 25,000 Afghan cavalry in 1756. The town still forms a great centre of Hindu devotion, and large numbers of pilgrims flock annually to the festivals. The special cult of Krishna with which the neighbourhood is associated seems to be of comparatively late date. Much of the prosperity of the town is due to the residence of a great family of sultans or native bankers, who were conspicuously loyal during the Mutiny. Temples and bathing-stairs line the river bank. The majority are modern, but the mosque of Aurangzeb, on a lofty site, dates from 1669. Most of the public buildings are of white stone, handsomely carved. There is an American mission, a Roman Catholic church, a museum of antiques, and a cantonnement for a British cavalry regiment. Cotton, paper and pilgrims' charms are the chief articles of manufacture.

The District of Muttra has an area of 1445 sq. m. It consists of an irregular strip of territory lying on both sides of the Jumna. The general level is only broken at the south-western angle by low ranges of limestone hills. The eastern half consists for the most part of a rich upland plain, abundantly irrigated by wells, rivers and canals, while the western portion, though rich in mythological association and antiquarian remains, is comparatively unfavoured by nature. For eight months of the year the Jumna shrinks to the dimensions of a mere rivulet, meandering through a waste of sand. During the rains, however, it swells to a mighty stream, a mile or more in breadth. Formerly nearly the whole of Muttra consisted of pasture and woodland, but the roads constructed as relief works in 1837–1838 have thrown open many large tracts of country, and the task of reclamation has since proceeded rapidly. The population in 1901 was 763,099, showing an increase of 7 % in the decade. The principal crops are millets, pulse, cotton, wheat, barley and sugar cane. The famine of 1878 was severely felt. The eastern half of the district is watered by the Agra canal, which is navigable, and the western half by branches of the Ganges canal. A branch of the Rajputana railway, from Agra to Lucknow, crosses the district; the chord line of the East India, from Agra to Delhi, traverses it from north to south; and a new line, connecting with the Great Indian Peninsula, was opened in 1905.

The central portion of Muttra district forms one of the most sacred spots in Hindu mythology. A circuit of 84 kos around Gokul and Brindaban bears the name of the Braj-Mandal, and
MUTULE—MUZAFFARNAGAR

MUTULE (Lat. mutulus, a stay or bracket), in architecture the rectangular block under the soffit of the corinth of the Greek Doric temple, which is studded with guttae. It is supposed to represent the piece of timber through which the wooden pegs were driven to hold the lintel in position. It is perfectly rectangular, and it follows the rake of the roof. In the Roman Doric order the mutule was horizontal, with sometimes a crowning fillet, so that it virtually fulfilled the purpose of the modillion in the Corinthian cornice.

MUZAFFAR-ED-DIN, shah of Persia (1853-1907), the second son of Shah Nasr-ed-Din, was born on the 25th of March 1853. He was in due course declared vâlî ahd, or heir-apparent, and invested with the governorship of Azerbaijan, but on the assassination of his father in 1856 it was feared that his elder brother, Zill-es-Sultan, the governor of Isfahan, might prove a dangerous rival, especially when it was remembered that Muzaifar-ed-Din had been recalled to Teheran by his father upon his failure to suppress a Kurd rising in his province. The British and Russian governments, in order to avoid widespread disturbances, agreed however to give him their support. All opposition was thus obviated, and Muzaifar-ed-Din was duly enthroned on the 8th of June 1866, the Russian general Kosakovsky, commander of the Persian Cossacks, presiding over the ceremony with drawn sword. On this occasion the new shah announced the suppression of all purchase of civil and military posts, and then proceeded to remit in perpetuity all taxes on bread and meat, thus lightening the taxation on food, which had caused the only disturbances in the last reign. But whatever hopes may have been aroused by this auspicious beginning of the reign were soon dashed owing to the extra- vangence and profligacy of the court, which kept the treasury in a chronic state of depletion. Towards the end of 1866 the Amin-es-Sultan, who had been grand vizier during the last years of Nasr-ed-Din's reign, was disgraced, and Muzaifar-ed-Din announced his intention of being in future his own grand vizier. The Amin-ad-Dowlah, a less masterful servant, took office with the lower title of prime minister. During his short administration an elaborate scheme of reforms was drawn up on paper, and remained on paper. The treasury continued empty, and in the spring of 1868 Amin-es-Sultan was recalled with the special object of filling it. The delay of the British government in sanctioning a loan in London gave Russia her opportunity. A Russian loan was followed by the establishment of a Russian bank at Teheran, and the vast expansion of Russian influence generally. At the beginning of 1900 a fresh gold loan was negotiated with Russia, and a few months later Muzaifar-ed-Din started on a tour in Europe by way of St Petersburg, where he was received with great state. He subsequently went to Paris to visit the Exhibition of 1900, and while there an attempt on his life was made by a madman named François Salsón. In spite of this experience the shah so enjoyed his European tour that he determined to repeat it as soon as possible. By the end of 1901 his treasury was again empty; but a fresh Russian loan replenished it and in 1902 he again came to Europe, paying on this occasion a state visit to England. On his way back he stopped at St Petersburg, and at a banquet given in his honour by the tsar toasts were exchanged of unmistakable significance. None the less, during his visit to King Edward VII. the shah had been profuse in his expressions of friendship for Great Britain, and in the spring of 1903 a special mission was sent to Teheran to invest him with the Order of the Garter.

The shah's misguided policy had created widespread disaffection in the country, and the brunt of popular disfavour fell on the atâbeg (the title by which the Amin-es-Sultan was now known), who was once more disgraced in September 1903. The war with Japan now relaxed the Russian pressure on Teheran, and at the same time dried up the source of supplies; and the clergy, giving voice to the general misery and discontent, grew more and more outspoken in their denunciations of the shah's misrule. Nevertheless Muzaifar-ed-Din defied public opinion by making another journey to Europe in 1905; but, though received with the customary distinction at St Petersburg, he failed to obtain further supplies. In the summer of 1906 popular discontent culminated in extraordinary demonstrations at Teheran, which practically amounted to a general strike. The government was forced to make a liberal morpholine constitution, the first parliament being opened by him on the 12th of October 1906. Muzaifar-ed-Din died on the 8th of January 1907, being succeeded by his son Mohammed Ali Mirza.

MUZAFFARGARH, a town and district of British India, in the Multan division of the Punjab. The town is near the right bank of the river Chenab, and has a railway station. Pop. (1901), 4018. Its fort and a mosque were built by Nawab Muzaifar Khan in 1794-1796.

The District of Muzaifar-Garh occupies the lower end of the Sind-Sagar Doab. Area, 3655 sq. m. In the northern half of the district is the wild thal or central desert, an arid elevated tract with a width of 40 m. In the extreme north, which gradually contracts until it disappears about 10 m. south of Muzaifar-Garh town. Although apparently a table-land, it is really composed of separate sandhills, with intermediate valleys lying at a lower level than that of the Indus, and at times flooded. The towns stand on high sites or are protected by embankments; but the villages scattered over the lowlands are exposed to annual inundations, during which the people abandon their grass-built huts, and take refuge on wooden platforms attached to each house. Throughout the cold weather large herds of camels, belonging chiefly to the Povindah merchants of Afghanistan, graze upon the sandy waste. The district possesses hardly any distinct boundaries of its own, having always formed part of Multan (q.v.). The population in 1901 was 405,656, showing an increase of 0-4% in the decade, due to the extension of irrigation. The principal crops are wheat, pulse, rice and indigo. The most important domestic animal is the camel. The district is crossed by the Northern railway, and the boundary rivers are navigable, besides furnishing numerous irrigation channels, originally constructed under native rule.

MUZAFFARNAGAR, a town and district of British India, in the Meerut division of the United Provinces. The town is 790 ft. above the sea, and has a station on the North-Western railway. Pop. (1901), 23,444. It is an important trading centre and has a manufacture of blankets. It was founded about 1852 by the son of Muzaifar Khan, Khan-i-Jahan, one of the famous Sayid family who rose to power under the emperor Shah Jahan. The District of Muzaifar-Nagar has an area of 1666 sq. m. It lies near the northern extremity of the Doab or great alluvial plain between the Ganges and the Jumna, and shares to a large extent in the general monotony of that level region. A great portion is sandy and unfertile; but under irrigation the soil is rapidly improving, and in many places the villages have succeeded in introducing a high state of cultivation. Before the opening of the canals Muzaifar Nagar was liable to famines and was sometimes flooded; but now it is Memorably im- porated by the spread of irrigation. It is traversed by four main canals, the Ganges, Anupshahr, Deoband and Eastern Jumna. Its trade is confined to the raw materials it produces.
MUZAFFARPUR—MYCENAE

climate of the district is comparatively cool, owing to the proximity of the hills; and the average annual rainfall is 33 in. The population in 1901 was 877,188, showing an increase of 13.5% in the decade, which was a period of unexampled prosperity. The principal crops are wheat, pulse, cotton and sugar-cane. The district is crossed by the North-Western railway from Delhi to Saharanpur.

Hindu tradition represents Muzaffarnagar as having formed a part of the Pahari kingdom of the Mahabharata; authentic history, however, dates from the time of the Moslem conquests in the 13th century, from which time it remained a dependency of the various Mahratta dynasties which ruled in Delhi until the practical downfall of the Mogul Empire in the middle of the 18th century. In 1788 the district fell into the hands of the Maharrattas. After the fall of Aligarh, the whole Doab as far north as the Siwalik hills passed into the hands of the British without a blow, and Muzaffarnagar became part of Saharanpur. It was created a separate jurisdiction in 1824. During the Mutiny there was some disorder, chiefly occasioned by official weakness, but no severe fighting.

See Muzaffarnagar District Gazetteer (Allahabad, 1903).

MUZAFFARPUR, a town and district of British India, in the Patna division of Bengal. The town is on the right bank of the Little Gandak river, and has a railway station. Pop. (1901), 46,617. The town is well laid out, and is an important centre of trade, being on the direct route from Patna to Nepal. It is the headquarters of the Behar Light Horse volunteer corps and has a college established in 1890.

The District of Muzaffarpur has an area of 3,035 sq. m. It was formed in January 1875 out of the great district of Tiharoot, which up to that time was the largest and most populous district of Lower Bengal. The district is an alluvial plain between the Ganges and the Great Gandak, the Baghmat and Little Gandak being the principal rivers within it. South of the Little Gandak the land is somewhat elevated, with depressions containing lakes toward the south-east. North of the Baghmat the land is lower and marshy, but is traversed by elevated dry ridges. The tract between the two rivers is lowest of all and liable to floods. Pop. (1901), 5,754,708, showing an increase of 15% in the decade. Average density, 194 per sq. m., being exceeded in all India only by the neighbouring district of Saran. Indigo (superseeded to some extent, owing to the fall in price, by sugar) and opium are largely grown. Rice is the chief grain crop, and cloth, carpets and pottery are manufactured. The district is traversed in several directions by the Tiharoot system of the Bengal and North-Western railway. It suffered from drought in 1873-1874, and again in 1891-1892.

See Muzaffarpur District Gazetteer (Calcutta, 1897).

MUZIANO, GIROLAMO (1528-1592), Italian painter, was born at Acquafreda, near Brescia, in 1528. Under Romanino, an imitator of Titian, he studied his art, designing and colouring according to the principles of the Venetian school. But it was not until he had left his native place, still in early youth, and had repaired to Rome about 1550, that he came into notice. There his pictures soon gained for him the surname of Il Giovane de' Pizzi (the young pictor); of the older one, Michelangelo, he next tried the more elevated style of historical painting. He imitated Michelangelo in giving great prominence to the anatomy of his figures, and became fond of painting persons emaciated by abstinence or even disease. His great picture of the "Resurrection of Lazarus", at once established his fame. Michelangelo praised it, and pronounced its author one of the first artists of that age. It was placed in the church of Santa Maria Maggiore, but was afterwards transferred to the Quirinal Palace. Muziano, with dogged perseverance (at one time he shaved his head, so as not to be tempted to go out of doors), continued to proceed in the path on which he had entered. He grew excellent in depicting foreign and military costumes, and in introducing landscapes into his historical pieces after the manner of Titian. Mosaic working also occupied his attention while he was employed as superintendent at the Vatican; and it became under his hands a perfect imitation of painting. His ability and industry soon gained for him a handsome fortune. Part of this he expended in assisting to found the Academy of St Luke in Rome. He died in 1592, and was buried in the church of Santa Maria Maggiore.

Many of Muziano's works are in the churches and palaces of Rome; he also worked in Orvieto and Loreto. In Santa Maria degli Angeli, Rome, there is his chief work, "St Jerome preaching to Monks in the Desert"; his "Circumcision" is in the church of the Gesù; his "Ascension" in the Arcelli, and his "St Francis receiving the Stigmata" in the church of the Concepcion. A picture by him, representing Christ washing the feet of His disciples, is in the cathedral of Reims.

MUZZIOLI, GIOVANNI (1854-1894), Italian painter, was born in Modena, whither his family had removed from Castelvetro, on the 10th of February 1854. From the time that he began to attend the local academy at the age of thirteen he was recognized as a prodigy, and four years later, by the unanimous vote of the judges, he gained the Poletti scholarship enabling him to four years' residence in Rome and Florence. After his return to Modena, Muzzioli visited the Paris exhibition, and there came under the influence of Sir L. Alma Tadema. His first important picture was "In the Temple of Bacchus" (1881); and his masterpiece, "The Funeral of Britannicus," was one of the chief successes of the Bologna Exhibition of 1888. From 1878 to his death (August 5, 1894) Muzzioli lived in Florence, where he painted the altar-piece for the church of Castelvetro. See History of Modern Italian Art, by A. R. Willard (London, 1898).

MWERU, a large lake of Eastern Central Africa, traversed by the Luapula or upper Congo. It lies 3,000 ft. above the sea; measures about 76 m. in length by some 25 in breadth, and is roughly rectangular, the axis running from S.S.W. to N.N.E. It is cut by a little stream of its name. On the N.E. corner passes 29° E. At the south end a shallow bay extends to 9° 31' S. East of this and some miles further north, the Luapula enters from a vast marsh inundated at high water; it leaves the lake at the north-west corner, making a sharp bend to the west before assuming a northerly direction. Besides the Luapula, the principal influent is the Kalungwizi, from the east. Near the south end of the lake lies the island of Kilwa, about 8 m. in length, rising into plateaus 600 ft. above the lake. Here the air is cool and balmy, the soil dry, with short turf and clumps of shady trees, affording every requirement for a sanatorium. Mweru was reached by David Livingstone in 1865, but his western shore was first explored in 1880 by Sir Alfred Sharpe, who two years later effected its circumnavigation. The eastern shores from the Luapula entrance to its exit, together with Kilwa Island, belong to British Central Africa; the western to the Belgian Congo.

MYAUNGMYA, a district in the Irrawaddy division of lower Burma, formed in 1893 out of a portion of Bassein district, and reconstituted in 1903. It has an area of 2,663 sq. m., and a population (1907) of 278,119, showing an increase of 49% in the decade and a density of 104 inhabitants to the square mile. Among the population were about 12,800 Christians, mostly KARENS. The district is a deltaic tract, bordering south on the sea and south-west on the Irrawaddy, and the chief cultivation and fishing occupy practically all the inhabitants of the district. The town of Myaungmya had 4711 inhabitants in 1901.

MYCENAE, one of the most ancient cities of Greece, was situated on a hill above the northern extremity of the fertile Argive plain—μυκόνης Ἀργεών ἔποιφας. Its situation is exceedingly strong, and it commands all the roads leading from Corinth and Achaea into the Argive plain. The walls of Mycenae are the greatest monument that remains of the Heroic age in Greece; part of them is similar in style and doubtless contemporary in date with the walls of the neighbouring town Tiryns. There can therefore be little doubt that the two towns were the strongholds of a single race, Tiryns commanding the sea-coast and Mycenae the inner country. Legend tells of the rivalry between the dynasties of the Pelopidae at Mycenae

...
and of the Proctidae at Argos. In early historic times Argos had obtained the predominance. The Mycenaeans, who had temporarily regained their independence with the help of Sparta, fought on the Greek side at Plataea in 479 B.C. The long warfare between the two cities lasted till 468 B.C., when Mycenae was dismantled and its inhabitants dispersed. The city never revived; Strabo asserts that no trace of it remained in his time, but Pausanias describes the ruins. For the character of Mycenaean art and of the antiquities found at Mycenae see Aegean Civilization.

The extant remains of the town of Mycenae are spread over the hill between the village of Charvati and the Acropolis. They consist of some traces of town walls and of houses, and of an early bridge over the stream to the east, on the road leading to the Heraeum. The walls of the Acropolis are in the shape of an irregular triangle, and occupy a position of great natural strength between two valleys. They are preserved to a considerable height on all sides, except where the ravine is precipitous and they have been carried away by a landslide; they are for the most part built of irregular blocks of great size in the so-called "Cyclopaean" style; but certain portions, notably that near the chief gate, are built in almost regular courses of squared stones; there are also some later repairs in polygonal masonry. The main entrance is called the Lion Gate, from the famous triangular relief which fills the space above its massive lintel. This represents two lions confronted, resting their front legs on a low altar-like structure on which is a pillar which stands between them. The device is a translation into stone of a type not uncommon in gem-cutter's and goldsmith's work of the "Mycenaean" age. The gate is approached by a road commanded on one side by the city wall, on the other by a projecting tower. There is also a postern gate on the north side of the wall, and at its eastern extremity are two apertures in the thickness of the wall. One of these leads out on to the rocks above the southern ravine, the other leads to a long staircase, completely concealed in the wall and the rocks, leading down to a subterranean well or spring. Just within the Lion Gate is a projection of the wall surrounding a curious circular enclosure, consisting of two concentric circles of thin slabs of stone set up on end, with others laid across the top of them; at the part of this enclosure nearest to the Lion Gate is an entrance. Some have supposed the circle of slabs to be the retaining wall of a tumulus; but its structure is not solid enough for such a purpose, and it can hardly be anything but a sacred enclosure. It was within this circle that Dr H. Schliemann found the five graves that contained a marvellous wealth of gold ornaments and other objects; a sixth was subsequently found. Above one of the graves was a small circular altar, and there were also several sculptured slabs set up above them. The graves themselves were mere shafts sunk in the rock. Dr Schliemann identified them with the graves of Agamemnon, Cassandra, and their companions, which were shown to Pausanias within the walls; and there can be little doubt that they are the graves that gave rise to the tradition, though the historical identity of the persons actually buried in them is a more difficult question. Outside the circle, especially to the south of it, numerous remains of houses of the Mycenaean age have been found, and others, terraced up at various levels, occupy almost the whole of the Acropolis. On the summit, approached by a well-preserved flight of steps, are the remains of a palace of the Mycenaean age, similar to that found at Tiryns, though not so complicated or extensive. Above them are the foundations of a Doric temple, probably dating from the last days of Mycenaean independence in the 5th century.

Numerous graves have been found in the slopes of the hills adjoining the town of Mycenae. Most of these consist merely of a chamber, usually square, excavated in the rock, and approached by a "dromos" or horizontal approach in the side of a hill. They are sometimes provided with doorways faced with stucco, and these have painted ornamentation. Many of these tombs have been opened, and their contents are in the Athens museum. Another and much more conspicuous kind of tomb is that known as the beehive tomb. There are eight of them at Mycenae itself, and others in the neighbourhood. Some of them were visible in the time of Pausanias, who calls them the places where Atreus and his sons kept their treasures. There can, however, be no doubt that they were the tombs of princely families. The largest and best preserved of them, now

Based on a plan in Schuchhardt's Schliemann's Excavations.

**Fig. 1.—Plan of the Citadel of Mycenae.**
MYCETOZOA

commonly called the Treasury of Atreus, is just outside the Lion Gate. It consists of a circular domed chamber, nearly 50 ft. in diameter and in height; a smaller square chamber opens out of it. It is approached by a horizontal avenue 20 ft. wide and 115 ft. long, with side walls of squared stone sloping up to a height of 45 ft. The doorway was flanked with columns of alabaster, with rich spiral ornament, now in the British Museum; and the rest of the façade was very richly decorated, as may be seen from Chipiez's fine restoration. The inside of the vault was ornamented with attached bronze ornaments, but not, as is sometimes stated, entirely lined with bronze. It is generally supposed that these tombs, as well as those excavated in the rock, belong to a later date than the shaft-tombs on the Acropolis.

See H. Schliemann, Mycenas (1879); C. Schuchhardt, Schliemans's Excavations (Eng. trans., 1891); Chr. Tsountas, Mykénai και Μυκηναῖοι πολιτισμοί (1893); Tsountas and Manatt, The Mycenaeen Age (1897); Perrot and Chipiez, Histoire de l'art dans l'antiquité, vol. vi., L'Art Mycéénien. Various reports in Περιοδικά της Ἑλληνικής Ἰστορικής Εταιρείας and Εφημερίς αρχαιολογίας.

MYCETOZOA (Mycyomycetes, Schlecht.), in zoology, a group of organisms reproducing themselves by spores. These are produced in or on sporangia which are formed in the air and the spores are distributed by the currents of air. They thus differ from other spore-bearing members of the animal kingdom (which produce their spores while immersed in water or, in the case of parasites, within the fluids of their hosts), and resemble the Fungi and many of the lower green plants.

In relation with this condition of their fructification the structures formed at the spore-bearing stage to contain or support the spores generally have a remarkable resemblance to the sporangia of certain groups of Fungi, from which, however, the Mycetozoa are essentially different.

Although the sporangial and some other phases have long been known, and Fries had enumerated 192 species in 1829, the main features of their life-history were first worked out in 1859-1860 by de Bary (1 and 2). He showed that in the Mycetozoa the spore hatches out as a mass of naked protoplasm which almost immediately assumes a free-swimming flagellate form (zoospore), that after multiplying by division this passes into an amoeboid phase, and that from such amoebae the plasmodia arise, though the mode of their origin was not ascertained by him. The generation of the Mycetozoa is a mass of single protoplasm, without a differentiated envelope and endowed with the power of active locomotion. It penetrates the interstices of decaying vegetable matter, or, in the case of the species Badhamia striolaris, spreads as a film on the surface of living fungi; it may grow almost indefinitely in size, attaining under favourable conditions several feet in extent. It constitutes the dominant phase of the life-history. From the plasmodium the sporangia take their origin. It was Cienkowski who (in 1863) contributed the important fact that the plasmodium arise by the fusion with one another of numbers of individuals in the amoeboid phase—a mode of origin which is now generally recognized as an essential feature in the conception of a plasmodium, whether as occurring among the Mycetozoa or in other groups (7). De Bary clearly expressed the view that the life-history of the Mycetozoa shows them to belong not to the vegetable but to the animal kingdom.

The individual sporangia of the Mycetozoa are, for the most part, minute structures, rarely attaining the size of a mustard-seed, though, in the composite form of aethalia, they may form cake-like masses an inch or more across (fig. 21). They are found, stalked or sessile, in small clusters or distributed by the thousand over a wide area many feet in diameter, on the bark of decaying trees, on dead leaves or sticks, in woods and shrub-beries, among the stems of plants on wet moors, and occasionally, at the surface in localities where there is a substratum of decaying vegetable matter sufficiently moist to allow the plasmodium to live. Tan-heaps have long been known as a favourite habitat of Fuligo septica, the plasmodia of which, emerging in bright yellow masses at the surface prior to the sporangial (in this case aethalial) phase, are known as "flowers of tan." The film-like, expanded condition of the plasmodium, varying in colour in different species and traversed by a network of vein-like channels (fig. 3), has long been known. The plasmodial stage was at one time regarded as representing a distinct group of fungi, to which the generic name Mesenterica was applied. The species of Mycetozoa are widely distributed over the world in temperate and tropical latitudes where there is sufficient moisture for them to grow, and they must be regarded as not inconsiderable agents in the disintegrating processes of nature, by which complex organic substances are decomposed into simpler and more stable chemical groups.

Classification.—The Mycetozoa, as here understood, fall into three main divisions. The Endosporae, in which the spores are contained within sporangia, form together with the Exosporae, which bear their spores on the surface of sporophores, a natural group characterized by forming true plasmodia. They constitute the Euplasmodida. Standing apart from them is the small group of the mould-like Sorophorae, in which the amoeboid individuals only come together immediately prior to spor-formation and do not completely fuse with one another.

A number of other organisms living on vegetable and animal bodies, alive or dead, and leading an entirely aquatic life, are included by Zopf (31) under the Mycetozoa, as the "Monadina," in distinction from the "Eumycetozoa," consisting of the three groups above mentioned. The alliance of some of these (e.g. Protomonas) with the Mycetozoa is probable, and was accepted by de Bary, but the relations of other Monadina are obscure, and appear to be at least as close with the Heliozoa (with which many may in fact belong) as the limits here adopted, following de Bary, include a group of organisms which, as shown by their life-history, belong to the animal stock, and yet alone among animals (3) they have acquired the habit, widely found in the vegetable kingdom, of developing and distributing their spores in air.

Class MYCETOZOA.

Sub-class 1.—Euplasmodida.1

Division 1.—Endosporae.


Sub-cohort 2.—Amaurochaetae.


Sub-cohort 2.—Calonemineae.


Division 2.—Exosporae.


Sub-class 2.—Sorophora.


1 Bursula, a member of Zopf's Monadina, likewise forms spores in air.

2 The classification of the Euplasmodida here given is that of A. and G. Lister (22), the outcome of a careful study of the group extending over more than twenty-five years. The writer of this article desires to express his indebtedness to the opportunities he has had of becoming familiar with the work of his father, Mr A. Lister, F.R.S., whose views on the Mycetozoa he has endeavoured herein to summarize.
MYCETOZOA

LIFE-HISTORY OF THE MYCETOZOA

EUPLASMODIDA

Endosporae.

We may begin our survey of the life-history at the point where the spores, borne on currents of air, have settled among wet decaying vegetable matter. Shrunken when dry, they may absorb moisture, and resume the spherical shape which is found in nearly all species. Each is surrounded by a thin, weak, sheltered by which the protoplasm, though losing moisture by drying, may remain alive for as many as four years. In several cases it has been found to give the chemical reactions of cellulose. It is smooth or variously sculptured according to the species. Within the protoplasm may be seen the nucleus, and one or more contractile vacuoles make their appearance.

After the spore has lain in water for a period varying from a few hours to a day or two months, or perhaps several years, a burst occurs and the contained protoplasm slips out and lies free in the water as a minute colourless mass, presenting amoeboid movements (fig. 1, c). It soon assumes an elongated pear-shaped form, and a flagellum is developed at the narrow end, attaining a length equal to the rest of the body. The minute zoospore, thus equipped, swims away with a characteristic dancing motion. The protoplasm is granular within but hyaline externally (fig. 1, d). The nucleus, lying at the end of the body where it tapers into the flagellum, is limited by a definite wall and contains a nuclear network and a nucleolus. It often presents the appearance of being drawn out into a point towards the flagellum, and a bell-like structure (first described by Plenge (27)) streaming more distinctly than the rest of the protoplasm, extends from the base of the flagellum and invests the nucleus (fig. 2, a and e). The other end of the zoospore may be narrowly rounded (fig. 1, d) or it may be produced into short pseudopodia (fig. 1, c). By means of these the zoospore captures bacteria which are drawn into the body and enclosed in digestive vacuoles. A contractile vacuole is also present near this hind end. Considerable movement may be observed among the granules of the interior, and the mass may be thrown off at any point. The nucleus may apparently become amoeboid, either with (fig. 1, f) or without (fig. 2, c) the temporary retraction of the flagellum; or it may take an elongated slug-like shape and creep with the flagellum extended in front, with tactile and apparently exploratory movements.

Other shapes may be temporarily assumed by the zoospore. By attaching itself to an object it may become amoeboid, either with (fig. 1, f) or without (fig. 2, c) the temporary retraction of the flagellum; or it may take an elongated slug-like shape and creep with the flagellum extended in front, with tactile and apparently exploratory movements.

That the zoospores of many species of the Endosporae feed on bacteria has been shown by A. Lister (18). New light has recently been thrown on the matter by Pinoy (26), who has worked chiefly with Sorophora, in which, as shown below, the active phase of the life-history is passed mainly in the state of isolated amoebae. Pinoy finds that the amoebae of this group live on particular species of bacteria, and that the presence of the latter is a necessary condition for the development of the Sorophora, and even (as has been recognized by other workers) for the hatching of their spores. Pinoy’s results indicate, though they do not conclusively, that bacteria are likewise the essential food of the Euplasmodida in the early phases of their life-history. The zoospores do, however, ingest other solid bodies, e.g. carrots, granules (Saville Kent, 15).

The zoospores multiply by binary fission, the flagellum being withdrawn and the nucleus undergoing mitotic division, with the formation of a well-marked achromatic spindle (fig. 3). It is probable that fusion occurs not at the zoospore stage; but there is not satisfactory evidence to show how often it may be repeated.

At this, as at other phases of the life-history, a resting stage may be assumed as the result of drying, but also from other and unknown causes. The flagellum is withdrawn and the protoplasm, becoming spherical, is endowed, as was first recognized by Cienkowski, with mutual attraction, and on meeting fuse with one another. Fig. 4 represents a group of such amoebae. Several have already united to form a common mass, to which others, still free, are converging. The protoplasmic mass thus arising is the plasmodium. The fusion between the protoplasmic bodies of the amoebae which unite to form it is complete. Their nuclei may be traced for some time in the young plasmodium and no fusion between them has been observed at this stage (26). As the plasmodium increases in size by the addition of amoebae the task of following the fate of the individual nuclei by direct observation becomes impossible.

The presence of an active plasmodium of Badhamia utricularis, which, as we have seen, lives and feeds on certain fungi, is shown in fig. 5. It consists of a film of protoplasm, of a bright yellow colour, varying in size up to a foot or more in diameter. It is traversed by a network of branching and anastomosing strands, which divide up and are gradually lost as they approach the margin where the protoplasm forms a uniform and lobate border. Elsewhere the

1 Figures 1, 4, and 11-22 are from the British Museum Guide to the British Mycetozoa. The other figures are from Lankester’s Treatise on Zoology, part I. Introduction and Protozoa. Fascicle I. Article Mycetozoa.

2 Pinoy states (26) that the spores of Spumaria alba, cultivated with bacteria on solid media, hatch out into amoebae, which under these conditions do not assume the flagellate stage. The amoeba secretes a film of slime which is observed to give rise by three successive divisions to eight amoebae.
spore formation they present an essentially similar appearance. There is, however, great variety in the degree of concentration or expansion presented by plasmodia, in relation with food supply, moisture and other circumstances. The plasmodium move slowly about over or in the substratum, concentrating in regions where food supply is abundant, and leaving those where it is exhausted.

On examining under the microscope a film which has spread over a cover-slip, the channels are seen to be streams of rapidly moving granular protoplasm. This movement is rhythmic in character, being directed alternately towards the margin of an advancing region of the plasmodium, and away from it. As a channel is watched the stream of granules is seen to become slower, and after a momentary pause to begin in the opposite direction. In an active plasmodium the duration of the flow in either direction varies from a minute and a half to two minutes, though it is always longer when in the direction of the general advance over the substratum. When the flow of the protoplasm in this latter direction the border becomes turgid, and lobes of hyaline protoplasm are seen (under a high magnification) to start forward, and soon to become filled with granular contents. When the flow is reversed, the margin becomes thin from the drainage away of its contents. A delicate hyaline layer invests the plasmodium, and is apparently less fluid than the material flowing in the channels. The phenomena of the rhythmic movement of the protoplasm are not inconsistent with the view that they result from alternating contraction and relaxation of the outer layer in different regions of the plasmodium, but any dogmatic statement as to their causation appears at present inadvisable.

Prowazek (a8) has recently referred to nuclear stages, similar to those here regarded as of amitotic division, but has interpreted them as nuclear fusions. He does not, however, discuss the mode of multiplication of nuclei in the plasmodium.

A second group of granules of carbonate of lime are abundant in the plasmodia, and in all Mycetozoa other granules of undetermined nature are present. The colour of plasmodia varies in different species, and may be yellow, white, pink, purple or green. This coloring matter is in the form of minute drops, and in the Calcareae these invest the lime granules.

Nutrition.—The plasmodium of Badhamia utricularis, advancing over the pilei of suitable fungi, feeds on the superficial layer dissolving it. In this the plasmodia of the homothallic species, which contain abundant foreign bodies such as spores of fungi or sclerotium cysts (tide infra) which have been taken in and are undergoing digestion. It has been found experimentally (11) that pieces of corn meal, dipeptide, proteids, and other foodstuffs, be they solid or liquid, can be taken in, coagulated by the plasmodium, and digested in vacuo.

On the other hand it has been found that plasmodia will live, ultimately producing sporangia, in nutrient solutions (6) .1 It would appear that this mode of nutrition, by the digestion of solid foodsstuff, and in part by the absorption of material in solution, and that there is great variety in the complexity of the substances which serve as their food.

Sclerotium.—As the result of drought, the plasmodium, having become much denser by loss of water, passes into the sclerotial condition. Drawing together into a thickish layer, the protoplasm divides up into a number of distinct masses, each containing some 10 to 20 nuclei, and a cyst wall is excreted round each mass (fig. 7). The whole has now a hard brittle consistency. In this state the protoplasm will remain alive for two or three years. On the addition of water the cyst walls are ruptured and in part absorbed, their contents join together, and the active streaming condition of the plasmodium is resumed. It is to be noted, however, that the sclerotal condition may be assumed under other conditions than dryness, and sclerotia may even be formed in water.

The appearance of the sclerotal stage affords a ready means of obtaining the plasmodium for experimental purposes. If a cultivation of the plasmodium of Badhamia utricularis on suitable fungi (Sclerotium, Drawia) is allowed to become partially dry the plasmodium draws together and would, if drying were continued, pass into the sclerotal stage on the fungus. If now strips of wet blotting-paper are placed so as to touch the plasmodium, the latter, attracted by the moisture, crawls on the blotting-paper. If this is now removed and allowed to dry rapidly the plasmodium passes into a state similar to that of the sclerotal stage on the fungus. By this means the plasmodium is removed from the partially disintegrated and decayed fungus on which it has been feeding, and a clean sclerotium is obtained, which, as above stated, remains alive for years (21, p. 7) . An easy method for obtaining small plasmodia for microscopic examination is to scatter small fragments, scraped from a piece of the hard sclerotium, over cover-slips wetted with rain-water and kept in a moist atmosphere. In twelve to twenty four hours small plasmodia will be seen spreading on the cover-slips and these may be mounted for observation.

The plasmodial stage ends by the formation of the sporangia. The plasmodium wall will be thin in the interiors for which it has fed, and emerges on the surface in a diffuse or concentrated mass. In the case of Badhamia utricularis it may withdraw from the fungus on which it has been feeding, or change into a mass of protoplasm. The mode of formation of the sporangia will be described in the case of Badhamia, some of the chief differences in the process and in the structure of the sporangia in other forms being subsequently noticed.

It may happen that the sporangia begins the protoplasm of the plasmodium becomes gradually massed in discrete rounded lobes, about a half to one millimeter in diameter and scattered in clusters filling the area occupied by the plasmodium. The reticulum of channels of the plasmodium becomes meanwhile less and less marked. When the whole of the protoplasm is drawn in to the lobes, the circulation ceases. The lobes are the young sporangia. In some genera, when the food, are ejected, and the protoplasm secretes on its outer surface a delicate membranous, transparent substance which dries as the sporangia ripen. This invests the young sporangia, and as they rise above the substratum they are dried. At this stage (fig. 7) of the sporangium the substance of the sporangium it forms the hypothallus, and in contact with the rounded surface of the sporangium it forms the sporangium-wall. While the sporangium-wall is formed externally a secretion of

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1 A solution which has thus been found favourable contains the following mineral salts: KHPO₄, K₂HPO₄,MgSO₄, KNO₃, Ca(NO₃)₂, Fe₂(SO₄)₃, and 5% sugar.

2 If the plasmodium is slowly dried it is very apt to pass into sporangia.
similar material occurs along branching and anastomosing tracts through the protoplasm of the sporangium, giving rise to the capillitium. The greater part of the lime granules pass out of the protoplasm and are deposited in the capillitium, which in the ripe sporangia of Badhamia is white and brittle with the contained lime (cf. fig. 8). In this genus some granules are found also in the sporangium-wall. Strasburger concludes that the sporangium-wall of Trichia is a modification of cellulose (29).

Fig. 8.—Sporangia of Badhamia panicula, some intact, others (to left) ruptured, exposing the black masses of spores and the capillitium. The latter is white with deposited lime granules. An empty sporangium is seen above (X 30).

It has been stated (16), but the observation requires confirmation, that a fusion of the nuclei in pairs occurs early in the development of the sporangium.

At a later stage, after the capillitium is formed, the nuclei undergo a mitotic division which affects all the nuclei of a sporangium simultaneously. This was first described by Strasburger (29). While it

Fig. 9.—Part of a section through a young Sporangium of Trichia varia, showing the mitotic division of the nuclei (n) prior to spore formation.

c, Capillitium thread (X 650).

is in progress the protoplasm of the sporangium divides, into successively smaller masses, until each daughter nucleus is the centre of a single mass of protoplasm. These nucleated masses are the young spores. A spore-wall is soon secreted and the sporangium has now resolved itself into a mass of spores, traversed by the strands of the capillitium and enclosed in a sporangium-wall, connected with the substratum by a stalk. As ripening proceeds, the wall becomes membranous and readily ruptures, and the dry spores may be carried abroad on the currents of air or washed out by rain.

Fig. 10.—Part of a section through a Sporangium of Trichia varia after the spores are formed (X 650).

Fig. 11.—Badhamia utricularis.

a, Sporangia (X 34).
b, Capillitium and cluster of spores (X 140).

c, Sporangium (X 650).

In some genera such as Arcyria and Trichia (illustrated in figs. 9 and 10) the division of the protoplasm does not occur until the nuclei have undergone this division. The protoplasm then divides up about the daughter nuclei to form the spores.
The condition of the capillitium is very various. In the Calcari-
neae the lime may be generally distributed through it (fig. 11), or
aggregated at the nodes of the network in "lime-knots" (figs. 12 and
14) or it may be absent from the capillitium altogether. The
capillitium attains its highest development in the Calcinoneae
in which the threads, distinct (in which case they are known as
elaters, figs. 9 and 10) or united into a network (fig. 20), present
regular thickenings in the form of spiral bands or transverse bars.
These threads, altering their shape with varying states of moisture,
are efficient agents in distributing the spores. In another group,
the Anemoneae, the capillitium is absent altogether.

The Didymiaceae are characterized by the fact that the line,
though present in a granular form in the plasmodium, is deposited
on the sporangium-wall in the form of crystals, either in radiating
groups (fig. 15) or in disks (fig. 16). In most Endosporae the sporangia are separate symmetrical bodies, but in many genera a form of fructification occurs in which

(23, b). Each of these masses now grows out perpendicularly to
the surface of the sporophore. As it does so an envelope is
secreted, which, closing in about the base forms a slender stalk.
When the mass, or stipe, is long enough, the stalk becomes the ellipsoidal sporule, surrounded by the sporophore.

In this manner the whole of the protoplasmic substance of the plasmodium is converted into spores, borne on supporting structures (stalks and sporophores), which are formed by secretion of the plasmodium.

In the course of the development of which the external features have now been traced nuclear changes occur which have been
given by Jahn (14) and by Olive (24 and 25). Jahn has shewn
that prior to the conversion of the protoplasm a mitotic division of
the nuclei takes place, the daughter nuclei of which are those
occupying the protoplasmic masses seen in fig. 23 b. After the
spore has risen on its stalk two further mitotic divisions occur in
forming a group of four nuclei. The four-nucleated condition characteristic of the spore of Ceratiomyxa is, thus attained. The spores, on being brought into water, soon hatch (fig. 23, d), and the four nuclei contain an endospore and a mitotic protoplasm. Meanwhile the
plasmodium divides, at first into four, then into eight masses, and
the latter acquire flagella, although for some time remaining con-

From observation of cultivations of zoosporae the impression is
that here, as in the Endosporae, they multiply by binary division,
though no exact observations of the process have been recorded.
The spores lose their flagella and become amoebulae, but the
fusion of the latter to form plasmodia has not been directly observed in
Ceratiomyxa, although from analogy with the Endosporae it can
hardly be doubted that such fusions occur.

Sorophora.
The Sorophora of Zopf (Acrasieae of Van Tieghem) are a group of
microscopic organisms which feed on the dung of herbivorous
animals and other decaying vegetable matter. As Finlay
(26) has shown, the presence of a particular species of bacteria
with the spores is necessary for their hatching and as the
essential food of the protoplasm which emerge from there. There
is no flagellate stage, and it is in the form of amoebulae, multiplying by fission, that the vegetable stage of the life-
history is passed. At the end of this stage numbers of amoebulae
draw together to form a "pseudo-plasmodium." This
appears to be merely an aggregation of amoebulae in the process
of spor formation. The outlines of the individual amoebulae are
maintained, and there is no fusion between them as in the
development of the plasmodium of the Euplasmida.

In some genera certain of the amoebulae, known as the "amoebulae
cases" (Coproxya, fig. 24, a and b) the pseudo-plasmodium is modified
into a stalk (simple in Gullula and Dictyostelium, and Polysphondylum, adapted to form a stalk, becomes the ellipsoidal sporule, surrounded by the sporophore.

b). The investing protoplasm, with its nuclei, having become arranged in an even layer, undergoes cleavage and thus forms a pavement-like layer of protoplasmic masses, each occupied by a single nucleus

FIG. 21.—Fuligo septica.  
E. Aethalium (X 1).  
B. Group of Plasmodiopsorae (X 2).  
C. A continuous Plasmodiopsorae (X 6).  
D. The spores are produced in masses of more or less irregular outline, retaining in extreme cases much of the distinctive character of the plasmodium. With the spores they contain capillitium, but there are no traces of sporangial walls to be found in their interior. They are known as Plasmodiopsorae (fig. 22). They are characteristic of certain species, but in others they may be formed side by side with separate sporangia from the same plasmodium. There is indeed no sharp line to be drawn between sporangia and plasmodiopsorae. On the other hand, the crowded condition of the sporangia of some species forms a transition to the large compound fructifications known as aethalium (fig. 21). These, either in their young stages or up to maturity, retain some evidence of their formation by a coalescence of sporangia, and in addition to the capillitium they are generally penetrated by the remains of the walls of the sporangia which have thus united.

Exosporae.

It will be convenient to begin our survey of the life-histories of
Ceratiomyxa, the single representative of the Exosporae, at the stage at which the plasmodium emerges from the rotten
wood in which it has fed. At this stage it has been observed to spread as a film over a slice, and to exhibit the network of channels and
rhythmic flow of the protoplasm in a manner precisely similar to that seen in the Endosporae (20, p. 10). It
soon, however, draws together to form compact masses, from the surface of which finger-like or antler-like lobes grow upwards. Here too the secretion of a transparent mucoid substance
occurs, which is at first penetrated by the anastomosing strands of the protoplasm, but gradually the latter tends more and
more to form a reticulate and finally a wholly continuous superficial investment, covering the mucoid ma-
terial. The latter eventually dries and forms the exceedingly delicate support of the spores or sporophore (fig. 23, a). The investing protoplasm, with its nuclei, having become arranged in an even

From Lanketer's Treatise on Zoology, figs. a and c after A. Lister; fig. e after Parnelida and Woonin.

FIG. 23.—Ceratiomyxa mucida.  
A. Riphe sporophore (X 40).  
B. Maturing sporophore showing the development of the spores.  
C. Riphe sporophore. Instead of the single nucleus here indicated there should be four nuclei, as in d.  
D. Hatching sporophore.  
e-h. Stages in the development of the zoosporae.

1 Jahn (14) described two mitotic divisions at this stage, but in "Myxomycetenstudien 7—Ceratiomyxa," Ber. deut. bot. Gesellschaft, xxvi. a (1908) he shows that only one mitotic division occurs in the mature sporophore prior to cleavage. Olive gives a preliminary account of a fusion of nuclei prior to cleavage, but as he has not seen the mitotic division which certainly occurs at this stage his account cannot be accepted as secure.
At some stage or other we are led by analogy to expect that a division of nuclei would occur in which the number of chromosomes would be reduced by one half, that this would be followed by the formation of gametes, and that the nuclei of the latter would subsequently fuse into one.

It is clear that both in the Endospora and Exospora a mitotic division of nuclei immediately precedes spore-formation. This is regarded by Jahn as a reduction division. If this is the case, the zoological or the amoeboide phase must be represented by the genera of the Endospora, and the division of the former into the genera of the Exospora and Endospora are mitotic divisions.

The fusion of the latter to form plasmodia appears to offer a process comparable with the conjugation of gametes, but though the fusion of the latter to form the sporangia (in which a reduction of the nuclei in a glandular factory) has been found to accompany a fusion of nuclei has indeed been described as occurring in the plasmodium, or at stages in the development of the sporangia or sporidia. The existence of a spore-forming factory is thus the first step in this process, the sporidia being regarded as the first stages of the factory.

Until we have clear evidence on this point the nuclear history of the mycetozoa must remain incomplete.

Jahn's observation of the mitotic division of nuclei preceding spore-formation leads to the conclusion that the mycetozoa of the Endospora and Exospora with the Endospora. Starting from this division it seems clear that the spore of Ceratothyza is comparable with the spore of the Endospora except that the nucleus of the former has undergone two mitotic divisions.


From the school at Rottweil, he went (1510) to the university of Basel, and became a good classic. From 1514 he obtained schoolmaster posts at Basel, where he married, and made the acquaintance of Erasmus and of Holbein, the painter.

In 1516 he was called, as schoolmaster, to Zürich, where he attached himself to the reforming party of Zwingli. This led to his being transferred to Lucerne, and again (1523) reinstated at Zürich. On the death of Zwingli (1531) he migrated to Basel, and there held the office of town's preacher, and (till 1542) the chair of New Testament exegesis. Though he published a good many tracts and pamphlets, he was for a union of all Protestants; though a Zwinglian, his readiness to compromise with the advocates of consubstantiation gave him trouble with the Zwinglian stalwarts. He had, however, a distinguished follower in Theodoric Bihain. He died on the 14th of October 1552.
goldsmith, occupying a shop in Bassishaw, or Basinghall Street; he made money by commercial ventures on the Spanish main, being associated in these with Sir Walter Raleigh; and he was also interested in cloth-making. He was an alderman, and then recorder of Denbigh, and was member of parliament for this borough from 1603 to 1628. In 1609 Myddelton took over from the corporation of London the projected scheme for supplying the city with water obtained from springs near Ware, in Hertfordshire. For this purpose he made a canal about 10 ft. wide and 4 ft. deep and over 38 m. in length, which discharged its waters into a reservoir at Islington called the New River Head. The completion of this great undertaking put a severe strain upon Myddelton's financial resources, and in 1612 he was successful in securing monetary assistance from James I. The work was completed in 1613 and Myddelton was made the first governor of the company, which, however, was not a financial success until after his death. In recognition of his services he was made a baronet in 1622. Myddelton was also engaged in working some lead and silver mines in Cardiganshire and in reclaiming a piece of the Isle of Wight from the sea. He died on the 10th of December 1631, and was buried in the church of St Matthew, Friday Street, London. He had a family of ten sons and six daughters.

One of Sir Hugh's brothers was Sir Thomas Myddelton (c. 1550-1631), lord mayor of London, and another was William Myddelton (c. 1556-1621), poet and seaman, who died at Antwerp on the 27th of March 1621.

Sir Thomas was a member of parliament under Queen Elizabeth and was chosen lord mayor on the 29th of September 1613, the day fixed for the opening of the New River. Under James I. and Charles I. he represented the city of London in parliament, and helped Rolland and Heylyn to publish the first popular edition of the Bible in Welsh. He died on the 10th of August 1631. Sir Thomas's son and heir, Sir Thomas Myddelton (1586-1660), was a member of the Long Parliament, being an adherent of the popular party. After the outbreak of the Civil War he served in Shropshire and in north Wales, gaining a signal success over the royalists at Oswestry in July 1644, and another at Montgomery in the following September. In 1659, however, he joined the rising of the royalists under Sir George Booth, and in August of this year he was forced to surrender his residence, Chirk Castle. His eldest son, Thomas (d. 1663), was made a baronet in 1660, a dignity which became extinct when William, the 4th baronet, died in 1718.

**MYELAT**—**MYERS**

**MYELAT**, a division of the southern Shan States of Burma, including sixteen states, none of any great size, with a total area of 3723 sq. m., and a population in 1901 of 110,445. The name properly means "the unoccupied country," but it has been occupied for many centuries. All central Myelat and great parts of the northern and southern portions consist of rolling grassy downs quite denuded of jungle. It has a great variety of different races, Taungthus and Danus being perhaps the most numerous. They are all more or less hybrid races. The chiefs of the Myelat are known by the Burmese title of *gweynan-su*, i.e. chiefs paying the revenue in silver. The amount paid by the chiefs to the British government is Rs. 90,567.

The largest state, Loi Long, has an area of 1600 sq. m., a great part of which is barren hills. The smallest, Nam Hkon, had no more than 4 sq. m., and has been recently absorbed in a neighbouring state. The majority of the states cover less than 100 sq. m. Under British administration the chiefs have powers of a magistrate of the second class. The chief cultivation besides rice is sugar-cane, and considerable quantities of crude sugar are exported. There is a considerable potato cultivation, which can be indefinitely extended when cheaper means of export are provided. Wheat also grows very well.

**MYELITIS** (from Gr. *myelos*, marrow) a disease which by its inspection and dissection is destructive in the tissues composing the spinal cord. In the acute variety the nerve element in the affected part become disintegrated and softened, but repair may take place; in the chronic form the change is slower, and the diseased area tends to become denser (sclerosed), the nerve-substance being replaced by connective tissue. Myelitis may affect any portion of the spinal cord, and its symptoms and progress will vary accordingly. Its most frequent site is in the lower part, and its existence there is marked by the sudden or gradual occurrence of weakness of motor power in the legs (which tends to pass into complete paralysis), impairment or loss of sensibility in the parts implicated, nutritive changes affecting the skin and giving rise to bed-sores, together with bladder and bowel derangements. In the acute form, in which there is at first pain in the region of the spine and much constitutional disturbance, death may take place rapidly from extension of the disease to those portions of the cord connected with the muscles of respiration and the heart, from an acute bed-sore, which is very apt to form, or from some intercurrent disease. Recovery to a certain extent may, however, take place; or, again, the disease may pass into the chronic form. In the latter the progress is usually slow, the general health remaining tolerably good for a time, but gradually the strength fails, the patient becomes more helpless, and ultimately sinks exhausted or is cut off by some complication. The chief causes of myelitis are injuries or diseases affecting the spinal column, extension of inflammation from the membranes of the cord to its substance (see MENINGITIS), exposure to cold and damp, and occasionally some pre-existing constitutional morbid condition, such as syphilis or a fever. Any debilitating cause or excess in mode of life will act powerfully in predisposing to this malady. The disease is most common in adults. The treatment for myelitis in its acute stage is similar to that for spinal meningitis. When the disease is chronic the most that can be hoped for is the relief of symptoms by careful nursing and attention to the condition of the body and its functions. Good is sometimes derived from massage and the use of baths and douches to the spine.

**MYERS, FREDERIC WILLIAM HENRY** (1843-1902), English poet and essayist, son of Frederic Myers of Keswick—author of Lectures on Great Men (1856) and Catholic Thoughts (first collected 1873), a book marked by a most admirable prose style—was born at Keswick, Cumberland, on the 6th of February 1843, and educated at Cheltenham and Trinity College, Cambridge, where he won a long list of honours and in 1865 was appointed classical lecturer. He had no love for teaching, which he soon discontinued, but he took up his permanent abode at Cambridge in 1872, when he became a school inspector under the Education Department. Meanwhile he published, in 1867, an unsuccessful essay for the Seatonian prize, a poem entitled St Paul, which met at the hands of the general public with a success that would be difficult to explain, for it lacks sincerity and represents views which the writer rapidly outgrew. It was followed by small volumes of collected verses in 1870 and 1882; both are marked by a flow of rhetorical ardour which culminates in a poem of real beauty, "The Renewal of Youth," in the 1882 collection. His best verse is in heroic couplets. Myers is more likely to be remembered by his two volumes of Essays, Classical and Modern (1883). The essay on Virgil, by far the best thing he ever wrote, represents the matured enthusiasm of a student and a disciple of Thomas Carlyle. The aim of Virgil's method was profoundly congenial. Next to this in value is the carefully wrought essay on Ancient Greek Oracles (this had first appeared in Hellenica). Scarcely less delicate in phrasing and perception, if less penetrating in insight, is the monograph on Wordsworth (1881) for the "English Men of Letters" series. In 1882, after several years of inquiry and discussion, Myers took the lead among a small band of explorers (including Henry Sidgwick and Richard Hodgson, Edmund Gurney and F. Podmore), who founded the society for Psychical Research. He continued for many years to be the mouthpiece of the society, a position for which his *perferriodum ignatum*, still more his abnormal fluency and alertness, admirably suited him. He contributed greatly to the coherence of the society by steering a mid-course between extremes (the extreme sceptics on the one hand, and the enthusiastic spiritualists on the other), and by helping to sift and revise the cumbrous mass of
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Proceedings, the chief concrete results being the two volumes of *Phantasms of the Living* (1886), to which he contributed the introduction. Like many theorists, he had a faculty for ignoring hard facts, and in his anxiety to generalize plausibly upon the alleged data, and to hammer out striking formulae, his insight into the real character of the evidence may have left something to be desired. His long series of papers on subliminal consciousness, the results of which were embodied in a posthumous work called *Human Personality and Its Survival of Bodily Death* (2 vols. 1907), constitute his own chief contribution to psychical theory. This, as he himself would have been the first to admit, was little more than provisional; but Professor William James has pointed out that the series of papers on subliminal consciousness is "the first attempt to consider the phenomena of hallucination, hypnotism, automatism, double personality and mediumship, as connected parts of one whole subject." The last work published in his lifetime was a small collection of essays, *Science and a Future Life* (1893). He died at Rome on the 17th of January 1901, but was buried in his native soil at Keswick.

MYINGYAN, a district in the Meiktila division of Upper Burma. It lies in the valley of the Irrawaddy, to the south of Mandalay, on the east bank of the river. Area, 3,137 sq. m. Pop. (1901), 356,052, showing an increase of 1% in the decade and a density of 114 inhabitants to the square mile. The greater part of the district is flat, especially to the north and along the banks of the Irrawaddy. Inland the country rises in gently undulating slopes. The most noticeable feature is Popa hill, an extinct volcano, in the southern-eastern corner of the district. The highest peak is 4,062 ft. above sea-level. The climate is dry and healthy, with high south winds from March till September. The annual rainfall averages about 35 in. The temperature varies between 106° and 70° F. The ordinary crops are millet, sesameum, cotton, maize, rice, gram, and a great variety of peas and beans. The district as a whole is not well watered, and most of the old irrigation tanks had fallen into disrepair before the annexation. There are no forests, but a great deal of low scrub. The lacquer wares of Nyaung-u and other villages near Pagan is noted throughout Burma. A considerable number of Chinese inhabit Myingyan and the larger villages. The headquarters town, MYINGYAN, stands on the Irrawaddy, and had a population in 1901 of 16,139. It is the terminus of the branch railway through Melktila to the main line from Mandalay to Rangoon. The steamers of the Irrawaddy Flotilla Company also call here. A cotton-pressing machine was erected here in the time of independent Burma, and still exists.

MYITKYINA, the most northerly of the districts of Upper Burma in the Mandalay division, separated from Bhamo district in 1895. It is cut up into strips by comparatively low parallel ranges of hills running in a general way north and south. The chief plan is that of Myitkyina, covering 600 sq. m. To the east of the Irrawaddy, which bisects the district, it is low-lying and marshy. To the west it rises to a higher level, and is mostly dry. Except in the hills inhabited by the Kachin tribes there are practically no villages off the line of the Irrawaddy. The Indawgyi lake, a fine stretch of water measuring 16 m. by 6, lies in the south-west of the district. A small stream, the Dov, runs along the eastern side of the lake. The Irrawaddy, which at this place is 10,640 sq. m.; estimated population (1901) 67,390, showing a density of six persons to the square mile. More than half the total are Kachins, who inhabit the hills on both sides of the Irrawaddy. The headquarters town, MYITKYINA, had in 1901 a population of 30,188. It is the limit of navigation on the Irrawaddy, and the terminus of the railway from Rangoon and Sagaing.

MYLODON (Gr. for "mill-tooth" from μύλων and δόντης), a genus of extinct American edentate mammals, typified by a species (M. horlani) from the Pleistocene of Kentucky and other parts of the United States, but more abundantly represented in the corresponding formations of South America, especially Argentina and Brazil. The mylodons belong to the group of ground-sloths, and are generally included in the family Megatheriidae, although sometimes made the type of a separate family. From Megatherium these animals, which rivalled the Indian rhinoceros in bulk, differ in the shape of their cheek-teeth; these (five above and four below) being much smaller, with an ovate section, and a cupped instead of a ridged crown-surface, thus resembling those of the true sloths. In certain species of mylodon the front pair of teeth in each jaw is placed some distance in front of the rest and has the crown surface obliquely bevilled by wearing against the corresponding teeth in the opposite jaw. On this account such species have been referred to a second genus, under the name of *Lestodon*, but the distinction scarcely seems necessary. The skull is shorter and lower than in *Megatherium*, without any vertical expansion of the middle of the lower jaw, and the teeth also extend nearly to the front of the jaws; both the genus being sloth-like. In the fore feet the three inner toes have large claws, while the two outer ones are rudimentary and clawless; in the hind-limbs the first toe is wanting, as in *Megatherium*, but the second and third are clawed. The skin was strengthened by a number of small deeply-embedded bony nodules.

Although the typical *M. horlani* is North American, the mylodons are essentially a South American group, a few of the representatives of which effected an entrance into North America when that continent became finally connected with South America. Special interest attaches to the recent discovery in the coves of Ultima Esperanza, South Patagonia, of remains of the genus *Glossotherium* or *Cryotherium*, a near relative of *Mylodon*, but differing from it in having a bony arch connecting the nasal bones of the skull with the premaxillae; these include a considerable portion of the skin with the hair attached. Ossicles somewhat resembling large coffee-berries had been previously found in association with the bones of *Mylodon*, and in *Glossotherium* nearly similar ossicles occur embedded on the inner side of the thick hide. The coarse and shaggy hair is somewhat like that of the sloths. The remains, which include not only the skeleton and skin, but likewise the droppings, were found buried in grass which appears to have been chopped up by man, and it thus seems not only evident that these ground-sloths dwelt in the cave, but that there is a considerable probability of their having been kept there in a semi-domesticated state by the early human inhabitants of Patagonia. The extremely fresh condition of the remains has given rise to the idea that *Glossotherium* may still be living in the wilds of Patagonia.

*Sclerotherium* is another genus of large South American Pleistocene ground-sloths, characterized, among other features, by the elongation and slenderness of the skull, which thus makes a decided approximation to the anteater type, although retaining the full series of cheek-teeth, which were, of course, essential to an herbivorous fauna. The feet resemble those of *Megatherium*. A much smaller South American species represents the genus *Nothrotherium*. In North America *Mylodon* was accompanied by another gigantic species typifying the genus *Megalonyx*, in which the fore part of the skull was usually wide, and the third and fourth front toes carried claws. Another genus has been described from the Pleistocene
of Nebraska, as *Paramylodon*; it has only four pairs of teeth, and an elephant-like mouth. It appears to have been a relative of *Mega*therium in having a foramen on the inner side of the lower end of the humerus. A presumed large ground-sloth from Madagascar has been described, on the evidence of a limb-bone, as *Brady-therium* sp. It is suggested by Dr. F. Ameghino that it really belongs to a lemuroid. Be this as it may, the North American mammals described as *Moropus* and *Morotherium*, in the belief that they were ground-sloths, are really referable to the ungulate group Anserata.

Although a few of the Pleistocene ground-sloths, such as *Nothro-\textit{pus} and *Nothotherium (= Coelodon), were of comparatively small size, in the Santa Cruz beds of Patagonia few of the representatives of the family much exceeded a modern sloth in size, and the known generic types are *Eucleoholops*, *Hopalops* and *Pseudakalops*, of which considerable portions of the skeleton have been disintegrated. In these diminutive ground-sloths the correctness of the once accepted appellation of *Megatherium*, or the diagnostic generic type of *Megalltherium*, as distinct from the subcylindrical type occurring in *Mylonodon*, *Glossotherium*, etc.

By many palaeontologists a group of North American Lower Tertiary mammals, known as Gondodonta, has been regarded as representing the ancestral stock of the ground-sloths and those of other South American edentates; but according to Professor W. B. Scott this view is incorrect and there is no affinity between the two groups. If this be so, we are still in complete darkness as to the stock from which the South American edentates are derived.


**MYLONITE** (Gr. μυλόν, a mill), in petrology, a rock which has been crushed and ground down by earth movement and at the same time rendered compact by pressure. Mylonites are fine-grained, sometimes even flinty, in appearance, and often banded in parallel fashion with stripes of varying composition. The great majority are quartzose rocks, such as quartzite and quartz-schist; but in almost any type of rock mylonitic structure may be developed. Graininess of various kinds, hornblende-schists, chlorite-schists and the like, frequently serve as a basis for the formation of mylonites. The process of crushing by which mylonites are formed is known also as "granulitization" and "cataclasis," and mylonites are often described as granulites, though the two terms are not strictly equivalent in all their applications. Mylonites occur in regions where there has been considerable metamorphism. Thrust planes and great reversed faults are often bounded by rocks which have all been crushed to fine slaty mylonites, that split readily along planes parallel to the direction in which movement has taken place. These "crush-belts" may be only a few feet or several hundred yards broad. The movements have probably taken place slowly with little change in structure, and hence the rocks have not recrystallized to any extent.

Crushing and movement on so extensive a scale are to be expected principally in regions consisting of rocks greatly folded and compressed. Hence mylonites are commonest in Archean regions, but may be found also in Carboniferous and later rocks where the necessary conditions have prevailed. Within a short space it is often possible to trace rocks from a normal to a highly mylonitized condition, and to follow by means of the microscope all the stages of the process. A sandstone, grit, or fine quartzose conglomerate, for example, when it approaches a mylonitic zone begins to lose its clastic or pebbly structure. The rounded grains of quartz become cracked, especially near their edges, and are then surrounded by narrow borders, consisting of detached granules; this is due to the peculiar conditions which, on one hand, remove the rock from the pressures which once at least it is almost always reserved, giving the rock a flat banding and marked schistosity (see *PETROLEO*, Pl. iv., fig. 6). When these mylonitic gneisses contain pink garnet (often with kyanite or sillimanite) they approach to normal granitoid gneisses; limestones, if fissilolose, become changed into finely crystalline calcareous, often well-laminated, calc-schists, with lenticular or augen structure. An interesting variety of mylonite, developed in granite-porphry and gneiss, is fine, dark and almost always in the appearance, consisting mainly of very minute grains of quartz and felspar and resembling flint in appearance. These form threads and vein-like streaks ramifying through the normal rocks. Examples are furnished by the flinty-crushes of west Scotland and the "trap-shotten" gneisses of south India. (J. S. F.)

**MYENSINGH**, or MAIMENSINGH, a district of British India, in the Dacca division of Eastern Bengal and Assam. It occupies a portion of the alluvial valley of the Brahmaputra east of the main channel (called the Jamuna) and north of Dacca. The administrative headquarters are at Nasirabad, sometimes called Mymensingh town. Area, 6,622 sq. m. (1901), 3,560,150, showing an increase of 12.8% in the decade. The district is for the most part level and open, covered with well-cultivated fields, and intersected by numerous rivers. The Madhupur jungle is a slightly elevated tract, extending from the north of Dacca district into the heart of Mymensingh; its average height is about 60 ft. above the level of the surrounding country, and it nowhere exceeds 100 ft. The jungle contains abundance of sal, valuable both as timber and for charcoal. The only other elevated tract in the district is on the southern border, where the Susung hills rise. They are for the most part covered with thick thorny jungle, but in parts are baren and rocky. The Jamuna forms the western boundary, being about 2 miles wide at its mouth. It is navigable for large boats throughout the year; and during the rainy season it expands in many places to 5 or 6 m. in breadth. The Brahmaputra enters Mymensingh at its north-western corner near Karaihari, and flows south-east and south till it joins the Meghna a little below Bhairab Bazar. The gradual formation of clays and bars of sand in the upper part of its course has diverted the main volume of water into the present channel of the Jamuna, which has in consequence become of much more importance than the Brahmaputra proper. The Meghna only flows for a short distance through the south-east portion of the district, the eastern and south-eastern parts of which abound in marshes. The staple crops of the country are rice, jute and oil-seeds. A branch line of the Eastern Bengal railway runs north from Dacca through Nasirabad, etc., to the Jamuna. The district was severely affected by the earthquake of the 12th of June 1897.

**MYNGS, SIR CHRISTOPHER** (1625-1666), British admiral, came of a Norfolk family. Pepys' story of his humble birth is said to be erroneous. It is probable that he saw a good deal of sea-service before 1642. He first appears prominently as the captain of the "Elisabeth," which after a sharp action brought in a Dutch convoy with two men-of-war as prizes. From 1652 to 1655 he continued to command the "Elisabeth," high in favour with the council of state and recommended for promotion by the flag officers under whom he served. In 1665 he was appointed to the "Marston Moor," the crew of which was on the verge of mutiny. His firm measures quelled the insubordinate spirit, and he took the vessel out to the West Indies, where he remained for some years. The Restoration government retained him in his command, and in 1664 he was made vice-admiral in Prince Rupert's squadron. As vice-admiral of the White he flew his flag at Lowestoft in 1665, and for his share in that action received the honour of knighthood. In the following year he served under the new lord high admiral, Sandwich, as vice-admiral of the Blue. He was on detachment with Prince Rupert when the great Four Days' Battle began, but returned to the Channel to meet the time of part, and in this action he received a wound of which he died.

**MYONEMES**, in Infusoria and some Flagellates, the differentiated threads of cecosarc, which are contractile and doubly refractive, performing the function of muscular fibres in the Metazoa.

**MYRA** (mod. Dembre), an ancient town of Lycia situated a short distance inland between the rivers Myrus and Andracus. In common with that of most other Lycian towns its early history
is not known, and it does not play any part of importance in either Greek or Roman annals. Its fame begins with Christianity. There St Paul touched on his last journey westward (A.D. 62), and changed into "a ship of Alexandria sailing into Italy." In the 3rd century the great St Nicholas, born at Patara, was its bishop, and he died and was buried at Myra. His tomb is still shown, but his relics are supposed to have been translated to Bari in Italy in the 11th century. Theodosius II. made Myra the Byzantine capital of Lycia, and a much it was hemmed and taken by Harun al-Rashid in 808. The town seems shortly afterwards to have decayed. A small Turkish village occupied the plain at the foot of the acropolis, and a little Greek monastery lay about a mile westward by the church of St Nicholas. The latter has formed the nucleus of modern Dembre, which has been increased by settlers from the Greek island of Castelforte. Myra has three notable sights, its carved cliff-cemetery, its theatre, and its church of St Nicholas. The first is the most remarkable of the Lycian rock-tomb groups. The western scarp of the acropolis has been sculptured into a number of sepulchres imitating wooden houses with pillared façades, some of which have painted reliefs and inscriptions in Lycian. The theatre lies at the foot of this cliff and is partly excavated out of it, partly built. It is remarkable for the preservation of its corridors. The auditorium is perfect in the lower part, and the scena still retains some of its decoration—both columns and carved entablature. The church of St Nicholas lies out in the plain, at the western end of Dembre, near a small monastery and new church recently built with Russian money. Its floor is far below the present level of the plain, and until recently the church was half filled with earth. The excavation of it was undertaken by Russians about 1854 and it cost Dembre dear; for the Ottoman government, suspicious of foreign designs on the neighbouring harbour of Kêkova, proceeded to inhibit all sale of the precious marbles and to carry the church under a minor state of siege. The ancient church is of the domed basilica form with throne and seats still existent in the tribunal. In the south aisle as a tomb with marble balustrade which is pointed out as that wherein St Nicholas was laid. The locality of the tomb is very probably genuine, but its present ornament, as well as the greater part of the church, seems of later date (end of 7th century?). None the less this is among the most interesting early Christian churches in Asia Minor. There are also extensive ruins of Andreae, the port of Myra, about 3 m. west, containing churches, baths, and a great grain store, inscribed with Hadrian's name. They lie along the course of the Andrakí river, whose navigable estuary is still fringed with ruinous quays.

See E. Petersen and F. v. Luschek, Reisen in Lykien, &c. (1886).

(M. G. H.)

MYRIAPODA (Gr. for "many-legged"), arthropod animals of which centipedes and millipedes are familiar examples. Linnaeus included them in his Insecta Aptera together with Crustacea and Arachnida; in 1796 P. A. Latreille designated them as Myriapoda, making of them, along with the Crustacean Oniscus, one of the seven orders into which he divided the Aptera of Linnaeus. Later on J. C. Saviugy, by study of the mouth-parts, clearly distinguished them from Insects and Crustacels. In 1824 W. E. Leach defined them and divided them into Centipedes and Millipedes. In 1825 Latreille carried further the observations of Leach, and suggested that the two groups were very distinct, the millipedes being nearer Crustacea and the centipedes approaching Arachnida and Insecta. Although Latreille's suggestion has not been adopted, it is recognized that centipedes and millipedes are too far apart to be united as Myriapoda, and they are now treated as separate classes of the Arthropoda. See CENTIPEDA (Chilopoda) and MILLIPEDAE (Diplopoda).

MYRMIDONES, in Greek legend, an Achaean race, in Homeric times inhabiting Phthiotis in Thessaly. According to the ancient tradition, their original home was Aegina, whence they crossed over to Thessaly with Peleus, but the contrary view is now more generally accepted. Their name is derived from a supposed ancestor, son of Zeus and Eurymedusa, who was wooed by the god in the form of an ant (Gr. μυρμής); or from the reappearance of Aegina (when all its inhabitants had died of the plague) with ants changed into men by Zeus at the prayer of Aeacus, king of the island. The word "myrmidon" has passed into the English language to denote a subordinate who carries out the orders of his superior without mercy or consideration for others. See Strabo viii. 375, ix. 433; Homer, IIiad, li. 681; schol. on Pindar Nem. iii. 21; Clem. Alex., Protrepticum, p. 34, ed. Potter.

MYROBALANS, the name given to the astringent fruits of several species of Terminalia, largely used in India for dyeing and tanning and exported for the same purpose. They are large deciduous trees and belong to the family Combretaceae. The chief kinds are the chebulic or black myrobalan, from Terminalia Chebula, which are smooth, and the beleric, from T. bellerica, which are five-angled and covered with a greyish down.

MYRON, a Greek sculptor of the middle of the 5th century B.C. He was born at Eleutheræa on the borders of Boeotia and Attica. He worked almost exclusively in bronze: and though he made back the discus with the full stretch of his arm, and is about to his representations of athletes, in which he made a revolution by introducing greater boldness of pose and a more perfect rhythm. His most famous works according to Pliny (Nat. Hist., 34, 57) were a cow, Ladas the runner, who fell dead at the moment of victory, and a discus thrower. The cow seems to have earned its fame mainly by serving as a peg on which to hang epigrams, which tell us nothing about the pose of the animal. Of the Ladas there is no known copy. But we are fortunate in possessing several copies of the discobolus, of which the best is in the Massimi palace at Rome (see Greek Art, Pl. iv. fig. 68). The example in the British Museum has the head put on wrongly. The athlete is represented at the moment when he has swung back the discus with the full stretch of his arm, and is about to hurl it with the full weight of his body. The head should be turned back toward the discus.

A marble figure in the Lateran Museum (see Greek Art, Pl. iii. fig. 64), which is now restored as a dancing satyr, is almost certainly a copy of a work of Myron, a Marsyas desirous of picking up the flutes which Athena had thrown away (Pausanias, i. 24, 1). The full group is copied on coins of Athens, on a vase and in a relief which represent Marsyas as oscillating between curiosity and the fear of the displeasure of Athena.

The ancient critics say of Myron that, while he succeeded admirably in giving life and motion to his figures, he did not succeed in rendering the emotions of the mind. This agrees with the extant evidence, in a certain degree, though not perfectly. The bodies of his men are of far greater excellence than the heads. The face of the Marsyas is almost a mask; but from the attitude we gain a vivid impression of the passions which sway him. The face of the discus-thrower is calm and unruffled; but all the muscles of his body are concentrated in an effort. A considerable number of other extant works are ascribed to the school or the influence of Myron by A. Furtwängler in his suggestive Masterpieces of Greek Sculpture (pp. 168-219). These attributions, however, are anything but certain, nor do the arguments by which Furtwängler supports his attributions bear abridgment.

A recently discovered papyrus from Egypt informs us that Myron made statues of the athlete Timanthus, victorious at Olympia in 456 B.C., and of Lycius, victorious in 448 and 444. This helps us to fix his date. He was a contemporary, but a somewhat older contemporary, of Phidias and Polyclitus.

(M. P. G.)

MYRRH (from the Latinized form myrrha of Gr. μύρρος; the Arabic murr, bitter, was applied to the substance from its bitterness), a gum-resin highly esteemed by the ancients as an unguent and perfume, used for incense in temples and also in embalming. It was one of the gifts offered by the Magi, and a royal oblation of gold, frankincense and myrrh is still annually presented by the sovereign on the feast of Epiphany in the Chapel Royal in London, this custom having been in
existence certainly as early as the reign of Edward I. The tree is the product of Balsamodendron (Commiphora) Myrrha, a small tree of the natural order Amyridaceae that grows in eastern Africa and Arabia, but the name is also applied to gum resins obtained from other species of Balsamodendron.

1. Balsa Bol, Bhesa Bol or Bissa Bol, from Balsamodendron Katal, resembles true myrrh in appearance, but has a disagreeable taste and is scarcely bitter. It is used in China, mixed with food, to give to milch cows to improve the quality and increase the quantity of milk, and when mixed with lime as a size to impart a gloss to walls. (2) Opaque balsamm produced by B. Playfairii, when shaken with water forms a slight but permanent lather, and on this account is used by the Somali women for cleansing their hair, and by the men to whiten their shields; it is known as meena harma in Bombay, and was formerly used there for the expellation of the guinea-worm. (3) African balsamm is from B. africanaum, and like opaque balsamm lacks the white streaks which are characteristic of myrrh and bessa bol, both are acid, but have scarcely any bitterness or aroma. (4) Indian balsamm, probably identical with the Indian drug googol obtained in Sind and Baluchistan from B. Mukul and B. pubescens, Hook, is of a dark reddish colour, has an acid taste and an odour resembling cedar-wood, and softens in the hand.

As met with in commerce true myrrh occurs in pieces of irregular size and shape, from ⅛ in. to 2 or 3 in. in diameter, and of a reddish-brown colour. The transverse fracture has a resinous appearance with white streaks; the flavour is bitter and aromatic, and the odour characteristic. It consists of a mixture of resin, gum and essential oil, the resin being present to the extent of 25 to 40%, with 2% to 8% of the oil, myrrhol, to which the odour is due.

Myrrh has the properties of other substances which, like it, contain a volatile oil. Its only important application in medicine is as a carminative to lessen the griping caused by some purgatives such as aloes. The volatile oils have for centuries been regarded as of value in disorders of the reproductive organs, and the reputation of myrrh in this connexion is simply a survival of this ancient but ill-founded belief.

**MYRTLE.** The μύρος of the Greeks, the myrtus of the Romans, and the myrtle, Myrtus communis (see fig.), of botanists, as now found growing wild in many parts of the Mediterranean region, doubtless all belong to one and the same species. It is a low-growing, evergreen shrub, with opposite leaves, varying in holes owing to the translucency of these oil-cysts. The fragrance of the plant depends upon the presence of this oil. Another peculiarity of the myrtle is the existence of a prominent vein running round the leaf within the margin. The flowers are borne on short stalks in the axils of the leaves. The flower-stalk is dilated at its upper end into a globose or ovoid receptacle enclosing the 2- to 4-partitioned ovary. From its margin proceed the five sepals, and within them the five rounded, spoon-shaped, spreading, white petals. The stamens spring from the receptacle within the petals and are very numerous, each consisting of a slender white filament and a small yellow two-lobed anther. The style surmounting the ovary is slender, terminating in a small button-like stigma. The fruit is a purplish berry, consisting of the receptacle and the ovary blended into one succulent investment enclosing very numerous minute seeds. The embryo-plant within the seed is usually curved. In cultivation many varieties are known, dependent on variations in the size and shape of the leaves, the presence of so-called double flowers, &c. The typical species is quite hardy in the south of England. The Chilean species, M. *Ugni*, a shrub with ovate, dark green leaves and white flowers succeeded by globular red or black glossy fruit with a pleasant smell and taste, is a greenhouse shrub, hardy in south-west Britain. The common myrtle is the sole representative in Europe of a large genus which has its headquarters in extra-tropical South America, whilst other members are found in Australia and New Zealand. The genus *Myrtus* also gives its name to a very large natural order, Myrtaceae, the general floral structure of which is like that of the myrtle above described, but there are great differences in the nature of the fruit or seed-vessel according as it is dry or capsular, dehiscent, indehiscent or pulpy; minor differences exist according to the way in which the stamens are arranged. The aromatic oil to which the myrtle owes its fragrance, and its use in medicine and the arts, is a very general attribute of the order, as may be inferred from the fact that the order includes, amongst other genera, *Eucalyptus* (gums), *Pimenta* and *Eucalyptus* (gloves). Myrtol, a constituent of myrtle oil, has been given in doses of 5-15 minims on sugar or in capsules for pulmonary tuberculosis, fetid bronchitis, bronchiectasis, and similar conditions. It appears to lessen expectoration in such cases. The leaves of *Myrtus chekan* are aromatic and expectorant, and have been used in chronic bronchitis.

**MYSIA,** the district of N.W. Asia Minor in ancient times inhabited by the Mysians. It was bounded by Lydia and Phrygia on the S., by Bithynia on the N.E., and by the Propontis and Aegean Sea on the N. and W. But its precise limits are difficult to assign, the Phrygian frontier being vague and fluctuating, while in the north-west the Troad was sometimes included in Mysia, sometimes not. Generally speaking, the northern portion was known as Mysia Minor or Hellespontica and the southern as Major or Pergamene.

The chief physical features of Mysia (considered apart from that of the Troad) are the two mountain-chains, Olympus (7600 ft.) in the north and Temnus in the south, which for some distance separates Mysia from Lydia, and is afterwards prolonged through Mysia to the neighbourhood of the Gulf of Adramyttium. The only considerable rivers are the Maeus and its tributary the Rhynacus in the northern part of the province, both of which rise in Phrygia, and, after diverging widely through Mysia, unite their waters below the lake of Apollonia about 15 m. from the Propontis. The Caicus in the south rises in Temnus, and from thence flows westward to the Aegean Sea, passing within a few miles of Pergamum. In the northern portion of the province are two considerable lakes, Artynia or Apolloniatis (Abulliont Geul), and Aphnith (Maniyan Geul), which discharge their waters into the Maeus and from the east and west respectively.

The most important cities were Pergamum (q.v.) in the valley of the Caicus, and Cyrus (q.v.) on the Propontis. But the whole sea-coast was studded with Greek towns, several of which were places of considerable importance; thus the northern portion included Parium, Lampascus and Abydos, and the southern
ASSUS, ADRANYTTUS, and farther south, on the Elatic Gulf, Elaea, Myrina and Cyme.

Ancient writers agree in describing the Mysians as a distinct people, like the Lydians and Phrygians, though they never appear in history as an independent nation. It appears from Herodotus and Strabo that they were kindred with the Lydians and Carians, a fact attested by their common participation in the sacred rites at the great temple of Zeus at Labranda, as well as by the statement of the historian Xanthus of Lydia that their language was a mixture of Lydian and Phrygian. Strabo was of opinion that they came originally from Thrace (cf. Bithynia), and were a branch of the same people as the Mysians or Moesians (see Moesia) who dwelt on the Danube—a view not inconsistent with the fact that they have considered by Phrygians and Lydians also as having migrated from Europe into Asia. According to a Carian tradition reported by Herodotus (i. 171) Lydus and Myus were brothers of Car—an idea which also points to the belief in a common origin of the three nations. The Mysians appear in the list of the Trojan allies in Homer and are represented as settled in the Carcianus of Lydia; at the coming of Telephus to Pergamum; but nothing else is known of their early history.

The story told by Herodotus (vii. 20) of their having invaded Europe in conjunction with the Teurcians before the Trojan War is probably a fiction; and the first historical fact we learn is their subjugation, together with all the surrounding nations, by Lydian Croesus. After the fall of the Lydian monarchy they remained under the Persian Empire until its overthrow by Alexander. After his death they were annexed to the Syrian monarchy, of which they continued to form a part until the defeat of Antiochus the Great (190 B.C.), after which they were transferred by the Romans to the dominion of Eumenus of Pergamum. After the extinction of the Pergamene dynasty (130 B.C.) Mysia became a part of the Roman province of Asia, and from this time disappears from history. The inhabitants probably became gradually Hellenized, but none of the towns of the interior, except Pergamum, ever attained to any importance.

See C. T. Wood, _Asia minore_ (Paris, 1839); W. J. Hamilton, _Researches_ (London, 1842); J. A. R. Munro in _Geog. Journal_ (1897); Hellespontica; W. von Dries, _Petermanns Mitth._ (Erganzungshft 94; Gotta, 1889; Pergamene).

**MYSLOWITZ,** a town of Germany, in the Prussian province of Silesia. Pop. (1905), 15,845. It lies on the navigable Przewa, across which an iron bridge leads to the Polish town of Modrzejow, 120 m. S.E. from Breslau by rail, and an important junction of lines to Oswiecim-Lemberg and Vienna. It contains a Protestant and three Roman Catholic churches, a palace and a gymnasium, and other schools. Extensive coal-mines are worked, and among its other industries are flax-spinning and brick-making. It became a town in 1587.

See Lustig, _Geschichte von Myslowitz_ (Myslowitz, 1867).

**MYSOER,** a native state of southern India, almost surrounded by the Madras presidency, but in political relations with the governor-general. It is naturally divided into two regions of distinct character—the hill country called the Malnad, on the west, and the more open country known as the Maidan, comprising the greater part of the state, where the wide-spreading valleys and plains are covered with villages and populous towns. The drainage of the country, with a slight exception, finds its way into the Bay of Bengal, and is divisible into three great river systems—that of the Kistna on the north, the Cauvery on the south, and the Northern and Southern Penner and Palar on the east. Owing to either rocky or shallow beds none of the Mysore rivers is navigable, but some are utilized for floating down timber at certain seasons. In the main streams, especially the Cauvery and its tributaries, support an extensive system of irrigation by means of channels drawn from immense dams (anicut), which retain the water at a high level and permit only the overflow to pass down stream. The streams which gather from the hill-sides and fertilize the valleys are embanked at every favourable point in such a manner as to form a series of reservoirs or tanks, the outflow from one at a higher level supplying the next lower, and so on, all down the course of the stream at short intervals. These tanks, varying in size from small ponds to extensive lakes, are dispersed throughout the country to the number of 20,000; the largest is the Sulekere lake, 40 m. in circumference.

Mysore is perhaps the most prosperous native state in India. Situated on a healthy plateau, it receives the benefit of both the south-west and north-east monsoons, a natural advantage which, in conjunction with its irrigation system, has brought to Mysore a larger degree of immunity from famine than almost any other internal tract of India (always excepting the great caluminy of 1876-1877, when one-fourth of the population is believed to have perished). Coffee, sandal-wood, silk, gold and ivory are among the chief products. The famous Kolar gold-fields are worked by electric power, which is conveyed for a distance of 92 m. from the Cauvery Falls. This was the first electric power scheme of magnitude in Asia. A long period of administration by British officers led to the introduction of a system based on British models, which has been maintained under a series of exceptionally able native ministers, and the state can boast of public works, hospitals, research laboratories, &c., unsurpassed in India.

The total area of the state is 29,433 sq. m., subdivided into 8 districts, namely: Bangalore, Kolar, Tumkur, Mysore, Hassan, Kadur, Shimoga and Chitrala. Pop. (1901), 5,539,399, showing an increase of 18% between 1891 and 1901, and of 12% between 1881 and 1901. The proportion of Hindus (90.1%) is larger than in any province of India, showing how ineffectual was the persecution of Hyder and Tippoo. The Christians (apart from native converts, who are chiefly Roman Catholics) largely consist of the garrison at Bangalore, the families of military pensioners at the same town, coffee-planters and gold-miners. The finances of the state have been very successfully managed under native rule, assisted by large profits from railways and gold-mines. The revenue amounts to about £1,400,000, of which nearly half is derived from land. In accordance with the "instrument of transfer," Mysore pays to the British government a tribute of £234,000, as contribution to military defence; but the full amount was not exacted until 1866. The state maintains a military force, consisting of two regiments of siddlar cavalry and three battalions of infantry—total, about 2800 men; and also a regiment of imperial service lancers, with a transport corps. An interesting experiment has been made, in the constitution of a representative assembly, composed of 350 representatives of all classes of the community, who meet annually to hear an account of the state administration for the previous year. The assembly has no power to enact laws, to vote supplies, or to pass any resolution binding upon the executive. But it gives to the leading men of the districts a pleasant opportunity of visiting the capital, and to a limited extent brings the force of public opinion to bear upon the minister. Since 1891 this representative assembly has been elected by local boards and other public bodies.

In the earliest historical times the northern part of Mysore was held by the Kadamba dynasty, whose capital, Banavasi, is mentioned by Ptolemy; they reigned with more or less splendour during fourteen centuries, though latterly they became feudatories of the Chalukyas. The Cheras were contemporary with the Kadambas, and governed the southern part of Mysore till they were subverted by the Cholas in the 8th century. Another ancient race, the Pallavas, held a small portion of the eastern side of Mysore, but were overthrown by the Chalukyas in the 7th century. These were overthrown in the 12th century by the Ballalas (Hoysalas), an enterprising and warlike race professing the Jain faith. They ruled over the greater part of Mysore, and portions of the modern districts of Coimbatore, Salem and Dharwar, with their capital at Dwarasamudra (the modern Halebid); but in 1310 the Ballala king was captured by Malik Kafur, the general of Ala-ud-din; and seventeen years later the town was entirely destroyed by another force sent by Mahommed Tughlak. After the subversion of the Ballala dynasty, a new and powerful Hindu sovereignty arose at Vijayanagar on the Tungabhadra.
In 1653 a confederation of the Mahoomedian kingdoms defeated the Vijayanagar sovereign at the battle of Talikota; and his descendants ultimately became extinct as a ruling house. During the feeble reign of the last king, the petty local chiefs (ruledars) asserted their independence. The most important of these was the wodeyar of Mysore, who in 1610 seized the fort of Seringapatam, and so laid the foundation of the present state. His fourth successor, Chikka Deva Raja, during a reign of 34 years, made his kingdom one of the most powerful in southern India. In the middle of the 18th century the famous Mahoomedian adventurer Hyder Ali usurped the throne, and by his military prowess made himself one of the most powerful princes of India. His dynasty, however, was as brief as it was brilliant, and ended with the defeat and death of his son Tippoo at Seringapatam in 1799. A representative of the ancient Hindoo line was then replaced on the throne. This prince, Krishnaraja Wodeyar, was only five years old, and until he came of age in 1811 the state was under the administration of Parnaiya, the Brahmam minister of Hyder and Tippoo. When Krishnaraja took over the management of his state he received an orderly and contented principality with a surplus of two crores of rupees. Within twenty years he had driven his subjects into rebellion and involved himself and his state in heavy debt. The British government therefore assumed the administration in 1831, and placed it in the hands of commissioners. In 1856 the new Maharaja Krishnaraja adopted him as his son and successor, although he had been informed that no adoption could be recognized except to his own private property, already once more heavily weighted with private debts. In 1867 the policy of government underwent a change; it was determined to secure the continuance of native rule in Mysore, by acknowledging the adoption upon certain conditions which would secure to the people the continued benefits of good administration enjoyed by them under British control. The old maharaja died on the 27th of March 1868, and Chamarajendra Wodeyar was publicly installed as the future ruler of Mysore on the 23rd of September 1868. His education was taken in hand, abuses which had grown up in the palace establishment were reformed, the late maharaja's debts were again paid off, and the whole internal administration perfected in every branch during the minority. On the 25th of March 1883 Maharaja Chamarajendra, having attained the age of 18 years, was publicly entrusted with the administration of the state. He made over to the British government, with full jurisdiction, a small tract of land at Bangalore, forming the "civil and military station," and received in return the island of Seringapatam. But the most important incident of the change was the signing of the "instrument of transfer," by which the young maharaja, for himself and his successors, undertook to perform the conditions imposed upon him. To that agreement the maharaja steadfastly adhered during his reign, and the instrument is a landmark in the history of British relations with the protected states of India. The maharaja's first minister was Ranga Charlu, who had been trained in the British administration of Mysore. He signalized the restoration of native rule by creating the representative assembly. In 1883 Sheshadri Aiyar succeeded Ranga Charlu, and to him Mysore is indebted for the extension of railways and schemes of irrigation, the development of the Kolar goldfields, and the maintenance of the high standard of its administration. The maharaja died at Calcutta on the 28th of December 1894. His eldest son, Krishnaraja Wodeyar, born in 1884, succeeded him, and his widow, Maharani Vanivilas, was appointed regent, until in 1902 the maharaja was formally invested with full powers by the viceroy in person.

See B. L. Rice, Mysore (2nd ed., Bangalore, 1897); Mysore and Coorg Gazetteer (Calcutta, 1908).

MYSORE, capital of the state of Mysore, India, 10 m. S.W. of Seringapatam on the Mysore State railway. Pop. (1901), 68,111. The city, which is spread over an area of about 7½ sq. m., has its nucleus at the foot of the Chamundi hill, in a valley formed by two parallel ridges running north and south. The fort stands in the south of the town, forming a quarter by itself; the ground-plan is quadrangular, each of the sides being about 4½ yds. long. The old palace of the maharaja within the fort, built in an extravagant style of Hindu architecture, was partly destroyed by fire in 1897, whereupon a new palace was built on the same site. The principal object of interest in the old palace was the throne, which is said to have been presented to Chikka Deva Raj by the emperor Aurangzeb. The houses of the European residents are for the most part to the east of the town. The residency or government house was built in 1805. The building afterwards used for the district offices was originally built by Colonel Wellesley (duke of Wellington) for his own occupation. The domed building for the public offices in Gordon Park, the Maharaja's College, the Victoria Jubilee Institute, and the law courts are conspicuous. Mysore, though the dynastic capital of the state, was superseded by Seringapatam as the seat of the administration from the middle of the 18th century until the British occupation, the seat of administration was removed to Bangalore.

MYSTERY (Gr. μυστήριον, from μύστης, an initiate, μικροί, to shut the mouth), a general English term for what is secret and wonder, derived from the word μυστήριον, which is often associated with and at times appears synonymous with the words ταξιν, δρωγα. We may interpret "mystery" in its original Greek meaning as a "secret" worship, to which only certain specially prepared people—εὐμυστήριοι—were admitted after a special period of purification or other preliminary probation, and of which the ritual was so important and perilous that the "catechumen" needed a hierophant or expounder to guide him aright. In the ordinary public worship of the state or the private worship of the household the sacrifice with the prayer was the chief act of the ceremony; in the "mysteries" something other than a sacrifice was of the essence of the rite; something was shown to the eyes of the initiated, the mystery was a δραμα, νυκτα, and δραματους και μυστα, and δραμα and δραματους are verbal terms expressing the mystical act. We have an interesting account given us by Theo Smyrnæus of the various elements and moments of the normal mystic ceremony: first is the καθαρια, or preliminary purification; secondly, the ταξιν, or the revelation to sight of certain holy things, which is the central point of the whole; fourthly, the crowning with the garland, which is henceforth the badge of the privileged; and finally, that which is the end and object of all this, the happiness that arises from the friendship or communion with the deity. This exposition is probably applicable to the Greek mysteries in general, though it may well have been derived from his knowledge of the Eleusinian. We may supplement it by a statement of Lucian's that "no mystery was ever celebrated without dancing" (De saltat. 15), which means that it was in some sense a religious drama, ancient Greek dancing being generally mimetic, and represented some ιερος λογος or sacred story as the theme of a mystery-play.

Before we approach the problem as to the content of the mysteries, we may naturally raise the question why certain

1 De ult. math., Herscher, p. 15.
ancient cults in Greece were mystic, others open and public. An explanation often offered is that the mystic cults are the Pelasgic or pre-Hellenic and that the conquered populations desired to shroud their religious ceremonies from the profane eyes of the conquerors. But we should then expect to find them administered chiefly by slaves and the lower population; on the contrary they are generally in the hands of the noblest families, and the evidence that slaves possessed in any of them the right of initiation is only slight. Nor does the explanation in other respects fit the facts at all. The deities who are worshipped with mystic rites have in most cases Hellenic names and do not all belong to the earliest stratum of Hellenic religion. Besides those of Demeter, by far the most numerous in the Hellenic world, we have record of the mysteries of Ge at Phyle in Attica, of Aglauros and the Charities at Athens, of Hecate at Aegina; a shrine of Artemis Moera on the road between Sparta and Arcadia points to a mystic cult of this goddess, and we can infer the existence of a similar worship of Themis. Now these are either various forms of the earth-goddess, or are related closely to her, being powers that we call "chthonian," associated with the world below, the realm of the dead. We may surmise then that the mystic setting of a cult arose in many cases from the dread of the religious mismas which emanated from the nether world and which suggested a prior ritual of purification as necessary to safeguard the person before approaching the holy presence or handling certain holy objects. This would explain the necessity of mysteries in the worship of Dionysus also, the Cretan Zagreus, Triphonius at Lebadeia, Palaeon-Melicertes on the Isthmus of Corinth. They might also be necessary for those who desired communion with the deified ancestor or hero, and thus we hear of the mysteries of Dryops at Asine, of Antinous the favourite of Hadrian at Martineia. Again, where there was hope or promise that the mortal should by communion be able to attain temporarily to divinity, so hazardous an experiment would be safeguarded by special preparation, secrecy and mystic ritual; and this may have been the prime motive of the institution of the Attis-Cybele mystery. (See Great Mother of the Gods.)

For the student of Hellenism, the Eleusinian and Orphic ceremonies are of paramount importance; the Samothracian, which vied with these in attractiveness for the later Hellenic world, were not Hellenic in origin, nor wholly hellenized in character, and cannot be considered an article of the common culture...

As regards the Eleusinian, we are in a better position for the investigation of them than our predecessors were; for the modern methods of comparative religion and anthropology have at least taught us to ask the right questions and to apply relevant hypotheses; archaeology, the study of vases, excavations on the site, yielding an ever-increasing hoard of inscriptions, have taught us much concerning the external organization of the mysteries, and have shown us the beautiful figures of the deities as they appeared to the eye or to the mental vision of the initiated.

As regards the inner content, the secret of the mystic celebration, it is in the highest degree unlikely that Greek inscriptions or art would ever reveal it; the Eleusinian scenes that appear on Attic vases of about the 5th century cannot be supposed to show us the heart of the mystery, for such sacrilegious rashness would be dangerous for the vase-painter. If we are to discover it, we must turn to the ancient literary records. These must be handled with extreme caution and a more careful scrutiny than is often applied. We must not expect full enlightenment from the Pagan writers, who convey to us indeed the poetry and the glow of this fascinating ritual, and who attest the deep and purifying influence that it exercised upon the religious temperament, but who are not likely to tell us more. It is to the Christian Fathers we must turn for more esoteric knowledge, for they would be withheld by no scruple from revealing what they knew. But we cannot always believe that they knew much, for only those who, like Clement and Arnobius, had been Pagans in their youth, could ever have been initiated. Many of them uncritically confuse in the same context and in one sweeping verdict of condemnation Orphic, Phrygian-Sabazian and Attis-Mysteries with the Eleusinian; and we ought not too lightly to infer that these were actually confused and blended at Eleusis. We must also be on our guard against supposing that when Pagan or Christian writers refer to "mysteries," they always have the Eleusinian in their mind.

The questions that the critical analysis of all the evidence may hope to solve are mainly these: (a) What do we know or what can we infer concerning the personality of the deities to whom the Eleusinian mysteries were originally consecrated, and were new figures admitted at a later period? (b) When was the mystery taken over by Athens and opened to all Hellas, and what was the state-organization provided? (c) What was the inner significance, essential content or purport of the Eleusinia, and what was the source of their great influence on Hellas? (d) Can we attribute any ethical value to them, and did they strongly impress the popular belief in immortality? Limits of space allow us only to adumbrate the results that research on the lines of these questions has hitherto yielded.

The paramount divine personalities of the mystery were in the earliest period of which we have literary record, the mother and the daughter, Demeter and Kore, the latter being never styled Persephone in the official language of Eleusis; while the third figure, the god of the lower world known by the euhemeristic names of Plato (Plouton) and at one time Eubouleus, the ravisher and the husband, is an accessory personage, comparatively in the background. This is the conclusion naturally drawn from the Homeric hymn to Demeter, a composition of great ritualistic value, probably of the 7th century B.C., which describes the abduction of the daughter, the sorrow and search of the mother, her sitting by the sacred well, the drinking of the κονάκιον or sacred cup and the legend of the pomegranate. An ancient hymn of Paphbos, from which Paussanias freely quotes and which he regards as genuine,1 appears to have told much the same story in much the same way. As far as we can say, then, the mother and daughter were there in possession at the very beginning. The other pair of divinities known as ὁ θεὸς ἡ θεά, that appear in a 5th-century inscription and on two dedicatory reliefs found at Eleusis, have been supposed to descend from an aboriginal period of Eleusinian religion when deities were nameless, and when a peaceful pair of earth-divinities, male and female, were worshipped by the rustic community, before the earth-goddess had pluralized herself as Demeter and Kore, and before the story of the madre dolorosa and the lost daughter had arisen.2 But for various reasons the contrary view is more probable, that ὁ θεὸς and ἡ θεά are later cult-titles of the married pair Pluto-Cora (Plouton-Kore), the personal names being omitted from that feeling of reverential shyness which was specially timid in regard to the sacred names of the deities of the underworld. And it is a fairly familiar phenomenon in Greek religion that two separate titles of the same divinity engender two distinct cults.

The question as to the part played by Dionysus in the Eleusinian is important. Some scholars, like M. Foucart, have supposed that he belonged from the beginning to the inner circle of the mystery; others that he forced his way in at a somewhat later period owing to the great influence of the Orphic sects which captured the stronghold of Attic religion and engraved the Orphic-Sabazian ἔριστος λάγος, the story of the incestuous union of Dionysos-Sabazius with Demeter-Kore, and of the death and rendering of Zagreus, upon the primitive Eleusinian faith. A saner and more careful criticism rejects this view. There is no genuine trace discovered as yet in the inner circle of the mysteries of any characteristically Orphic doctrine; the names of Zagreus and Phanes are nowhere heard, the legend of Zagreus and the death of Dionysus is not known to have been mentioned there. Nor is there any print within or in the precincts of the ἄλοιχαν: the hall of the Μυστέρες, of the footsteps of the Phrygian deities, Cybele, Attis, Sabazius.

1 38: 39: i. 39: 1.
2 See Dittenberger, Syll. 13; Corp. inscr. alt. 2, 1620 c. 3, 1190; Ephem. arch. (1886), iv. 31; Hesbert in Pafstarch für Benndorf, 3, Tal. 4; Von der Osten in Athen. Mittheil. (1899), p. 255.
The exact relation of Dionysus to the mysteries involves the question as to the divine personage called Iacchus; who and what was Iacchus? Strabo (p. 468), who is a poor authority on such matters, describes him as "the daemon of Demeter, the founder of the leader of the mysteries." More important is it to note that "Iacchus" is unknown to the author of the Homeric hymn, and that the first literary notice of him occurs in the well-known passage of Herodotus (viii. 63), who describes the procession of the mystae as moving along the sacred way from Athens to Eleusis and as raising the cry "Iacchus." We find Iacchus the theme of a glowing invocation in an Aristophanic Ode (Frogs, 324-398), and described as a beautiful "young god"; but he is first explicitly identified with Dionysus in the beautiful ode of Sophocles' Antigone (1119); and that this was in accord with the popular ritualistic lore is proved by the statement of the scholiast on Aristophanes (Frogs, 482) that the people at the Lenaea, the winter-festival of Dionysus, responded to the command of "Invoke the god!" with the invocation "Hail, Iacchus, son of Semele, thou giver of wealth!" We are sure, then, that in the high tide of the Attic religious history Iacchus was the youthful Dionysus, a name of the great god peculiar to Attic cult; and this is the name we shall use.

We can now answer the question raised above. This youthful Attic Dionysus has his home at Athens; he accompanies his votaries along the sacred way, filling their souls with the exaltation and ecstasy of the Dionysiac spirit; but at Eleusis he had no temple, altar or abiding home; he comes as a visitor and departs. His image may have been carried into the Hall of the Mysteries, but whether it played any part there in a passion-play we do not know. That he was a primary figure of the essential mystery is hard to believe, for we find no traces of his name in the other Greek communities that at an early period had instituted mysteries on the Eleusinian model. Apart from Iacchus, Dionysus in his own name was powerful enough at Eleusis as in most other localities. And the votaries carried with them no doubt into the hall the Bacchic exaltation of the Iacchus procession and the nightly revel with the god that preceded the full initiation; many of them also may have belonged to the private Dionysiac sects and might be tempted to read a Dionysiac significance into much that was presented to them. But all this is conjecture. The interpretation of what was shown would naturally change somewhat with the changing sentiment of the ages; but the mother and the daughter, the stately and beautiful figures presented to us by the author of the homeric hymn, who says no word of Dionysus, are still found reigning paramount and supreme at Eleusis just before the Gothic invasion in the latter days of Paganism. Triptolemus the apostle of corn-culture, Eubouleus—originally a euphemistic name of the god of the under-world, "the giver of good counsel," conveying a hint of his oracular functions—these are accessory figures of Eleusinian cult and mythology that may have played some part in the great mystic drama that was enacted in the hall.

The development and organization of the Eleusinia may now be briefly sketched. The legends concerning the initiation of Heracles and the Dioscuri preserve the record of the time when the mysteries were closed against all strangers, and were the privilege of the Eleusinians alone. Now the Homeric hymn in its obvious appeal to the whole late pre-Greek world to avail themselves of these mysteries gives us to suppose that they had already been thrown open to Hellas; and this momentous change, abolishing the old gentle barriers, may have naturally coincided with, or have resulted from, the fusion of Eleusis and Athens, an event of equal importance for politics and religion which we may place in the prehistoric period. The reign of Peisistratus was an era of architectural activity at Eleusis; but the construction of the νυμφεῖον σπήδος was one of the achievements of the Periclean administration. Two, containing decrees passed during the supremacy of Pericles, the one proclaiming a holy truce of three months for the votaries that came from any Greek community,1 the other bidding the subject allies and inviting the independent states to send ἄραργυος or tithe-offerings of corn to Eleusis,2 record the favored sight of Periclean Athens, her determination to find a religious support for her hegemony.

At least from the 5th century onwards, the external control and all questions of the organization of the mysteries were in the hands of the Athenian state, the rule holding in Attica as elsewhere in Hellas that the state was supreme over the Church. The head of the general management was the king-archon (archon basileus) who with his ἀρχιερεῖα and the four "πρεσβείαι" formed a general committee of supervision, and matters of importance connected with the ritual were decided by the Boule or Ecclesia. But the claim of Eleusis as the religious metropolis was not ignored. The chief of the two priestly families, in whose hands lay the mystic celebration itself and the formal right of admission, was the Eleusinian "gens" of the Eumolpidæ; it was to their ancestor that Demeter had entrusted her ἄργυρα, and the recognition of their claims maintained the principle of apostolic succession. To them belonged the hierophant (ἱεροφάνης), the high priest of the Eleusinia, whose function alone it was to "reveal the orgies," to show the sacred things, and warn one—or perhaps with his consort-priestesses could indubitably enter into the Eleusinian temple, was the impressive figure, so sacred in person that no one could address him by his personal name, and bound, at one period at least, by a rule of celibacy. We hear also of two "hierophantides,"3 female attendants on the older and younger goddesses. In fact, while the male priest predominates in this ritual, the women play a prominent part: as we should expect, considering that the sister-festival of the Thesmophoria was wholly in their hands.

The other old priestly family was that of the "Kerykes," to whom the διδύμοι belonged, "the holder of the torch," the official second in rank to the ἱεροφάνης. It is uncertain whether this family was of Eleusinian origin; and in the 4th century it seems to have died out, and the office of the διδύμοι passed into the hands of the Lycomideæ, a priestly family by Pylæ, suspected of being devotees of Orphism.

Turning now to the celebration itself, we can only sketch the more salient features here. On the 15th of Boedromion, on the Attic month corresponding roughly to our September, the Ephæi (q.v.) marched out to Eleusis, and returned to Athens the next day bringing with them the "holy things" (ἱερά) to the Eleusinion in the city; these ἱερά probably included small images of the goddesses. The 16th was the day of the ἄγρυψ, the gathering of the catechumens, when they met to hear the address of the hierophant, called the προφάνης. This was no sermon, but a proclamation bidding those who were disqualified or for some reason unworthy of initiation to depart. The legally qualified were all Hellenes and subsequently all Romans above a certain—very youthful—limit of age, women, and as it appears even slaves; barbarians, and those uncleaned of some notorious guilt, such as homicide, were disqualified. We are sure that there was no dogmatic test, nor would time allow of any searching moral scrutiny, and only the Samothracian rites, in this respect unique in the world of classical religion, possessed a system of confessional. The hierophant appealed to the conscience of the multitude; but we are not altogether sure of the terms of his proclamation, which can only be approximately restored from the aforesaid and many other Christian writers. We know that he demanded of each candidate that he should be "of intelligible speech (i.e. an Hellene) and pure of hand"; and he catechized him as to his condition of ritualistic purity—the food he had eaten or abstained from. It appears also from Libanius that in the later period at least he solemnly proclaimed that the catechumen should be "pure of soul," and this spiritual conception of holiness had arisen already in the earlier periods of Greek religious thought. On the other hand we must bear in mind the criticism that Diogenes is said to have passed upon the Eleusinia, that many bad characters were admitted to communion, thereby securing a promise of higher happiness than an uninitiated Ἐπάμινον might aspire to. An essential preliminary was purification and lustration, and

1 Corp. inscr. att. i. 1.
2 Dittenberger, Sylloge, 15.
3 Or. Corinth, iv. 356.
after the assembly the "mystae" went to the sea-shore (ἄλατος μύσται) and purified themselves with sea-water, and probably with sprinkling of pigs' blood, a common cathartic medium. After their return from the sea, a sacrifice of some kind was offered as an essential condition of μύσις, but whether as a sacrament or a gift-offering to the goddesses it is impossible to determine. On the 19th of Boedromion the great procession started along the sacred way bearing the "fair young god" Iacchus; and as they visited many shrines by the way the march must have continued long after sunset, so that the 20th is sometimes spoken of as the day of the exodus of Iacchus. On the way each wore a saffron band as an amulet; and the ceremonial reviling to which the "mystai" were subjected as they crossed the bridge of the Cephissus answered the same purpose of averting the evil eye. Upon the arrival at Eleusis, on the same night or on the following, they celebrated a midnight revel under the stars with Iacchus, which Aristophanes glowingly describes.

The question of supreme interest now arises: What was the mystic ceremony in the hall? what was said and what was done? We can distinguish two grades in the celebration; the greater was the τέαμα and ἑσπόρια, the full and satisfying celebration, to which only the public was admitted; but passages from the lesser stage at least a year before. As regards the actual ritual in the hall of the mystae, much remains uncertain in spite of the unwearying efforts of many generations of scholars to construct a reasonable statement out of fragments of often doubtful evidence. We are certain at least that something was acted there in a religious drama or passion-play, the revelation was partly a pageant of holy figures; the accusations against Aeschylus and Alcibiades would suffice to prove this; and Porphyry speaks of the hierophant and the διδοὺχος acting divine parts.

What the subject of this drama was may be gathered partly from the words of Clement—Deo (Demeter) and Kore became the personages of a mystic drama, and Eleusis with its διδοὺχος celebrates the wandering, the abduction and the sorrow (Protrept., p. 12 Potter), partly from Psyche's appeal to Demeter in Apuleius (Metamorph. 6)—"by the unspoken secrets of the mystic chest, the winged chariots of thy dragon-ministers, the bridal descent of Proserpine [Persephone], the torch-lit wanderings to find thy daughter and all the other mysteries that the shrine of Attic Eleusis shrouds in secret." We may believe then that the great myth of the mother's sorrow, the loss and the partial recovery of her beloved was part of the Eleusinian passion-play. Did it also include a λεπός γάμος? We should naturally expect that the sacred story acted in the mystic pageant would close with the scene of reconciliation, such as a holy marriage of the god and the goddess. But the evidence that this was so is mainly indirect, a fact from a doubtful passage in Asterius, a writer of questionable authority in the 4th century a.d. (Econom. marty. p. 194, Combe). At any rate, if a holy marriage formed part of the passion-play, it may well have been acted with solemnity and delicacy. We have no reason to believe that even to a modern taste any part of the ritual would appear coarse or obscene; even Clement, who brings a vague charge of obscenity against all mysteries in general, does not try to substantiate it in regard to the Eleusinia, and we hear from another Christian writer of the scrupulous purity of the hierophant.

It would be interesting to know if the birth of a holy child, a babe Iacchus, for example, was a motive of the mystic drama. The question seems at first sight to be decided by a definite statement of Hippolytus (Philosoph. 5, 8), that at a certain moment in the mysteries the hierophant cried aloud: "The lady-goddess Brimo has borne Brimos the holy child." But a careful consideration of the context almost destroys the value of his authority. For he does not pretend to be a first-hand witness, but admits that he is drawing from Gnostic sources, and he goes on at once to speak of Attis and his self-mutilation. The formula may then refer to the Sabazian-Phrygian mystery, which the Gnostics with their usual spirit of religious syncretism would have no scruple in identifying with the Eleusinian. And the archaeological evidence that has been supposed to support the statement of Hippolytus is deceptive.

Finally, we must not suppose that there could be any very elaborate scenic arrangements in the hall for the representation of Paradise and the Inferno, whereby the rewards of the faithful and the punishments of the damned might be impressively brought home to the mystae. The excavations on the site have proved that the building was without substructures or under-ground passages. A large number of inscriptions present us with elaborate accounts of Eleusinian expenditure; but there is no item for scenic expenses or painting. We are led to suppose that the pageant-play produced its effect by means of gorgeous raiment, torches and stately figures.

But the mystic action included more than the pageant-play. The hierophant revealed certain holy objects to the eyes of the assembly. There is reason to suppose that these included certain primitive idols of the goddesses of immemorial sanctity; and, if we accept a statement of Hippolytus (loc. cit.) we must believe that the ἐποπλαί were also shown "that great and marvelous mystery of perfect revelation, a cut corn-stalk." The value of this definite assertion, which appears to be an explicit revelation of the secret, would be very great, if we could trust it; but uncritically we cannot accept it, at least in this context as the Brimo-Brimos formula, and we again suspect the same uncritical confusion of Eleusinian with Phrygian ritual, for we know that Attis himself was identified in his mysteries with the "reaped corn," the στάχυς ἄμπρος, almost the very phrase used by Hippolytus. Only, it is in the highest degree probable, whether Hippolytus knew anything or not, that a corn-token was shown among the sacred things of a mystery which possessed an original agrarian significance and was intended partly to consecrate and foster the agricultural life. But to say this is by no means the same as to admit the view of Lenormant 1 and Dr Jevons 2 that the Eleusinians worshipped the actual corn, or revered it as a clan-totem. For of direct corn-worship or of corn-totemism there is no trace either at Eleusis or elsewhere in Greece.

Among the δώραμα or "things done" may we also include a solemn sacraiment, the celebration of a holy communion, in which the votary was united to the divinity by partaking of some holy food or drink? We owe to Clement of Alexandria (Protrept. p. 18, Potter) an exact transcription of the pass-word of the Eleusinian mystae; it ran as follows (if we accept Lobeck's emendation of ἐγγαγάμενοι for ἐγαγάμενοι): "I have fasted, I have drunk the barley-drink, I have taken [the things] from the sacred chest, having tasted thereof I have placed them into the basket and again from the basket into the chest." We gather from this that some kind of sacrament was at least a preliminary condition of initiation; the mystae drank of the cup as the goddess drank in her sorrow, partly—as we say—"in memory of her," partly to unite themselves more closely with her. We know also from an inscription that the priest of the Samothracian mysteries broke sacred bread and poured out drink for the mystae (Arch. epigr. Milh. 1882, p. 8, No. 14.) But neither in these nor in the Eleusinian is there any trace of the more mystic sacramental conception, any indication that the votaries believed themselves to be partaking of the actual body of their divinity; for there is no evidence that Demeter was identified with the corn, still less with the barley-meal of which the Κυνόδωρ was compounded. Nor is it likely that the sacrament was the pivot of the whole mystery or was part of the essential act of the μύσις itself. In the first place we have an almost certain representation of the Eleusinian sacrament on an archaic vase in Naples, probably of Attic provenance, and the artistic reproduction of a holy act would have been impious and dangerous, if this had belonged to the inner circle of the mystery. Again, there is no mention of sacrament or sacrifice among the five essential parts of μύσις given by Theo 3 Daremberg et Saglio, Dictionnaire, 1, p. 1666.

3 Introduction to the Study of Religion.
4 This is Dr Jevons's supposition—op. cit.—on which he bases an important theory of the whole Eleusinian mysteries and their intrinsic attraction.

5 Farnell, Cults. vol. iii. pl. xiv.
Mysteries

Smyrnaeus, nor in the imaginary narrative of the late rhetorician Sophatros, who supposes the strange case of a man being initiated by the goddesses in a dream: they admit him to their full communion merely by telling him something and showing him something.

Besides the ὅρωμα, then, there were also certain things said in the hall, or in the earlier stages of initiation, which we would gladly discover. Part of these were mystic formulæ, one of which has been discussed already, the pass-word of the votaries. We gather also from Proclus and Hippolytus that in the Eleusinian rites they gazed up to heaven and cried aloud "rain"—φανερωτετε—"and gazed down upon the earth and cried "conceive"—κάιξαι. This ritual charm—we cannot call it prayer—descends from the old agrarian magic which underlay the primitive mystery. What else the votaries may have uttered, whether by way of thanksgiving or solemn litany, we do not know.

But there was also a certain ἴδιος μάρτυς, some exposition accompanying the unfolding of the mysteries; for it was part of the prestige of the hierophant that he was chief spokesman, "who poured forth winning utterance and whose voice the catechumens ardently desired to hear" (Ανθικ. Παλ., app. 246); and Galen speaks of the rapt attention paid by the initiated to "the things done and said in the Eleusinian and Samothranian mysteries" (De usu part. 7, 14). But we have no trustworthy evidence as to the real content of the μάρτυς of the hierophant. We need not believe that the whole of his discourse was taken up with corn-symbolism, as Varro seems to imply (Aug. De civ. Dei. 20), or that he taught natural philosophy rather than theology; or again, the special doctrine of Euhemerus, as two passages in Cicero (De natur. deor. 1. 42; Tusc. 1. 13) might prompt us to suppose. His chief theme was probably an exposition of the meaning and value of the ἱππαξ, as in an Australian initiation rite it is the privilege of the elders to explain the nature of the "churingas" to the youths. And his discourse on these may have been coloured to some extent by the theories current in the philosophic speculation of the day. But though in the time of Julian he appears to have been a philosopher of Neo-platonic tendencies, we ought not to suppose that the hierophant as a rule would be able or inclined to rise above the anthropomorphic religion of the times. Whatever symbolism attached to the ἱππαξ, the sacred objects shown, was probably simple and natural; for instance, the Baphian, as it is called, a cylinder with an eschatological, the token of the growing corn may have served as an emblem—though not a proof—of man's resurrection. The doctrine of the continuance of the soul after death was already accepted by the popular belief, and the hierophant had no need to preach it as a dogma; the votaries came to Eleusis to ensure themselves a happy immortality. And in our earliest record, the Homeric hymn, we find that the mysteries already hold out this higher promise. How, we may ask, were the votaries assured? M. Foucart in Les grands mystères d'Eleusis has maintained that the object of the mysteries was much the same as that of the Egyptian Book of the Dead; to provide the mystic with elaborate rules for avoiding the dangers that beset the road to the other world, and for attaining to last to the happy regions; that for this purpose the hierophant recited magic formulæ whereby the soul could repel the demons that it might encounter on the path; and that it was to seek this delivery from the terrors of hell that all Greece flocked to Eleusis. This is in accord with his whole "egyptizing" theory concerning the Eleusinian, a theory which, though Egyptian influence cannot be a priori be ruled out, is not found in harmony with the facts of the two religious systems. And the particular hypothesis just stated is altogether wanting in direct evidence, or—we may say—in vraisemblance. There is no hint or allusion to be found in the ancient sources suggesting that the recital of magic formulæ was part of the ceremony. The μάρτυς, whatever it was, was comparatively unimportant. And the Greek public in general, in its vigorous period when the Eleusinian religion reached its zenith, was not tormented, as modern Europe has at times been, by ghostly terrors of judgment.

The influence of the Eleusinian mysteries was obtained by the feeling of friendship and mystic sympathy, established by mystic contact, with the mother and the daughter, the powers of life after death. Those who won their friendship by initiation in this life would by the simple logic of faith regard themselves as certain to win blessing at their hands in the next.

It is obvious that the mysteries made no direct appeal to the intellect, nor on the other hand revolted it by any oppressive dogmatism. As regards their psychic effect, we have Aristotle's invariable judgment: 'The initiated do not learn anything so much as feel certain emotions and are put into a certain frame of mind' (Synes. Dion. p. 482). The appeal was to the eye and to the imagination through a form of religious mesmerism working by means that were solemn, stately and beautiful. To understand the quality and the intensity of the impression produced, we should borrow something from the modern experiences of Christian communion-service, mass, and passion-play, and bear in mind also the extraordinary susceptibility of the Greek mind to an artistically impressive pageant.

That the Eleusinia reached a higher morality than that of the current standard is not proved. That they exercised a direct and elevating influence on the individual character is nowhere explicitly maintained, as Diodorus (v. 49) maintains concerning the Samothracian. But on general grounds it is reasonable to believe that such powerful religious experience as they afforded would produce moral fruit in many minds. The genial Aristophanes (Frogs, 455) intimates as much, and Andocius (De myst. p. 36, § 31; p. 44, § 125) assumes that those who had been initiated would take a juster and sterner view of moral innocence and guilt, and that such conduct was a greater sin when committed by a man who was in the official service of the mother and the daughter.

Besides the greater mysteries at Eleusis, we hear of the lesser mysteries of Agra in the banks of the Ilissos. Established, perhaps, originally by Athens herself at a time when Eleusis was independent and closed her rites to strangers, they became wholly subordinated to the greater, and were put under the same management and served merely as a necessary preliminary to the higher initiation into them. Sacrifice was offered to the same great goddesses at both; but we have the authority of Duris (Athenea, 253d), the Samian historian, and the evidence of an Attic painting, called the πίναξ of Nannion,4 that the predominant goddess in the mysteries at Agra was Kore. And this agrees with the time of their celebration, in the middle of Anthesterion, when Kore was supposed to return in the young corn. Stephanus (s.v. Ἀγρᾶ), drawing from an unknown source, declares that the Dionysiac story was the theme of their mystic drama. Hence theorists have supposed that their content was wholly Orphic or that their central motive was the marriage of Dionysus and Kore. The theory has no archaeological or literary support except the passage in Stephanus, nor have we reason for believing that the marriage of these two divinities was recognized in Attic state ritual.

The influence of Eleusis in early times must have been great, for we find offshoots of its cult, whether mystic or not, in other parts of Greece. In Boeotia, Laconia, Arcadia, Crete and Thrace, Demeter brought with her the title of "Eleusinia"; and no other explanation is so probable as the obvious one that the same designation was given to the goddess of Eleusis; and though there may have been other places called "Eleusis," the only famous religious centre was the Attic. The initiation rites of Demeter at Cелеe near Phlius, at Lerna in Argolis, and at Naples, were organized after the pattern of the Eleusinian. But of these and the other Demeter mysteries in the Greek world,
there is little to record that is certain and at the same time of primary importance for the history of religion. The Arcadian city of Pheneus possessed a mystery that boasted an Eleusinian character and origin, yet in the record of it there is no mention of Kore, and we may suspect that, like other Demeter-worships in the Peloponnesse, it belonged to a period when the earth-goddess was revered as a single personality and Kore had not yet emanated from her. We know much more of the details of the great Andanian mysteries in Messenia, owing to the discovery of the important and much-discussed Andanian inscription of 91 B.C. But what we know are facts of secondary importance only. We gather from Pausanias (4. 33. 4; cf. 4. 1. 5, and 4. 26. 8; 4. 27. 6) that the rites, which he regards as secondarily solemn in nature and yet to the Eleusinian alone, were consecrated to the Meγάλα θεία, ... the great goddesses, ... and that Kore enjoyed the mystic title of Hagnē, "the holy one." The inscription has been supposed to correct and to refute Pausanias, but it does not really controvert his statements, which are attested by other evidence; it proves only that other divinities came at a later time to have a share in the mysteries, such as the Meγάλα θεία who were probably the Caberei (q.v.). It is clear that the Andanian mysteries included a sacred drama, in which women personated the goddesses. The priestesses were married women, and were required to take an oath that they had lived "in relation to their husbands a just and holy life." We hear also of grades of initiation, purification-ceremonies, but of no sacrament or eschatologic promise; yet it is probable that these mysteries, like the Eleusinian, maintained and secured the hope of future happiness.

The Eleusinian faith is not wholly unattested by the grave-inscriptions of Hellas, though it speaks but rarely on these. The most interesting example is the epitaph of a hierophant, who proclaims that he has found that "death was not an evil, but a blessing." Of equal importance for the private religion of Greece were the Orphic mystic societies, bearing a Thracio-Phrygian tradition into Greece, and associated originally with the name of Dionysus, and afterwards with Sabazius also and the later cult-ideas of Phrygia. The full account of the Dionysiac mysteries would demand a critical study of the Dionysiac religion as a whole, as well as of the private sects that sprang up under its shadow. It is only possible here to indicate the salient characteristics of those which are of primary value for the history of religion.

Of the Orphic teachings, it is certain that its head-god was the Thracian-Phrygian stock, powerful over all vegetation and especially revealing his power in the vine, Dionysus was forcing his way into Greece at least as early as the Homeric period, and by the 6th century was received into the public cults of most of the Greek communities. We can gather with some certainty or probability his aboriginal characteristics and the form of his worship. Being a god of the life of the earth, he was also a nether divinity, the lord of the world of souls, with whom the dead votary entered into privileged communion; his rites were mystic, and nightly celebrations were frequent, marked by wild ecstasy and orgiastic self-abandonment, in which the votary became at one with the god. The Orphic myth of the Chthonian Orpheus, so much played a prominent part in the ritual; a savage form of sacramental communion was in vogue, and the animal victim of whose flesh and blood the votaries partook was at times regarded as the incarnation of the divinity, so that the god himself might be supposed to die and to rise again; finally we may regard certain cathartic ideas as part of the primeval tradition of this religion. Admitted among the soberer cults of the Greek communities, it lost most of its wildness and savagery, while still retaining a more emotional ecstatic character than the rest. But this cooling process was arrested by a new wave of Dionysiac fervour that spread over Greece from the 4th century onwards, with bringing it the name of Orpheus, and engendering at some later date the Orphic brotherhoods. This religious movement may have started like the earlier one from the lands north of Greece; but Crete and even Egypt are supposed to have contributed much to the Orphic doctrine and ritual. Our earliest authority for the proceedings of the mystery-practitioner who used the name of Orpheus is the well-known passage in Plato's Republic (p. 364a), in which he speaks contemptuously of the itinerant ritualists who knock at the doors of the rich, the vendors of magic incantations, who promise absolution from sins and happiness in the next world to be attained by a ritual of purification and mystic initiation. This record brings to our notice a phenomenon unknown elsewhere in Greek religion; the missionary spirit, the impulse to preach to all who would hear, which foreshadows the breaking down of the genial religious barriers of the ancient world. And it is probable that some kind of "Orphic" propaganda, whether through books or itinerant mystery-priests, or both, had been in vogue some time before Plato. We may fairly conjecture that it has to some extent inspired the glowing eschatology of Pindar, who describes the next world as a place of penance and purification from ancestral or personal taint and of final reward for the purified soul, and who unites this belief with a doctrine of reincarnation. In the Hippolytus of Euripides, Theseus taunts his son with cloaking his immorality under hypocritical "Orphic" pretensions to purity, the phalic sacrifice, for instance, of a vegetarian diet (952-954). Still more important is the fragment of the Cretans of Euripides, attesting the strength of the antiquity of these mystic Dionysiac associations in Crete. The initiated votary proclaims himself as sanctified to Zeus of Ida, to Zagreus—the Orphic name of the nether-world Dionysus—and to the mountain-goddess Rhea-Cybele; he has fulfilled "the solemn rite of the banquet of raw flesh," and henceforth he "robes himself in pure white and avoids the taint of childbirth and funerals and abstains from meat." And—what is most significant—he calls himself by the very name of his god—he is himself Bάσιν. In spirit and in most of its details the passage accords well with the Ἐπιθυμεῖα of Euripides, which reflects not so much the public worship of Greece, but rather the mystic Dionysiac brotherhoods. Throughout this inspired drama the votary rejoices to be one with his divinity and to call himself by his name, and this mystic union is brought about partly, though Euripides may not have known it, through "the meal of raw flesh" or the drinking of the blood of the goat or the kid or the bull. The sacramental intention of this is confirmed by abundant proof; even in the state-cult of Tenedos they dressed up a bull-calf as Dionysus and reverently sacrificed it (Ael. Nat. 12. 34); those who partook of the flesh were partaking of what was temporarily the body of the god. The oldest and greatest single source of this rite is found in the Life of Dionysius, at the end of his history of the god (364), and it is a sacred hymn that has been in vogue at least as early as the 3rd century B.C., and which was inscribed in order to

3. The best account of the origin and development of the Dionysiac religion is Le Bas, Voyage archéol. 2. No. 320; see also A. von Harnack, christliche Religion, II, 1. for Orphic ritual and doctrine, and see article on Orpheus in Roscher's Ausführliches Lexikon der griechischen und römischen Mythologie; Miss Harrison, Prolegomena to the Study of Greek Religion, pp. 455-469, with critical appendix by G. Murray on the Orphic tablets discovered in Crete, near Rome, and in south Italy.
4. The name Orphēs first occurs in Ibycus, Frag. 10: ὁμαλοπλήθος Ὀρφής.
be buried with the defunct, as an amulet that might protect him from the dangers of his journey through the under-world and open to him the gates of Paradise. The verses have the power of an incantation. The initiated soul proclaims its divine descent: "I am the son of Earth and Heaven"; "I am perishing with thirst, give me to drink of the waters of memory"; "I come from the pure"; "I have paid the penalty of unrighteousness"; "I have flown out of the weary, sorrowful circle of life." His reward is assured him: "O blessed and happy one, thou hast put off thy mortality and shalt become divine." The strange formula ἐρείπω οὖς γάλα τεσσαρα, "I a kid fell into the milk," has been interpreted by Dieterich (Eine Milkarst-Liturgie, p. 174) with great probability as alluding to a conception of Dionysus himself as ἐρείπω, the divine kid, and to a ritual of milk-baptism in which the initiated was born again.

We discern, then, in these mystic brotherhoods the germs of a supreme, all-pervading, and indwelling power, in whom all things are one. Hence the speculative utterances of mysticism are always more or less pantheistic in character. On the practical side, mysticism maintains the possibility of direct intercourse with this Being of beings—intercourse, not through any external media such as an historical revelation, oracles, answers to prayer, and the like, but by a species of ecstatic transfusion or identification, in which the individual becomes in very truth "partaker of the divine nature." God ceases to be an object to him and becomes an experience. In the writings of the mystics, ingenuity exhausts itself in the invention of phrases to express the closeness of this union. Mysticism differs, therefore, from ordinary pantheism in that its inmost motive is religious; but, whereas religion is ordinarily occupied with a practical problem and develops its theory in an ethical reference, mysticism displays a predominatingly speculative bent, starting from the divine nature rather than from man and his surroundings, taking the symbolism of religious feeling as literally or metaphysically true, and straining after the present realization of an ineffable union. The union which sound religious teaching represents as realized in the submission of the will and the ethical harmony of the whole life is then reduced to a passive experience, to something which comes and goes in time, and which may be of only momentary duration. Mysticism, it will be seen, is not a name applicable to any particular system. It may be the outgrowth of many differing modes of thought and feeling. Most frequently it appears particularly in relation to some definite system of belief, as a reaction of the spirit against the letter. When a religion begins to ossify into a system of formulas and observances, those who protest in the name of heart-religion are not unfrequently known by the name of mystics. At times they merely bring into prominence again the ever-fresh fact of personal religious experience; at other times mysticism develops itself as a powerful solvent of definite dogmas.

A review of the historical appearances of mysticism will serve to show how far the above characteristics are to be found, separately or in combination, in its different phases.

In the East, mysticism is not so much a specific phenomenon as a natural deduction from the dominant philosophic systems, and the normal expression of religious feeling in the lands in which it appears. Brahmanic pantheism and Buddhist nihilism alike teach the unreality of the seeming world, and preach mystical absorption as the highest goal; in both, the sense of the worth of human personality is lost. India consequently has always been the fertile mother of practical mystics and devotees. The climate itself encourages to passivity, and the very luxuriance of vegetable and animal life tends to blunt the feeling of the value of life. Silent contemplation and the total deadening of consciousness by perseverence for years in unnatural attitudes are among the commonest forms assumed by this mystical asceticism. But the most revolting methods of self-torture and self-destruction are also practised as a means of rising in sanctity. The sense of sin can hardly be said to enter into these exercises—that is, they are not undertaken as penance for personal transgression. They are a despite done to the principle of individual or separate existence.

The so-called mysticism of the Persian Sufis is less intense and practical, more airy and literary in character. Sufism (q.v.) appears in the 9th century among the Mahomedans of Persia as a kind of reaction against the rigid monotheism and formalism of Islam. It is doubtless to be regarded as a revival of ancient habits of thought and feeling, and as the same which underlay the Koran, not by affinity, but by compulsion. Persian literature after that date, and especially Persian poetry, is full of an ardent natural pantheism, in which a mystical apprehension of the unity and divinity of all things heightens the delight in natural and in human beauty. Such is the poetry of Hafiz and Saadi, whose verses are chiefly devoted to the praises of wine and women. Even the most licentious of these have been fitted by Mahomedan theologians with a mystical interpretation.
The delights of love are made for standing to the raptures of union with the divine, the tavern symbolizes an oratory, and intoxication is the bewildernent of sense before the surpassing vision. Very often, if not most frequently, it cannot be doubted that the occult religious significance depends on an artificial exegesis; but there are also poems of Hafiz, Saadi, and other writers, religious in their first intentions. These are unequivocally pantheistic in tone, and the desire of the soul to escape and rest with God is expressed with all the fervour of Eastern poetry. This speculative mood, in which nature and beauty and earthly satisfaction appear as a vain show, is the counterpart of the former mood of sensuous enjoyment.

For opposite reasons, neither the Greek nor the Jewish mind lent itself readily to mysticism: the Greek, because of its clear and sunny naturalism; the Jewish, because of its rigid monothelism and its turn towards worldly realism and statutory observance. It is only with the exhaustion of Greek and Jewish civilization that mysticism becomes a prominent factor in Western thought. It appears, therefore, contemporaneously with Christianity, and is a sign of the world-weariness and deep religious need that mark the decay of the old world. Whereas Plato's main problem had been the organization of the perfect state, and Aristotle's intellect had ranged with fresh interest over all departments of the knowable, political speculation had become a mockery with the extinction of free political life, and knowledge as such had lost its freshness for the Greeks of the Roman Empire. Knowledge is nothing to these men if it does not show the way to a truly important end. Man's true end is void within. Accordingly, the last age of Greek philosophy is theosophical in character, and its ultimate end is a practical satisfaction. Neoplatonism seeks this in the ecstatic intuition of the ineffable One. The systematic theosophy of Plotinus and his successors does not belong to the present article, except so far as it is the presupposition of their mysticism; but, inasmuch as the mysticism of the medieval Church is directly derived from Neoplatonism through the speculations of the pseudo-Dionysius, Neoplatonic mysticism fills an important section in any historical review of the subject.

Neoplatonism owes its form to Plato, but its underlying motive is the widespread feeling of self-despair and the longing for divine illumination characteristic of the age, in which it appears. Before the rise of Neoplatonism proper we meet with various mystical or semi-mystical expressions of the same religious craving. The contemplative asceticism of the Essenes of Judea may be mentioned, and, somewhat later, the life of the Therapeutae on the shores of Lake Mocis. In Philo, Alexandrian Judaism had already seized upon Plato as "the attic Moses," and done its best to combine his speculations with the teaching of his Jewish prototype. Philo's God is described in terms of absolute transcendency; his doctrine of the Logos or Divine Sophia is a theistical transformation of the Platonic world of ideas; his allegorical interpretation of the Old Testament represents the spiritualistic dissolution of historical Judaism. Philo's ethical ideal is renunciation, contemplation, complete surrender to the divine influence. Apollonius of Tyana and the so-called Neopythagoreans drew similar ethical consequences from their ecstatic study of Plato. Wonder-workers like Alexander the Paphlagonian exhibit the grosser side of the longing for spiritual communion. The traits common to Neoplatonism and all these speculations are well summed up by Zeller (Philos. der Griechen, iii, 2, 213) as consisting in: (1) the dualistic opposition of the divine and the earthly; (2) an abstract conception of God, excluding all knowledge of the divine nature; (3) contrary to the Platonic, it cannot be reduced to a combination of Platonic doctrines of matter and of the descent of the soul from a superior world into the body; (4) the theory of intermediate potencies or beings, through whom God acts upon the world of phenomena; (5) the requirement of an ascetic self-emancipation from the bondage of sense and faith in a higher revelation to man when in a state called "enthusiasm." Neoplatonism appears in the first half of the 3rd century, and has its greatest representative in Plotinus. He develops the Platonic philosophy into an elaborate system by means of the doctrine of emanation. The One, the Good, and the Idea of the Good were identical in Plato's mind, and the Good was not therefore deprived of intelligible essence. It was not separated from the world of ideas, of which it was represented as either the crown or the sum. By Plotinus, on the contrary, the One is explicitly exalted above the νοῦς and the "ideas"; it transcends existence altogether (ἐκθέσας τὸν θεὸν), and is not cognizable by reason. Remaining itself in repose, it rays out, as it were, from its own fullness an image of itself, which is called νοῦς, and which constitutes the system of ideas of the intelligible world. The soul is in turn the image or product of the νοῦς, and the soul by its motion begets corporeal matter. The soul thus faces two ways—towards the νοῦς, from which it springs, and towards the material life, which is its own product. Ethical endeavour consists in the repudiation of the sensible; material existence is itself estrangement from God. (Porphyry tells us that Plotinus was unwilling to name his parents or his birthplace, and seemed ashamed of being in the body.) Beyond the καθαροῦς, or virtues which purify from sin, lies the further stage of complete identification with God (ἀφ’ ἑαυτοῦ ἡμέρας ἄριστον; ἀλλα θεὸν ἡμᾶς). To reach the ultimate goal, thought itself must be left behind; for thought is a form of motion, and the desire of the soul is for the motionless rest which belongs to the One. The union with transcendent deity is not so much knowledge or vision as ecstasy, coalescence, the "flowering," to use the popular Hebraic phrase. Our present state of existence the moments of this ecstatic union must be few and short; "I myself," says Plotinus simply, "have realized it but three times as yet, and Porphyry hitherto not once."

It will be seen from the above that Neoplatonism is not mystical as regards the faculty by which it claims to apprehend philosophic truth. It is first of all a system of complete rationalism; it is assumed, in other words, that reason is capable of mapping out the whole system of things. But, inasmuch as a God is affirmed beyond reason, the mysticism becomes in a sense the necessary complement of the would-be all-embracing rationalism. The system culminates in a mystical act, and in the sequel, especially with Iamblichus and the Syrian Neoplatonists, mystical practice tended more and more to overshadow the theoretical groundwork.

It was probably about the end of the 5th century, just as ancient philosophy was dying out in the schools of Athens, that the speculative mysticism of Neoplatonism made a definite lodgment in Christian thought through the literary forgeries of the pseudo-Dionysius (see DIONYSIUS THE AREOPA- GITUS). The doctrines of Christianity were by that time so firmly established that the Church could look upon a symbolic or mystical interpretation of them without anxiety. The author of the Θεολογία mystica and the other works ascribed to the Areopagite proceeds, therefore, to develop the doctrines of Proclus with very little modification into a system of esoteric Christianity. God is the nameless and supra-essential One, elevated above goodness itself. Hence "negative theology," which ascends from the creature to God by dropping one after another every determinate predicate, leads us nearest to the truth. The return to God (ἐνυποστασις, ἔννοιας) is the consummation of all things and the goal indicated by Christian teaching. The same doctrines were preached with more of earthly fervour by Maximus the Confessor (580-622). St Maximus represents almost the last speculative activity of the Greek Church, but the influence of the pseudo-Dionysian writings was transmitted to the West in the 9th century by Eriugena. In whose work the spirit both the scholasticism and the mysticism of the middle ages have their rise. Eriugena translated Dionysius into Latin along with the commentaries of Maximus, and his system is essentially based upon theirs. The negative theology is adopted, and God is stated to be predicateless Being, above all categories, and therefore not improperly called Nothing. Out of this Nothing or incomprehensible essence the world of ideas or
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primordial causes is eternally created. This is the Word or Son of God, in whom all things exist, so far as they have substantial existence. All existence is a theophany, and as God is the beginning of all things, so also is He the end. Erfigena teaches the institution of all things under the form of the Dionysian adunatio or deficiatio. These are the permanent outlines of what may be called the philosophy of mysticism in Christian times, and it is remarkable how little variation they are repeated from age to age.

In Erfigena mysticism has not yet separated itself in any way from the dogma of the Church. There is no revulsion, as later, from dogma as such, nor is more stress laid upon one dogma than another; all are treated upon the same footing, and the whole dogmatic system is held, as it were, in solution by the philosophic medium in which it is presented. No distinction is drawn, indeed, between what is reached by reason and what is given by authority; the two are immediately identical for Erfigena. In this he agrees with the speculative mystics everywhere, and differentiates himself from the scholastics who followed him. The distinguishing characteristic of scholasticism is the acceptance by reason of a given matter, the truth of which is independent of rational grounds, and which remains a presupposition even when it cannot be understood. Scholasticism aims, it is true, in its chief representatives, at demonstrating that the content of revelation and the teaching of reason are identical. But what was matter of immanent assumption with Erfigena is in them an equating of two things which have been dealt with on the hypothesis that they are separate, and which, therefore, still retain that external relation to one another. This externality of religious truth to the mind is fundamentally in scholasticism, while the opposite view is equally fundamental in mysticism. Mysticism is not the voluntary demission of reason and its subjection to an external authority. In that case, all who accept a revelation without professing to understand its content would require to be ranked as mystics; the fierce sincerity of Tertullian's credo quia absurdum, Pascal's reconciliation of contradictions in Jesus Christ, and Bayle's half-sneering subordination of reason to faith would all be marks of this standpoint. But such a temper of mind is much more akin to scepticism than to mysticism; it is characteristic of those who either do not feel the need of philosophizing their beliefs, or who have failed in doing so and take refuge in sheer acceptance. Mysticism, on the other hand, is marked on its speculative side by even an overweening confidence in human reason. Nor need this be wondered at if we consider that the unity of the human mind with the divine is its underlying presupposition. Hence where reason is discarded by the mystic it is merely reason overlapping itself; it occurs at the end and not at the beginning of his speculations. Even then there is no appeal to authority; nothing is accepted from without. The appeal is still to the individual, who, if not by reason then by some higher faculty, claims to realize absolute truth and to taste absolute blessedness.

Mysticism first appears in the medieval Church as the protest of practical religion against the predominance of the dialectical spirit. It is so with Bernard of Clairvaux (1090-1153), who condemns Abelard's distinctions and reasonings as externalizing and degrading the faith. St Bernard's mysticism is of a practical cast, dealing mainly with the means by which man may attain to the knowledge and enjoyment of God. Reason has three stages, in the highest of which the mind is able, by abstraction from earthly things, to rise to contemplatio or the vision of the divine. More exalted still, however, is the sudden ecstatic vision, such as was granted to a nun at Paris, for example. But the German mind was a peculiarly fruitful soil for mysticism, and, in connexion either with the Beguines or the Church organization, a number of women appear about this time, combining a spirit of mystical piety and asceticism with sturdy reformatory zeal directed against the abuses of the time. Even before this we hear of the prophetic visions of Hildegard of Bingen (a contemporary of St Bernard) and Elizabeth of Schönenau. In the 13th century
Elizabeth of Hungary, the pious landgravine of Thuringia, assisted in the foundation of many convents in the north of Germany. (For an account of the chief of these female saints see the first volume of W. Preger's Geschichte der deutschen Mystik.) Mechthild of Magdeburg appears to have had a mystical temperament, and their book Das Rätselnde Licht der Gottheit is important as the oldest work of its kind in German. It proves that much of the terminology of German mysticism was current before Eckhart's time. Mechthild's clero-political utterances show that she was acquainted with the "eternal gospel" of Joachim of Floris. Joachim had proclaimed the doctrine of three world-ages—the kingdom of the Father, of the Son, and of the Spirit. The reign of the Spirit was to begin with the year 1260, when the abuses of the world and the Church were to be effectually cured by the general adoption of the monastic life of contemplation. Very similar to this in appearance is the teaching of Amalric of Bena (d. 1207); but, while the movements just mentioned were reformatory without being heretical, this is very far from being the case with the mystical pantheism derived by Amalric from the writings of Eriegena. His followers held a progressive revelation of God in the ages of the Father, Son, and Holy Spirit. Just as the Mosaic dispensation came to an end with the appearance of Christ, so the sacraments of the new dispensation have lost their meaning and efficacy since the incarnation of God as Holy Spirit in the Amalrians. With this opposition to the Church they combine a complete antinomianism, through the identification of all their desires with the impulses of the divine Spirit. Amalric's teaching was condemned by the Church, and his heresies led to the public burning of Eriegena's De divisione naturae in 1225. The sect of the New Spirit, or of the Free Spirit as it was afterwards called, spread widely through the north of France and into Switzerland and Germany. They were especially numerous in the Rhineland in the end of the 13th and during the 14th century; and they seem to have continued the original orthodox communities of Beghards, for Beghards and Brethren of the Free Spirit are used henceforward as convertible terms, and the same immoralities are related of them. Such was the seed-ground in which what is specifically known as German mysticism sprang up.

In Meister Eckhart (?1260–1327) the German mind definitively asserts its pre-eminence in the sphere of speculative mysticism. Eckhart was a distinguished son of the Church; but in reading his works we feel at once that we have passed into quite a different sphere of thought from that of the churchly mystics; we seem to leave the cloister behind and to breathe a freer atmosphere. The scholastic mysticism was, for the most part, practical and psychological in character. It was largely a devotional aid to the realization of present union with God; and, so far as it was theoretical, it was a theory of the faculties by which such a union is attainable. Mysticism was placed on somewhat incongruously to a scholastically accepted theology; the feelings and the intellect were not brought together. But in Eckhart the attitude of the churchman and traditionalist is entirely abandoned. Instead of systematizing dogmas, he appears to evolve a philosophy by the free exercise of reason. His system enables him to give a profound significance to the doctrines of the Church; but, instead of the system being accommodated to the doctrines, the doctrines—and especially the historical facts—acquire a new sense in the system, and often become only a mythical representation of speculative truth. The freedom with which Eckhart treats historical Christianity allies him much more to the German idealists of the 19th century than to his scholastic predecessors.

The political circumstances of Germany in the first half of the 14th century were in the last degree disastrous. The war between the rival emperors, Frederic of Austria and Louis of Bavaria, and the interdict under which the latter was placed in 1324 inflicted extreme misery upon the unhappy people. From some places the interdict was not removed for twenty-six years. Men's minds were pained and disquieted by the conflict of duties and the absence of spiritual consolation. The country was also visited by a succession of famines and floods, and in 1348 the Black Death swept over Europe like a terrible scourge. In the midst of these unhappy surroundings religion became more inward in men of real piety and the desire grew among them to draw closer the bonds that united them to one another. This need gave rise to the society of the Gottesfreunde ("Gottesfreunde") in the south and west of Germany, spreading as far as Switzerland on the one side and the Netherlands on the other. They formed no exclusive sect. They often took opposite sides in politics and they also differed in the type of their religious life; but they uniformly desired to strengthen one another in living intercourse with God. Among them chiefly the followers of Eckhart were to be found. Such were Heinrich Suso of Constance (1295–1366) and Johann Tauler of Strassburg (1300–1361), the two most celebrated of his immediate disciples. Nicolas of Basel, the mysterious layman from whose visit Tauler dates his true religious life, seems to have been the chief organizing force among the Gottesfreunde. The society counted many members among the pious women in the convents of southern Germany. Such were Christina Ebner of Engelthal near Nuremberg, and Margaretha Ebner of Medingen in Swabia. Laymen also belonged to it, like Hermann of Fritzlar and Rulman Merswin, the rich banker of Strassburg (author of a mystical work, Buch der neuen Felsen, on the nine rocks or upwards steps of contemplation). It was doubtless one of the Friends who sent forth anonymously from the house of the Teutonic Order in Frankfort the famous handbook of mystical devotion called Eine deutsche Theologie, first published in 1516 by Luther.

Jan van Ruysbroeck (1294–1381), the father of mysticism in the Netherlands, stood in connexion with the Friends of God, and Tauler is said to have visited him in his seclusion at Groenendal (Vauvert, Grünthal) near Brussels. He was decisively influenced by Eckhart, though there is noticeable occasionally a shrinking back from some of Eckhart's phraseology. Ruysbroeck's mysticism is more of a practical than a speculative cast. He is chiefly occupied with the means whereby the unio mystica is to be attained, whereas Eckhart dwells on the union as an ever-present fact, and dilates on its metaphysical implications. Towards the end of Ruysbroeck's life, in 1378, he was visited by the fervid lay-preacher Gerhard Groel (1400–1534), who was so impressed by the life of the community at Groenendal that he conceived the idea of founding a Christian brotherhood, bound by no monastic vows, but living together in simplicity and piety with all things in common, after the apostolic pattern. This was the origin of the Brethren of the Common Lot (or Common Life). The first house of the Brethren was founded at Deventer by Gerhard Groel and his youthful friend Florentius Radewyn; and here Thomas à Kempis (q.v.) received his training. Similar brother-houses soon sprang up in different places throughout the Low Countries and Westphalia, and even Saxony.

It has been customary for Protestant writers to represent the mystics of Germany and Holland as precursors of the Reformation. In a sense this is true. But Mysticism it would be false to say that these men protested against the doctrines of the Church in the way the Reformers themselves called upon to do. There is no sign that Tauler, for example, or Ruysbroeck, or Thomas à Kempis had felt the dogmatic teaching of the Church jar in any single point upon their religious consciousness. Nevertheless, mysticism did prepare men in a very real way for a break with the traditional system. Mysticism instinctively recedes from formulas that have become stereotyped and mechanical. On the other hand its claim for spiritual freedom was soon to be found in opposition also to the Reformers.

The wild doctrines of Thomas Münzer and the Zwickau prophets, merging eventually into the excesses of the Peasants' War and the doings of the Anabaptists in Münster, first roused Luther to the dangerous possibilities of mysticism as a disintegrating force. He was
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also called upon to do battle for his principle against men like Caspar Schwenkfeld (1490–1561) and Sebastian Franck (1500–1559), the latter of whom developed a system of pantheistic mysticism, and went so far in his opposition to the letter as to declare the whole of the historical element in Scripture a mythical representation of eternal truths. (cf. Calvinitism). Caleb Wiigel (1545–1588), who stands under manifold obligations to Franck, represents also the influence of the semi-mystical physical speculation that marked the transition from scholasticism to modern times. The final breakdown of scholasticism as a rationalized system of dogma may be seen in Nicolas (or Nicolaus) of Cusa (1401–1464), who distinguishes between the intellectus and the discursively active ratio almost precisely in the style of later distinctions between the reason and the understanding. The intellect combines what the understanding separates; hence Nicolas teaches the principle of the coincidentia oppositorum. If the results of the understanding go by the name of knowledge, then the higher teaching of the intellectual intuition may be called ignorance—ignorance, however, that is conscious of itself, docta ignorantia. "Intuitio," "speculatio," "visio sine comprehensione," "comprehensio incomprensibilis," "mystica theologia," "tertius caelus," are some of the terms he applies to this knowledge above knowledge; but in the working out of his system he is remarkably free from extravagance. Nicolas’s doctrines were of influence upon Giordano Bruno and other physical philosophers of the 16th and 17th centuries. All these physical theories are blended with a mystical theosophy, of which the most remarkable example is, perhaps, the thechem-astrological speculations of Paracelsus (1493–1541). The influence of Nicolas of Cusa and Paracelsus mingled in Valentin Weigel with that of the Deutsche Theologie, Andreas Osiander, Schwenkfeld and Franck. Weigel, in turn, handed on these influences to Jakob Boehme (1575–1624), philosophus teutonicus, and father of the chief developments of theosophy in modern German philosophy (see Boehme).

Mysticism did not cease within the Catholic Church at the Reformation. In St Theresa (1515–1582) and John of the Cross (1542–1591), and the counter-reformation can boast of saints second to none in the calendar for the austerity of their mortifications and the capture of the visions to which they were admitted. But, as was to be expected, their mysticism moved in that comparatively narrow round, and consists simply in the bearing up of these sensuous experiences. The speculative character has entirely faded out of it, or rather has been crushed out by the tightness with which the directors of the Roman Church now held the reins of discipline. Their mysticism represents, therefore, no widening or spiritualizing of their theology; in all matters of belief they remain the docile children of their Church. The gloom and harshness of these Spanish mystics are absent from the tender, contemplative spirit of Francois de Sales (1567–1622); and in the quietism of Mme Guyon (1649–1717) and Miguel de Molinos (1627–1696) there is again a sufficient implication of mystical doctrine to seize the suspicion of the ecclesiastical authorities. Quietism, name and thing, became the talk of all the world through the bitter and protracted controversy to which it gave rise between Fénelon and Bossuet.

In the 17th century mysticism is represented in the philosophical field by the so-called Cambridge Platonists, and especially by Henry More (1614–1687), in whom the influence of the Kabbalah is combined with a species of Christianized Neoplatonism. Pierre Poiret (1646–1719) exhibits a violent reaction against the mechanical philosophy of Descartes, and especially against its consequences in Spinoza. He was an ardent student of Tauler and Thomas a Kempis, and became an ardent injected into the teaching of Mme Guyon. His philosophical works emphasize the passivity of the rational faculty. The first influence of Boehme was in the direction of an obscure religious mysticism. J. G. Gichtel (1638–1710), the first editor of his complete works, became the founder of a sect called the Angel-Brethren. All Boehme’s works were translated into English in the time of the Commonwealth, and regular societies of Boehmenists were formed in England and Holland. Later in the century he was much studied by the members of the Philadelphian Society, John Fordage, Thomas Bromley, Jane Lead, and others. The mysticism of William Law (1686–1761), of Louis Clauris (1713–1774), and of Franz Schelling, (1743–1805), who were also students of Boehme, is of a much more rationalized and spiritual type. The "Cherubic Wanderer," and other poems, of Johann Scheffler (1624–1677), known as Angelus Silvius, are more closely related in style and thought to Eckhart than to Boehme.

The religiosity of the Quakers, with their doctrines of the "inner light" and the influence of the Spirit, has decided affinities with mysticism; and the autobiography of George Fox (1624–1691), the founder of the sect, proceeds throughout on the assumption of supernatural guidance. Stripped of its definitely miraculous character, the doctrine of the inner light may be regarded as the familiar mystical protest against formalism, literalism, and scripture-worship. Swedenborg, though selected by Emerson in his Representative Men as the typical mystic, belongs rather to the history of spiritualism than to that of mysticism as understood in this article. He possesses the cool temperament of the man of science rather than the fervid Godward aspiration of the mystic proper; and the speculative impulse which lies at the root of this form of thought is almost entirely absent from his writings. Accordingly, his supernatural revelations resemble a course of lessons in celestial geography more than a description of the beatific vision.

Mysticism had never in any case been a perfect, unadulterated system as a set method. From the 18th century, there was a frequent shown a tendency to diverge into mysticism. This has been especially so in Germany. The term mysticism is indeed often extended by popular usage and philosophical partisanship to the whole activity of the spiritualist, whether or not he is an intellectual mystic. Schelling's definition of "theology," for instance, which is more equivalent to the more recent and scarcely less abused term, transcendentalism, and as such it is used even by a sympathetic writer like Carlyle; but this looseness of phraseology only serves to blur important distinctions. Though abstract, mystical thinking may, be, is erroneously styled a mystic if he moves towards his conclusions only by the patient labour of the reason. Hegel, therefore, to take an instance, can no more fitly be classed as a mystic than as a rationalist; and both can not hold the same place as types of a thoroughgoing rationalism. In either case it is of course open to anyone to maintain that the apparent completeness of synthesis really rests on the subtle intrusion of elements of feeling into the rational process. But in that case it might be difficult to find a systematic philosopher who would escape the charge of mysticism; and it is better to remain by long-established and explicitly recognized distinctions. When, however, we take the term mysticism as "the tendency to draw near to the Absolute in moral union by symbolic means," the definition, as developed by him, is one which would apply to the philosophy of Kant. Récellé’s interesting essay, "Analyse critique des impressions et des concepts," (1789), though it touches mysticism at various points, and quotes from mystic writers, is in fact a protest against the limitations of experience to the data of the senses and the pure reason to the exclusion of the moral consciousness and the deliverances of "the heart." But such a position is not describable as mysticism in any recognized sense. On the other hand, where philosophy despairs of itself, exults in its own overthrow, and yet revels in the "mysteries" of a speculative Christianity, as in J. G. Hamann (1730–1788), the term mysticism may be fitly applied. So, again, it is in place where the movement of revaluation from a mechanical philosophy takes the form rather of immediate assertion than of reasoned demonstration, and where the writer is simply putting up his hands in despair, on the basis of phenomena, either leave the position without further definition or expressly declare that the ultimate problems of philosophy have been reduced to symbolic formulas. Examples of this are men like Novalis, Carlyle, and Emerson; whereas the writer may be said to be impatient of its own task. Schelling’s explicit appeal in the Identitäts-philosophie to an intellectual intuition of the Absolute as the eidos of the entire world, or one of the elements of rational faculty and as a claim not merely to know but to realize God. The opposition of the reason to the understanding, as formulated by S. T. Coleridge, is not free from the first of these faults. The method of the philosophers of the eighteenth century—Leibnitz, Baader, both largely founded upon Boehme, belonging rather to theosophy (q.v.) than to mysticism proper.

AUTHORITIES.—Besides the sections on mysticism in the general literature of philosophy, especially in the history of the philosophy of religion, and in works on church history and the history of dogma, reference may be made for the medieval period to Heinrich Schmid, Der Mysticismus in seiner Entwicklungsperiode (1824); Charles Schmidt, Essai sur les mystiques du 17ème siècle (1836); Ad. Höllerich, Die christliche Mystik (1842); L. Noack, Die christliche Mystik des
Mythology (Gr. μυθολογία, the science which examines μύθος, myths or legends of cosmogony and of gods and heroes. Mythology is also used as a term for such legends themselves. Then when we speak of "the mythology of Greece," we mean the whole body of Greek divine and heroic and cosmogonic legends. When we speak of the "science of mythology" we refer to the various attempts which have been made to explain these ancient narratives. Very early indeed in the history of human thought men awoke to the consciousness that their religious stories were much in want of explanation.

The myths of civilized peoples, as of Greeks and the Aryans of India, contain two elements, the rational and what to modern minds seems the irrational. The rational myths are those which represent the gods as beautiful and wise beings. The Armenis of the Odyssey taking her pastime in the chase of boars and swift deer, while great birds and wild wood-tyne of Zeus at Olympia, or in the Homeric conception of Zeus as a god who "turns everywhere his shining eyes" and beholds all things. But the Zeus whose grave was shown in Crete, or the Zeus who played Demeter an obscene trick by the aid of a ram, or the Zeus who, in the shape of a swan, became the father of Castor and Pollux, or the Zeus who was merely a rough stone, or the Zeus who deceived Hera by means of a feigned marriage with an inanimate object, or the Zeus who was afraid of Attes, is a being whose myth is felt to be unnatural and in great need of explanation. It is this irrational and unnatural element— as Max Müller says, "the silly, savage and senseless element"—that makes mythology the puzzle which men have so long found it.

Early Explanations of Myths.—The earliest attempts at a crude science of mythology were efforts to reconcile the legends of the gods and heroes with the religious sentiment which recognized in these beings objects of worship and respect. Closely as religion and myth are intertwined, it is necessary to hold them apart for the purposes of this discussion. Religion may here be defined as the conception of divine, or at least supernatural powers entertained by men in moments of gratitude or of need and distress, in hours of weakness, when, as Homer says, "all folk yearn after the gods." Now this conception may be rude enough, and it is nearly related to certain mythical ideas, to efforts to secure supernatural aid by magical ceremonies. Still the roughest form of spiritual prayer has for its basis the hypothesis of beneficent beings, visible or invisible. The senseless stories or myths about the gods are soon felt to be at variance with this hypothesis. As an example we may take the instance of Cing, the Bushman hunter. Omg, when first he met white men, he asked about his religion. He began to explain, and mentioned Cagn. Mr. Orpen, the chief magistrate of St. John's Terri- tory, asked: "Is Cagn good or malicious? how do you pray to him?" Answer (in a low imploring tone): "O Cagn! O Cagn! are we not your children? do you not see our hun- gry? give us food:; and he gives us both hands full." (Cape Monthly Magazine, July 1874.) Here we see the religious view of Cagn, the Bushman god. But in the mythological account of Cagn given by Qing he appears as a kind of grass- hopper, supernaturally endowed, the hero of a most absurd cycle of senseless adventures. Even religion is affected by these irrational notions, and the gods of savages and of many civilized peoples are worshipped with cruel, obscene, and irrational emotions.

But on the whole, the attempt to reconcile the mythical conceptions of the gods, and is shocked and puzzled by the mythical narratives. As soon as this sense of perplexity is felt by poets, or by priests, or by most men in an age of nascent criticism, explanations of what is most crude and absurd in the myths are put forward. Men ask themselves why their gods are worshipped in the form of beasts, birds, and fishes; why their gods are said to have prosecuted their amours in bestial shapes; why they are represented as lustful and passionate—thieves, robbers, murderers and adulterers. The answers to these questions sometimes become myths themselves. Thus both the Mangaians and the Egyptians have been puzzled by their own gods in the form of beasts. The Egyptians invented an explanation— it is a myth—that in some moment of danger the gods concealed themselves from their foes in the shapes of animals. The Mangaians, according to W. W. Gill, hold that "the heavenly family had taken up their abode in these birds, fishes, and reptiles."

A people so curious and refined as the Greeks were certain to be greatly perplexed by even such comparatively pure mythological narratives as they found in Homer, still more by the coarser legends of Hesiod, and above all by the ancient local myths preserved by local priesthoods. Thus, in the 6th century before Christ, Xenophon of Colophon severely blamed the poets for their unbecoming legends, and boldly called certain myths "the fables of men of old." Theaegenes of Rhegium (520 B.C.), according to the scholiast on iliad, xx. 67,1 was the author of a very ancient system of mythology. Admitting that the fable of the battle of the gods was "unbecoming," if literally understood, Theaegnes represented it as an allegorical account of the war of the elements. Apollo, Helios, and Hephaestus were fire, Hera was air, Poseidon was water, Artemis was the moon, kai η λακων δαμων. Or, by another system, the names of the gods represented moral and intellectual qualities. Heraclitus, too, disposed of the myth of the bondage of Hera as allegorical philosophy. Socrates, in the Crito of Plato, expresses a philosophy which came to him all in an instant: an explanation of the divine beings based on crude philological analyses of their names. Metrodorus, rivaling some recent flights of conjecture, resolved not only the gods but even heroes like Agamemnon, Hector and Achilles “into elemental combinations and physical agencies.” Euripides makes Pentheus (but he was notoriously impious) advance a “rationalistic” theory of the story that Dionysus was stitched up in the thigh of Zeus.

When Christianity became powerful the heathen philosophers evaded its satire by making more and more use of the allegorical and non-natural system of explanation. That method has two faults. First (as Arnoldus and Eusebius reminded their heathen opponents), the allegorical explanations are purely arbitrary, depend upon the fancy of their author, and are all equally plausible and equally unsupported by evidence. Secondly, there is no proof at all that, in the distant age when the myths were developed, men entertained the moral notions and physical philosophies which are supposed to be “wrapped up,” as Cicero says, “in impious fables.” Another system of explanation is that associated with the name of Hermeus (316 B.C.). According to this author, the myths are history in disguise. All the gods were once men, whose real feats have been decorated and distorted by later fancy. This view suited Lucan, St. Augustine and other early Christian writers.

1 Plutarch, De Iside et Osiride.
2 Myths and Songs from the South Pacific, p. 35 (1876).
3 Xenoph. Fr. i. 42.
4 Dindorf’s ed., iv. 231.
5 Grote, Hist. of Greece, (ed. 1866) i. 404.
6 Cf. Lobeck, Aymaophamas, i. 151-152, on allegorical interpretation of myths in the mysteries.
very well. They were pleased to believe that Eueumerus "by historical research had ascertained that the gods were once but mortal men." Precisely the same convenient line was taken by Sahagun in his account of Mexican religious myths. As there can be no doubt that the ghosts of dead men have been worshipped in many lands, and as the gods of many faiths are tricked out with attributes derived from ancestor-worship, the system of Eueumerus retains some measure of plausibility. While we need not believe with Eueumerus and with Herbert Spencer that the god of Greece or the god of the Hottentots was once a man, we cannot deny that the myths of both these gods have passed through myth-coloured by the imaginations of men who practised the worship of real ancestors. For example, the Cretans showed the tomb of Zeus, and the Phocians (Pausanias x. 5) daily poured blood of victims into the tomb of a hero, obviously by way of feeding his ghost. The Hottentots show many tombs of their god, Tsui-Goab, and tell tales about his death; they also pray regularly for aid at the tombs of their own parents. We may therefore say that, while it is rather absurd to believe that Zeus and Tsui-Goab were once real men, yet their myths are such as would be developed by people accustomed, among other forms of religion, to the worship of their ancestors. Portionary, the legends of real men have been attracted into the mythic accounts of gods of another character, and this is the element of truth at the bottom of Eueumerism.

Later Explanations of Mythology.—The ancient systems of explaining what needed explanation in myths were, then, physical, ethical, religious and historical. One student, like Theagenes, would see a physical philosophy underlying Homeric legends. Another, like Porphyry, would imagine that the meaning was partly moral, partly of a dark theosophic and religious character. Another would detect moral allegory alone, and Aristotle expresses the opinion that the myths were the inventions of legislators "who persuade the many, and to be used in support of law" (Met. xi. 8, 10). A fourth, like Eueumerus, would get rid of the supernatural element altogether, and find only an imaginative rendering of actual history. When Christians approached the problem of heathen mythology, they sometimes held, with St Augustine, a form of the doctrine of Eueumerus. Some later philosophers, especially of the 17th century, misled by the resemblance between Biblical narratives and ancient myths, came to the conclusion that the Bible contains a pure, the myths a distorted, form of an original revelation. The abbe Banier published a mythological compilation in which he systematically reduced the ancient myths to their ethnographic bases. He published (1774) A New System, or an Analysis of Ancient Mythology, wherein an Attempt is made to divert Tradition of Fable, in which he talked very learnedly of "that wonderful people, the descendants of Cush," and saw everywhere symbols of the ark and traces of the Noahian deluge. Thomas Taylor, at the end of the 18th century, indulged in much mystical allegorizing of myths, as in the notes to his translation of Pausanias (1794). At an earlier date (1760) De Brosses struck on the true line of interpretation in his little work Du Culte des dieux fétiches, ou parallèle de l'ancienne religion de l'Égypte avec la religion actuelle de Nigritie. In this tract De Brosses explained the animal-aship of the Egyptians as a survival among a civilized people of ideas and practices springing from the intellectual condition of savages, and actually existing among negroes. A vast symbolical explanation of myths and mysteries was attempted by Friedrich Creuzer. The learning and sound sense of Lobec, in his Aglaophamus, explained the idea that the Eleusinian and other mysteries revealed or concealed matter of momentous religious importance. It ought not to be forgotten that Lafatou, a Jesuit missionary in North America, while inclined to take a mystical view of the secrets concealed by Iroquois myths, had also pointed out the savage element surviving in Greek mythology.

Recent Mythological Systems.—Up to a very recent date students of mythology were hampered by orthodox traditions, and still more by ignorance of the ancient languages and of the natural history of man. Only recently have Sanskrit and the Egyptian and Babylonian languages become books not absolutely sealed. Again, the study of the evolution of human institutions from the lowest savagery to civilization is essentially light on the human element branch of research, though ideas derived from an unsystematic study of anthropology are at least as old as Aristotle. The new theories of mythology are based on the belief that "it is man, it is human thought and human language combined, which naturally and necessarily produced the strange conglomerate of ancient fable." But, while there is now universal agreement so far, modern mythologists differed essentially on one point. There was a school (with internal divisions) which regarded ancient fable as almost entirely "a disease of language," that is, as the result of confusion arising from misunderstood terms that have survived in speech after their original significance was lost. Another school (or "divisions of a divided school") believes that a misunderstood language played but a very slight part in the evolution of mythology, and that the irrational element in myths is merely the survival from a condition of thought which was once common, if not universal, but is now found chiefly among savages, and to a certain extent among children. The former school considered that the state of thought out of which myths were developed was produced by decaying language; the latter maintains that the corresponding phenomena of language were the reflection of thought. For the sake of brevity we might call the former the "philological system," as it rests chiefly on the study of language, while the latter might be styled the "historical" or "anthropological" school, as it is based on the study of man in the sum of his manners, ideas and institutions.

The System of Max Müller.—The most distinguished and popular advocate of the philological school was Max Müller, whose views may be found in his Selected Essays and Lectures on Language. The problem was to explain what he calls "the silly, savage and senseless element" in mythology (Sci. Ess., i. 578). Max Müller says (speaking of the Greeks), "their poets had an instinctive aversion to everything excessive or monstrous, yet they would relate of their gods stories as the prodigies of nature, and even incredible stories, as the shudder "—stories, that is, of the cannibalism of Demeter, of the mutilation of Uranus, the cannibalism of Cronus, who swallowed his own children, and the like. Among the lowest tribes of Africa and India we hardly find anything more solid and revolting.

Max Müller refers the beginning of his system of mythology to the discovery of the connexion of the Indo-European or, as they are called, "Aryan" languages. Celts, Germans, speakers of Sanskrit and Zend, Latins and Greeks, all prove by their languages that their tongues may be traced to one family of speech. The comparison of the various words which, in different forms, are common to all Indo-European languages must inevitably throw much light on the original meaning of these words. Take, for example, the name of a god, Zeus, or Athene, or any other. The word may have no intelligible meaning in Greek, but its counterpart in the ancient tongues, especially in Sanskrit or Zend, may reveal the original significance of the term. To understand the origin and meaning of the names of the Greek gods, and to enter into the original intention of the fables told of each, we must take into account the collateral evidence supplied by Latin, German, Sanskrit and Zend philosophy (Lect. on Lang., 2nd series, p. 406). A name may be intelligible in Sanskrit which has no sense in Greek. Thus Athene is a divine name without meaning in Greek, but Max Müller advances reasons for supposing that it is identical with Indra or Varuna, and the Persian, Latin, and German names, etc., of the same deity. It is his opinion, apparently, that whatever story is told of Athene must have originally been told of the dawn, and that we must keep this before us in attempting to understand the legends of Athene. Just as the Sanskrit Agni, the Greek Agni, "fire," and the Latin's "fire," etc., correspond to the original idea of fire. It is his opinion, apparently, that whatever story is told of Athene must have originally been told of the dawn, and that we must keep this before us in attempting to understand the legends of Athene. This system is simply this: the original meaning of the names of gods must be ascertained by comparative philology. The names, as a rule, will be found to denote elemental phenomena. And the silly,
savage and senseless elements in the legends of the gods will be shown to have a natural significance, as descriptions of sky, storms, sunset, water, fire, dawn, twilight, the life of earth, and other celestial and terrestrial phenomena. Stated in the barest form, these results do not differ greatly from the conclusions of Theagene of Rhegium, who held that "Hephaestus was fire, Hera was air, Poseidon was water, Artemis was the moon, and Odysseus was dawn." But Max Müller’s statement about Zeus is more significant. He has demonstrated that the whole of mythology is supported by a theory of the various processes in the evolution of myths out of language.

It is no longer necessary to give an elaborate analysis of this theory, because neither in its philological nor mythological side has it any advocates who need be reckoned with. The attempt to disengage the history of times forgotten and unknown, by means of analysis of roots and words in Aryan languages, has been undertaken in various branches of science, and a great deal of material and labor has been spent. Max Müller’s system was a result of the philological theories that indicated the linguistic unity of the Indo-European or "Aryan" peoples, and was founded on an analysis of their language. But myths precisely similar in origin and repulsive character, even in minute details, to those of the Aryan races, exist among Australians, South Sea Islanders, Eskimo, Bushmen in Africa, among Solomon Islanders, Iroquois, and so forth. The facts being identical, an identical explanation should be sought, and, as the languages in which the myths exist are essentially different, an explanation founded on the Aryan language is likely to prove too narrow. Once more, even if we discover the origin of a myth, the name of its original will be unknown, and it will be impossible to explain by aid of the significance of the name the myths about the god. For nothing is more common than the attraction of a more ancient story into the legend of a later god or hero. Myths of unknown origin are a commonplace. Hence, Max Müller’s theory of Charlemagne, just as the "bonds of mott of old win" are transferred to living humorists. Therefore, though we may ascertain that Zeus means "sky" and Agni "fire," we cannot assert, with Max Müller, that the name Zeus was originally the name of a deity of fire and sky. When these gods became popular they inevitably inherited any current exploits of earlier heroes or gods. These exploits would thereby be connected erroneously if regarded as of a different origin. In other words, we cannot prove Max Müller’s proposition "there was nothing told of the sky that could not in some form or other be ascribed to Zeus" into there was nothing analogously told not at least at some time in the story of fire and sky." This is also, perhaps, the proper place to observe that names derived from natural phenomena—sky, clouds, dawn and sun—habitually assigned by Brazilians, Ojibways, Australians and others to certain gods, it may be supposed, is partly the result of the names being halfway between beings by earthly processes. And when even we discover an elemental meaning in a god’s name, that meaning may be all unlike what the word suggests to civilized men. A final objection is that there is no evidence that Max Müller’s theory of "mythicism" is justified in the divine names. For example, connects Kronos (Zëbut) with xboros, "time"; Peller with xelevu, "I fulfill," and so forth. The mythologized men of the Mythoic age were not aged, as Max Müller held, to believe that all phenomena were persons, because the words which denoted the phenomena had gender-terminations. On the other hand, the gender-terminations of phenomena may have been derived from an early stage of thought in which personal characteristics, including sex, had been attributed to all phenomena. This condition of thought is demonstrated to be, and to have been, until comparatively recent times, and it is highly probable that primitive peoples, being fond of bodies and passions. Thus, even when we discover an elemental meaning in a god’s name, that meaning may be different from what the god suggests to civilized men. A final objection is that there is no evidence that Max Müller’s theory of "mythicism" is justified in the divine names. For example, connects Kronos (Zëbut) with xboros, "time"; Peller with xelevu, "I fulfill," and so forth.

Theory of Herbert Spencer.—The system of Herbert Spencer, as explained in Principles of Sociology, has many points in common with that of Max Müller. Spencer attempts to account for the state of mythology as a whole. He contends that, by a process of misinterpretation, the more primitive races are gradually led to believe in the personality of phenomena. He too notes the "defect in early speech"—that is, the lack of words free from implications of vitality, which "favour personalization." Here, of course, we have to ask Spencer, with Max Müller, why words in early languages "imply vitality." These words must reflect the thought of the men who use them before they react upon that thought and confirm it in its misconceptions. So far Spencer seems at one with the philological theory of Max Müller, but he is wrong in the fact that the meaning of language in his system is "different in kind, and the erroneous course of thought is opposite in direction." According to Spencer (and his premises, at least, are correct), the names of human beings are fixed for the most part by a race of men who have demonstrated that they have a tradition that they came to their actual seats from this mountain, or that lake or river, or from lands across the sea. They will mistake this tradition of local origin for one of actual parentage, and will come to believe that, like certain Homeric heroes, they are the sons of a river (now personified), or of a mountain, or, like a tribe mentioned by Garcilasso de la Vega, that they are descended from the sea. Once more, if their old legend told them that they were the sons of a god of fire and sky, and that the fire and sky are actually the children of the sun. By this process of misinterpretation, mountains, rivers, lakes, sun and sea would receive human attributes, while men would degenerate from a more primitive type of being than they are. Thus, the mythologists of Charlemagne, just as the "bonds of mott of old win" are transferred to living humorists. Therefore, though we may ascertain that Zeus means "sky" and Agni "fire," we cannot assert, with Max Müller, that the name Zeus was originally the name of a deity of fire and sky. When these gods became popular they inevitably inherited any current exploits of earlier heroes or gods. These exploits would thereby be connected erroneously if regarded as of a different origin. In other words, we cannot prove Max Müller’s proposition "there was nothing told of the sky that could not in some form or other be ascribed to Zeus" into there was nothing analogously told not at least at some time in the story of fire and sky." This is also, perhaps, the proper place to observe that names derived from natural phenomena—sky, clouds, dawn and sun—habitually assigned by Brazilians, Ojibways, Australians and others to certain gods, it may be supposed, is partly the result of the names being halfway between beings by earthly processes. And when even we discover an elemental meaning in a god’s name, that meaning may be all unlike what the word suggests to civilized men. A final objection is that there is no evidence that Max Müller’s theory of "mythicism" is justified in the divine names. For example, connects Kronos (Zëbut) with xboros, "time"; Peller with xelevu, "I fulfill," and so forth.

Preliminary Problems.—We have stated and criticized the more prominent modern theories of mythology. It is now necessary first to recapitulate the chief points in the problem, and then to attempt to explain them by a comparison of the myths of various races. The difficulty of mythology is to account for the following among other apparently irrational elements in myths: the wild and senseless stories of the
beginnings of things, of the origin of men, sun, stars, animals, death, and the world in general; the infamous and absurd adventures of the gods; why divine beings are regarded as incestuous, adulterous, murderous, thievish, cruel, cannibals, and addicted to wearing the shapes of animals, and subject to death in some stories; the myths of metamorphosis into plants, beasts and stars; the repulsive stories of the state of the dead; the descents of the gods into the place of the dead, and their return thence. It is extremely difficult to keep these different categories of myths separate from each other. If we investigate myths of the origin of the world, we often find gods in animal form active in the work of world-making. If we examine myths of human descent, from animals, we find gods busy there, and if we try to investigate the myths of the origin of the gods, the subject gets mixed up with the mythical origins of things in general.

Our first question will be, Is there any stage of human society, and of the human intellect, in which facts that appear to us to be monstrous and irrational are accepted as ordinary occurrences of every day life? E. W. Lane, in his preface to the Arabian Nights, says that the Arabs have an advantage over us as story-tellers. They can introduce such incidents as the change of a man into a horse, or of a woman into a dog, or the instantaneous transfiguration from one state to another, without our feeling that they are not told in the same way as the following kind of stories:

Our own novelists feel in describing a duel or the concealment of a will. Among the Arabs the actions of magic and of spirits are regarded as at least as probable and common as duels and concealments of wills in European society. It is obvious that we need look no farther for the explanation of the supernatural events in Arab romances. Now let us apply this system to mythology. It is admitted that Greeks, Romans, Aryans of India in the age of the Sanskrit commentators, Egyptians of the Ptolemaic and earlier ages, were as much puzzled as we are by the mythical adventures of their gods. But is there any known stage of the human intellect in which these divine and monstrous phenomena, being introduced into animals, trees, stars, and converse with the dead, and all else that puzzles us in the civilized mythologies, are regarded as possible incidents of daily human life? Our answer is that everything in the civilized mythologies which we regard as irrational seems only part of the accepted and rational order of things (at least in the case of "medicine-men" or magicians) to contemporary savages, and in the past seemed equally rational and natural to savages concerning whom we have historical information. Our theory is, therefore, that the savage and senseless element in mythology is, for the most part, a legacy from ancestors of the civilized races who were in an intellectual state not higher than that of Australians, Bushmen, Red Indians, the lower races of South America, Mincopies, and other worse than barbaric peoples. As the ancestors of the Greeks, with the Aryans of India, the Egyptians, and others advanced in civilization, their religious thought was shocked and surprised by myths (originally dating from the period of savagery, and natural in that period) which were preserved down to the time of Pausanias by local priesthoods, or which were stereotyped in the ancient poems of Hesiod and Homer, or in the Brahmanas and Vedas of India, or were retained in the popular religion of Egypt. This theory recommended itself to Lobeck. We may believe that ancient and early tribes and races, with their gods having themselves in action and in experience, and that the allegorical element in myths is the addition of later peoples who had attained to purer ideas of divinity, yet dared not reject the religion of their ancestors" (Aglaoph. i. 153). The senseless element in the myths would by this theory be for the most part a "survival." And the age and condition of human thought from which it survived would be one in which our most ordinary ideas about the nature of things and the limits of possibility did not yet exist, when all things were conceived of in quite other fashion—the age, that is, of savagery. It is universally admitted that "survivals" of this kind do account for many anomalies in our institutions, in law, politics, society, even in dress and manners. If isolated fragments of an earlier age abide in these, it is still more probable that other fragments will survive in anything so closely connected as mythology with the conservative religious sentiment.

If this view of mythology can be proved, much will have been done to explain a problem which we have not yet touched, namely, the distribution of myths. The science of mythology has to account, if it can, not only for the existence of certain stories in the legends of certain races, but also for the presence of stories practically the same among almost all races. In the long history of mankind it is impossible to deny that stories may conceivably have spread from a single centre, and been handed on from races like the Indo-European and the Semitic to races as far removed from them in every way as the Zuñi, the Australians, and the Eskimo, the natives of the South Sea Islands. But, while the possibility of the diffusion of myths by borrowing and transmission must be allowed for, the hypothesis of the origin of myths in the savage state of the intellect supplies a ready explanation of their wide diffusion. Archaeologists are acquainted with objects of early art and craftsmanship, rude clay pipkins and stone weapons, which can only be classed as "human," and which do not bear much impress of any one national taste and skill. Many myths may be called "human" in this sense. They are the rough products of the early human spirit, which were afterwards modified by the differentiations of race and culture. Such myths might spring up as the inventions of some untutored men, and anywhere might survive into civilized literature. Therefore where similar myths are found among Greeks, Australians, Egyptians, Mangaians and others, it is unnecessary to account for their wide diffusion by any hypothesis of borrowing, early or late. The Greek "key" pattern found on objects in Peruvian graves was not necessarily borrowed from Greece, nor did Greeks necessarily borrow from Aztecs the "wave" pattern which is common to both. The same explanation may be applied to Greek and Aztec myths of the deluge, to Australian and Greek myths of the original theft of fire. Borrowed they may have been, but they may as probably have been independent inventions.

It is true that some philologists deprecate as unscientific the comparison of myths which are found in languages not connected with each other. The objection rests on the theory that myths are a disease of language, a morbid offshoot of language, and that the legends in unconnected languages must therefore be kept apart. But, as the theory which we are explaining does not admit that language is more than a subordinate cause in the development of myths, as it seeks for the origin of myths in a given condition of thought, which is the result of the races' previous history, we need do no more than record the objection.

The Intellectual Condition of Savages.—Our next step must be briefly to examine the intellectual condition of savages, that is, of races varying from the condition of the Andaman Islanders to that of the Solomon Islanders and the ruder Red Men of the American continent. In a developed treatise on the subject of mythology it would be necessary to criticize, with a minuteness which is impossible here, our evidence for the very peculiar mental condition of the lower races. Max Müller asked (when speaking of the mental condition of men when myths were developed), "was there a period of temporary madness through which the human mind had to pass, and was it a madness identically the same in the south of India and the north of Iceland?" To this we may answer that the human mind had to pass through the savage stage of thought, that this stage was for all practical purposes "identically the same" everywhere, and that to civilized observers it does resemble "a temporary madness." Many races are still abandoned to that temporary madness; many others which have escaped from it were observed and described while still labouring under its delusions. Our evidence for the intellectual ideas of man in the period of savagery we derive partly from the reports of voyagers, historians, missionaries, partly from an examination of the customs, institutions, and laws in which the lower races gave expression to their notions.

As to the first kind of evidence, we must be on our guard against several sources of error. Where religion is concerned, travellers in general and missionaries in particular are biased in several distinct
ways. The missionary is sometimes anxious to prove that religion can only come by revelation, and that certain tribes, having received no revelation, have no religion or religious myths at all. Sometimes the missionary, on the other hand, is anxious to demonstrate that the gods of his tribe have the same prejudices, or may be a sect of revealed religion. In the former case he neglects the study of savage myths; in the latter he unconsciously accommodates what he hears to what he calls "the truth." The traveller who is not a missionary may either have the same prejudices, or may be a sceptic about revealed religion. In the latter case he is perhaps unconsciously moved to put lurid scenes of Biblical stories into the mouths of his savage informants, or to represent the savages as ridiculing the Biblical mythology, or as in some way showing that they are "unconscious savages." We again must remember that the leading questions of a European inquirer may furnish a savage with a thread on which to string arguments which would be quite unsuited to the surroundings in which you ever had a great flood?" "Yes" "Was any one saved?"

The question starts the invention of the savage on a deluge-myth, of which, perhaps, the idea has never before entered his mind. There still remain the difficulties of all conversation between civilized men and unacquainted savages, the tendency to hoax, and other sources of error and confusion. By this time, too, almost every explorer of savage life is a theorist. He is a Spencerian, or a believer in the universal prevalence of the faith in an " All-Father," or he looks everywhere for gods who are "spirits of vegetation." In receiving this kind of evidence, then, we need to know the character of our informant, his means of communicating with the heathen, how near he is to the traveller, and his ends. The Indian will will have additional weight if supported by the "undesigned coincidences" of other evidence, ancient and modern. If Strabo and Herodotus and Pomponius Mela, for example, describe a custom, ritual or change notion in the Old World, and if missionaries and missioners find the same notion or custom or rite in Polynesia or Australia or Kamchatka, we can scarcely doubt the truth of the reports.

The evidence is best when given by ignorant men, who are astonished and pained by the translation which ethnologists are familiar with in other parts of the world.

Another method of obtaining evidence is by the comparative study of savage laws and institutions. Thus we find in Asia, Africa, America and Australia that the marriage laws of the lower races are connected with a belief in kinship or other relationship with animals. The evidence for this belief is thus entirely beyond suspicion. The Indian or Australian and Melanesian ideas are based on the ideas of magic, of metamorphosis, and of the power which certain men possess to talk with the dead and to visit the abodes of death. All these ideas are the stuff of which myths are made, and the evidence of savage institutions, in every part of the world, proves that these ideas are the universal inheritance of savages.

Savage men are like ourselves in curiosity and anxiety causa cogitare rerum, but with our curiosity they do not possess almae ideae. Our powers of attention. They are as easily satisfied with an explanation of phenomena as they are eager to fabricate an explanation of their own, and to shape the few ideas which they possess for the expression of their needs. They are content with a theory which is not original with themselves and they transmute their scanty stock of acquired ideas, and these ideas and general conceptions seem almost imbecile to civilized men. Curiosity and credulity, then, are the characteristics of the savage intellect. When a phenomenon presents itself the savage requires an explanation, and that explanation he makes for himself, or receives from tradition, in the shape of a myth. The basis of these myths, which are just as much a part of early conjunctural science as of early religion, is naturally the experience of the savage as constituted by himself. Man's craving to know "the reason why" is already "among rude savages an intellectual appetite," and the "habit of the intellect" has its germ in actual experience." How does he try to satisfy this craving? E. B. Tylor replies, "When the attention of a man in the myth-making stage of intellect is drawn to any phenomenon or custom which has to him no obvious reason, he invents and tells a story to account for it." Against this statement he has been urged that men in the lower stages of culture are not curious, but take all phenomena for granted. If there were no direct evidence in favour of Tylor's opinion, it would be enough to point to the nature of savage myths themselves. It is not arguing in a circle to point out that almost all of them are nothing more than explanations of intellectual difficulties. The ordinary savage, when presented with a mystery, came to and movements? How are the motions of sun and moon to be accounted for? Why has this tree a red flower, and this bird a black mark on the tail? What was the origin of the tribal dances, or of this or that law of custom or etiquette? Savage mythology, which is also savage science, has a reply to all these and all similar questions, and that reply is always found in the shape of a story. The answers cannot be accounted for without the previous existence of the questions.

We have now shown how savages come to have a mythology. It is their way of satisfying the early form of scientific curiosity, their way of realizing the world in which they move. But they frame their stories, necessarily and naturally, in harmony with their general theory of things, with what we may call "savage metaphysics." Now early man, as Max Muller says, "not only did not think as we think, but did not think as we suppose he ought to have thought." The chief distinction between the mode of conceiving the world and ours is his vast extension of the theory of personality. To the savage, and apparently to men more backward than the most backward peoples we know, all nature was a congeries of animated personalities. The savage's notion of personality is more a universally diffused feeling than a reasoned conception, and this feeling of a personal self he impartially distributes all over the world as known to him. One of the Jesuit missionaries in North America thus describes the Red Man's philosophy: "The savages believe that our earth is peopled by men, and that every tree, and every bird, and every animal, as well as every cloud and your face, is inhabited. They are of the opinion that all the beasts have priests (sorcerers and doctors) like themselves." This opinion we may name personification, and it is the necessary condition of savages (and, as will be seen, of civilized) mythology. The Jesuits could not understand how spherical bodies like sun and moon could be mistaken for human beings. Their catechumsen put them off with the answer that the drawn bows of the heavenly bodies gave them their round appearance. "The wind was formerly a person; he became a bird," says the Bushmen, and "that bird, that is to say, the Bushmen, and their stories, and the savage, and the savage philosophy, that he is an animated person, that the beasts have priests, and that they are inhabited by priests, like ourselves, and like the Bushmen." These are examples of the animistic theory applied to what, in our minds, seems one of the least personal of natural phenomena. The sky (which appears to us even less personal) has been regarded as a personal being by Samoyeds, Red Indians, Zulus, and traces of this belief survive in Chinese, Greek and Roman religion.

We must remember, however, that to the savage, Sky, Sun, Sea, Wind, are not only persons, but they are savage persons. Their conduct is not what civilized men would attribute to characters so august; it is what uncivilized men think probable and befitting among beings like themselves.

The savage regards all animals as endowed with personality. "Is tienne les poissons raisonnables, comme aussi les serfs," says a Jesuit father about the North-American Indians (Relations, loc. cit.). In Australia the Aborigines believe that the wild dog has the power of speech, and can tell the story of the world. Spectator. The Breton peasants, according to P. Sébillot, credit all birds with language, which they have even attempted to invent. The Old English and the Arab superstitions about the language of beasts are examples of this opinion surviving among civilized races. The bear in Norway is regarded as almost a man, and his dead body is addressed and his wrath deprecated by Samoyeds and Red Indians. "The native bear..."
"the usual prayers demand for the deceased the power of going from and to everywhere, under any form they like." 1 Thus, a trace of this opinion may be noticed in the Aeneid. The serpent that appeared at the sacrifice of Aeneas was regarded as possibly a "manifestation" of the soul of Anchises (Aeneid, v. 84)—

"Dixert haru aditya the luminous anguis ab imis Septem ingens gyros, septena volumina, traxit," 2 and Aeneas is

"Incercus, geniium loc, famulum parentis
Patronos popiut." 3

On the death of Plotinus, as he gave up the ghost, a snake glistened from his right hand in the hollow of the wall. 4 Compare Pliny 5 on the cave "in quo manes Scipionis Africani majoris custodire draco dicitur."

The last peculiarity in savage philosophy to which we need call attention here is the belief in spirits and in human intercourse with the shades of the dead. With the savage natural death is not a universal and inevitable metaphysical event. "All men must die" is a generalization which he has scarcely reached; in his philosophy the proposition is more like this—"all men who die by violence." A natural death is explained as the result of a sorcerer's spiritual violence, and the disease is attributed to magic or to the action of hostile spirits. After death the man survives as a spirit, sometimes taking an animal form, sometimes invisible, sometimes to be observed "in his habit as he lived" (see APPARITIONS). The philosophy of the subject is shortly put in the speech of Achilles (IIIiad, xxiii. 103) after he has beheld the dead Patroclus in a dream: "Ay me, there remaineth then even in the house of Hades a spirit and phantom of the dead, for a glorious night long hath the ghost of hapless Patroclus stood over me, wailing and making bitter cries." It is always significant to quote here the voluminous evidence for the intercourse with spirits which savage chiefs and medicine men are believed to maintain. They can call up ghosts, or go to the ghosts, in Australia, New Caledonia, New Zealand, North America, Zululand, among the Eskimo, and generally in every quarter of the globe. The men who enjoy this power are the same as they who can change themselves and others into animals. They too command the weather, and, says an old French missionary, "are regarded as very Jupiters, having in their hands the lightning and the thunder" (Relations, loc. cit.). They make good or bad seasons, and control the vast animals who, among ancient Persians and Aryans of India, as among Zulus and Iroquois, are supposed to grant or withhold the rain, and to thunder with their enormous wings in the region of the clouds.

Another fertile source of myth is magic, especially the magic designed to produce fertility, vegetable and animal. From the natives of northern and central Australia to the actors in the ritual of Adonis, or the folk among whom arose the customs of crowning the May king or the king of the May, all peoples have done magic to encourage the breeding of animals as part of the food supply, and to stimulate the growth of plants, wild or cultivated. In the opinion of J. G. Frazer, the human representatives or animal representatives, in the rites, of the spirit of vegetation: of the corn spirit; of the changing seasons, winter or summer, have been developed into many forms of gods, with appropriate myths, explanatory of the magic, and of the sacrifice of the chief performer. In the same way the adoration of living human beings, the deification of living kings—whose title survives in our king or queen of the May, and in the rex nemorensis, the priest of Diana in the grove of Arcia—has been most fruitful in myths of divine beings. These human beings are often sacrificed, for various reasons, actual or hypothetical, and gods and heroes are almost as likely to be explained as spirits of vegetation now, as they were likely to become solar mythological figures in the system of Max Müller. It is certainly true that the same beings in mythology are apt to acquire solar with other elemental attributes, including vegetable attributes. But that the origins of such mythical beings were, ab initio, either solar or vegetable, or, for that matter, animal, it would often be hard to prove.

Frazer's ideas are to be found in a work of immense erudition, The Golden Bough (London, 1900). Two studies by him, pursuing

1 R. Brough Smyth, Aborigines of Victoria, i. 446 (1879).
2 J. Hawkesworth, Voyages, iii. 756.
3 Lord Redesdale, Tales of Old Japan (1871).
4 Bleek, Brief Account of Bushman Folk-Lore, pp. 15, 40.
5 "Recordes of the Past," x. 10.
6 Plotini vita, pp. 2, 95.
7 H. N. xv. 44, 85.
8 W. H. Dall, Alaska, p. 423 (1870).
9 "Dorman, Origin of Primitive Superstitions, pp. 130, 134.
10 "Sahagun, French trans., p. 226.

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the same set of ideas in more detail, are Adams, Atis, Osiris (1906) and Lectures on the Early History of the Kingship (1905). See A. Lang, Magic and Religion (London, 1901), for a criticism in detail of the general theory as set forth in The Golden Bough. Whatever may be said, Frazer has certainly made the greatest contribution to the study of mythology. He has fixed the attention of students on a mass of early ideas, previously much neglected save by W. Mannhardt, and on the facts of ritual, which preserve these ideas and represent them in a kind of mystery play.

We are now in a position to sum up the ideas of savages about man's relations to the world. We started upon this inquiry because we found that savages regarded sky, wind, sun, earth and so forth as practically men, and we had then to ask, what sort of men, men with what powers? The result of our examination, so far, is that in savage opinion sky, wind, sun, sea and many other phenomena have, being personal, all the powers attributed to real human persons. These powers and qualities are: (1) relationship to animals and ability to be transformed and to transform others into animals and other objects; (2) magical accomplishments, as—(a) power to visit or to procure the visits of the dead; (b) other magical powers, such as control over the weather and over the fertility of nature in all departments. Once more, the great forces of nature, considered as personal beings, are found as personalities. Often the sky is a great god, endowed with all the characteristics of man, and with such supernatural powers as a man has. There are also the prototypes of such human beings as the sky-god or the sun-god. Oftentimes the opposite sex, women, are shown as the sky, the sun, and all the phenomena of the world, which are regarded as the products of the disease of the mind, and which are attributed to real human beings. This is the philosophy of savage life, and it is on these principles that the savage constructs his myths, while these, again, are the scientific explanations of the universe with which he has been able to supply himself.

Examples of Mythology.—Myths of the origin of the world and man are naturally most widely diffused. Man has everywhere asked himself whence things came and how, and his myths are his earliest extant form of answer to this question. So confused and inconsistent are the mythical answers that it is very difficult to classify them according to any system. If we consider the myths of the world as a whole, we find that the origin of the world is sometimes represented as pre-existent to the divine race. If we try beginning with myths of the origin of the world, we find that the mytho-sacred being is the idea of a being who is not the product of evolution but is regarded as an independent form of thought, independent of and unformed from human beings, or the mytho-sacred being of the world.

It is important to note that the All-Father belief in the lowest culture is to be recognized. R. H. experimenting in Australia. Under the names of Baime, Pundelji, Malkuri, Daramuli and many others, the south-eastern tribes (both those who reckon descent in the female and those who reckon the descent in the male line) have this faith in an All-Father, this sacred being, with attributes varying in various communities. The most highly developed All-Father is the Baime or Byamee of the Euahlayi tribe of north-western New South Wales, to whom prayers for the dead are offered and who is thought to dwell in the hills and to watch over human conduct, but this is by no means invariably the case. Sometimes he, like the Atmatu of the Kaitish tribe of central Australia, is only vigilant in matters of ritual, such as circumcision, subincision and the use of the sacred bull-roarer, the Greek boiōs. As an almost universal rule, in the lowest culture, no prayers are addressed to this being; he has no sacrifices, no dwelling made with hands; and the images of him, in clay, that are made round the house or at the tribal ceremonies of initiation, are destroyed at the close of the performances. If the name "god" is denied to such beings because they receive little cult, it may still be admitted that the belief might easily develop into a form of theism, independent of and unformed from animism, or the ghost theory.

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It is plain that the All-Father belief, in favourable circumstances, emerges as the most abstract of all gods, and may be regarded as the first step in the formation of a god, a spirit, or a being capable of surviving bodily death. The spirit of the dead may transform a material object, a "fairy," or may roam hungry and comfortless and need propitiation by food, for unpropitiated it is dangerous, or may be reincarnated, or may go "to its own herd"
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Century, 1892) have not been successful (see Lang, Magic and Religion, "The Gods of the Bushmen" and N. W. Thomas in Modern Mythology, seq. The All-Father belief is most potent among the lowest races, and always tends to become obsolete under the competition of serviceable ancestral spirits, or gods made in the image of such spirits, who are often kept alive by sacrifices or induced by prayers to help man in his various needs.

The belief in the All-Father in southern Australia is concealed from the women and children who, at most, know his exoteric aspects only, and is only revealed to the initiate, among whom are a very few white men, like Howitt. Mrs Langloh Parker, of course, was not inititated (indeed, no white man has gone through this actual and very difficult process), but was made to her with great secrecy. The All-Father, even at his best, in among the Kurnai, Kamilaroi and Eungalyi, is the centre of many grotesque and sportive myths. He usually has a wife and children. One of these children is usually his mediator with men, and has the charge of the rites and the mystic bull-roarer. The relation is that of Apollo to Zeus in Greek myth.

Thus coastal conditions have no causal influence on the development of the All-Father belief. If they had, the natives of Australia would, reasoning the case, have no All-Father (Mulkari), and the natives of northern and northeastern coasts should have an All-Father, who is still to seek. The Arunta of Messrs Spencer and Gillen may have possessed and deposed the Altjira superior being of the Arunta known to Mr Strehlow, like the Atluna of the adjacent Kaitish, or the All-Father of the neighbouring Luritja; or these beings may be more recent divergences of doctrine, departures from pure Alcheringaism with no All-Father present, at least, it is premature to dogmatize on these problems.

The chief being among the supernatural characters of Bushman mythology is the insect called the Mantis. Cagn or Ikaggen, the Mantis, is sometimes represented with religious respect as a beneficent god. But his adventures are the mere nightmares of puerile fancy. He has a wife, an adopted daughter, whose real father is the “swallower” in Bushman swallowing myths, and the daughter has a son, who is the Ichneumon. The Mantis made an eldant out of the shoe of his son-in-law. The moon was also created by the Mantis out of his shoe, and it is red, because he would not put it in his mouth, as Zeus did with the ants in Argelia.

The Mantis is defeated in an encounter with a cat which had been singing a song about a lynx. The Mantis (like Poseidon, Hades, Metis and other Greek gods) was once swallowed, but dissipated himself in the belly of the monster. Like a cat when he leaped into the belly of the monster which was about to swallow Hesione, the Mantis once jumped down the throat of a hostile elephant, and so destroyed him. The heavenly Mantis, or the Mantis of the Bushmen, must be described in the myths of other suns, moon and stars. As a creator Cagn is sometimes said to have “given orders, and caused all things to appear to be made.” He struck snakes with his staff and caused them to swell, as Zeus did with the ants in Argelia. But the Bushmen’s mythical theory of the origin of things must, as far as possible, be kept apart from the fables of the Mantis, the Ichneumon and other divine beings. Though animals, these gods have human passions and character, and possess the usual magical powers attributed to sorcerers.

Concerning the mythology of the Hottentots and Namas, we have g a great variety of information, but no one can say how much of the spiritual life that has been discovered by Messrs Spencer and Gillen, from whom the tribes north, and among the tribes north by east of the Arunta, no such belief has been discovered by Messrs Spencer and Gillen, from whom the tribes north keep no secrets, or by Mr Sebert, a missionary among the now all extinct people of the north coast, but is thought to be a divine being, Arawotja, possibly an all but obliterated survival of an All-Father. Howitt speaks too of the Dieri Kutchi, who inspires medicine-men with ideas, but about him our information is scanty. Arunta medicine-man, taking another line, has a supernatural race of Titan-like beings, with no superiors, who were the first dwellers on earth; who possessed powers far exceeding those of the medicine-men of to-day; and who, in one way or another, were connected with, or developed from, the totem animals, vegetables and other objects. These beings modified the face of the country; in Arunta belief rocks and trees arose to mark the places where these gods had worked. These spirits still haunt certain places such as these; and are reincarnated in native women who pass by. These beings, in Arunta called "the people of the Alcheringa, or dream time" (but cf. Streloeh in Globus, 1884), originated the ritual rite in which the thong which the Dieri they are called Mura-Mura, and to them prayers are made for rain, accompanied by rain-making magic ceremonies, which in this case may be a symbolic expression of the prayers. There is a large group of other totems (see Spencer and Gillen, Native Tribes of Central Australia, Native Tribes of Northern Australia, and Howitt, Native Tribes of South-

The drawback to knowledge is the rarity of full acquaintance with native languages. Streloeh, Roth and Ridley seem best equipped of all for the examination of these questions. It seems possible that they have a colloquial knowledge of any Australian language. Gason, author of a work on the Dieri tribe, knew their language imperfectly. If this is correct, all the statements appear to be inaccurate. Mrs Langloh Parker describes their methods of checking and controlling native statements made in English.

The belief in these Mura-Mura or Alcheringa folk may be obviously devotional. They have the same origin and shade away into the folk beliefs of the Inuit Eskimos. The Hans Grund, the loop-wrench, the amorous and adventurous of the gods, myths ignored by Homer, are parallel to the adventures of the Alcheringa people, and the fable of the mutilation of Osiris and the search for the lost organ by Isis, according to these Alcheringa among the Arunta, is a more extreme version of the myth. According to the Arunta, the Alcheringa folk are part of a strangely elaborate theory of evolution and of animism, which leaves no room for a creative being, or for a future life of the spirit, which is so dear to the Bushman. Thus the doctrines of evolution and of creation, or the making of things, stand apart, or blend, in the metaphysics and religion of the Bushman. As has been seen above, the question of the datum, which theory came first, whether Alcheringaism was a scientific effort that swept away All-Fatherism, or whether All-Fatherism is a religious reaction in despair of science and of the evolutionary doctrine, is an open one. It has been argued that All-Fatherism is an advance, conditioned by coastal influences—more rain and more food—concurrent with a social advance to individual marriage, and reckon-
represented as at war (in the usual crude dualism of savages) with "their" husbands. These are typically plump and affectionate, and the adoration of the New Hebrides for Tootah is simple and natural in character, the "private ejaculations" of men in moments of need or distress. As usual, religion is more advanced than mythology. It appears that, by some accounts, Tootah is the sky-god by whose smooth and ample body the neighbouring race of Namase has another old chief for god, a being called Heiti Eibib. His graves are shown in many places, like those of Osiris, which, says Plutarch, abounded in Egypt. He is propitiated by sacrifices by his septah, which have intimate relations in peace and war with a variety of animals whose habits are sometimes explained (like those of the serpent in Genesis) as the result of the curse of Heiti Eibib. Heiti Eibib was born in a mysterious way. He was born in the "upper air." So spoke the sage Bough. He was born from the womb of a being also more a cow. The *Rig-Veda* (v. 18, 1) remarks, "His mother, a cow, bore Indra, an underling of the host of gods." It was a period of metempsychosis. Heiti Eibib, like countless other gods and heroes, is also said to have been the son of a virgin who tasted a particular plant, and so became pregnant, as in the German and Gallophrygian märchen of the bird is born for the sake of the F, which is used by him in the feats of Heiti Eibib. Tsai-Goab, in the opinion of his worshippers, as we have seen, is a defiled dead sorcerer, whose name means Wounded Knee, the sorcerer having been injured in the knee by an enemy. Or to take it in Latin (by philological convention) and call the name really means "red dawn," and is a Hottentot way of speaking of the infinite. The philological arguments advanced are extremely weak, and by no means convincing. If we grant, however, that it is a divine conception, it does not follow that it shipped the infinite under the figure of the dawn, and that, by forgetting their own meaning, they came to believe that the words which really meant "red dawn" meant wounded knee we must still ask what he does that he has associated the "red dawn" with the attributes of an ancestral sorcerer. In short, "their Red Dawn," if red dawn he is, is a person, and a savage person, adored exactly as the ancient fathers and grandfathers of the Hottentots are adored. What the Hottentots mean by sorcery, therefore, is as much an allegory of the dawn as the dawn appears to civilized people. About Gaunab (the Abriman to Tsai-Goab's Ormuzd) Dr Hahn gives two divergent opinions. Gaunab was at first a ghost, a monstrous snake, and evil-doer" (op. cit. p. 85). But Gauab de claims to be the "night-sky" (p. 120). Whether we regard Gauab, Heiti Eibib and Tsai-Goab as original mythological representations of nature, or the soul of comatose men, or as defied dead men, it is plain that they are now venerated as non-natural human beings, possessing the customary attributes of sorcerers. Thus of Tsai-Goab it is said, "he could do wonderful things which no other man could do, because he was very wise." He could tell what would happen in future times. He died several times, and several times he rose again" (statement of old Kxarab in Hahn, p. 61).

The mythology of the Zulus as reported by H. Callaway (Unkülünkulu) is thin and interesting. The Zulus are great worshipers of ancestors (who appear to man in the form of snakes), and they regard a being called Unkülünkulu as their first ancestor, and sometimes as the creator, or at least as the maker of man. Unkülünkulu may be connected with "the lord of heaven," which, who, like Indra, causes the thunder. The word answering to our lord is also applied, even to beasts, as the lion and the elephant. The thunder is the "lord of heaven," which, in its popular signification, the "storm god," who gives rain. The Zulus think much of the weather and of the thunder. But to the west coast the "anazi" or spider takes the place of the mantis insect among the Bushmen. For some of his exploits Daset's "Tales from the Noot (2nd ed., Appendix) may be consulted. For South African religion see Lang, *Magic and Religion*; Donnell, *The Back of the Black Man's Mind*; Junod, *Les Barotsi*; Spieh, *Die Ewe-Slämme*; Frazer, *The Golden Bough*. Stories of living, farming, and herding, from Europe, Asia, and Africa are given by *Anthropol. Inst.* (Feb. 1881) by the Rev. R. H. Codrington. The article contains a critical description of the difficulty with which missionaries obtain information about the precreed. The people of the Melanesian Islands are chiefly ancestor-worshipers, but they also believe in a deity, who is kind and generous, and who is sometimes associated with a human race endowed with supernatural powers who here, as elsewhere, do good as gods. Here is an example of a prayer to Qat—the devotee is supposed to be in danger with his canoe: "Qat! Marawal! look at his canoe which will run away. I want to boil it; but one man came to me, beat down for me the crests of the tide-rip; let the tide-rip set down away from me, beat it down level that it may sink and roll away, and I may come to a quiet landing-place. Compare the prayer of Odysseus to the river, whose mouth he had reached after three days' swimming on the tempestuous sea. "*Hear me, O king, whose thou art, unto thee I come as to one to whom prayer is made . . . nay, pity me, O king, for I avow myself thy servant*" (Odys. v. 450). The prayer of the Melanesian is on a rather lower religious level. The myths of Qat's adventures, however, are very crude, though not as wild as some of the Scandinavinan myths about Odin and Loki, while they are less immoral than the adventures of Indra and Zeus. Qat was born in the isle of Lesotho; he was born there in the morning. From Qat he received the first fire, he taught the people the arts of life, and he taught them to worship and pray to Qat. He first made Marawa's acquaintance when he was cutting down a tree for a canoe. Every night (as in the common European story, about bridge-building and church-building) the work was all undone by Marawa, whom Qat found means to conciliate. In all his future adventures the spider was as serviceable as the cat in *Fuss in Boots* or the other grateful animals in European legend. Qat's great enemy, Qasvura, was dashed against the hard sky, and was turned into a stone. The stone is called the "stone of Qat's wife," and has the name Levu, like the stone which was Zeus in Laconia. Qat, like so many other "culture-heroes," disappeared mysteriously, and white men arriving in the island have been mistaken for Qat. His departure marks the beginning of a new period in the social development of the Zulu nation. The oral tradition of the Beagare, in the New Hebrides, Tagar takes the rôle of Qat, and Supe of the bad principle, Loki, Ahriman, Tungaro Loloqong, the Australian Crow and so on. The Zulu also have two idols, and the Jackals and the Birds. For their All-Fathers see Holmes, *J. A. I.,* vol. xxxv., and O'Farrell, *J. A. I.,* vol. xxiv., with Sundeman in Warneck's *Allgemeine Missionszeitlschrif*., vol. xi. 1884.

Levu is the name of a mountain. Vana Levu to Vancouver Island, and ethnologically, the Ahts of the latter region are extremely remote from the Papuans with their mixture of Malay and Polynesian blood. The Ahts, however, differ but little from the American Musqueam and their relatives on the American coast, from European races of various degrees of culture, to the Papuan inhabitants of Melanesia and other parts of the world. Wherever tribes of African origin are found, whether in India, Africa, or Australia, wherever we find that mythological ideas are scarcely on a higher level, an excellent account of the myths of the Banks Islanders is given by *Manchester Geographical Journal* (Dec. 1880).
alain, met a friendly dolphin, which advised him to swallow a pebble and a little sea-water. The birth of Yehl was the result. In his youth he shot a supernatural crane, and can always fly about in its feathers, like Odin and Loki in Scandinavian myth. He is usually, however, represented as a bird, a raven, and water, in his bird-like aspects, as Odin stole "Suttung's mead" when in the shape of an eagle. 1 Yehl's powers of metamorphosis and of flying into the air are the characteristics of his being. This is a rather crude form of first father, "culture-hero" and creator. 2

Among the Karok Indians we find the great hero and divine benefactor in the shape of, not a raven, nor an eagle-hawk, nor a wolf, but a demiurge, which is more like a magical agent. Among both Karok and Navaho the coyote is the Prometheus Purphoros, or, as the Aryans of India call him, Matarisvan the fire-stalker. Among the Papagos, on the eastern side of the Gulf of California, the coyote or prairie wolf is the creative hero and chief supernatural being. In Oregon the coyote is also the "demijure," but most of the myths about him refer to his creative exploits, and will be more appropriately treated in the next section.

Moving on to the coast of British Columbia, we find the musk-rat taking the part played by Vishnu, when in his avatar as a boar he fished up the earth from the waters. Among the Tinnch a miraculous dog, who, like an enchanted fairy prince, could assume the form of any animal, was the chief of the mythological men of gods. He too is chiefly a creative or demiurgic being, answering to Purusha in the Rig Veda. So far the peculiar mark of the wilder American Indian myths is the legendary character of the dogs. This is also illustrated in Australia and Africa, where the bestial clothing, feathers, or drops, but slowly off Indra, Zeus and the Egyptian Ammon, and the Scandinavian Odin. All these are more or less anthropomorphic, but retain, as will be seen, numerous relics of a theriomorphic condition.


Maori and Polynesian Cultures.—Passing from the lower savage myths, of which space does not permit us to offer a larger selection, we turn to races in the upper strata of barbarism. Among these: the Maoris of New Zealand, and the Polynesian people generally, are remarkable for a mythology largely intermixed with early astrological-philosophical ideas, and which is the heritage of the ancient Aryans and the Biblical Magoni, and others, have had spectators among them not very removed from the mental condition of the earliest Greek children. What remains now of these myths is the product of a process from the view of nature which we call personalism to the crudest theories of the physicist was apparently begun in New Zealand before the arrival of Europeans. In Maori mythology it is more usual to dignify the early fire-stealer, Tawhirimatea, as the Supreme being, and as the benefactor and sustainer of the whole creation, and the origin and nature of the gods. Long traditional hymns give an account of the "becoming out of nothing" which resulted in the evolution of the gods and the world. In the beginning (as in the Great Myth) one of the gods (Tangaroa) alone came forth; a being, without speech, so that all men were indissolubly united to his wife Earth (Tapa), and between them they begat gods which necessarily dwelt in darkness. These gods were some in vegetable, some in animal form; some traditions place among these gods Tiki the demijure, the most ancient of the Prometheus) made men out of clay. The offspring of Rangi and Papa (kept in the dark as they were) held a council to determine how the world was to be adorned, and the heavens, and the earth, to what use shall we separate them? In the Hesiodic fable, Cronus and his heavenly pair by mutilating his oppressive father Uranus. Among the Maoris the god Tungtangahana cut the sinews which united the earth (Papa) and the sky (Rangi). This myth may also have been borrowed from the ancient Indian gods, and Asuras of the Vedas, there were many wars in the divine race, and as the incarnations of the Indian Brahmanas are derived from those old experiences of the Vedic gods, so are the incarnations of the New Zealand gods, especially in the water god. Here again may be called "departmental": each person who is an elementary force is also the god of that force. As Te Heu, a powerful chief, says: "I have nine sons, seven men, and so there is among gods. "One made this, another that with the trees, tannins, Tanga-roa fish, and so forth." The "departmental" arrangement prevails among the polytheism of civilized peoples, and is familiar to all from the Greek examples. Leaving the high gods whose functions are so large, while their forms (as of lizard, fish and tree) are often so mean, we come to Maui, the great divine hero of the supernatural race in Polynesia. Maui in some respects answers to our own chief, Cronus, and in others to Qat, Quawteaht, and other savage divine personages. Like the son of the Vedic Adit, 2 Maui is a rejected and abortive child of his mother, but afterwards attains to the highest reputation. As Maui was left by his mother, he dwelt with the birds, and grew and mooned in their proper courses. He induced the sun to move orderly by giving him a violent beating. A similar feat was performed by the Sun-trapper, a famous Red Indian chief. These stories are usually thought to be formed by the wandering thoughts of the metalepsis, and the sun, but the sun could hardly give the sun a dumbing. Maui stole monkeys, invented bananas, and discovered tattoo. He was also a great inventor, as Prometheus Purphoros the fire-stalker, drew a whole island up from the bottom of the deep; he was a great sorcerer and magician. Had Maui succeeded in his attempt to pass through the body of Night, he would have been immortal. But a little bird which sings at sunset wakened Night, she snapped up Maui, and men die. This has been called a myth of sunset, but the sun does what Maui failed to do; he passes through the body of Night unharmed. The adventure is one of the myths of the origin of death, which are almost universally diffused. Maui, though regarded as a god, is not often addressed in prayer.

The whole system, as far as it can be called a system, of Maori mythology is the obvious expression of the religious conceptions of the world which have already been explained. The Polynesian system differs mainly in detail; we have the separation of heaven and earth, the animal-shaped gods, the fire-steeing the exploits of Maui, and evidently the supposed differentiation of the central empire of the Polynesians, in the researches of W. Ellis, of Williams, in G. Turner's Polynesia, and in many other accessible works.

The Mexican and Peruvian civilizations were far ahead of the Maori culture, in so far as they possessed the elements of a much more settled and highly-organized society. Their religion had their fine lucid intervals, but their mythology and ritual were little better than the mythical rather than the actual. Their mythology was saturated in cruelty and superstitious piety. In cruelty the Aztecs surpassed perhaps all peoples of the Old World, except certain Semitic stocks, and their gods, of course, surpassed almost all other gods in blood-thirstiness. But in grotesque and savage points of faith the ancient Egyptians, the Greeks, and the Vedic Indians ran even the Aztecs pretty close.

Bernal Diaz, the old "conquistador," has described the hideous aspect of the idols which Cortez destroyed, "idoles in the shape of hideous dragons, as large as calves," idols half in the form of men, half of dogs, and serpents which were worshipped as divine. The Mexican and Peruvian civilizations are far ahead of the Maori and of the Polynesians, and are the only genuine examples of a mythology more or less accurately founded on a knowledge of the real world. The only mythology that can be compared to the ideal theories of the ancient Egyptians, the Greeks, and the Vedic Indians ran even the Aztecs pretty close.

1 Dasent, Bragi's Telling: Younger Edda, p. 94.
3 Taylor, New Zealand, p. 108

1 Riag Veda, x. 72, 1; Suir, Sanskrit Texts, iv, 13, where the fable from the Satapatho-Brahman is given.

2 The New Zealand myths are the old traditional priestly hymns, collected and translated in the works of Sir George Grey, in Taylor's New Zealand, in Shortland's Traditions of New Zealand (1842), in Bastian's Heilige Sage der Polynesier, and in W. H. E. Another Ancient Polynesian Myth, p. 592.
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gods, not to symbolism (Zeus was a cuckoo), but to survivals from that quality of early thought which draws no line between man and god and beast and fish and bird. If spiders may be great gods, why not the more attractive humming-birds? Like many other gods, Huitzilopochtli was associated with his namesake. He is analogous to Δείδας and Φοίβος: Tylor (Primitive Culture, ii. 307) calls Huitzilopochtli an "inextricable compound partheno- genetic" god. His sacra, in which the past idols of him were eaten by the current occupants (Müller, op. cit. p. 305). As a humming-bird, Huitzilopochtli led the Aztecs to a new home, as a wolf he led the Hiranip, and as a woodpecker led the Sabines. Quetzalcoatl, the Toltec deity is as much a swallow (or similar small bird) as Huitzilopochtli is a humming-bird, and they both always be found in connection with a statue. For the composite character of Quetzalcoatl as a "cultures hero" (a more polished version of Qat), as a "nature-god" and as a theriomorphic god see Müller (op. cit. pp. 383-384), Müller Iran, and the Communist of European and Near Eastern origins. At the "departmental" god belonging to some other polytheisms; there is an Aztec Ceres, an Aztec Lucina, an Aztec Vulcan, an Aztec Floran, an Aztec Venus. The creative myths and the legends of the Aztec Gaelic and the Aztec pyramid seem more obscure than Egyptian mythology. Writers are apt to speak of Egyptian religion as if it were a single phenomenon of which all the aspects could be observed at a given time. In point of fact Egyptian religion (conservative though it was) lasted through perhaps five thousand years; was subject to innumerable influences, historical, ethnological, and philosophic, and was variously represented by various schools of priests. We cannot take the Plutonic speculation of a full-fledged, or the Greek, for the native Egyptian theology, and trace it. In the "millennium" in which it is found to be a godhead as evidence for the belief of the peoples who first worshipped the Egyptian gods an innumerable series of ages before lamblichus and Plutarch. Nor can the esoteric and pantheistic theories of priests be taken as evidence for the native religion. It is the god who forms the key to all the manifestations of the divine essence) be received as an historical account of the origin of the local animal-worships. It has already been suggested that the development of the cults is the result of animal worship, and the stock having its parent bird, beast, fish, or even plant, or inanimate object. It has also been shown that these backward peoples recognize a non-natural race of men or animals as the fittest fashions of themselves. Such ideas are consonant with, and may be traced to the confused and nebulous condition of, savage thought. Precisely the same ideas are found at various periods among the ancient Egyptians. If we are to believe their own writings, the idea of Osiris was a god, a godshape, and about the non-natural superhuman heroes, and their wars and loves, as esoteric allegories devised by civilized priests, perhaps we should also explain Pand-jel, Qat, Quwacht, the Mantis god, and the Great Goddess of the Canaanite country, and her inventions, put forth in a civilized age, and retained by Australians, Bushmen, Hotentots, Abts, Thlinkeats, Papuans, who preserve no other vestiges of high civilization. Or we may take the opposite view, and recognize the site of Osiris as an image and him up in a box and mutilated him) as a dualistic myth, originally on the level of the battle between Gauanab and Tswi-Gob, or between Tagar and Suq. We may regard the local beast- and plant-gods of Egypt as the idea of totem- and totemic-gods like those of the Toda to India, America, Africa, Siberia and other countries. In this article the latter view is adopted. The beast-gods and dualistic and creative myths of Egypt, as they stand, are as fragmentary as those of any people. They are not pictorially represented, and we have not obtained from these records any description of Osiris byd mourning for the burial of his dead son, Anubis, and after the Christian era is described at full length by Plutarch. Whether the same myth was current in the far more distant days of Mycerinus, it is, of course, impossible to say with diagnostic certainty. The religious history of Egypt, perhaps Dynasty X. to Dynasty XX., is interrupted by an invasion of Semitic conquerors and Semitic ideas. Prior to that invasion the gods, when mentioned in monuments, are always represented by animals, and these animals are the object of strictly local worship. The name of each god is spelled in hieroglyphs beside the image of the animal they held sacred, not far from the image. The custom with savage totemism is absolute. Of all the explanations, then, of Egyptian animal-worship, that which regards the practice as a survival of totemism and of savagery seems the most satisfactory. Even the numerous survivals of a human-like, theriomorphic shape: Beasts also appeared in the royal genealogies, as if the early Egyptians had filled up the measure of totemism by regarding themselves as actually descended from animals.

The idea that the theriomorphic (or animal) figures of gods known in the civilised parts of Egypt are on the granite obelisk of Bes as in the Fayum, erected by Usertesen I. of Dynasty XII., and here we find the forms all full-blown at once. The first examples of deities belongs to a period a little before. Recent "Ibis and The dog Anubis" with the rest of the semi-theriomorphic deities. These survived even their defeat by the splendid human gods of Rome, and only fled from the folding stage.

Though Egypt was rich in gods, her literature is not fertile in myths. The religious compositions which have survived are, as a rule, hymns and litanies, the funereal service, the Book of the Dead, and such like; with these the Egyptians seem to be content. We are alluded to in the course of addresses to the divine beings, but, naturally, are not told in full. As in the case of the Vedas, hymns and litanies of gods are put together, and are being taken or granted for them. The Church would throw little light on the incidents of the gospel story or of the Old Testament. The "sacred legends" which the priests or temple servants freely communicated to Herodotus are largely supplying the blanks in an epic which is by no means an Epic in the ordinary sense. Though Osiris is not a real Osiris, the "Osiris" figure of god is used in Egypt. Osiris is, therefore, a myth and not a god, and his name is an Egyptian mystery. Osiris is a god, a Semitic one, and an Egyptian one, as well. Used in the midst of certain types of growth, it is possible to use Osiris as a means of developing the philosophy of the Semite, of the earth, or of the sun. Osiris is one of the chief Egyptian deities, and is the symbol of the resurrection of the dead. His name means "the living one," and is used in connection with the words "Osiris" and "Osirian." Osiris is the god of the underworld, and is the god of the dead. His myth, to be afterwards narrated, is found pictorially represented in a tomb and in the temple of Philae, and is frequently added to in the litanies of the dead about 1200 B.C., is indicated with reverence awed by Herodotus, and after the Christian era is described at full length by Plutarch. Whether the same myth was current in the far more distant days of Mycerinus, it is, of course, impossible to say with diagnostic certainty. The religious history of Egypt, perhaps Dynasty X. to Dynasty XX., is interrupted by an invasion of Semitic conquerors and Semitic ideas. Prior to that invasion the gods, when mentioned in monuments, are always represented by animals, and these animals are the object of strictly local worship. The name of each god is spelled in hieroglyphs beside the image of the animal they held sacred, not far from the image. The custom with savage totemism is absolute. Of all the explanations, then, of Egyptian animal-worship, that which regards the practice as a survival of totemism and of savagery seems the most satisfactory. Even the numerous survivals of a human-like, theriomorphic shape: Beasts also appeared in the royal genealogies, as if the early Egyptians had filled up the measure of totemism by regarding themselves as actually descended from animals.

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some great moral or physical mystery. But we apply no such explanation to similar savage legends, and our theory is that the Osirian myth is one of these retained to the time of Pytharch by the Egyptians, with the addition of the sun-god Osiris, preserved in full vigour most of the practices of totemism. As a slight confirmation of the possibility of this theory we may mention that Greek mysteries retained two of the features of savage mysteries. The first is that of the mother goddess, which custom prevails in African mysteries, in Guiana, among Australians, Papuans, and Andaman Islanders. The other custom is the use of the toruudus, as the Australians call a little fish-shaped instrument, which worshipping Indians wet with boiling and whirring noise and keep away the profane, especially women. It is employed in New Mexico, South Africa, New Zealand and Australia. We have no more than the names of these mysteries. 3 Neither the use of the 

3 Demosthenes, De corone, pp. 315, καλουμενος των γυμνοσωομαν καλομενος των τηρουσαντων τη νεα σαραντομα κατακεραυνωμας πολε την δε τηζωνη. Quoted by Lobeck, Agiostrophus, i. 700, from Bastiaud et Gregoire's Latin, in which the etymology is discussed. 4 cf. Arnobius, v. c. 19, where the word turbines is the Latin term. 5 Wilkinson, iii. 62, see note by Dr Birch. A more detailed account of Egyptian religion is given under Egypt. Unfortunately Egyptian literature is not written in a wide language, but the anthropologists are sordid or never Egyptians.

3 For examples of the lofty morality sometimes attributed to the gods, see Max Müller, Hibbert Lectures, p. 284; Rig-Veda, lii. 28; iv. 12. 4; viii. 93 seq.; Mun, Sanskrit Texts, v. 218. poet recalls the noblest aspirations and regrets of the Hebrew

4 Müller, Hibbert Lectures, p. 230.

5 Muir, S. T., v. 55; i. 27.

6 See Sir A. Lyall, Asiatic Studies. For Vedic examples, see R.-V. xcv. 51; i. 159; iv. Muir, S. T. viii. 12.

7 See Sir W. Prinsep, Primae Operis, 388, 329, 356. 8 The chief authority for the constant strife between gods and Asuras is the Saptasatha-Brahmana, of which one volume is translated in the Blue Books of India, New Series, 1863.

9 Hahn, Tsmi-Goam, the Superb Being of the Hotentots, p. 68.

10 See Muir, S. T., vi. 16, 17, for Indra's peculiar achievements with a cow.

11 Sacred Books of the East, xii. 1, 48.
enemy. Indra cut him in two, and made the moon out of half of his body. This serpent was a universal devourer of everything and everybody, like Kwai Heman, the all-devourer in Bushman my- thology. The Indian Matsya yajurveda (an early date), as edited into the Satapatha-Brahmana must have reverted to the intellectual condition of Bushmen. In the fight with Vrittra, Indra lost his energy, which fell to the earth and produced plants and shrubs. In such a way, the sacred cow, the cloven-hoofed animals, whose manes, four pieces knocked off Chokanipok in his fight with Manabozho, Vines, in particular, are the entrails of Chokanipok. In Egypt, wine was the blood of the enemies of the gods. The Aryan versions of this sensible legend will be found in Satapatha-Brahmana. The civilized mind soon wearies of this stuff, and perhaps enough has been said to prove that, in the traditions of Vedic devotees, Indra was not a god without an irrational element in his myth. Our argument is, therefore, that Vrittra and Indra, as presented in India by the Satapatha-Brahmana, have no necessary connexion with the worship of a pure nature-god as a nature-god would now be constructed by men. The legends are survivals of a time in which natural phenomena were regarded, not as we regard them, but as persons, and savage persons, Alcheringa folk, in fact, and became the centres of the savage manner. Space does not permit us to recount the equally puerile and barbarous legends of Vishnu, Agni, the houses of Vivasvan in the form of a horse, the adventures of Soma, nor the Vedic amours (paralleled in several savage mythologies) of Pururavas and Urvashi.

Divine Myths of Greece.—If any ancient people was thoroughly civilized in the true sense of the word, it was the Greeks, probably the oldest of the Egyptian religion of Greece we find abundant survivals of savage manners and of savage myths. As to the religion, it is enough to point to the traces of human sacrifice and to the worship of rude fetish stones. The process of the primitive past, however, was not at an end. Phthision may be said to have continued almost to the conversion of the empire (Grote i. 125, ed. 1869). Pausanias seems to have found human sacrifices to Zeus still lingering in Arcadia in the 2nd century. The vast majority of all Greek gods were of the worship of Zeus in a manner that may not be spoken, and little liking had I to pry far into that sacrifice. But let it be as it is, and as it hath been from the beginning. Now " from the beginning " the sacrifice, according to all ancient traditions, was held with great human veneration; other places there were manifest communions of human sacrifice, as at the altar of Artemis the Impalatable at Patrae, where Pausanias saw the wild beasts being driven into the flames. Many other examples of human sacrifices in ancient Greece might be quoted, but I give full and interesting details of the worship of rude stones, the oldest worship, he says, among the Greeks. Almost every temple of Zeus, a horse, a serpent, a panther, a hare, a lion, which is the Poseidon of the Mangaians. The Argives had a large stone called Zeus Cappotas. The oldest idol of the Thespians was a rude stone. Another has been found beneath the pedestal of Apollo in Delos. In Achaea Phare was thirty square stones, each named by the name of a god. Among monstrous images of the gods which Pausanias, who saw them, regarded as the oldest idols, were the three-headed Artemis, each head being that of an animal, the Demeter the crowded, turned, the horse-headed Zeus, of which Zeus with three eyes, the ithyphallic Hermes, represented after the fashion of the Priapic figures in paintings on the walls of caves among the Bushmen. We also hear of the bull and the bull-footed Dionysus. The primitive objects of Zeus, as he is worshipped in processions at Attica both by women and men. The Greek custom of daubing people all over with clay in the mysteries results as we saw in the mysteries of negroes, Australians and Americans.

1 Sacred Books of the East, xii. 176, 177.
2 It is difficult to get a clear conception of the ancient Sanskrit Texts, with translations, Ludwig's translation of the Rig Veda, the version of the Satapatha-Brahmana already referred to, and the translation of the Aslareya-Brahmana by Haug, are the sources most open to English readers. (See Professor Preller's 'The Greek Mythology,' who unfortunately only deals with the hymns to the Maruts. The Indian epics and the Puranas belong to a much later date, and are full of deities either unknown to or undeveloped in the Rig Veda and the Brahmanas. The Asvamedha is contained in the Atharva-Veda, which contains the magical formulae and incantations of the Vedic Indians, is still untranslated, though, by the very nature of its theme, it must contain matter of extreme antiquity and interest.
3 Preller, Griechische Mythologie, i. 126, note 1, for this and other classical authorities.
4 The derivation of Άνθρωπος remains obscure. The derivation of Leto from καινός, and the conclusion that her name means " the concealer "—that is the night, whence the sun is born—is disputed by Mr. A. W. H. Armstrong (noted above, note 4). The derivation of Poseidon is discussed by Max Müller (Selected Essays, i. 386) Latinos being derived from the same root as Leto, Latona, the night.
5 Aristotle, H. A. n. 6; Aelian, N. A. iv. 4. The name, as usual, is variously interpreted by various etymologists.
6 We learn from the Odyssey (xix. 209) that this was the custom of sons on the death of their father.
of primogeniture, while Hesiod (Hymn, lines 141-145) claims Zeus the youngest of the sons of Cronus. Among the other gods Dionysus is but slightly alluded to in Homer as the son of Zeus and Demeter, as the object of persecution, and as connected with the myth of Attis. The more sacred episodes, and the more elaborate and often unexpected, are those of the gods of love and life. Venus is the more personal element, the product of the union of Aphrodite from θεία and φυή, or, by Max Müller, the name is connected with Sarameya (Sky). If he had originally an elemental character, it is now difficult to distinguish, though interpreters connect him with ocean, and the sea-goddess (a mixed creature) with the sea, fortune, luck, and the conductor of men’s souls down the dark ways of death. In addition to the great Homerian gods, the poet knows a whole "Olympian consistory of deities, nympha, nereids, oceanids, and sea-gods, the rainbow goddess, Sleep, Demeter who lay with a mortal, Aphrodite the goddess of love, wife of Hephaestus and leman of Ares, and so forth. As to the origin of the gods, Hesiod says: ‘We know not why the gods were 3 the first to be born, of an older dynasty now deposed, the dynasty of Cronus and the Titans. In the IIiad (vii. 478) Zeus says to Hera, "For thine anger rack I not, not even though thou go to the nethermost bounds of earth and of hell, were born of the loves of vaticus-Eumetral is round about them." ‘The gods below that are with Cronus " are mentioned (II. xiv. 274; xv. 225). Romulus of old wars dive echo in the IIiad, as (i. 400) where it is said that when the other immortals revoluted against and bound Zeus, he brought to his aid Aegaeon of the hundred arms. The streams of Oceanus (II. xiv. 246) are spoken of as the source of all the gods, and in the same book (290) Oceanus and mother Tethys are regarded as the parents of the sea-gods. (It is usual to call Tethys the mother of Oceanus, which Homer certainly understood to mean "son of Cronus," yet it is expressly stated that Zeus "imprisoned Cronus beneath the earth and the unapproachable vault of heaven," and it is only in these cases that Oceanus is called a son of Cronus. On the whole it may be said that the Homeric deities are powerful anthropomorphic beings, departmental rulers, united by the ordinary social and family ties of the Homeric age, capable of a variety of forms, and yet not connected with any one of the sacrifices of men (Od. v. 100, 102), able to assume all forms at will, and to intermarry and propagate the species with mortal men and women. Their past has been stormy, and their ruler has attained power after defeating and mediating a more ancient dynasty of his own kindred. From Hesiod we receive a much more elaborate—probably a more ancient, certainly a more barbaric—story of the gods and their depositions. (By looking at the IIiad, and attempting to denote an early non-natural race) were begotten by Earth and Heaven, conceived of as beings with human parts and passions (Hesiod, Theog. 45). This idea recurs in Maori, Vedic and Chinese mythology. Heaven and Earth, united in an endless embrace, produced children never which saw the light. In New Zealand, Chinese, Vedic, Indian and Greek myths the past had to be s bunded. Hesiod enumerates the children whom Earth bore "when he was joined with Heaven," Ceres, Ceres, Cybele, Cythera, Hyperion, Iapetus, Thela, Rhea, Themis, Mnemosyne, Phoebe, Tethys and the youngest, Cronus, "and he hated his glorious father." Others of the ancient deities who developed into the principal gods, with their three children of enormous strength, Cottus, Briareus (Aegaeon) and Gyes, each with one hundred hands and fifty heads. Uranus detested his offspring, and hid them in crannies of Earth. Earth exists without their knowledge. The fact that the children were known to all men is a sign that learning has by no means settled the questions of relative purity and antiquity in the myths. The Edda songs, according to F. Y. Powell, one of the editors of the Corpus peonicum septentrionale cronicorum, was an earlier work on the mythology before the present form "than the 9th century," and may be vaguely placed between A.D. 800-1100. The collector of the Edda probably had the old poems recited to him in the 13th century, and where there were gaps in the memory of the reciters the lacuna was filled up in prose. "As one goes through the poems, one is ever and anon face to face with a myth of the most childish and barbaric type, which carries one back to pre-Aryan days. Side by side with these old stories some fragments of a different strain of thought, Christian ideas, the belief in a supreme God, the notion of Doomsday. The Scandinavian cosmogonic myth (with its "earthly" and "Heavenly" worlds, and the origin of the stars) is the oldest of all the myths. The most important god is Odin, the son of Besla and Bor, the husband of Frigg, the father of Balder and many other sons, the head of the Asir stock of gods. Odin's name is connected with the Teutonic wotan = meares, cum imperia ferri (Grimm, Teut. Myth., Eng. trans.), and "Zeus the ancient of days" became "Zeus the son of Cronus." Having thus got a Cronus, the Greeks—and the misunderstanding could have happened in Greece only—needed a myth of Cronus. They therefore invented or adapted the swallow-trick so as to bring them to fruition, as Bushmen and Cossacks make it. This savagery itself needs some explanation. But the hypothesis that Cronus is a late derivation from Koqohe, and Koqohe by no means universally accepted. Others derive Koqohe from spaio, say, so as to bring them to fruition. But the hypothesis that Schwartz (Prřehistorisch-anthropologišchen Studien) readily proves Cronus to be the storm, swallowing the clouds. Perhaps we may say of Schwartz's view, as he says of Feller's "das ist Gedanken- spiel, aber nimmermehr Mythologie."
Odin would thus (if we admit the etymology) be the swift goer, the “ganger,” and it seems superfluous to make him (with our modern ideas of him) a living entity or something abstract and scarcely an early conception. Odin’s brethren (in Gylf’s Mocking) are Vile and Ve, who with him slew Ymir the giant, and made all things out of the fragments of his body. They also beheld the first birds and birds—some of the first birds—took upon himself most of the attributes of the medicine-man. In Loka Senna, Loki, the evil god, says that “Odin dealt in magic in Samsey.” The goddess Frigg remarks, Ye should never talk of your old dealings before men, of what ye Asir went through in old times.” But many relics of these “old times,” many traces of the medicine-man and the “skin-shifter,” survive in the myth of Odin. When he stole Suttung’s mead (which answers somewhat to the drinking-bird of Tannatorg), he took, not in the plain, but with the egg which floated on the waters, perhaps a fragment of soil fished up out of the floods by a beast or a god. But this conception does not exclude the idea that many of the things in the world—minerals, rocks, plants, and what not—are fragments of the frame of an animal or non-natural magnetized man, or are excretions from the body of a god. We proceed to state briefly the various forms of these ideas. The most backward races usually assume the prior existence of the car. Ye have believed in it.

The aborigines of the northern parts of Victoria (Australia) believe that the earth was made by Pund-jel, the bird-creator, who cut the valleys with a knife. Another Australian theory is that the men of a previous race, the Kooralie (very old ones), made the earth.

The problem of the origin of the world seems scarcely to have troubled the minds of many of the Indians. People do not say much about the making of the world. Among people a little more advanced, the earth is presumed to have grown out of the waters. In the most famous myth of a tribe of the Zend Avesta, the earth was tossed out of heaven, and fell on a turtle, which developed into the world. Another North-American myth assumes a single island in the midst of three waters, and this island grew into the world. The Navaho and the Zunis believe that earth was granted as a starting-point in their myths. The Winnebagos, not untouched by Christian doctrine, do not go farther back. The Maoris represent Creation of themselves according to God, Creation of his body and a piece of earth and made a man. Here the existence of earth is assumed (Bancroft iv. 228). Even in Guatemala, though the younger sons of a divine race succeed in making the world, the whole of the earth, and the sons of God, is made of clay as first material. The Pima, a Central-American tribe, say the earth was made by a powerful being, and at first appeared like a spider’s web. This reminds one of the Ananzi or spider creator of West Africa. The more metaphysical Tauculties of British Columbia say that in the beginning nought but earth was made, the water and a musk-rat. The musk-rat sought his food at the bottom of the water, and his mouth was generally filled with mud. By wrapping up the soil into a sort of ball, and sucking and blowing it into the world. Among the Timneh, the frame of a dog (which could assume the form of a handsome young man) became the first man. The British dog breed of dogs, like Osiris, Dionysus, Purusha and other gods, was born to pieces by the gods, and engaged in making some of the things in the world (Bancroft i. 106). Even here the existence of earth for the dog to live in is assumed.

The races of the New World, when they are studied, we find the New Zealanders in possession of ancient hymns in which the origin of things is traced back to nothing, to darkess, and to a metaphysical process from nothing to something, from being to becoming. The hymns may be found in Dr. T. Kears’ ‘Polynesian Mythology’ and in Taylor’s New Zealand. It has been suggested that these hymns bear traces of Buddhist and Indian influence; in any case, they are rather metaphysical than mystical. Myth comes in when the ancestors of the first tribe appear, when the gods themselves appear, and is the form of the gods, male and female, united in a secular embrace, and finally severed by their children, among whom Tane Mahuta takes the part of Cronus in the Greek myth. The gods were partly elemental, and partly personifications in children. The idea in children’s minds that human crime was fiercely attributed to them. In the South Sea Islands, generally, the fable of the union and separation of Heaven and Earth, and the recurrence of the two forms will be found in Gill’s ‘Myths and Songs from the South Pacific.’

The cosmogonic myths of the Aryans of India are peculiarly interesting, as we find in the Vedas and Brahmanas and Puranas the story of the creation of the world, the origin of the gods, the creation of man, the origin of the world, and the origin of the deities. The ideas of the origin of things are not abstract metaphysical speculations. We have the theory that earth grew, as in the Iroquois story of the turtle, from a being named Utanapad (Muir v. 335). We find that Brahmanaspati, the first of the gods and the father of Purusha and Tvashtrih, the mechinac among the deities, is credited with having fashioned the earth and the heaven (Muir v. 354). The Purusha, the god of the tenth book of the Rig Veda, gives us the Indian version of the theory that all things were made out of the mangled limbs of Purusha, a magnified non-natural man, who was sacrificed by the gods. As this hymn gives an account of the origin of the castes (which elsewhere are scarcely recognized in the
Rig Veda, it is sometimes regarded as a late addition. But we can scarcely avoid the conclusion that the Rig Veda contains stars which form a group of "familiar" stars, such as is the case with many other constellations. It is not to be presumed, therefore, that it means to us most myths, including those of Chaldæa and Egypt, and various North-American tribes. Not satisfied with this myth, the Aryans of India accounted for the origin of the stars in the following manner. The Brahma-Purusha was alone in the world. He differentiated himself into two beings, husband and wife. The wife, regarding union with her producer as incest, fled from his embraces as Nemesis did from those of Zeus. The purpose of the Nordic and the Brahmanic myth differs, according to Acosta) by which beasts and anthropomorphic gods and stars are all jumbled together. The Rig Veda contains examples of the idea that the good become stars.

As a rule, destruction by a deluge is the most favourable myth, but destruction by fire and wind and by the wrath of a god are common in Australian, Peruvian and Egyptian tradition. The idea of a god in the shape of a bear, fish, or bull, up a fish of earth, which subsequently became the world, out of the waters, is very well known to the Aryans of India, and recalls the feats of American musk-rats and coyotes already described. The tortoise from which the stars come is also common in Australian myths. The husband pursued in the form of the male of each animal, and from these unions sprang the various species of beasts (Satapatha-Brahmana, ii. 12. 3; Mâli. i. 25). The idea of the world being formed from all things being of the Lunar style is also current in the Brahmanas. In the Puranas we find the legend of many successive creations and destructions of the world a myth of world-wide distribution.

As a rule, reconstruction by a deluge is the most favourable myth, but destruction by fire and wind and by the wrath of a god are common in Australian, Peruvian and Egyptian tradition. The idea of a god in the shape of a bear, fish, or bull, up a fish of earth, which subsequently became the world, out of the waters, is very well known to the Aryans of India, and recalls the feats of American musk-rats and coyotes already described. The tortoise from which the stars come is also common in Australian myths. The husband pursued in the form of the male of each animal, and from these unions sprang the various species of beasts (Satapatha-Brahmana, ii. 12. 3; Mâli. i. 25). The idea of the world being formed from all things being of the Lunar style is also current in the Brahmanas. In the Puranas we find the legend of many successive creations and destructions of the world a myth of world-wide distribution.

The Greek and Māgian myth of the marriage of Heaven and Earth and its dissolution is found in the Aitareya-Brahmana (Haeg's trans. ii. 308; Rig Veda, i. 33.). The marriage of Ehe and Earth was in the Brahmanas associated with the idea that the world would be destroyed and then re-created.

A Scandinavian cosmogonic myth starts from the abyss, Ginnungagap, a chaos of ice, from which, as it thawed, was produced the giant Ymir. Ymir is the Scandinavian Purusha. A man and woman appeared from the body of Ymir, a cow licked the hoar-frost, whence rose Bur, whose children, Odin, Vile and Ve, slew the giant Ymir. "Of his flesh they formed the earth, of his blood seas and waters, of his bones mountains, of his teeth rocks and stones, of his hair all manner of plants. This is the story in the Prose Edda, derived from older songs, such as the Grimmiurmal. However the distortion of this singular myth may be explained, its origin can scarcely be sought in the imagination of some primitive man. But the idea that women, dogs and men are the thermomorphic form of Purusha or Ymir is common in the Indo-European world. It is the Indian, Persian, Greek, and Germanic idea. In each case the myth has been changed from a myth of the world to a myth of the family, and the myth of the family has been changed at times to a myth of the society. That is how the "familiar" myth is preserved.

**Myths of the Origin of Man.**—These partake of the conceptions of evolution and of creation. Man was made out of clay by a supernatural being. Australians: was made by Kundel. New Zealand: man was made by Tiaki; he took red clay, and kneaded it with this oil, and his hands, in the manner of the Tongans. Man was made by the Sun-goddess. The position of the gods is also related to the myth of the Icelanders. The Cyprian myth reminds us of the Iroquois turtle. The Greek and Māgian myth of the marriage of Heaven and Earth and its dissolution is found in the Aitareya-Brahmana (Haeg's trans. ii. 308; Rig Veda, i. 33.). The marriage of Ehe and Earth was in the Brahmanas associated with the idea that the world would be destroyed and then re-created.

The Greek myth of the descent of the Arcadians, Myrmidons, children of the swan, the cow, and the sow, may be compared. Yet again, men came out of trees or plants or rocks: as on the Australian wattle-gum, the Zulu bed of reeds, the great tree of the Ovahereros, the rock of the tribes in Central Africa, the cave of Bushman and North-American and Peruvian myth. "from tree or stone?" (Odyssey, xix. 163.). This view was common among the Greeks, who boasted of being autochthonous. The Cyprian marsh was one scene of man's birth according to a fragment of Pindar, who mentions Egyptian and Libyan legends of the same descent. The story of the Arts of Life.**—These are almost unanimously attributed to "culture-heroes," beings theriomorphic or anthropomorphic, who, like Kundel, Qaï, Quawt, etc., Prometheus in Hesiod, Aesop in Iceland, were men who were made after many efforts, in which the experimental beings did not harmonize with their environment, by Prajapati. In another class of myths, man was evolved out of the lower animals —men from sharks, the man from the hare in Persia, the man from the bird in America. The Greek myths of the descent of the Arcadians, Myrmidons, children of the swan, the cow, and the sow, may be compared. Yet again, men came out of trees or plants or rocks: as on the Australian wattle-gum, the Zulu bed of reeds, the great tree of the Ovahereros, the rock of the tribes in Central Africa, the cave of Bushman and North-American and Peruvian myth. "from tree or stone?" (Odyssey, xix. 163.). This view was common among the Greeks, who boasted of being autochthonous. The Cyprian marsh was one scene of man's birth according to a fragment of Pindar, who mentions Egyptian and Libyan legends of the same descent.

**Stars.**—"The stars came otherwise," says Browning's Caliban. In savage and civilized myths they are usually meta-
morphic heroes, but in some myths they are discussed as human. As in Greece, were girls. Castor and Pollux in Greece, as in Australia, were young men. Our Bear was a bear, according to Charlesvoix and Lafaite, among the North-American Indians; the Eskimo, ram, etc. The story is also quoted by Lactantius from Hesiod.

1 Black Yafur-Veda and Satapatha-Brahmana; Muir, i. 52.
2 Aristophanes, Ave, 636; Elys. Mag., 27. 160. Munzias said the clay (Paus. x. 29. 4). The story is also quoted by Lactantius from Hesiod.

3 See also Vishnu Purana, i. 131.
4 See Corthell Magazine, "How the Stars got their Names" (1882, p. 35), and "Some Solar and Lunar Myths" (1882, p. 440).
5 Max Müller, Selected Essays, i. 609-611.
MYXOEDEMA—MYZOSTOMIDA

ments of a rather limited set of incidents. These incidents have been roughly classified by Von Hahn.1 We may modify his arrangement.

There is (1) the story of a bride or bridegroom who transgresses a commandment of a mystic nature, and disappears as a result of the sin. The bride sins as in Eros and Psyche, Freja and Oddur, Purusha and Adverse, Ching-chou and the sun; the bridegroom sins as their husbands—naked in the latter case. The sin was against "the manner of women." Now the rule of etiquette which forbids seeing or naming the husband (especially the latter) is of the widest distribution. The offence in the Welsh form of the story is to the partner—a thing forbidden among early Greeks and modern Zulus. Presumably the tale (with its example of the sanction) survives the rule in many cases. (2) "Fenelope formula." The man leaves his spouse adrift. Another comes to the aid of the celestial family. A good deal occurs in Chinese legend. (3) Formula of the attempt to avoid fate or the prophecy of an oracle. This incident takes numerous shapes, as in the story of the fatal marriage of Phrixus, Paris, Creusa, and other characters. This up to the present, the birth of Oedipus. (4) Slaughter of a monster. This is best known in the case of Andromeda and Perseus. (5) Flight, by aid of an animal usually, from cannibalism, human sacrifice, or incest. The Greek example is Phrixus, Helle, and the ram of the golden fleece. (6) Flight of a lady and her lover from a giant father or wizard father. Jason and Medea furnish the Greek example. (7) The youngest brother takes over the family property. This family, as has been noted the example of Greek mythic illustrations of "Jüngsterecht," or supremacy of the youngest, in the Hesiodic myth of Zeus, the youngest child of Cronus. (8) Bride given to whoever with taller growth or due attention. A girl is put to serve a pious life. A custom of giving a bride without demanding bride-price, in reward for a great exploit, is several times alluded to in the Iliad. In Greek heroic myth Jason thus wins Medea, and in the race Millian with the papyrus plants. In the legends of the Phrixus, Paris, Phlegyas, this part, recurs. The rider through the fire wins Brunnihild but this may belong to another cycle of ideas. (9) The grateful beasts, who, having been aided by the hero, aid him in his adventures. His appearance in the Greek heroic epic is often so different that, Jason has conditions like these, as had Ilmarinen and Heracles, the Greek "strong man." (11) Adventure with an ogre, who is blinded and deceived by a pious old woman. " enormously tall" and "a person who vanquishes ogres" is the Greek ex.

example. (12) Descent into Hades of the hero. Heracles, Odysseus, Wainamoinen in the Kalevala, are the best-known examples in epic literature. These are twelve specimens of the incidents, to which we may add (13) "the false bride," as in the poem of Beric aux grand Pârs, and (14) the legend of the bride said to produce beast-children. The belief in the latter phenomenon is very common in Africa, and in the Arabian Nights, and we have seen it in America. Of the stories of these "bride" legends—(1) is a sanction of barbarous nuptial etiquette; (2) is an obvious ordinary incident; (3) is moral, and both (3) and (1) may pair off with all the myths of the origin of death from the inordinate passion for the nuptial contract; whatever, as on the West Coast of Africa, human victims have been offered to sharks or other beasts; (5) the story of flight from a horrible crime, occurs in some stellar myths, and is an easy maturating of the myth of (6) flight from wizard father or husband, is found in Bushman and Namaqua myth, where the husband is an elephant; (7) success of youngest brother, may have been an explanation and sanction of "Jüngsterecht" —Maui in New Zealand is an example, and Herodotus found the same thing. The story of the boy who went adventuring as a child, and who was successful in his efforts, only to return, but in the life of an elephant—(8) the bride given to successful adventurier, is consonant with heroic manners as late as Homer; (9) is no less consonant with the belief that beasts have human sentiments and supernatural powers; (10) the damsel and the ogre, who if they are not in the West Coast of Africa, human victims have been offered to sharks or other beasts; (11) the baffled ogre, is found among Basques and Irish; (12) descent into Hades, is the natural result of the savage conception of Hades, and the tale is told of actual people living in the Solomon Islands and in New Caledonia; Eskimo Angeokoks can and do descend into Hades—it is the prerogative of the necromantic magician; (13) "the false bride," found among the Zulus, does not permit of such easy explanation—naturally, in Zululand, the false bride is an animal; (14) the bride accused of bewitching a husband; of all these "bride" legends, the one that is inseparable in an inevitable where no distinction worth mentioning is taken between men and animals. English folk-lor has its woman who bore rabbit.

The formulæ here summarized, with others, are familiar in the märchen of Samoyeds, Zulus, Bushmen, Hottentots and Red Indians. For an argument intended to show that Greek heroic myths may be adorned and classified märchen, in themselves survivals of savage fancy, see Fortnightly Review, May 1872, "Myths and Mährchen," p. 410. A rather old explanation was that märchen are degenerate heroic myths. This does not explain the märchen of African, and perhaps not of Siberian races. In this sketch of mythology that of Rome is not included, because its treatment of the subject is confined to the family märchen and by a slide into harmony with the mythology of Greece. Greece, India and Scandinavia will supply a fair example of Aryan mythology (without entering on the difficult Slavonic and Celtic fields). (A. L.)

MYXOEDEMA (or athyreos), the medical term for a constitutional disease (see Metabolic Diseases) due to the degeneration of the thyroid gland, and occurring in adults; it may be contrasted with cretinism, which is a condition appearing in early childhood. There are two forms, myxoedema proper and operative. The question of the "Gull’s" disease.

(1) Myxoedema has been termed "Gull’s Disease" from Sir William Gull’s observations in 1873. Women are more often the victims than men, in a ratio of 6 to 1. It frequently affects members of the same family and may be transmitted through the mother, and it has been observed sometimes to follow exophthalmic goitre. The symptoms are a marked increase in bulk and weight of the body, puffy appearance of skin which does not pit on pressure, the line of the features becoming obliterated and getting coarse and broad, the lips thick and nostrils enlarged, with loss of hair, subnormal temperature and marked mental changes. There is striking slowness of thought and action, the memory becomes defective, and the patient becomes irritable and suspicious. For want of expression the term myxoedema is often used for dementia. The thyroid gland itself is diminished in size, and may become completely atrophied and converted into a fibrous mass. The untreated disease is progressive, but the course is slow and the symptoms may extend over 12 to 15 years, death from asthma or tuberculosis being the most frequent ending. (2) Symptoms similar to the above may follow complete removal of the thyroid gland. Kocher of Bern found that, in the total removal of the gland by operation, out of 408 cases operated myxoedema occurred in 69, but it is thought that if a small portion of the gland is left, or if accessory glands are present, these symptoms will not develop. The treatment of myxoedema is similar to that of cretinism.

MYZOSTOMIDA, a remarkable group of small parasitic worms which live on crinoid echinoderms; they were first discovered by Leuckart in 1827. Some species, such as Myzostoma curritum, move about on the host; others, such as M. glabrum, remain stationary with the pharynx inserted in the mouth of the crinoid. M. deformator gives rise to a "gall" on the arm of the host, one joint of the pinnule growing round the worm so as to enclose it in a cyst (see fig. E); whilst M. pulvinar lives actually in the alimentary canal of a species of Antedon.

A typical myzostomid (see A, B, C) is of a flattened rounded shape, with a thin edge drawn out into delicate radiating cirri. The skin is ciliated. The dorsal surface is smooth; there are five pairs of parapodia, armed with spiked setae, by means of which the worm adheres to its host. Beyond the parapodia are four pairs of organs, often called suckers, but probably of sensory nature, and comparable to the lateral sense organs of Capitellids (Wheeler). The mouth and cloacal aperture are generally at opposite ends of the ventral surface. The former leads to a protrusible pharynx (B). The duct of the excurrent system opens into a wide intestinal chamber with branching lateral diverticula. There appears to be no vascular system. The nervous system consists of a circumsophageal nerve, with scarcely difference in the nervous system, joining below a large gангlion mass no doubt representing many fused ganglia (B). The dorsoventral and the parapodial muscles are much developed, whilst the coelom is re-duced mostly to branched spaces in which the genital products The external branches of the coelomic ducts (C) consists of a branched sac opening to the exterior on each side. The paired ovaries discharge their products into a median coelomic chamber with lateral branches (C), often called the "antennae." The "antennae" open into the coelomic ducts through a dorsoventral pore into the terminal region of the rectum (cloaca). Into this same cloacal chamber open ventrally a pair of ciliated tubes communicating by funnels with the coelom (Nansen and Wheeler); these are possibly nephridia, and excretory in function.

The Myzostomida are protandric hermaphrodites, being functional males when small, spermatophore later, and finally

1 Griechische und altenberische Märchen, i. 45.
2 Tenth Book of Rig Veda and "Brahmana" of Yajur-Veda; Müller, Selected Essays, i. 410.
functional females (Wheeler). Small "males" are in some species constantly associated with large hermaphrodites, but according to Beard there are in some cases true dwarf males, comparable to the complementary males described by Darwin in the Cirripedia. The embryology of Myzostoma has been studied by Metchnikoff and Beard. Cleavage leads to the formation of an epibolic gastrula and ciliated embryo which hatches as a free-swimming larva remarkably like that of a Polychaete worm (D). The larva is provided with postoral and perianal ciliated bands, and on either side with a bunch of long provisional setae. The mesoderm becomes segmented, and the parapodia subsequently develop from before backwards; but almost all internal traces of segmentation are lost in the adult. The structure and development of the Myzostomida seem to show that they are nearly related to Polychaeta (see CHAETOPTERA), though highly modified in relation to their parasitic mode of life.


**MZABITES,** or BENI-MZAB, a confederation of Berber tribes, now under the direct authority of France. Of all the Berber peoples the Mzabites have remained freest from foreign admixture. Their own country is a region of the Algerian Sahara, about 100 m. south of El-Aghuat. It consists of five oases close together, viz. Ghardaia, Beni-Isguen, El-Atyah, Melika and Bu Nara, and two isolated oases farther north, Berrian and Guerrara. The total population numbered at the 1906 census 45,996, of whom about 100 were Europeans and a very small proportion Arabs and Jews. The Mzabites are of small and slender figure, with very short necks and under-developed legs. Their faces are flat, with short nose, thick lips and very deep-set eyes, and their complexion pale. Their dress is a shirt of thick wool, usually many-coloured. They are agriculturists, and are also famed as traders. The butchers, fruiters, bath-house keepers, road-sweepers and carriers of the African littoral from Tangier to Tripoli are nearly all Mzabites. Their industries, too, are highly organized. The Mzabite burnouses and carpets are found throughout North Africa. Their commercial honesty is proverbial. Nearly all read and write Arabic, though in talking among themselves they use the Zenata dialect of the Berber language, for which, in common with other Berber peoples, they have no written form surviving. They are Mahommedans, of the Ibadite sect, and are regarded as heretics by the Sunnites.

According to tradition the Ibadites, after their overthrow at Tiaret by the Fatimites, took refuge during the 10th century in the country to the south-west of Wargla, where they founded an independent state. In 1012, owing to further persecutions, they fled to their present quarters, where they long remained invulnerable. After the capture of El-Aghuat by the French, the Mzabites concluded with the Algerian government, in 1853, a convention by which they engaged to pay an annual contribution of £1,600 in return for their independence. In November 1882 the Mzab country was definitely annexed to Algeria. Ghardaia (pop. 7,688) is the capital of the confederation, and next in importance is Beni-Isguen (4,016), the chief commercial centre. Since the establishment of French control, Beni-Isguen has become the dépôt for the sale of European goods. French engineers have rendered the oases much more fertile than they used to be by a system of irrigation works. (See also Algeria.)

A letter which regularly follows M in the alphabet, and, like it in its early forms has the first limb longer than the others; thus, written from right to left, N. The Semitic languages gradually diminish the size of the other two limbs, while the Greek and Latin alphabets tend to make all three of equal length. The earliest name of the symbol was *Nun*, whence comes the Greek ν (nv). The sound of n varies according to the point at which the contact of the tongue with the roof of the mouth is made; it may be dental, alveolar, palatal or guttural. In Sanskrit these four sounds are distinguished by different symbols; the last two occur in combination with stops or affricates of the same series. The French or German n when standing by itself is dental, the English alveolar, *i.e.* pronounced like the English t and d against the sockets of the teeth instead of the teeth themselves. The guttural nasal is written in English ng as in ring; for the palatal n as in lynx there is no separate symbol. The sound of n stands in the same relation to d as m stands to b; both are ordinarily voiced and the mouth position for both is the same, but in pronouncing n the nasal passage is left open, so that the sound of n can be continued while that of d cannot. This is best observed by pronouncing syllables where the consonant comes last as in and id. When the nasal passage is closed, as when one has a bad cold, m and n cannot be pronounced; attempts to pronounce moon result only in bood. Two important points arise in connexion with nasals: (1) sonant nasals, (2) nasalization of vowels. The discovery of sonant nasals by Dr Karl Brugman in 1876 (Curtius, *Studien*, (9), pp. 285-338) explained many facts of language which had heretofore seemed obscure and elucidated many difficulties in the Indo-European vowel system. It had been observed, for example, that the same original negative prefix was represented in Sanskrit by a, Greek by a, in Latin by in and in Germanic by un, and these differences had not been accounted for satisfactorily. Dr Brugman argued that in these and similar cases the syllable was made by the consonant alone, and the nasal so used was termed a sonant nasal and written g. In most cases Sanskrit and Greek lost the nasal sound altogether and replaced it by a vowel a, a, while in Latin and Germanic a vowel was developed independently before the nasal. In the accusative singular of consonant stems Sans. *pādam*, Gr. ῥόθα, Lat. *pudem*, Sanskrit and Greek did not, as generally, agree, but it was shown that in such cases there were originally two forms according to the nature of the sound following the next word in the sentence. Thus an original Indo-European *pēdga*, would not be treated precisely in the same way if the next word began with a vowel as it would when a consonant followed. Sanskrit had adopted the form used before vowels, Greek the form before consonants and each had dropped the alternative form. The second point—the nasalizing of vowels—is difficult for an Englishman to understand or to produce, as the sounds do not exist in his language. Thus in learning to pronounce French he tends to replace the nasalized vowels by the nearest sounds in English, making the Fr. on a nasalyzed vowel (ō), into Eng. ong, a vowel followed by a guttural consonant. The nasalyzed vowels are produced by drawing forward the uvula, the "tab" at the end of the soft palate, so that the breath escapes through the nose as well as the mouth. In the Frenchnasalyzed vowels, however, many phoneticians hold that, besides the leaving of the nasal passage open, there is a change in the position of the tongue in passing from a to o. The nasalyzed vowels are generally written with a hook below, upon the analogy of the transliteration of such sounds in the Slavonic languages, but as the same symbol is used for both nasalized and *open* sounds derived from a "closed" one, the use is without ambiguity. On the other hand, it is not admissible to write 4 for the nasalyzed vowel in languages which have accent signs, e.g. Lithuanian. It is possible to nasalize some consonants as well as vowels; nasalized spirants play an important part in the so-called "Yankee" pronunciation of Americans.

**NAAS** (pron. Nace, as in place), a market town of Co. Kildare, Ireland, 20 m. S.W. from Dublin on branches of the Great Southern and Western railway and of the Grand Canal. Pop. (1901) 2036. It is situated among the foothills of the Wicklow Mountains, close to the river Liffey. The town is of great antiquity, and was a residence of the kings of Leinster, the place of whose assemblies is marked by a neighbouring rath or mound. Naas returned two members to the Irish parliament from 1559 until the union in 1800. Of a castle taken by Cromwell in 1650, and of several former abbeys, there are no remains. Punchestown racecourse, 23 m. S.E., is the scene of well-known steeplechases.

**NABATAEANS**, a people of ancient Arabia, whose settlements in the time of Josephus (*Ant.* i. 12, 4; comp. Jerome, *Quaest. in Gen. xxv.*.) gave the name of Nabatene to the border-land between Syria and Arabia from the Euphrates to the Red Sea. Josephus suggests, and Jerome, apparently following him, affirms, that the name is identical with that of the Ishmaelite tribe of Nêbâlîoth (*Gen. xxv.* 13; Isa. ix. 7), which in later Old Testament times had a leading place among the northern Arabs, and is associated with Kedar (Isa. ix. 7) much as Pliny v. 11 (12) associates *Nabataeae* and *Cedren*. The identification is rendered uncertain by the fact that the name Nabataean is properly spelled with t not s (on the inscriptions, *cf.* also Arabic Nabawf, Nabahf, etc.). Thus the history of the Nabataeans cannot certainly be carried back beyond 312 B.C., at which date they were attacked without success by Antigonus I. *Cyklops* in their mountain fortress of Petra. They are described by Diodorus (xix. 94 seq.) as being at this time a strong tribe of some 10,000 warriors, pre-eminent among the nomadic Arabs, eschewing agriculture, fixed houses and the use of wine, but adding to pastoral pursuits a profitable trade with the seaports in myrrh and spices from Arabia Felix, as well as a trade with Egypt in bitumen from the Dead Sea. Their arid country was the best safeguard of their cherished liberty; for the bottle-shaped cisterns for rain-water which they excavated in the rocky or argillaceous soil were carefully concealed from invaders. Petra (ρη) or Selâ was the ancient capital of Edom; the Nabataeans must have occupied the old Edomite country, and succeeded to its commerce, after the Edomites took advantage of the Babylonian captivity to press forward into southern Judaea. This migration, the date of which cannot be determined, also made them masters of the shores of the Gulf of 'Akaba and the important harbour of Elath. Here, according to Agatharchides (*Geog. Gr. Min.*, i. 178), they were for a time very troublesome, as wretches and pirates, to the reopened commerce between Egypt and the East, till they were chastised by the Greek sovereigns of Alexandria.

The Nabataeans had already some tincture of foreign culture when they first appear in history. That culture was naturally Aramaic; they wrote a letter to Antigonus "in Syriac letters," and Aramaic continued to be the language of their coins and inscriptions when the tribe grew into a kingdom, and profited by the decay of the Seleucids to extend its borders northward over the more fertile country east of the Jordan. They occupied Haurân, and about 85 B.C. their king Aretas (Hiráthå) became lord of Damascus and Coeles-Syria. Allies of the first Hasmonaean in their struggles against the Greeks (1 *Macc.* v. 25, ix. 35; 2 *Macc.* v. 8), they became the rivals of the Judaean dynasty in the period of its splendour, and a chief element in the disorders which invited Pompey's intervention in Palestine. The Roman arms were not very successful, and King Aretas retained his whole possessions, including Damascus, as a Roman

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1 See *Edom*, and (for the view that Mal. i. 7-5, refers to the expulsion of Edomites from their land) *Malachi.*
NABBES—NACHMANIDES

vassal. As "allies" of the Romans the Nabataeans continued to flourish throughout the first Christian century. Their power extended far into Arabia, particularly along the Red Sea; and Petra was a meeting-place of many nations, though its commerce was diminished by the rise of the Eastern trade-route from Myos Hormos to Coptos on the Nile. Under the Roman peace their kings, however, were but nominal vassals. Their position was acquisitive, orderly people, wholly intent on trade and agriculture (Strabo xvi. 4). They might have long been a bulwark between Rome and the wild hordes of the desert but for the short-sighted cupiditv of Trajan, who reduced Petra and broke up the Nabataean nationality (105 A.D.). The new Arab invaders who soon pressed forward into their seats found the remnants of the Nabataeans transformed into jelādān, and speaking Aramaic like their neighbours. Hence Nabataeans became the Arabic name for Aramaeans, whether in Syria or Iraq, a fact which has been incorrectly held to prove that the Nabataeans were originally Aramaeans. Their independence is now known, however, that they were true Arabs—as the proper names on their inscriptions show—who had come under Aramaic influence.

See especially on this last point (against Quatremère, Journ. asiat. xvi., vol. ii., 1835). Nöldeke in Zeit. d. morgenländ. Gesell. xvii. 705 seq., xxv. 122 seq. The so-called "Nabataean Agriculture" (Pankevitch, 1884) is probably an Arabic translation by Ibn Walibshiya from an ancient Nabataean source, is a book of the 10th century (see A. von Gutschmid, Z. d. morgenländ. Gesell. xi. seq.; Nöldeke, ib. xxix. 445 seq.). Complete bibliographical information is given in P. Schürer, History of the Jewish People in the Time of Jesus Christ (1907). See also the Academy's Répertoire d'épig. sém.; and the discussions, &c., in the writings of Clermont-Ganneau (Rec. d'archéol. Orient.) and M. Lidzbarski (Handbuch d. nord-semit. Epig.; Ephemeris f. sem. Epig., 1890). For English readers the selection in G. A. Cooke, North-Semitic Inscriptions (Oxford, 1903) is the most useful.

NABBES, THOMAS (b. 1605), English dramatist, was born in humble circumstances in Worcestershire. He entered Exeter College, Oxford, in 1621, but left the university without taking a degree. He subsequently acted as a manager of a London theatre.

His works include: Covent Garden (acted 1633, printed 1638), a prose comedy of small merit; Tottenham Court (acted 1634, printed 1638), a comedy the scene of which is laid in a holiday resort of the London tradesmen; Hannibal and Scipio (acted 1635, printed 1637), a historical tragedy; The Bride (1638), a comedy; The Unfortunate Mother (1640), an unacted tragedy; Microcosmus, or Morall Maske (printed 1637); two other masques, Spring's Glory and Presentation intended for the Prince his Highness on his Birthday (printed together in 1638); and a continuation of Richard Knoles's General Historie of the Turks (1638). His verse is smooth and musical, and if his language is sometimes coarse, his general attitude is moral. The masque of Microcosmus—a really a morality play, in which Phusynder after much error is reunited to his wife Bellanima, who personifies the soul—is admirable in its own kind, and the other two masques, slighter in construction but ingenious, show Nabbes at his best.

Nabbes's plays were collected in 1639; and Microcosmus was printed in Dodson's Old Plays (1744). All his works, with the exception of his continuation of Knoles's history, were reprinted by H. Bullen in his Old English Plays (second series, 1878). See also F. G. Fleay, Bng. Chron. of the English Drama (1891).

NABA, a native state of India, within the Punjab. Area, 660 sq. m. Pop. (1901) 207,949. Its territories are scattered; one section, divided into twelve separate tracts, lies among the territories of Patiala and Jind, in the east and south of the Punjab; the other section is in the extreme south-east. The whole of the territories belongs physically to a plain; but they vary in character from the great fertility of the Panwad region to the aridity of the Rajputana desert. Naba is one of the Sikh states, founded by a member of the Phulkian family, which established its independence about 1763. The first relations of the state with the British were in 1807-1808, when the raja obtained protection against the threatened encroachments of Ranjit Singh. During the Mutiny in 1857 the raja showed distinguished loyalty, and was rewarded by grants of territory to the value of over £10,000. The imperial service troops of the raja Hira Singh (b. c. 1843; succeeded in 1871) did good service during the Tirah campaign of 1897-98. The chief products of the state are wheat, millets, pulses, cotton and sugar. The estimated gross revenue is £1,00,000; no tribute is paid. The territory is crossed by the main line and also by several branches of the North-Western railway, and is irrigated by the Sirhind canal.

The town of Naba, founded in 1755, has a station on the Rajpura-Bhatinda branch of the North-Western railway. Pop. (1901) 18,468.

See Phulkian States Gazetteer (Lahore, 1900).

NABIGHA DHUBYĀNĪ [Zīyād ibn Muṣʿawlyā] (6th and 7th centuries), Arabian poet, was one of the last poets of pre-Islamic times. His tribe, the Bani Dhubyān, belonged to the district near Mecca, but he himself spent most of his time at the courts of Hira and Ghassān. In Hira he remained under Mundhir (Mundhir) III, and under his successor in 562. After a sojourn at the court of Ghassān, he returned to Hira under Numa. He was, however, compelled to flee to Ghassān, owing to some verses he had written on the queen, but returned again about 600. When Nu'mān died some five years later he withdrew to his own tribe. The date of his death is uncertain, but he does not seem to have known Islam. His poems consist largely of eulogies and satires, and are concerned with the strife of Hira and Ghassān, and of the Bani Abis and the Bani Dhubyān. He is one of the six eminent pre-Islamic poets whose poems were collected before the middle of the 2nd century of Islam, and have been regarded as the standard of Arabian poetry. Some writers consider him the first of the six.

His poems have been edited by W. Ahwardt in the Diwan of the six ancient Arabic Poets (London, 1870), and separately by H. Denenberg (Paris, 1869, a reprint from the Journal asiatique for 1868).

NABOB, a corruption of the Hindustani naūbah, originally used for native rulers. In the 18th century, when Clive's victories made Indian terms familiar in England, it began to be applied to Anglo-Indians who returned with fortunes from the East.

NABUA, a town in the province of Camarines, Luzon, Philippine Islands, on the Bicol river, about 22 m. S.S.E. of Nueva Caceres, the capital. Pop. (1903) 18,893. Nabua is in the district known as La Rincónada—a name originally given to it on account of its inaccessible. It is connected by road, railway and the Bicol river (navigable for light-draft boats) with Nueva Caceres. Nabua is the centre of an agricultural region, which produces much rice and some Indian corn, sugar and pepper. The language is Bicol.

NACAIRE, NAKER, NAQUAIRE (Arab. naqādra), the medieval name for the kettledrum, the earliest representation of which appears in the unique MS. known as the Vienna Genesis (5th or 6th century). The name was, according to Thomas, derived from initials used at the triumphal entry of Edward III. into Calais. The Chronicles of Joinville describe the instrument as a kind of drum: "Lor il fist sonner les tabours que l'on appelle nacaires." Chaucer, in his description of the tournament in the Knight's Tale, line 1653, also refers to this early kettledrum.

NACHMANIDES (Nahmanides), the usual name of Moses ben Nahman (known also as Ramban), Jewish scholar, was born in Gerona in 1140 and died in Palestine c. 1270. His chief work, the Commentary on the Pentateuch, is distinguished by originality and charm. The author was a mystic as well as a philologist, and his works unite with peculiar harmony the qualities of reason and feeling. He was also a Talmudist of high repute, and wrote many controversial Tractates. Metaon and other legal works. Though not a philosopher, he was drawn into the controversy that arose over the scholastic method of Maimonides (q.v.). He endeavoured to steer a middle course between the worshippers
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and the excomunicators of Maimonides, but he did not succeed in healing the breach. His homiletic books, Epistle on Sanctity (1ggereth ha-qodesh) and Law of Man (Torath ha-Adam), which deal respectively with the sanctity of marriage and the solemnity of death, are full of intense spirituality, while at the same time treating of ritual customs—a combination which shows essential Rabbinism at its best. He occupies an important position in the history of the acceptance by medieval Jews of the Kabbala (q.v.); for, though he made no fresh contributions to the philosophy of mysticism, the fact that this famous rabbi was himself a mystic induced a favourable attitude in many who would otherwise have rejected mysticism as Maimonides did. In 1263 Nahmanides was forced to enter into a public disputation with a Jewish-Christian, Pablo Christiani, in the presence of King James of Aragon. Though Nachmanides was assured that perfect freedom of speech was conceded to him, his defence was pronounced blasphemous and he was banished for life. In 1267 he went to Palestine and settled at Acre. He died about 1270.

See S. Schechter, Studies in Judaism, first series, pp. 120 seq.; Graetz, History of the Jews (English translation vol. iii. ch. xvi. and xviii.). (I. A.)

NÁCHOD, a town of Bohemia, Austria, 109 m. E.N.E. of Prague by rail. Pop. (1900) 8999, mostly Czech. It is situated on the Mettau river, at the entrance of the Léwin-Náchod pass. The old castle contains a collection of historical paintings and archives, and there are several old churches, of which that of St Lawrence is mentioned as the parish church in 1350. The town originally gathered round the castle of Náchod, of which the first lord was a member of the powerful family of Hron, in the middle of the 13th century. It suffered much during the Hussite Wars, and in 1437 was captured by the celebrated robber knight Kolda of Zampach, and retaken by George of Podebrad in 1456 and included in his estates. It was sold in 1624, and in 1632 it was given to Ottavio Ficcolomini; finally, after many changes of ownership, the castle and titular lordship came in 1840 to the princes of Schaumburg-Lippe. The important engagements fought near the town on the 27th and 28th of June 1860 opened Bohemia to the victorious Prussians.

NÁCHTGAL, GUSTAV (1834-1885), German explorer in Central Africa, son of a Lutheran pastor, was born at Eichstedt in the Mark of Brandenburg, on the 23rd of February 1834. After medical study at the universities of Halle, Würzburg and Greifswald, he practised for a few years as a military surgeon. Finding the climate of his native country injurious to his health, he went to Algiers and Tunis, and took part, as a surgeon, in several expeditions into the interior of Africa, and in 1855 was sent thither as consul-general for the German empire, and remained there until 1884, when he was despatched by Prince Bismarck to West Africa as special commissioner, ostensibly to inquire into the condition of German commerce, but really to annex territories to the German flag. As the result of his mission Togoland and Cameroon were added to the German empire. On his return voyage he died at sea off Cape Palmas on the 20th of April 1885, and was buried at Grand Bassam.

Nachtigal's travels are summarized in Gustav Nachtigal's Reisen in der Sahara und im Sudan, by Dr Albert Frankel (Leipzig, 1887). A translation of the first volume of the work concerning Wadai, was published in the Bull. du comité de l'Afrique française for 1903 under the title of "Le Voyage de Nachtigal au Ouaddi." Nachtigal died before transcribing his notes on Wadai, and they were edited in the German edition by E. Groduck.

NÁDÁSY, TAMÁS I., Count, called the great palatine (1498-1562), Hungarian statesman, was the son of Francis I. Nádasy and was educated at Graz, Bologna and Rome. In 1521 he accompanied Cardinal Cajetan (whom the pope had sent to Hungary to preach a crusade against the Turks) to Buda as his interpreter. In 1525 he became a member of the council of state and was sent by King Louis II. to the diet of Spires to ask for help in the imminent Turkish war. During his absence the Mohács catastrophe took place, and Nádasy only returned to Hungary in time to escort the queen-widow from Komárom to Pressburg. He was sent to offer the Hungarian crown to the archduke Ferdinand, and on his coronation (Nov. 3rd, 1527) was made commandant of Buda. On the capture of Buda by Suleiman the Magnificent, Nádasy went over to John Zapolya. In 1530 he successfully defended Buda against the imperialists. In 1533 his jealousy of the dominant influence of Ludovic Gritti caused him to desert John for Ferdinand, to whom he afterwards remained faithful. He was endowed with enormous estates by the emperor, and from 1537 onwards became Ferdinand's secret but most influential counsellor. Subsequently, as ban of Croatia-Slavonia, he valiantly defended that border province against the Turks. He did his utmost to promote education, and the school which he founded at Új-Sziget, where he also set up a printing-press, received a warm eulogy from Philip Melanchthon. In 1540 Nádasy was appointed grand-justiciar; in 1547 he presided over the diet of Nagysombat, and finally, in 1559, was elected palatine by the diet of Pressburg. In his declining years he aided the heroic Miklós Zrínyi against the Turks.

See Mihály Horváth, The Life of Thomas Nádasy (Hung.) (Buda, 1873); The Nádasy, Family correspondence of Thomas Nádasy (Hung.) (Budapest, 1882). (R. N. B.)

NADEN, CONSTANCE CAROLINE WOODHILL (1858-1888), English author, was born at Edgbaston, on the 24th of January 1858, her father being an architect. Her mother died just after the child's birth, and Constance was brought up in the home of her grandfather. In 1871 she began to study physical science at Mason College, Birmingham. In 1881 she published Songs and Sonnets of Springtime; in 1887, A Modern Apostle, and other Poems. Her poems made such an impression on W. E. Gladstone that he included her, in an article in the Speaker, among the foremost English poetesses of the day. After her grandfather's death Miss Naden found herself rich, and she travelled in the East and then (1888) settled in London. She died on the 3rd of December 1889. After 1876 she had paid increasing attention to her friendship with her friend Dr Robert Lewins, and the two had formulated a system of their own, which they called "Hylo-Idealism." Her main ideas on the subject are contained in a posthumous volume of her essays (Induction and Deduction, 1890), edited by Dr Lewins.

NADIA, or NUDDEA, a district of British India, in the Presidency division of Bengal. The administrative headquarters are at Krishnagar. Area, 2793 sq. m.; pop. (1901) 7,667,401. It is a district of great rivers. Standing at the head of the Gangetic delta, its alluvial surface, though still liable to periodical inundation, has been raised by ancient deposits of silt sufficiently high to be permanent dry land. Along the entire north-eastern boundary flows the main stream of the Ganges or Padma, of which all the remaining rivers of the district are offshoots. The Bhagirathi on the eastern border, and the Jalangi and the Matabanga meandering through the centre of the district, are the chief of those offshoots, called distinctively the "Nadia rivers." But the whole surface of the country is interlaced with a network of minor streams, communicating with one another by side channels. All the rivers are navigable in the rainy season for boats of the largest burthen, but during the rest of the year they dwindle down to shallow streams, with dangerous sandbanks and bars. In former times the Nadia rivers afforded the regular means of communication between the upper valley of the Ganges and the seaboard; and much of the trade of the district still comes down to Calcutta by this route during the height of the rainy season. But the railways,
with the main stream of the Ganges and the Sundarbans route, now carry by far the larger portion of the traffic. Rice is the staple crop; but the district is not as a whole fertile, the soil being sandy and the methods of cultivation backward. It is traversed by the main line and also by several branches of the Eastern Bengal railway. The battlefield of Plassey was situated in this district, but the floods of the Bhágirathi have washed away part of it.

NADIA or NARADWP, an ancient capital of Bengal, was formerly situated on the east bank of the Bhágirathi, which has since changed its course. Pop. (1901) 10,886. It is celebrated for the sanctity and learning of its pundits, and as the birthplace of Chaitanya, the Valshnav reformer of the 16th century. Its Sanskrit schools, called tos, are well known and of ancient foundation.

NADIM [Abularrāj Mahommēd ibn Ṭsist ibn abide Ya'qūb un-Nadīm] (d. 902), of Bagdad, was the author of one of the most interesting works in Arabic literature, the Fihrist al-Ūlam ("the list of the books of all nations that were to be found in Arabic") with notices of the authors and other particulars. Aided down to 508 it is continued in the Leiden MS. places the death of the author eight years later. Of his life we know nothing. His work gives us a complete picture of the most active intellectual period of the Arabien empire. He traces the rise and growth of philology and belles-lettres, of theology, orthodox and heretical, of law and history, of mathematics and astronomy, of medicine and alchemy; he does not despise the histories of knights errant, the fables of Kalila and Dimna, the facetiae of the "boon companions," the works of magic and divination. But to us no part of his work is more interesting than his account of the beliefs of sects and peoples beyond Islam. Here, fortunately, still more than in other parts of his work, he goes beyond the functions of the mere cataloguer; he tells what he heard of China from a Christian missionary of Nejrān, of India from a description of its religion compiled for the Barmecide Yahya; his full account of the Sabians of Harran and of the doctrines of Mani are of the first importance for the historian of Asiatic religions.


NADIR [Arabic nadīr, "opposite to," used elliptically for naḍīr es-semt, "opposite to the zenith"], a term used in astronomy for the point in the heavens exactly opposite to the zenith, the zenith and nadir being the two poles of the horizon. It is thus used figuratively for the lowest depth of a person's spirits or the lowest point in a career.

NAEGELI, KARL WILHELM VON (1817-1891), Swiss botanist, was born on the 27th of March 1817 near Zurich. He studied botany under A. P. de Candolle at Geneva, and graduated with a botanical thesis at Zurich in 1840. His attention having been directed by M. J. Schleiden, then professor of botany at Jena, to the microscopical study of plants, he engaged more particularly in that branch of research. Soon after graduation he became Privat dozent and subsequently professor extraordinary, in the university of Zurich; in 1832 he was called to fill the chair of botany in the university of Freiburg-in-Breisgau; and in 1837 he was promoted to Munich, where he remained as professor until his death on the 11th of May 1891. Among his more important contributions to science were a series of papers in the Zeitschrift für wissenschaftliche Botanik (1844-1846); Die neuen Algensysteme (1847); Gattungen einzigeliger Algen (1849); Pflanzenphysiologische Untersuchungen (1855-1858), with C. E. Cramer; Beiträge zur wissenschaftlichen Botanik (1859-1868); a number of papers contributed to the Royal Bavarian Academy of Sciences, forming three volumes of Botanische Mitteilungen (1861-1881); and, finally, his volume, Mechanisch-physiologische Theorie der Abstammunglehre, published in 1884.

The more striking of his many and varied discoveries are embodied in the Zeitschr., f. wiss. Bot. In this we begin with Naegeli's extension to the vegetable kingdom of Schleiden's idea of the origin of the Cryptogams, and the assertion of its universal occurrence in plants, together with the recognition of its vesicular structure. There is much of Naegeli's investigation in the discovery of a thread-like cell-substance forming the wall of all normal cells, where he shows that it consists of granular "mucus," which, at an earlier stage, filled the cell-cavity, and which differs chemically from the cell-wall in that it is nitroso-vitriolic. This layer he proved to be never thrown from the protoplasm, and, in fact, itself the living part of the cell, a discovery which was simultaneously (1846) made by Hugo von Mohl (1805-1872), who gave to the living matter of the plant-body the name "protoplasm.

In connection with these discoveries, Naegeli contended for Schleiden's view of the universality of free-cell-formation as the mode of cell-multiplication, and showed that in the vegetative organs, at least, new cells are formed by division. In the Zeitschrift, too, is Naegeli's most important allogical work—such as the paper on Calystegia, which brought to light the remarkable unseparate structure of the Siphonae, and his research on Delesserie, which resulted in the discovery of growth by a single apical cell. This discovery led Naegeli on to the study of the growing-point in other plants. He consequently gave the first accurate account of the apical cell, and of the mode of growth of the stem in various Mosses and Liverworts. Subsequently he observed that in Lycopodium and in Angiospermas the growing-point has no apical cell, but consists of a small-celled meristem, in which the first differentiation of the permanent tissues can be traced. One of the most remarkable discoveries recorded in his works is that of Hainhainia mellea, an inhabitant of Arderea, and of Pilaquaria. The Beiträge zur wiss. Botanik consists almost entirely of researches into the anatomy of vascular plants, while the main feature of the Pflanzenphysiologische Untersuchungen is the work on the growth of the ferns and the structure of the various forms of starch-grains. The Botanische Mitteilungen include a number of papers in all departments of botany, many of them continuations and extensions of his earlier work. In his Theorie der Abstammungsgeschichte Naegeli introduced the idea of a definite material basis for heredity; the substance he termed "idiplasm." His theory of evolution is that the idiplasm of any one generation is not identical with that of either its progenitors or its progeny: it is always increasing in complexity, and the result that each successive generation marks an advance upon its predecessor. Hence variation takes place determinately, and in the higher direction only; but the affinity is not limited to the family, and it is often a matter of play, but a small part in evolution. Whereas, on the Darwinian theory, all organization is adaptive, according to Naegeli the development of higher organisation is the outcome of the spontaneous evolution of the idiplasm.

More detailed accounts of Naegeli's life and work are to be found in Nature, 16th October 1891, and in Proc. Roy. Soc., vol. lii. (S. H. V.)

NAESTVED, a town of Denmark, in the amt (county) of Præstø, near the S.W. coast of Zealand, 59 m. by rail S.W. of Copenhagen. Pop. (1901) 7167. From 1740 to the Reformation it was the mercantile centre of the northern part of the country, dependent upon the monastery of St Peter (founded here in 1135). North of the town (1½ m.) lies Herlufsholm, where Admiral Herluf Trolle founded a Latin school in 1567, still extant.

NAEVIIUS, GNAEUS (c. 264-7 104 B.C.), Latin epic poet and dramatist. There is great uncertainty in regard to his life. From the expression of Gellius (li. 24. 1) characterizing his epiphant as written in a vein of "Campanian arrogance" it has been inferred that he was born in one of the Latin communities settled in Campania. But the phrase "Campanian arrogance" seems to have been used proverbially for "gasconade" and; as, there was a plebeian tribune named Naevius of Rome in 296 B.C., it is even possible that he may have been a Roman citizen. He served either in the Roman army or among the socii in the first Punic War, and thus must have reached manhood before 241. His career as a dramatic author began with the exhibition of a drama in or about the year 235, and continued for thirty years. Towards the close he incurred the hostility of some of the nobility, especially, it is said, of the Metelli, by the attacks which he made upon them on the stage, and at their instance he was imprisoned (Plautus, Mil. Glor. 211). After writing two plays during his imprisonment, in which he is said to have apologized for his former rudeness (Gellius iii. 3. 19), he was liberated through the interference of the tribunes of the commons; but may still afterwards to retire from Rome (in or about 204) to Utica. It may have been during his exile, when withdrawn from his active career as a dramatist, that he composed or completed his
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poem on the first Punic war. Probably his latest composition was the epigraph already referred to, written like the epic in Saturnian verse:

"Immortales mortales si foret fas flere,
Ferent divae Camenae Naevium poetam;
Itaque in pois credo divas Artis
Obliti sunt Romai loquere lingua Latina." 1

If these lines were dictated by a jealousy of the growing ascendency of Ennius, the life of Naevius must have been prolonged considerably beyond 204, the year in which Ennius began his career as an author in Rome. As distinguished from Livius Andronicus, Naevius was a native Italian, not a Greek; he was also an original writer, not a mere adapter or translator. If it was due to Livius that the forms of Latin literature were, from the first, moulded on those of Greek literature, it was due to Naevius that much of its spirit and substance was of native growth.

Like Livius, Naevius professed to adapt Greek tragedies and comedies to the Roman stage. Among the titles of his tragedies are Aegisthus, Lycus, Andromache or Hector Profectus, Equus Trojana. The poet was one continuous work, but was divided into nine books. The national cast of his genius and temper was shown by his deviating from his Greek originals, and producing at least twenty-five lines of verse, which is more artistic than a rude copy of them, as those of Livius probably were, or an artistic copy like those of Terence. The titles of most of them, like those of Plautus, and unlike those of Caecilius and Terence, are Latin, not Greek. He drew from the writers of the old political comedy of Athens, as well as from the new comedy of manners, and he attempted to make the stage at Rome, as it had been at Athens, an arena of political and personal warfare. A strong spirit of partisanship is recognized in more than one of the fragments; and this spirit is thoroughly popular and adverse to the senatorial ascendency which became more and more confirmed with the progress of the senatorial party, the distinction of his position as a member of the aristocracy, the great Scipio is the object of a censorious criticism on account of a youthful escapade attributed to him. Among the few lines still remaining from his lost comedies, we seem to recognize the presence of that virulence of manner and of expression characteristic of the style of Plautus. There is also found that love of alliteration which is a marked feature in all the older Latin poets down even to Lucetius. In one considerable comic fragment attributed to him—the description of a croquet—there is great truth and shrewdness of observation. But we find no trace of the exuberant comic power and originality of his great contemporaries.

He was not only the oldest native dramatist, but the first author of an epic poem (Bellum Punicum)—which, by combining the representation of actual contemporary history with a mythical background, may be said to have created the Roman type of epic poetry. The poem was one continuous work, but was divided into seven books by a grammarian of a later age. The earlier part of it treated of the mythical adventures of Aeneas in Sicily, Carthage and Egypt; the later part was founded from the interview of Zeus and Themis in the first book of the Iliad the idea of the interview of Jupiter and Venus; which Virgil has made one of the cardinal passages in the Aeneid. The later part treated of the events of the first Punic war in the style of the Iliad, with all the grandeur of composition and vivid imagination which the flow of the native Saturnian verse, in contradistinction to the weighty and complex structure of the hexameter, was naturally adapted.

The impression we get of the man is that, whether or not he actually enjoyed the full rights of Roman citizenship, he was a

1 If it were permitted that immortals should weep for mortals, the divine Camenae would weep for Naevius the poet; for since he hath passed into the treasure-house of death men have forgotten at Rome how to speak in the Latin tongue.
tribes on the North-West Frontier. Since 1892, however, little trouble has been experienced.

See Nagah Hills District Gazetteer (Calcutta, 1905).

NAGAR, formerly Bednur, a village and ruined city of Mysore, India; pop. (1901) 715. About 1675 the seat of government of the rajas of Keladi was transferred to this place. When taken by Hyder Ali in 1763, it is said to have yielded a plunder of twelve millions. In 1783 it surrendered to a British detachment under General CARTER, but being shortly after invested by Tippoo Sultan, the garrison capitulated on condition of safe conduct to the coast. Tippoo violated the stipulation, put General CARTER and the principal officers on board a prison, and imprisoned the remainder of the force.

NAGARJUNA, a celebrated Buddhist philosopher and writer. He is constantly quoted in the literature of the later schools of Buddhism, and a very large number of works in Sanskrit is attributed to him. None of these has been critically edited or translated; and there is much uncertainty as to the exact date of his career, and as to his opinions. The most probable date seems to be the early part of the 3rd century A.D. He seems to have been born in the south of India, and to have lived under the patronage of a king of southern Kosala, the modern Chattisgarh. Chinese and Tibetan authorities differ as to the name of this monarch; but it apparently is meant to represent an Indian name Sattavāhana, which is a dynastic title, not a personal name. Of the works he probably wrote one was a treatise advocating the Mahāyānaka views of which he is the reputed founder; another a long and poetical prose work on the stages of the Bodhisattva career; and a third a voluminous commentary on the Mahāprajñāpāramitā Sūtra. Chinese translators had the benefit of him, and to him special knowledge of herbs, of astrology, of alchemy and of medicine. Two medical treatises, one on prescriptions in general, the other on the treatment of eye-disease, are said, by Chinese writers, to be by him. Several poems of a didactic character are also ascribed to him. The best known of these poems is the Friendly Epistle addressed to King Udayana. A translation into English of a Tibetan version of this piece has been published by Dr. Wenzel.

NAGASAKI, a town on the south-west of the island of Kyushu, Japan, in 30° 44' N., 130° 51' E., with 163,324 (1905) inhabitants, and about 5,800,000 (1901) within its limits (including Chinese). The first port of entry for ships coming from the south or the west to Japan, it lies at the head of a beautiful inlet some 3 m. long, which forms a splendid anchorage, and is largely used by ships coming to coal and by warships. Marine products, coal and cotton goods are the chief exports, and raw cotton, iron, as well as other metals and materials used for shipbuilding, constitute the principal imports. The value of imports approaches £4,000,000 annually. That of exports has fluctuated considerably. In 1889 it was £1,000,307, but in 1894 it was only £4,448,389, and does not generally exceed £450,000. The most important industries of the town are represented by the engine works at Kakashima, the large docks and a patent slip, the property of the Mitsui Bishi Company. Steamers of over 6000 tons have been constructed at these docks, which, as well as the engine works, are situated on the western shore of the inlet. The brisk atmosphere of business that pervades them does not reach the town on the eastern side, which lies under the shadow of forests of tomstone that cover the over-looking hills. Nagasaki is noted as a coaling station. The coal is obtained chiefly from Takashima, an island 8 m. S.E. of the entrance to the harbour, and in lesser quantities from two other islets, Naka-no-shima and Ha-shima, which lie about 1 m. farther out. These sources of supply, however, show signs of exhaustion. There are several favourite resorts in the neighbourhood of Nagasaki, notably Unzen, with its sulphur springs.

Nagasaki owed its earliest importance to foreign intercourse. Originally called Fukae-no-ura (Fukae Bay), it was included in the fief of Nagasaki Kotaro in the 12th century, and from him it took its name. But it remained an insignificant village until the 16th century, when, becoming the headquarters of Japanese Christianity, and subsequently the sole emporium of foreign trade in the hands of the Dutch and the Chinese, it developed considerable prosperity. The opening of the port of Mojiki for commerce destroyed Nagasaki of its monopoly as a coaling station, and the visits of war vessels to the port of Nanking acquired Port Arthur, Great Britain Wei-hai-wei and Germany Kiaochow. On the north side of the channel by which the harbour is entered there stands a cliff called Taksaboko, which, under the name of Pappenberg, has long been rendered notorious by a tradition that thousands of Christians were precipitated from it in the 17th century because they refused to trample on the Cross. It has been conclusively proved that the legend is untrue.

NAGAUR or NAGORE, a town in India, in Jodhpur state of Rajputana, with a station on the Jodhpur-Bikaner railway. Pop. (1901) 13,372. Nagaur is surrounded by a wall more than 4 m. in circuit. It has given its name to a famous breed of cattle.

NÄGELSCHACH, Carl Friedrich (1806-1859), German classical scholar, was born at Währing near Nuremberg on the 28th of March 1806. After studying at Erlangen and Berlin, he accepted in 1827 an appointment at the Nuremberg gymnasium, and was professor of classics at Erlangen from 1842 till his death on the 21st of April 1859. Nägelsbach is chiefly known for his excellent Lateinische Stilistik (1846; 9th ed. by Ivan Müller, 1905). Two other important works by him are Die Homeriche Theologie (1849; 3rd ed. by G. Autenrieth, 1886) and Die Nachhomeriche Theologie (1857).

See J. L. Doelscher, Gedächtnissrede für Herrn K. F. Nägelsbach (1890); article by G. Autenrieth in Allgemeine Deutsche Biographie, xxiii. (1886).

NAGINA, a town of British India, in Bijnor district of the United Provinces, on the Oudh & Rohilkhand railway, 48 m. N.W. of Moradabad. Pop. (1901) 21,412. There is considerable trade in sugar, besides manufactures of guns, glassware (especially bottles for the use of pilgrims carrying the sacred water of the Ganges from Hardwar), ebony wares, hemp-sacking and cotton cloth.

NAGODE, a native state of Central India, in the Baghelkhand agency. Area, 501 sq. m. Pop. (1901) 67,092, showing a decrease of 20% in the decade, due to famine; estimated revenue, £11,000. The chief, whose title is raja, is a Rajput of the Parhar clan. The town of Nagode is 17 m. W. of the British station of Sutna. Pop. (1901) 3887. It was formerly a military cantonment, and has an Anglo-vernacular school and dispensary. The former capital (until 1720) was Unchhara.

NAGOYA, the capital of the province of Owari, Japan, on the great trunk railway of Japan, 235 m. from Tokyo and 44 m. from Kioto. Pop. (1903) 284,829. It is the fifth of the chief cities in Japan. It lies near the head of the shallow Isenumi Bay, about 30 m. from the port of Yokkaichi, with which it communicates by light-draught steamers and by rail. The castle of Nagoya, erected in 1610, never suffered in war, but in modern times became a military depot; the interior contains much splendid decoration. The tower-like building of the castle is a remarkable structure, covering close upon half an acre, but rapidly diminishing in each of its five storeys till the top room is only about 12 yds. square. Gabled roofs and hanging rafters break the almost pyramidal outline; and a pair of gold-plated dolphins 8 ft. high form a striking finial. Both were removed in 1872, and one of them was at the Vienna Exhibition in 1873; but they have been restored to their proper site. The religious buildings of Nagoya include a very fine Buddhist temple, Higashi Hongwanji. Nagoya is well known as one of the great seats of the pottery trade; 173 m. distant are the potteries of Seto, where the first glazed pottery made in Japan was produced by Kato Shoshin, after whom is named the town of Shoshin, in 1729. From Kato's time Seto continued, during several centuries, to be the chief centre of ceramic production in Japan, the manufacture of porcelain being added to that of pottery in the 19th century. All the
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products of the flourishing industry now carried on there and at other places in the province are transported to Nagoya, for sale there or for export. Cotton mills have been established, and an extensive business is carried on in the embroidery of handkerchiefs. Another of its celebrated manufactures is arimatsu-shibori, or textile fabrics (silk or cotton), dyed so as to show spots in relief from which the colour radiates. It is further distinguished as the birthplace of dei sonnete enamelling in Japan, all work of that nature before 1385—when a new departure was made by Kaji Tsunekichi—having been for purposes of subordination and decoration. Quantities of dei sonnete enamels are now produced in the town.

NAGPUR, a city, district and division of British India, in the Central Provinces. The city is 1125 ft. above the sea; railway station, 520 m. E. of Bombay. Pop. (1901) 127,734. The town is well laid out, with several parks and artificial lakes, and has numerous Hindu temples. The prettily wooded suburb of Sitabdi contains the chief government buildings, the houses of Europeans, the railway station and the cantonments, with fort and arsenal. In the centre stands Sitabudi Hill, crowned by the fort. Beyond the station lies the broad sheet of water known as the Jama Talao, and farther south, within the city, completely hides the fortified town of Hamira. Handsome tanks and gardens constructed by the Mahrratta princes, lie outside the city. The palace, built of black basalt and profusely ornamented with wood-carving, was burnt down in 1864, and only the great gateway remains. The garrison consists of detachments of European and native infantry from Khandi. Nagpur is the headquarters of two corps of rifle volunteers. It is the junction of two important railway systems—the Great Indian Peninsula to Bombay and the Bengal-Nagpur to Calcutta. The large weaving population maintains their reputation for producing fine fabrics. There are steam cotton mills and machinery for ginning and pressing cotton. The town contains an important printing establishment and Education provided by two aided colleges—the Hislop and the Morris, called after a missionary and a former chief commissioner; four high schools; a law school; an agricultural school, with a class for the scientific training of teachers; a normal school; a zenna mission for the management of girls' schools; an Anglican and two Catholic schools for Europeans. There are several libraries and reading rooms, and an active Anjuman or Mohommedan society.

The District of Nagpur has an area of 384 sq. m. Pop. (1901) 751,844. It lies immediately below the great tableland of the Sâtpura range. A second line of hills shuts in the district on the south-west, and a third runs from north to south, paring the country into two plains of unequal size. These plains are all of the basaltic Sâtpuras, and nowhere attain any great elevation. Their heights are rocky and sterile, but the valleys and low lands yield rich crops of corn and garden produce. The western plain slopes down to the river Wardhâ, is watered by the Jam and Madâr, tributaries of the Wardhâ, and contains the most highly-tilled land in the district, abounding in fruit trees and the richest garden cultivation. The eastern plain (six times the larger), stretching away to the confines of Bhandâra and Chânda, consists of a rich undulating country, luxuriant with mango groves and dotted towards the east with countless small tanks. It is watered by the Kanhàn, with its tributaries, which flows into the Waimangâ beyond the district. The principal crops are millets, wheat, oil-seeds and cotton. There are steam factories for ginning and pressing cotton at the military cantonment of Kâmpi, which was formerly the chief centre of trades. An important new industry is manganese mining. The district is traversed by two lines of railway which meet at Nagpur city, and several branches are under construction.

The Division of Nagpur comprises the five districts of Nagpur, Bhandâra, Chânda, Wardhâ and Balaghat. Area, 23,521 sq. m. Pop. (1901) 3,728,653, showing a decrease of 9% in the decade. See NAGPUR District Gazetteer (Bombay, 1908).

NAGYKÁNIZSA, a town of Hungary, in the county of Zala, 137 m. S.W. of Budapest by rail. Pop. (1900) 25,255. It possesses distilleries and brick-making factories, and has trade in cereals and cattle. Nagykániizza once ranked as the second fortress of Hungary, and consequently played an important part during the wars with the Turks, who, having gained possession of it in 1600, held it until, in 1690, after a siege of two years, it was recovered by the Austrian and Hungarian forces. In 1702 the fortifications were destroyed.

NAGYKIKINDA, a town of Hungary, in the county of Torontál, 132 m. S.E. of Budapest by rail. Pop. (1900) 24,543, of which about 60% are Servians. Being one of the centres of production of the famous wheat of the Banat, its flour industry is important. Fruit-farming and cattle-rearing are extensively carried on in the neighbourhood.

NAGYSZEZEBEN (Ger. Hermannstadt, Rumanian Sibiul), a town of Hungary, in Transylvania, the capital of the county of Szeben, 122 m. S.S.E. of Kolozsvár by rail. Pop. (1900) 26,077, of whom 16,141 were Saxons (Germans), 7106 Rumanians, and 5747 Magyars. It is beautifully situated at an altitude of 1411 ft. in the fertile valley of the Cibin (Hungarian, Szeben), encircled on all sides by the Transylvanian Alps. It is the seat of a Greek Orthodox (Rumanian) archbishop, and of the superintendent of the Protocentist for the Transylvanian circle. Some parts of Nagyszeben have a picturesque appearance, with houses hidden in the old German style. The most notable public buildings is the handsome Protestant church, begun in the 14th century and finished 1520, in the Gothic style, containing a beautiful cup-shaped font, cast by Melzer Leonhardus in 1438, and a large mural painting of the Crucifixion by Johannes von Rosenau (1445). In the so-called New Church, comprising the west part of the whole building, which is an addition of the 16th century, are many beautiful memorials of Saxon notables. Other buildings are: the Roman Catholic parish church, founded in 1726; the church of the Ursuline nuns, built in 1474; the town hall, an imposing building of the 15th century, purchased by the municipality in 1545 and containing the archives of the "Saxon nation." The Brukenthal palace, built in 1777-1779 by Baron Samuel von Brukenthal (1727-1803), governor of Transylvania, contains an interesting picture-gallery with good examples of the Dutch school, and a library. The museum contains a natural history section with the complete fauna and flora of Transylvania, and a rich ethnographical section. Nagyszoben has a law academy, a seminary for Greek Orthodox priests, a military academy and several secondary schools. There are manufactures of cloth, linen, leather, caps, boots, soap, candles, ropes, as well as breweries and distilleries.

The German name of the town is traceable to Hermann, a citizen of Nuremberg, who about the middle of the 12th century established a colony on the spot. In the 13th century it bore the name of Villa Hermanni. Under the last monarchs of the native Magyar dynasty Hermannstadt enjoyed exceptional privileges, and its commerce with the East rose to importance. In the course of the 15th and 16th centuries it was several times besieged by the Turks. At the beginning of 1849 it was the scene of several engagements between the Austrians and Hungarians; and later in the year it was several times taken and retaken by the Russians and Hungarians.

NAGYZOMBAT (Ger. Tyrau), a town of Hungary, in the county of Pozsony, 115 m. N.W. of Budapest by rail. Pop. (1900) 12,422. It is situated on the Tnava, and has played an important rôle in the ecclesiastical history of Hungary. It gained prominence after 1543, when the archbishop of Esztergom and primate of Hungary made it his residence after the capture of Esztergom by the Turks. In consequence numerous churches and convents were built, and the town acquired the title of "Little Rome." It possesses a Roman Catholic seminary for priests, and was the seat of a university founded in 1635, which was transferred to Budapest in 1777. In 1820 the archbishop's residence was again removed to Esztergom. It has an active trade in cereals and cattle.

NAGY-VÁRAD (Ger. Grosswardein), a town of Hungary, capital of the county of Bihar, 153 m. E.S.E. of Budapest by rail. Pop. (1900) 47,018. It is situated in a plain on both banks of the river Szebes-kó, and is the seat of a Roman Catholic
and of a Greek (Old-United) bishopric. Among its principal buildings are the St Ladislaus parish church, built in 1733, which contains the remains of the king St Ladislaus (d. 1055), the Roman Catholic cathedral, built in 1752-1770, the Greek cathedral, the large palace of the Roman Catholic bishop, built in 1778 in the rococo style, the archaeological and historical museum, with an interesting collection of ecclesiastical art, and the county and town hall. Among the educational establishments are a law academy, a seminary for priests, a modern school, a Roman Catholic and a Calvinistic gymnasium, a commercial academy, a training school for teachers and a secondary school for girls. Nagy-Várád is an important railway junction; it possesses extensive manufactures of pottery and large distilleries, and carries on a brisk trade in agricultural produce, cattle, horses, fruit and wine. About 8 m. S. of the town is the village of Hajó, which contains the Püspök Fürdô or Bishop's Baths, with warm saline and sulphurous waters (92° to 105°F.), used both for drinking and bathing in cases of anaemia and scrofula.

Nagy-Várád is one of the oldest towns in Hungary. Its bishopric was founded by St Ladislaus in 1080. The town was destroyed by the Tatares in 1241. Peace was concluded here on the 24th of February 1358 between Ferdinand I. of Austria and his rival John Zápolya, voivode of Transylvania. In 1556 it passed into the possession of Transylvania, but afterwards reverted to Austria. In 1598 the fortress was unsuccessfully besieged by the Turks, but it fell into their hands in 1660 and was recovered by the Austrians in 1692. The Greek Old-United or Catholic bishopric was founded in 1776.

NAHE, a river of Germany, a left-bank tributary of the Rhine, rises near Selbach in the Oldenburg principality of Birkenfeld. For some distance it forms the boundary between the Bavarian Palatinate and the Prussian Rhine Province, and it falls into the Rhine at Bingen. Its length is 78 m., but it is too shallow and rocky to be navigable. Its picturesque valley, through which runs the railway from Bingerbrück to Neunkirchen, is largely visited by tourists.

See Schneegans, Geschichte des Nahetals (Kreuznach, 1890).

NAHUATLAN STOCK, a North and Central American Indian stock. Nahua or Nahuatlacaz was the collective name for the dominant Indian peoples of Mexico at the time of the Spanish conquest, and the Nahuatl stock consisted of the Nahua (or Aztecs) and a few scattered tribes in Central America.

NAHUM (Hebrew for "rich in comfort [is God]"), an Old Testament Book (after the book of Nahum in Nehemiah vii. 7 it is a scholiastic error for "Rehum.") Of the prophet himself all that is known is the statement of the title that he was an Elkoshite. But the locality denoted by the designation is quite uncertain. Later tradition associated Nahum with the region of Nineveh, against which he prophesied, and hence his tomb has been located at a place bearing the name of Alkush near Mosul (anc. Ninweh) and is still shown. According to Jerome, the prophet was a native of a village in Gallisce, which bore the name of Elkési in the 4th century A.D. (the Gallisean town of Capernaum, which probably means "village of Nahum,") may also point in the same direction; but cf. John vii. 27, who implies that in the time of Christ no prophet was supposed to have come out of Galilee. E. Nestle has proposed to locate Elkési "beyond Betogabra" (i.e. Eleutheropolis, mod. Beit Jibrin) in the tribe of Simeon (cf. Pal. Expl. Fund Quart. Statement, 1870, pp. 136-138).

BOOK OF NAHUM.—The original heading of Nahum's prophecy is contained in the second part of the superscription: "The book of the vision of Nahum the Elkoshite" (cf. the similar headings in Isaiah, Obadiah and Habakkuk). The first part: ("Oracle concerning Nineveh") is a late editorial insertion, but correctly describes the main contents of the little book.

Contents of the Book. (1) Chapters i. and ii.—The prophecy against Nineveh in its present form really begins with chap. ii. 1, followed immediately by ii. 2, and runs into iii. 1. vizi. (a) ii. 1, 3-10; (b) ii. 11-13; and (c) iii. Here (a) describes in language of considerable descriptive power the assault on Nineveh—

1 Jonah's grave has been located similarly in Nineveh itself.
NAIL VIOLIN—NAIRNE

the method of manufacture nails fall into four principal classes: (1) hand-wrought nails; (2) machine-wrought and cut nails; (3) wire or French nails; and (4) cast nails.

The nailer handicraft was formerly a great industry in the country around Birmingham. The nails are forged from nail-rods heated in a small smith's hearth, hammered on an anvil, the nail length cut off on a chisel and the head formed by dropping the spike into a hole in a "bolster" of steel, from which enough of the spike is left projecting to form the head. In the case of chisel nails the head is formed with two strokes of the hammer, while rose nails require four. The heads of the larger-sized nails are made with an "oilier" or mechanical hammer, and for ornamental or stamped heads "swages" or dies are employed. The conditions of life and labour among the hand nailers in England were exceedingly unsatisfactory: married women and young children of both sexes working long hours in small filthy sheds attached to their dwellings; their employment was controlled by middle-men or nail-masters, who supplied them with the nail-rods and paid for work done, sometimes in money and sometimes in kind on the truck system. Machine-wrought and cut nails have supplanted most corresponding kinds of hand-made nails. Horse nails are still made by strides made against its upper portion of the usual charcal iron, hammered out to a sharp point. They must be tough and homogeneous throughout, so that there may be no danger of their breaking over and leaving portions in the hoof.

In 1617 Sir D. Bulmer devised a machine for cutting nail-rods, and in 1700 T. Clifford patented a device for shaping the rods, but the credit of perfecting machine mainly belongs to American enterprise (the first American patent appears to be that of Ezekiel Reed, dated 1786). The machine, fed with heated (to black heat only) strips of metal, usually mild steel, having a breadth and thickness sufficient for the nail to be made, shears off by its slicer the "nail blank," which, falling down, is firmly clutched at the neck till a heading die strikes against its upper end and forms the head, the completed nail passing out through an inclined shoot. In large nails the taper of the shank and point is secured by the sectional form to which the strips are rolled; brads, sprgs and small nails, on the other hand, are cut from uniform strips in an angular direction from head to point, the strip being turned over after each blank is cut so that the points and heads are taken from opposite sides alternately, and a uniform taper on two opposite sides of the nail, from head to point, is secured. The machines turn out nails with wonderful rapidity, varying with the size of the nails produced from about 100 to 1000 per minute. Wire or French nails are made from round wire, which is unwound, straightened, cut into lengths and headed by a machine either by intermittent blows or by pressure, but the pointing is accomplished by the pressure of dies. Cast nails, which are cast in sand moulds by the ordinary process, are used principally for horticultural purposes, and the hobs-nails or tacks of shoemakers are also cast.

See Peter Barlow, Encyclopaedia of Arts, Manufactures and Machinery (1848); Bucknall Smith, Wire, Its Manufacture and Uses (New York, 1851).

NAIL VIOLIN (Ger. Nagelgeige, Nagelharmonica), a musical curiosity invented by Johann Wilde, a musician in the imperial orchestra at St. Petersburg. The nail violin or harmonica consists of a wooden soundboard about 14 ft. long and 1 ft. wide hinged into a semicircle. In this soundboard are fixed a number of iron or brass nails of different lengths, tuned to give a chromatic scale. Sound is produced by friction with a strong bow, strung with black horsehair. An improved instrument, now in the collection of the Hochschule in Berlin, has two half-moon sound-chests of different sizes, one on the top of the other, forming terraces. In the rounded wall of the upper sound-chest are two rows of iron staples, the upper giving the diatonic scale, and the lower the intermediate chromatic semitones. History records the name of a single virtuoso on this instrument, which has a sweet bell-like tone but limited technical possibilities; he was a Bohemian musician called Sena'l, who travelled all over Germany with his instrument about 1780-1790.

NAINI TAL, a town and district of British India, in the Kumaon division of the United Provinces. The town is 6400 ft. above sea-level. Pop. (1901) 7000. Naini Tal is a popular sanatorium for the residents in the plains, and the summer headquarters of the government of the province. It is situated on a lake, surrounded by high mountains, and is subject to landslides; a serious catastrophe of this kind occurred in September 1880. The approach from the plains is by the Rohilkhand and Kumaon railway from Bareilly, which has its terminus at Kathgodam, 22 m. distant by cart road. There are several European schools, besides barracks and convalescent depot for European soldiers.

The District of Naini Tal comprises the lower hills of Kumaon and the adjoining Tarar or submontane strip. Area, 2677 sq. m. Pop. (1901) 311,237, showing a decrease of 15.4% in the decade. The district includes the Gagar and other foothills of the Himalayas, which reach an extreme height of nearly 9000 ft. The Bahbar tract at their base consists of boulders from the mountains, among which the hill streams are swallowed up. Forests cover vast tracts of the hill-country and the Bahbar. Beyond this is the Tarai, moist and extremely unhealthy. Here the principal crops are rice and wheat. In the hills a small amount of tea is grown, and a considerable quantity of fruit. The only railway is the line to Kathgodam.

See Naini Tal District Gazetteer (Allahabad, 1904).

NAIRN, a royal, municipal and police burgh and county town of Nairnshire, Scotland. Pop. of the royal burgh (1901) 5089. It is situated on the Moray Firth, at the mouth of the Nairn and on its left bank, 151 m. N.E. of Inverness by the Highland railway. The town, though of immemorial age, shows no signs of its antiquity, being bright, neat and modern. It attracts many summer visitors by its good sea bathing and excellent golf-course. The industries include salmon fishing, deep-sea fishing, the making of rope and twine and the freestone quarries of the neighbourhood. There is a commodious harbour with warehouses and piers. Nairn has also a group of parliamentary burghs (Forres, Fortrose, Inverness and Nairn). Nairn was originally called Invermarne (the mouth of the Nairn). It was made a royal burgh by Alexander I. (d. 1124), but this charter having been lost it was confirmed by James VI. in 1580.

NAIRNE, CAROLINA, BARONNESS (1766-1845), Scottish song writer, was born in the "auld hoose" of Gask, Perthshire, on the 16th of August 1766. She was descended from an old family which had settled in Perthshire in the 13th century, and could boast of kinship with the royal race of Scotland. Her father, Laurence Oliphant, was one of the foremost supporters of the Jacobite cause, and she was named Carolina in memory of Prince Charles Edward. In the schoolroom she was known as "pretty Miss Car," and afterwards her striking beauty and pleasing manners earned for her the name of the "Flower of Strathearn." In 1806 she married W. M. Nairne, who became Baron Nairne (see below) in 1824. Following the example set by Burns in the Scots Musical Museum, she undertook to bring out a collection of national airs set to appropriate words. To the collection she contributed a large number of original songs, adopting the signature "B. B."—"Mrs Bogan of Bogan." The music was edited by R. A. Smith, and the collection was published at Edinburgh under the name of the Scottish Minstrel (1821-1824). After her husband's death in 1830 Lady Nairne took up her residence at Enniskerry, Co. Wicklow, but she spent much time abroad. She died at Gask on the 26th of October 1845.

Her songs may be classed under three heads: (1) those illustrative of the characters and manners of the old Scottish gentry, such as "The Laird o' Cockpen," "The Fife Laird," and "John Tod"; (2) Jacobite songs, composed for the most part to gratify her kinsman Robertson, the aged chief of Strowan, among the best known of which are perhaps "Wha 'll be King but Charlie!" "Charlie is my darling," "The Hundred Pipers," "He's owre the Hills," and "Bonnie Charlie's noo awa;" and (3) songs not included under the above heads, ranging over a variety of subjects from " Caller Herrin" to the "Land o' the
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Leal." For vivacity, genuine pathos and bright wit her songs are surpassed only by those of Burns. Lady Nairne's husband, William Murray Nairne (1737-1830). He was descended from Sir Robert Nairne of Strathord (c. 1630-1683), a supporter of Charles II., who was created Baron Nairne in 1681. After his death without issue the barony passed to his brother and William Murray (c. 1655-1750), the husband of his only daughter Margaret (1669-1747) and a younger son of John Murray, 1st marquess of Athole. William, who took the name of Nairne and became 2nd Baron Nairne, joined the standard of the Jacobites in 1715; he was taken prisoner at the battle of Preston and was sentenced to death. He was, however, paroloned, but his title was forfeited. His son John (c. 1691-1770), who but for this forfeiture would have been the 3rd Baron Nairne, was also taken prisoner at Preston, but he was soon set at liberty. In the rising of 1745 he was one of the Jacobite leaders, being present at the battles of Prestonpans, of Falkirk and of Culloden, and consequently he was attainted in 1746; but escaped to France. His son John (d. 1782) was the father of William Murray Nairne, who, being restored to the barony of Nairne in 1824, became the 5th baron. The male line became extinct when his son William, the 6th baron (1808-1837), died unmarried. The next heir was a cousin, Margaret, Baroness Keith of Stonehaven Marischal (1788-1867), wife of Auguste Charles Joseph, comte de Flahaut de la Billarderie, but she did not claim the title. In 1874, however, the right of her daughter, the wife of the 4th marquess of Lansdowne, was allowed by the House of Lords.

For Lady Nairne's songs, see Lay's from Strathearn, arranged with Symphonies and Accompaniments for the Pianoforte by Finlay Dun (1845); vol. i. of the Modern Scottish Minstrel (1857); Life and Songs of the Baroness Nairne, with a Memoir and Poems of Caroline Oliphant the Younger, edited by Charles Rogers (1860, new ed. 1890); also T. L. Kington-Ohlphant, Jacobite Lairs of Gaid (1870).

NAIRNSHIRE, a northern-eastern county of Scotland, bounded W. and S. by Inverness-shire, E. by Elginshire and N. by the Moray Firth. It has an area of 163,429 acres or 161-6 sq. m., and a coast line of 9 m. and is the fourth smallest county in Scotland. The seaboard, which is skirted by sandbanks dangerous to navigation, is lined by low dunes extending into Elginshire. Parallel with the coast there is a deposit of sand and gravel about 6 ft. thick, stretching inland for 2 miles. The undulating plain behind are a continuation westward of the fertile Laigh Moray. From this region southward the land rises rapidly to the confines of Inverness-shire, where the chief heights occur. Several of these border hills exceed 2000 ft. in altitude, the highest being Carn Glas (2162 ft.). The only rivers of importance are the Findhorn and the Nairn, both rising in Inverness-shire, the Findhorn after it leaves that county takes a mainly north-easterly direction down Strathearn for 17 m. and enters the sea to the north of Forres in Elginshire after a total course of 70 m. The Nairn, shortly after issuing from Strathnairn, flows towards the N.E. for 12 m. out of its complete course of 38 m. and falls into the Moray Firth at the county town. There are eight lochs, all small, but the loch of Clans is of particular interest because of its examples of crannogs, or lake-dwellings. Nairnshire contains many beautiful woods and much picturesque and romantic scenery.

Geology.—The county is divided geologically into two clearly-marked portions. The southern and larger portion is composed of the eastern, Dalradian or younger Highland schists with associated granite masses; this forms all the higher ground of the county. The northern part of the county bordering Moray Firth is occupied by Old Red Sandstone. The schistose rocks are mainly thin bedded mica-schists, greenstone and slate, and beds of Dallaichyle and Creag an Dainn a more massive higher horizon appears in the form of a synclinal fold. Porphyritic gneiss is found on the flanks of Carn nan tri-tighenan. The schists are frequently intersected by dikes of granite, amphibolite, and greenstone. The granite has been found penetrating the schists; the largest lies on the eastern boundary and extends from about Lethen Bar Hill southward by Ardclach and Glenfearsness to the Bridge of Dulsie. The second mass on the opposite side of the county belongs mainly to Inverness but the granite reaches into Nairn on the slopes of Bein nan Creagan and Ben Buide Mhor. A smaller mass near Rait Castle, with large pink crystals of orthoclase, has been employed as a building stone. One of the alleged sources of the schists of the Old Red Sandstone is the mediaeval castle of Nairn, and the supposed Granito de la Kylt is the name given to a deposit and formerly doubtless covered most of the county; outlying patches still remain near Drynanach Lodge and near Highland Boath in Muckie Burn. The Lower Old Red rocks are covered by a deposit of sands and gravels, followed by an outcrop of gravels and sands, followed by an Upper Boulder Clay, above which comes a series of gravel deposits forming ridges on the moorland between the Nairn and Findhorn rivers. A fine kame, resting on the deposits of sands and gravels, lies between Muckle Kiln and Loch Fleming, south of the railway. Traces of the old marine terraces at 100 ft., 50 ft. and 25 ft. are found near the coast, as well as considerable accumulations of blown sand.

Climate and Industries. The climate is moderate and equable. The temperature for the year averages 47° F., for January 38° F., and for July, 58° F. The mean annual rainfall is 25 in. The soil of the alluvial plain, or Laigh, is light and porous and careful cultivation has rendered it very fertile; and there is some rich land on the Findhorn. Although the most advanced methods of agriculture are in use, but a small proportion of the surface is capable of tillage, only one-fifth of the whole area being under crops. The hills are mostly covered with heath and pastures, suitable for sheep, and cattle are kept on the lower lying ground. The county enjoys many facilities for sport. A few distilleries, some sandstone and granite quarries and lime-kilns, and sawmills and sawyards are the industries of the shire, apart from agriculture. The Highland Railway from Forres to Inverness crosses the north of the shire.

Population and Government.—In 1891 the population numbered 91,181, of whom 15,901 persons were returned for the county town of Nairn (pop. 5089), there are the parishes of Ardciach (pop. 772), and Auldearn (pop. parish 1292, of village 313). Nairn and Elgin shires combine to return one member to parliament, and the county town belongs to the Inverness district group of parliamentary burghs (Forres, Fortrose, Inverness and Nairn). The shire forms a sheriffdom with Inverness and Elgin and a sheriff-substitute sits alternately at Nairn and Elgin.

History.—The country was originally possessed by the Gaelic or northern Picts. Stone circles believed to have been raised by them are found at Moyness, Auldearn, Urchany, Ballinravit, Dalcross and Croy, the valley of the Nairn being especially rich in such relics. To the north of Dulsie Bridge is a monolith called the Princess Stone. A greater number of the mysterious prehistoric stones with cup-markings occur in Nairn than anywhere else in Scotland. Mote hills are also common. Whether there was any effective Roman occupation of the land so far north is an open question, but there is little evidence of it in Nairn, beyond the occasional finding of Roman coins. Columba and his successors made valiant efforts to Christianize the Picts, and large numbers of Northmen who settled here in the long by are doubtless the saint's name was preserved late in the 10th century at the annual fair at Auldearn called "St. Colm's Market," while his biographer Adamnan—corrupted into Evan or Wean—was dedicated the church at Cawdor, where an old Celtic bell also bears this name. By the dawn of the 16th century the Picts had been subdued with the help of the Norsemen, and Nairn, which was one of the districts colonized by the Scandinavians, as part of the ancient province of Moray, soon afterwards became an integral portion of the kingdom of Scotland. Macbeth was one of the kings that Moray gave to Scotland, and his name and memory survive to the present day. Hardmuir, between Brodie and Nairn, is the reputed heath where Maccbeth met the witches. In the 13th century Moray possessed a bishopric and thenceforward the history of Nairn merges in the main that of the bishopric and earldom of Moray (see ELGON). The thane of Cawdor was constable of the king's castle at Nairn, and when the heritable sheriffdom was established towards the close of the 14th century this office was also filled by the thane of the time.

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Nairobi, capital of the British East Africa protectorate and of the province of Ukamba, 327 m. by rail N.W. of Mombasa and 257 m. S.E. of Port Florence on Victoria Nyanza. Pop.
NAJIBABAD, a town of British India, in the Bijnor district of the United Provinces, 31 m. S.E. of Hardwar. Pop. (1901) 19,568. It was founded in the middle of the 18th century by a Rohilla chief, and still contains several architectural monuments of Rohilla magnificence. It has a station on the Oudh & Rohilkhand railway, with a junction for the branch to Kotdwara. There is considerable trade in timber, sugar and grain, and manufactures of metal-ware, shoes, blankets and cotton cloth.

NAKCHEVAN, or NAKCHEVAR, a city of Russian Armenia, in the government of Erivan, 85 m. S.E. of the town of Erivan. It is situated on the brow of a spur of the Kara-baghi mountains, 2040 ft. above the sea, and looks out over the valley of the Aras. Pop. (1863) 6251, (1897) 8845. Built and rebuilt again and again, Nakchichevan is full of half-obiterated evidences of former prosperity. The present houses have for the most part been quarried from ancient ruins; of the palace of the princes of Azerbaijan there remains a gateway with a Persian inscription, flanked by two brick towers; and at a little distance stands the so-called Tower of the Khans, a richly decorated twelve-sided structure, 102 ft. in circumference and 75 ft. in height, dating, to judge by the inscription which runs around the cornice, from the 12th century. There are also ruins of a large mosque, erected on the height of Tabriz and bearing the name of a Persian governor; and there is a large transit trade. In the Persian period the city is said to have had 40,000 inhabitants; the population now consists chiefly of Tatars and Armenians, who carry on gardening, make wine and produce silk, salt and milkstoves.

Armenian tradition claims Noah as the founder of Nakchichevan (the Naxwana of Ptolomy), and a mound of earth in the city is still visited by many pilgrims as his grave. Laid waste by the Persians in the 14th century, Nakchichevan sank into comparative insignificance, but by the 16th century it had recovered its prosperity. In 1646 it was taken by Alp Arslan, sultan of the Seljuk Turks, and in the 17th century it fell a prey to the Mongols of Jenghiz Khan. It afterwards suffered frequently during the wars between the Persians, Armenians and Turks, and it finally passed into Russian possession by the peace of Turkman-chai in 1828.

NAKCHEVAN-ON-THE-DON, a town of southern Russia, in the Don Cossacks territory, 6 m. by rail N.E. of the town of Rostov and on the right bank of the Don. Pop. (1897) 30,885. It was founded in 1780 by Armenian immigrants. It soon became a wealthy place, and still is the administrative centre of the "Armenian district," a narrow strip along the banks of the Don, with a population of 27,730. The town has tobacco and wadding factories, tallow-melting works, soap-works, brickworks and tanneries. There is a large trade in cereals and timber.

NAKHON SRI TAMMARAT (also known as LAKHON and formerly as Ligor), a town of southern Siam, in the division of the same name, about 380 m. S. of Bangkok, on the east coast of the Malay Peninsula. It is one of the most ancient cities of Siam, and contains many buildings and ruins of antiquarian interest. The trade consists chiefly of the export of rice. In the bay, a short distance off, ships can lie safely at all seasons. The population (7000) is chiefly Siamese, but there is an admixture of Burmese, the descendants of prisoners of war and of refugees from Tenasserim. The town is the headquarters of a governor under the high commissioner at Singora. It has for long been a centre of the American Presbyterian Mission to Siam. It was once the capital of a feudatory state, the chief of which ruled the greater part of the Malay Peninsula in the name of the kings of Siam and bore the brunt of all the wars with Malacca and other Malay states. It lies, however, north of the limit of Malay expansion, and has never at any time come under Malay rule. With the fall of the Siamese capital of Ayuthia in 1767 it became independent, but returned to its allegiance on the founding of Bangkok. In the 17th century British, Portuguese and Dutch merchants had factories here and carried on an extensive trade.

NAKSKOV, a seaport of Denmark, in the amt (county) of Maribo, on a wide bay of the Laalands belt at the west end of the island of Laaland, 31 m. by rail W. of Nykjobing. Pop. (1901) 8310. The church dates from the beginning of the 12th century. There is a large sugar factory. A great dike,
extending S.E. to Röðby (20 m.), protects the coast against inundation, a serious inroad of the sea having occurred in 1872.

NAMAQUALAND, a region of south-western Africa, extending along the west coast over 600 m. from Damaraland (22° 43' S.) on the north to 31° S., and stretching inland 80 to 350 m. It is divided by the lower course of the Orange river into two portions—Little Namaqualand in the interior and Great Namaqualand to the north. Little Namaqualand forms part of Cape Colony (q.v.), and Great Namaqualand is the southern portion of German South-West Africa (q.v.). The people of Namaqualand are the purest surviving type of Hottentots, and number some twenty to thirty thousand.

NAMASUDRA, the name adopted by the great caste or tribe who inhabit the swamps of Eastern Bengal, India, whom the higher castes are wont to designate by the opprobrious term of Chandal. Their number in 1901 exceeded 2 millions; but if the cognate Ponds and also the Mahomedans of the same ethnical stock were to be added, the total would probably reach 11 millions.

NAME (O. Eng. nama; cognate forms in Teutonic languages are Dutch naam, Ger. Name, &c., but the word is common to all Indo-European languages; cf. Gr. ὄνομα, Lat. nomen, Sans. nāman, &c.), the distinguishing appellation by which a person, place, thing or class of persons or things is known.

Local Names.—The study of names and of their survival in civilization enables us in some cases to ascertain what peoples inhabited districts now tenanted by races of far different speech. Thus the names of mountains and rivers in many parts of England are Celtic—for example, to take familiar instances, Usk, Esk and Avon. There are also local names (such as Mona, Monmouth, Mynyw and others) which seem to be relics of tribes even older than the Celtic stocks, and "vestiges of non-Aryan people, whom the Celts found in possession both on the Continent and in the British Isles." The later English name is sometimes the mere translation, perhaps unconscious, of the earlier Celtic appellation, often added to the more ancient word. Penpole Point in Somerset is an obvious example of this redoubling of names. The pre-Aryan place-names of the Aegean are much discussed by philologists. Such a name as Corinthos, with all other words in athos, is hyaccinths, is thought to be pre-Hellenic. The river-names Gade, Ver, Test and many other monosyllabic river-names in the home counties, appear to be neither English nor Celtic, but have been neglected, being known to few but anglers and rustics. As to the meaning and nature of ancient local names, they are as a rule purely descriptive. A river is called by some word which merely signifies "the water"; a hill has a name which means no more than "the point," "the peak," "the castle." Celtic names are often of a more romantic tone, as Ardnamurchan, "the promontory by the great ocean," an admirable description of the bold and steep headland which breast the wash of the Atlantic. As a general rule the surviving Celtic names, chiefly in Ireland, Wales and Scotland, all contain some wide meaning of poetic appropriateness. The English names, on the other hand, commonly state some very simple fact, and very frequently do no more than denote property, such and such a town or hamlet, "ton" or "ham," is the property of the Billings, Uffings, Tootings, or whoever the early English settlers in the district may have been. The same attachment to the idea of property is exhibited in even the local names of petty fields in English parishes. Occasionally one finds a bit of half-humorous description, as when a sour, starred and weedy plot is named "starvacre"; but more usually fields are known as "Thompson's great field," "Smith's small field," "the fouracre," or the like. The name of some farmer or peasant owner or squatter of ancient date survives for centuries, attached to what was once his property. Thus the science of local names has an historical value. The names indicate the various races (Celtic, Roman and English in Great Britain) who have set in the form of names the seal of their possession on the soil. Again, the meanings of the names illustrate the characters of the various races. The Romans have left names connected with camps (castra, chesters) and military roads; the English have used simple descriptions of the baldest kind, or have exhibited their attachment to the idea of property; the Celtic names (like those which the red men have left in America, or the blacks in Australia) are musical with poetic fancy, and filled with the historical value of the mission of the race.

The British race carries with it the ancient names of an older people into every continent, and titles perhaps originally given to places in the British Isles by men who had not yet learned to polish their weapons of flint may now be found in Australia, America, Africa and the islands of the farthest seas. Local names were originally imposed in a handy local manner. The settler or the group of cave-men styled the neighbouring river "the water," the neighbouring hill "the peak," and these terms often still survive in relics of tongues which can only be construed by the learned.

Personal Names.—The history of personal names is longer and more complex, but proceeds from beginnings almost as simple. But in personal names the complexity of human character, and the gradual processes of tangling and disentangling the threads of varied human interest, soon come in, and personal names are not imposed once and for all. Each man in very early societies may have many names, in different characters and at different periods of his life. The oldest personal names which we need examine here are those which indicate, not an individual, but a group, held together by the conscious sense or less conscious sentiment of kindred, or banded together for reasons of convenience. An examination of customs prevalent among the most widely separated races of Asia, Africa, Australia and America proves that groups conceiving themselves to be originally of the same kin are generally styled by the name of some animal or other object (animate or inanimate) from which they claim descent. This object is known as the "totem" (see Totemism). The groups of supposed kin, however widely scattered in local distribution, are known as wolves, bears, turtles, suns, moons, cockatoos, reeds and what not, according as each group claims descent from this or that stock, and sometimes wears a mark representing this or that animal, plant or natural object. Unmistakable traces of the same habit of naming exist among Semitic and Teutonic races, and even among Greeks and Romans. The names chosen are commonly those of objects which can be easily drawn in a rude yet recognizable way, and easily expressed in the language of gesture. In addition to the totem names (which indicate, in each example, supposed blood-kindred), local aggregates of men received local names. We hear of the "hill-men," "the cave-men," "the bush-men," "the coast-men," "the men of the plain," precisely as in the old Attic divisions of Aktaoi, Pediaioi and so forth. When a tribe comes to recognize its own unity, as a rule it calls itself by some term meaning simply "the men," all other tribes being regarded as barbarous or inferior. Probably other neighbouring tribes also call themselves "the men" in another dialect or language, while the people in the neighbourhood are known by an opprobrious epithet, as Rakshasas among the early Aryan dwellers in India, or Eskimo (raw-eaters) in the far north of the American continent. Tribal names in Australia are often taken from the tribal term for "yes" or "no"; cf. Languedoc.

Leaving social for personal names, we find that, among most uncivilized races, a name (derived from some incident or natural object) is given at the time of birth by the parents of each newborn infant. Occasionally the name is imposed before the child is born, and the proud parents call themselves father and mother of such an one before the expected infant sees the light. In most cases the name (the earliest name) denotes some phenomenon of nature; thus Dobridzhofer met in the forests a young man who had a Gold-flower of clay, that is, "Dawn," his father having been named "Sun." Similar names are commonly given by the natives of Australia, while no names are more common among North-American Indians than those derived from sun, moon, cloud and wind.

The names of savage persons are not permanent. The name

first given is ordinarily changed (at the ceremony answering to confirmation in the church) for some more appropriate and descriptive nickname, and that, again, is apt to be superseded by various "honor-giving names" derived from various exploits. The common superstition against being "named" has probably produced the custom by which each individual has a secret name and is addressed, when possible, by some wide term of kinship, "brother," "father," and the like. The bad luck which is said to occur to Zulu customs as in Vedic myths attends the utterance of the real name is evaded by this system of addresses. Could we get a savage—an Iroquois, for example—to explain his titles, we would find that he is, say, "Morning Cloud" (by birth-name), "Hungry Wolf" (by confirmation name), "He that raises the white fellow's scalp" (by honor-giving name), of the Crane totem (by kinship and hereditary name, as understood by ourselves). When society grows so permanent that male kinship and paternity are recognized, the custom of patronymics is introduced. The totem name gives place to a gentile name, itself probably a patronymic in form; or, as in Greece, the gentile name gives place to a local name, derived from the deity. Thus a Roman is called Cæcilius; Julius is his gentile name (of the Julian clan); Caesar is a kind of hereditary nickname. A Greek is Thucydides (the name usually derived from the grandfather), the son of Olorus, of the deme of Halimius. This system of names answered the purposes of Greek and Roman civilization. In Europe, among the Teutonic races, the stock-names (conceivably totemistic in origin) survive in English local names, which speak of the "son" or "ham" of the Billings or Tootings. An examination of these names, as collected in Kemble’s Anglo-Saxons, proves that they were frequently derived from animals and plants. Such English names as: "noble Wolf," (Ethelewulfa), "Win," of "Var," and so forth clearly testify to a somewhat primitive and freer usage of society. Then came more vulgar nicknames and personal descriptions, as "Long," "Brown," "White" and so forth. Other names are directly derived from the occupation or craft (Smith, Fowler, Sadler) of the man to whom they were given, and yet other names were derived from places. The noble and landowner was called "of" such and such a place (the German von and French de), while the humbleman was called not "of" but "at" such a place, as in the name "Attewell," or merely by the local name without the particle. The "de" might also indicate merely the place of a person’s birth or residence; it was not a proof of noblesse. If we add to these names patronymics formed by the addition of "son," and terms derived from Biblical characters (the latter adopted after the Reformation as a reaction against the names of saints in the calendar), we have almost exhausted the sources of modern English and European names. A continual development of custom can be traced, and the analysis of any man’s family and Christian names will lead us beyond history into the manners of races devoid of literary records.

Greeks: Names.—The Greeks had only one, and no family, name; hence the name of a child was left to the discretion of the parents. The eldest son generally took the name of his paternal grandfather, girls that of their grandmother. Genuine patronymics (Phocion, son of Phocus), analogous compounds (Theophrastus, son of Theodorus), or names of similar meaning (Philomenus, son of Eros) also occur. Athenaeus divides names generally into (1) θεοπόρος, chiefly derivatives or compounds of the names of gods (Demetrius, Apollonius, Theodorus, Diodotus, Heracleitus, Diogenes); (2) ἄφες, simple or variously compounded names, especially such as were of good omen for a son’s future career (Aristides, Pericles, Sophocles, Alexander), although such hopes were frequently belied by the results. Instances of a subsequent change of name are not uncommon; thus, Plato and Theophrastus were originally Aristocles and Tyrtæus.

To avoid the ambiguity and confusion arising from the use of a single name, various expedients were adopted, the commonest being to add the father’s name—Διομεθεοτός Δημοτεόκρος, Ἀλκιβίδης ὁ Κλεονιοῦ. Sometimes the birthplace was added.
and any praenomen they pleased: L. Livius Andronicus, freedman of M. Livius Salinator. In the time of Caesar, the freedman took the praenomen L. and added in addition to his name one of the names of the latter; thus, Cicero calls his slave Dionysius M. Pomponius Dionysius as a token of friendship for T. Pomponius Atticus.

(J. H. F.)

Law.—The Christian name, i.e. the name given to a person at baptism, was transferred into the Christian church, dates from the earliest history of the Church. It is held that the practice of giving a name at baptism was possibly imitated from the Jewish custom of giving a personal name at circumcision. In England individuals were for long distinguished by Christian names only, and the surname (see below) or family name is still totally ignored by the Church. As population increased and intercourse became general, it became necessary to employ some further name by which one man might be known from another, and in process of time the use of surnames became universal, the only exceptions in England being the members of the royal family, who sign by their baptismal names only.

Where the ecclesiastical law does not conflict with the common law or has not been changed by it, it still prevails, and therefore it may be said that the name given at baptism may be regarded as practically unalterable. But that a baptismal name is not, in truth, of categorical force, is shown by the act of constitution of Archbishop Peckham (ob. 1292) directs that "ministers shall take care not to permit wanton names to be given to children baptized, and if otherwise be done, the same shall be changed by the bishop at his pleasure," whereas the Register of the Office for Confirmation must have contemplated the possibility of such a change, as the bishop is directed therein to ask the child's name before anointing him with the chrism, and afterwards, naming him according to the name granted by the bishop. But in the second and subsequent Prayer-books all mention of the name in the Office for Confirmation is omitted. Lord Coke was of opinion that such a change was permissible and gives examples (1 Inst. p. 5), but Dr Burn (Ecc. Law, i. 41) held a contrary opinion. Phillimore, however, gives several instances when such a change was made, one, in the diocese of Liverpool, on the 11th of June 1886 (see Phillimore, Ecc. Law, t. 517, 518; and Acts and Queries, 4th ser. vol. vi. p. 17, 717, etc.).

In the case of the adoption of a Christian name, a name (other than a surname) given them by their parents, such a name acquires force only by repute. The Registration of Births Act, 1875, does not provide for the insertion of a name, but such provision is purely permissive, and the only object of entering a name on the register is to have an authoritative record of the commencement of repute.

A clergyman of the Church of England is compelled to perform the ceremony of baptism when required by a parishioner, and to give whatever name or names the godparents select, but although the rubrics do not expressly say so, he can object to any name on religious or moral grounds.

The freedom enjoyed in England and the United States as to the kind of Christian name which may be given to a child is somewhat limited in France and Germany. In France, by a decree of the 11th September 1858, names or cognoms recorded as Christian names (prénom) of children were those of saints in the calendar and the names of personages known in ancient history. Even at the present day an official list is issued (revised from time to time) containing a selection of forenames of a Christian name of a child will be registered unless it occurs in this list. A limitation more or less similar prevails in Germany and other European countries.

As regards the surname (Fr. surnom, name in addition), custom has universally decreed that a man shall be known by the name of his father. But in England and the United States, at least, this custom has been transcended; thus, the surname, preventable from taking whatever name he has a fancy for, nor are there any particular formalities required to be observed on adopting a fresh surname; but, on the other hand, if a man has been known for a considerable time by the name of his father, or by a name of repute, and he changes it for another, he cannot compel others to address him or designate him by the new one. Neither does the English law recognize the absolute right of any person in any particular name to its use against all comers. Lord Brougham in his suit of Boulay v. Du Boulay, 1869, L. R. 2 P. C. 430, held that a person adopts a new name and wishes to have it publicly noticed and recognized as his own, he must assume it volitionally, and it is that by royal licence. This is by petition, prepared and presented through the Heralds' Office. If granted, the royal licence is given under the sign manual and privy seal of the sovereign, counter-signature is required thereon. In the United States, the distinction is often inserted whereby a testator or settler imposes upon the takers of the estate an obligation to assume his name and bear his arms. The stamp duty payable for a royal licence in this case is fifty pounds, but if the application is made for a voluntary, the stamp duty is ten pounds. Where there is a more formal adoption of a surname, it is usual, for purposes of publicity and evidence, to advertise the change of name in the newspapers and to execute a deed poll setting out the change, and enrol the same in the central office of the Supreme Court.

Both in France and Germany official authorization must be obtained before a change of name may be made. If the right to a new name is disputed by another or his interest is injured thereby, the person entitled can compel the abandonment of the new name.

A wife on marriage adopts the surname of her husband, disregarding entirely her maiden surname; in Scotland the practice usually is for the wife to retain her maiden name for all legal purposes, adding the name of her husband as an alias. On remarriage the rule applies unless to the contrary the act of parliament or the registration of the marriage by the certificate of registration, or some other exception to this is tacitly recognized in the case of a title acquired by marriage when the holder remarries a commoner. This exception was very fully discussed in Cowley v. Cowley, 1901, A.C. 450.

In England the United Kingdom when signing their names use only their surnames or peerage designations. It is merely a privileged custom, which does not go back further than the Stuart period. Peeresses sign by their Christian names or initials followed by their peerage designation. Bishops sign by their initials followed by the name of the see. In Scotland it is very usual for landowners to affix to their names the designation of their lands, and this was expressly sanctioned by an act of 1672.


(N. A. T.)

NAMUR, one of the nine provinces of Belgium. It lies between Hainault on the one side and Liège and Luxemburg on the other, and extends from Brabant up the Meuse valley to the French frontier. Area, 1,414 sq. m.; pop. (1904) 357,759. The north part of the Meuse is very fertile, but the rest is covered with forest and is little suited for agriculture. There are a few iron and coal-mines between the Sambre and Meuse, and the quarries are of great importance. Arboriculture, and especially fruit-tree plantation, is on the increase. The province is divided into the three arrondissements of Namur, Dinant and Philippeville, and there are fifteen cantons for judicial purposes.

NAMUR (Flemish, Namen), a town of Belgium, capital of the province of Namur. Pop. (1904) 31,940. It is most picturesquely situated at the junction of the rivers Sambre and Meuse, the town lying on the left banks of the two rivers, while the rocky promontory forming the fork between them is crowned with the old citadel. This citadel is no longer used for military purposes, and the hill on which it stands has been converted into a public park, while the crest is occupied by an enormous hotel to which access is gained by a cogwheel railway. Namur is connected with the citadel by two bridges across the Sambre, and from the east side of the promontory there is a fine stone bridge to the suburb of Jambes. This bridge was constructed in the 11th century and rebuilt in the reign of Charles V. It is the only old bridge in existence over the Meuse in the Belgian portion of its course. The cathedral of St Aubain or Albin was built in the middle of the 18th century. The church of St Loup is a century older, and is noticeable for its columns of red marble from the quarry at St Rémy near Rochefort. There is a considerable local industry in cutlery, and there are numerous tanneries along the river-side.

The site of the citadel is perhaps identical with Adaticum, the fortified camp of the Adatuci and destroyed by Julius Caesar after the defeat of the Nervii, although many authorities incline to the plateau of Hastédon, north of the Sambre and of Namur itself, as the more probable site of the Belgic position. Many antiquities of the Roman-Gallic period have been discovered in the neighbourhood and are preserved in the local archaeological museum. Here also are deposited the human fossils of the Stone Age discovered at Furfouze on the Loess. In the feudal period Namur was always a place of some importance, and long formed a marquisate in the Courtenay family. One institution of the medieval period came to modern times in the form of the confraternity of the religious of this name; the confraternity, however, has ceased to exist, and the Pope's dispensation to it was generally accompanied. This was the annual encounter on the Place d'Armes of rival parties mounted on stils. Galliot, the historian of Namur, says the origin of these jousts is lost in antiquity, but considers the use of stils was due
to the frequency with which the town was flooded before the rivers were embanked. Don John of Austria made Namur his headquarters during the greater part of his stay in the Netherlands, and died here in 1578. As a fortress Namur did not attain the first rank until after its capture by Louis XIV. in 1692, when Vauban endeavoured to make it impregnable; but it was retaken by William III. in 1695. The French recaptured it in 1702 and retained possession for ten years. In 1815 Marshal Grouchy on his retreat into France fought an action here with the Prussians under General Pirch. In 1888, under the new scheme of Belgian defence, the citadel and its detached works were abandoned, and in their place nine outlying forts were constructed at a distance of from 3 to 5 m. round the town. All these forts are placed on elevated hills, and are in their order, beginning on the left bank of the Meuse and ending on the right bank of the same river: (1) St Heribert, (2) Malonne, (3) Suarlée, (4) Emines, (5) Cognée, (6) Gélbressée, (7) Maizeret, (8) Andoy and (9) Davre. The whole position is correctly described as the "tête de pont" of Namur, and in addition to its strong bomb-proof forts it possesses great natural advantages for the defence of the intervals.

NANA FARNAVIS (1741–1800), the great Mahratta minister at Poona at the end of the 18th century. His real name was Babaji Janardhan Bhanu; but, like many other Mahrattas, he was always known by the name of Nana. Janardhan Bhanu was a maternal grandfather; Farnavis is the official title of the finance minister, derived from fard=an account and navis=a writer. He was born at Satara on the 4th of May 1741, and was the son of a Chitpavan Brahman, of the same class as the Peshwa, who held the hereditary office of Farnavis. He escaped from the fatal battle of Panipat in 1761; and from about 1774 was the leading personage in directing the affairs of the Mahratta confederacy, though never a soldier. This was the period when Peshwas rapidly succeeded one another, and there was more than one army acting under the name of Mahratta. Farnavis held together the confederacy against both internal dissensions and the growing power of the British. He died at Poona on the 13th of March 1800, just before the Peshwa placed himself in the hands of the British and thus broke up the Mahratta confederacy. In an extant letter to the Peshwa, the Marquess Wellesley thus describes him: "The able minister of your state, whose upright principles and honourable views and whose zeal for the welfare and prosperity both of the dominions of his own immediate superiors and of other powers were so justly celebrated."

See Captain A. Macnald, Memoir of Nana Farnavas (Bombay 1851).

NANAIMO, a city of British Columbia, on the east coast of Vancouver Island. Pop. (1906) about 6,500. It is connected with Victoria by the Esquimalt and Nanaimo railway, and has a daily steamer service to Vancouver, as well as to Comox, Sydney and other points on the coast. It is favourably situated for growing fruit, and mixed farming is carried on to a considerable extent. There is a large export trade in coal from the neighbouring mines, which is sent chiefly to San Francisco.

NANA SAHIB, the common designation of Dandu Panth, an adopted son of the ex-peshwa of the Maharratas, Baji Rao, who took a leading part in the great Indian Mutiny, and was proclaimed peshwa by the mutineers. Nana Sahib had a grievance against the British government because they refused to continue to him the pension of eight lakhs of rupees (£80,000) which was promised to Baji Rao by Sir John Malcolm on his surrender in 1818. This pension, however, was only intended to be a life grant to Baji Rao himself. For this refusal the Nana bore the British a lifelong grudge, which he washed out in the blood of women and children in the massacres at Cawnpore. In 1859, when the remnants of the rebels disappeared into Nepal, the Nana was among the fugitives. His death was reported some time afterwards, but his real fate remains obscure.

NANCY, a town of north-eastern France, the capital formerly of the province of Lorraine, and now of the department of Meurthe-et-Moselle, 219 m. E. of Paris on the railway to Strassburg. Pop. (1906), town, 98,322; commune (including troops), 110,370. Nancy is situated on the left bank of the Meurthe 6 m. above its junction with the Moselle and on the Marne-Rhine canal. The railway from Paris to Strasbourg skirts the city on the south-west side; other railways—to Metz, to Épinal, in l'Est, to Châlons, to Main and the Meuse, and the Ville-Vieille in the north-west between the Our Lady and the Pépinière gardens, with narrow and winding streets, and the Ville-Neuve. A large number of streets, allowing views of the hills around the city. Between the two hills, the Place Stanislas, a square worthy of a capital city: in the centre stands the statue of Stanislas Leczinski, ruler of Lorraine, and on all sides rise imposing buildings in the 18th century style—the town hall, an episcopal palace, theatre, etc. A fine triumphal arch erected by Stanislas in honour of Louis XV leads from the Place Stanislas to the Place Carrière, which forms a beautiful tree-plant promenade, containing at its further end the government palace (1766) now the residence of the general commanding the XX. army corps, and adjoins the so-called Pépinière (nursery) established by Stanislas. Other open spaces in the city are the Place d’Alliance (formed by Stanislas, with a fountain in memory of the alliance between Louis XV. and Maria Theresa in 1756), the Place de l’Académie, the Place Dombasle and the Place de Thiers, the two latter embellished with the statues of Mathieu Dombasle, the agriculturist, and Adolphe Thiers. The cathedral in the Ville-Vieille, built in the 18th century, has a wide façade flanked by dome-surmounted towers, and a somewhat frigid and sombre interior. Of particular interest is the church of the Cordeliers, in the old town, built by René II. about 1482 to commemorate his victory over Charles the Bold. Pillaged during the Revolution period, but restored to religious use in 1825, it contains the tombs of Stanislas de Vaudémont and of René the Younger, Philippe de Gueldres, second of René II., Henry III., Count of Vaudémont, and Isabella of Lorraine his wife, René II. (a monument ruined by his widow in 1512) and Cardinal de Vaudémont (d. 1587). Here also is a chapel built at the beginning of the 17th century to receive the tombs of the princes of the house of Lorraine. The church of St Évre, rebuilt between 1864 and 1874 on the site of an old church of the 13th, 14th and 15th centuries, has a fine spire and belfry and good stained glass windows. Bonsecours Church, at the end of the St Pierre Faubourg, contains the mausoleums of Stanislas (by Gobert) and his wife Catherine, and the tombs of his daughter Marie, queen of France, as well as the statue of Notre-Dame de Bonsecours, the object of a well-known pilgrimage. Of the old ducal palace, begun in the 15th century by Duke Raoul and completed by René II., there remains but a single wing, partly rebuilt after a fire in 1871. The entrance to this wing, which contains the archaeological museum of Lorraine, is a beautiful specimen of the late Gothic of the beginning of the 16th century. One of the greatest treasures of the collection is the tapestry found in the tent of Charles the Bold after the battle of Nancy. Of the old gates of Nancy the most ancient and remarkable is the Porte de la Craffe (1463). The town hall contains a museum of painting and sculpture, and there is a rich municipal library. A monument to President Carnot, and statues of Jacques Callot, the engraver, and of General Drouot, both natives of Nancy, and of Claude Gellée stand in various parts of the town.

Nancy is the seat of a bishop, a prefect, a court of appeal and a court of assizes, headquarters of the XX. army corps, and centre of an académie (educational division) with a university comprising faculties of Law, Medicine, Science and Letters, and a higher school of pharmacy. There are also tribunals of first instance and of commerce, a board of trade-arbitrators, lycées and training colleges for both sexes, a higher ecclesiastical seminary, a school of agriculture, the national school of forestry, a higher school of commerce, a technical school (école professionnelle), a school of arts and crafts (école préparatoire des arts et métiers), a chamber
of commerce and a branch of the Bank of France. The industries of Nancy include printing, brewing, cottage and woollen spinning and the weaving of cotton and woollen goods, and the manufacture of tobacco (by the State), of boots and shoes, straw hats, pottery, casks, embroidery, machinery, engineering material, farm implements and iron goods.

At the close of the 11th century Odoric of Nancy, brother of Gerard of Alsaee, possessed at Nancy a castle which enabled him to defy the united assaults of the bishops of Metz and Treves and the count of Bar. In the 12th century the town was surrounded with walls, and became the capital of the dukes of Lorraine; but its real importance dates from the 15th century, when through the marriage in 1477 Charles the Bold was defeated by René II. and perished at its gates.1 Enlarged, embellished and admirably refortified by Charles III., it was taken by the French in 1633 (Louis XIII. and Richelieu being present at the siege). After the peace of Ryswick in 1697 it was restored and Duke Leopold set himself to repair the disasters of the past. He founded academies, established manufactures and set about the construction of the new town. But it was reserved for Stanislas Leczinski, to whom Lorraine and Bar were assigned in 1736, to carry out the plans of improvement in a style which made Nancy one of the palatial cities of Europe, and of himself. The Prussians in 1870 wanted the last of the dukes of Lorraine. The city, which became French in 1766, was occupied by the allies in 1814 and 1815, and put to ransom by the Prussians in 1870. After the Franco-German war the population was greatly increased by the immigration of Alsation and of people from Metz and its district.


NANDAIR, or NANDAI, a town of India, in the state of Hyderabad, on the left bank of the Godavari, with a station on the Hyderabad-Godavari valley railway, 174 and 255 ft. above sea level. In 1822 it was the residence of the Nizam of Nurnur, a native prince, who was the hereditary chief of a powerful tribe of Warley or Lumbwa Indians. The present Nandair is a small town containing about 12,000 inhabitants. In 1681 it was captured from the Nandi-Lumbwa people, who were the original inhabitants of the district, and the town was rebuilt and the fortifications strengthened.

NANDGAON, a feudatory state of India, in the Chhattisgarh division of the Central Provinces. Area, 871 sq. m.; pop. (1901) 126,356, showing a decrease of 31% in the decade, due to famine; estimated revenue £25,000; tribute £4,000. The state has a peculiar history. Its foundation is traced to a religious celibate, who came from the Punjab towards the end of the 8th century, and of himself. The territory is ceded to the British in 1857, when it was formed into the state of Nandgaon, assigned to the Naidi family. The state has been feudatory to the British since that date, and has been occupied by the British in 1879, when the British government recognized the ruler as an hereditary chief and afterwards conferred upon him the title of Raja Bahadur.

NANDI, an East African tribe of mixed Nilotic, Bantu and Hamitic origin. With them are more or less closely allied the Lumbwa, correctly Lumbwa, Buret or Pure and L. or (Soot) tribes, as well as the Elgonyi (properly Kony) of Mount Elgon. They have also affinities with the Masai tribes. The Nandi-Lumbwa peoples inhabit the country stretching south from Mount Elgon to about 1° S. and bounded east by the escarpment of the eastern rift-valley and west by the territories of the tribes, such as the Kavirondo, dwelling round the Victoria Nyanza. They have given their name to the Nandi plateau. The Hamitic strain in these allied tribes is derived from the Galla; they also exhibit Pigmian elements. Their original home was in the north, and they probably did not reach their present home until the beginning of the 19th century. They differ considerably in physical appearance; some resemble the Masai, being men of tall stature with features almost Caucasian, other are dwarfish with markedly negro features. Like the Masai, Turkana and Suk, the Nandi-Lumbwa tribes were originally nomadic, but they have become agriculturists. They own large herds of cattle. They have a double administrative system, the chief medicine man or Orkoiot being supreme chief and regulating war affairs, while representatives of the people, called Kirughi, manage the ordinary affairs of the tribe. The medicine men are of Masai origin and the office is hereditary. The young men form a separate warrior class to whom is entrusted the care of the country. A period of about 7½ years is spent in this class, and during this time they are taught the art of making the cloak of the warriors, from which the succeeding "age" is of great importance. The arms of the warriors are a stabbing spear, shield, sword and club. Many also possess rifles. All the Nandi are divided into clans, each having its sacred animal or totem. They have no towns, each family living on the land it cultivates. The nuts are of circular pattern. The Nandi believe in a supreme deity—Aisia—who takes a benevolent interest in their welfare, and to whom prayers are addressed daily. They also worship ancestors and consider earthquakes to be caused by the spirits moving in the underworld. They practise circumcision, and girls undergo a similar operation. Spiritualism is a sign of blessing. Their scarcity clothing consists chiefly of dressed skins. The tribal mark is a small hole bored in the upper part of the ear. Their language is Nilotic and in general construction resembles the Masai. It has been slightly influenced by the Somali tongue. The primitive hunting tribe as the Wandorobo speak a dialect closely resembling Nandi. The Nandi at one time appear to have been subject to the Masai, but when the country was first known to Europeans they were independent and occupied the plateau which bears their name. Hardy mountainers and skilful warriors, they closed their territory to all who did not get special permission, and thus blocked the road from Mombasa to Uganda alike to Arab and Swahili. Caravans that escaped the Masai frequently fell victims to the Nandi, who were adepts at luring them to destruction. When the railway to the Victoria Nyanza was built it had to cross the Nandi country. The tribesmen, who had already shown hostility to the whites, attacked both the railway and the telegraph line and raided other tribes. Eventually (1903-1906) the Nandi were removed by the British to reserves somewhat north of the railway zone (see British East Africa). The present reserve is very small, and farther south still are the reserves of the Buret and Sotik.

See A. C. Hollis, The Nandi: Their Language and Folk-lore, with introduction by Sir Charles Eliot (Oxford, 1909), and the works there cited.

NANDIDRUG, a hill fortress of southern India, in the Kolar district of Mysore, 4851 ft. above the sea. It was traditionally held impregnable, and its storming by Lord Cornwallis in 1791 was one of the most notable incidents of the first war against Tipoo Sultan. It was formerly a favourite resort for British soldiers during the hot season.

NANGA, the most primitive form of the ancient Egyptian harp. The nanga consisted of a boat-shaped or vaulted body of wood, the back of which was divided down the centre by a sound bar built into the back; on this bar was fixed a cylindrical stick round which one end of the strings was wound, the soundboard or parchment being stretched over the back without interfering with the stick. The other end of the strings was fastened to pegs set in the side of a curved neck, so that the strings did not lie directly over the soundboard. There were but 3 or 4 strings, one note only being obtained from each. Some of these nangas are to be seen at the British Museum.

NANKEEN, a cotton cloth originally made in China, and now imitated in various countries. The name is derived from Nanking, the city in which the cloth is said to have been originally manufactured. The characteristic yellowish colour of nankeen is attributed to the peculiar colour of the cotton from which it was originally made.
NANKING ("the southern capital"), the name by which Kiang-ning, the chief city in the province of Kiangsu, China, has been known for several centuries. Pop. about 140,000. The city stands in 32° 5' N., 118° 47' E., nearly equidistant between Canton and Peking, on the south bank of the Yangtsze Kiang. It dates only from the beginning of the Ming dynasty (1368), although it is built on the site of a city which for more than two thousand years figured under various names in the history of the empire. The site of the third capital of China was chosen by Kao-tung; under the Han dynasty (206 B.C.-9 A.D.) its name was converted into Tan-yang; by the T'ang emperors (A.D. 618-907) it was styled Kiang-nan and Sheng Chow; by the first sovereign of the Ming dynasty (A.D. 1368-1644) it was created the "southern capital" (Nan-kung), and was given the distinctive name of Ying-t'ien; and since the accession to power of the present Manchu rulers it has been officially known as Kiang-ning, though still popularly called Nan-king. It was the seat of the imperial court only during the reigns of the first two emperors of the Ming dynasty, and was deserted for Shun-t'ien (Peking) by Yu Chien, third sovereign of the line, who in 1405 captured the town and usurped the crown of his nephew, the reigning emperor. The T'ai-p'ing rebels, who carried the town by assault in 1853, swept away all the national monuments and most of the more conspicuous public buildings it contained, and destroyed the greater part of the magnificent wall which surrounded it. This wall is said by Chinese topographers to have been 66 li, or 32 m., in circumference. This computation has, however, been shown to be a gross exaggeration, and it is probable that 60 li, or 20 m., would be a more accurate and trustworthy estimate. The outer walls, rising 8 ft. and 9 ft., and containing 28 gates, were nearly 30 ft. thick. The encircling wall of the inner city was about 60 ft. thick, measured at the base, and was pierced by thirteen gates. The north-east corner of the city contains the imperial palace reared by Hung-wu, the founder of the modern city. After suffering mutilation at the overthrow of the Ming dynasty, this magnificent building was burnt to the ground on the recapture of the city by the T'ai-p'ing rebels in 1864. But beyond comparison the most conspicuous public building at Nanking is the famous porcelain pagoda, 75 ft. high, erected by the emperor Yung-lo (1425-1428) to commemorate the virtues of his mother. Twelve centuries previously an Indian priest deposited on the spot where this monument afterwards stood a relic of Buddha, and raised over the sacred object a small pagoda of three stories in height. During the disturbed times which heralded the close of the Yuan dynasty (1368) this pagoda was utterly destroyed. It was doubtless out of respect to the relic, which then perished that Yung-lo chose this site for the erection of his "token-of-gratitude" pagoda. The building was begun in 1415. But before it was finished Yung-lo had passed away, and it was reserved for his successor to see the final pinnacle fixed in its place, after nineteen years had been consumed in carrying out the designs of the imperial architect. In shape the pagoda was an octagon, and was about 260 ft. in height, or, as the Chinese say, with that extraordinary love for inaccurate accuracy which is peculiar to them, 32 chang (a chang equals about 170 in.) 8 ft. 4 in. and 9/8 of an inch. The outer walls were cased with bricks of the finest white porcelain, and each of the nine stories into which the building was divided was marked by overhanging eaves composed of green glazed tiles of the same material. The summit was crowned with a gilt ball fixed on the top of an iron rod, which in its turn was encircled by nine iron rings. Hung on chains which stretched from this apex to the eaves of the roof were five large pearls of good augury for the safety of the city. One was supposed to avert floods, another to prevent fires, a third to keep dust-storms at a distance, a fourth to allure tempests, and a fifth to guard the city against disturbances. From the eaves of the several stories there hung one hundred and fifty-two bells and countless lanterns. In bygone days Nanking was one of the chief literary centres of the empire, besides being famous for its manufacturing industries. Satin, crape, nankeen, cloth, paper, pottery, and artificial flowers were among its chief products. At Nanking, after its capture by British ships in 1842, Sir Henry Pottinger signed the "Nanking treaty." It was made a treaty port by the French treaty of 1858, but was not formally opened. Its proximity to Chinkiang, where trade had established itself while Nanking was still in the hands of the rebels, made its occupation of little advantage, and the point was not pressed. In 1859 it was voluntarily thrown open to foreign trade by the Chinese government, and in 1900 it was connected by railway (192 m. long) with Shanghai. Since 1880 Nanking has been slowly recovering from the ruin caused by the T'ai-p'ing rebellion. Barely one-fourth of the area within the walls has been reoccupied, and though its ancient industries are reviving, no great progress has been made. As the seat of the provincial government of Kiang-nan, however, which embraces the three provinces of Kiang-su, Kiang-si, and N'gan-hai, Nanking is a city of first-class importance. The approach to Nanking is the most pleasant of all the provincial satraps, as he controls a larger revenue than any other, and has the command of larger forces both naval and military. He is also superintendent of foreign trade for the southern ports, including Shanghai, a position which gives him great weight in all political questions. The city contains an arsenal for the manufacture of munitions of war, also powder-mills. A naval college was opened in 1890, and an imperial military college a few years later under foreign instructors. The only foreign residents are missionaries (mostly American), and employees of the Imperial Government. The walls of Nanking are 16 ft. thick in some points, 12 ft. in others, and about 9 ft. in most parts, and are on a level with the top of the houses outside. The worst part of Nanking is the so-called Ming Tombs, being the mausolea of Hung-wu, the founder of the Ming dynasty, and of one or two of his successors, which lie outside the eastern wall of the city. They are ill cared for and rapidly going to decay. Since 1899 the foreign trade has shown a steady increase.

NANNING a treaty port in the province of Kwangsi, China, on the West river, 250 m. above Wuchow and 470 m. from Canton. Pop. about 40,000. It is the highest point accessible for steam traffic on the West river. From Canton to Wuchow the river has a minimum depth of 8 ft., but on the section from Wuchow to Nanning, as the most populous of all the provincial capitals, the river is under 8 ft. at times during the winter. The town is the chief market on the southern frontier. Its opening was long opposed by the French government, who had acquired the right to build a railway to it from Tongking, by which they hoped to divert the trade through their own possessions. Navigation by small native boats is open westwards as far as Paise.

NANSEN, FRIDTJOF (1861-- ), Norwegian scientist, explorer and statesman, was born at Froen near Christiania on the 10th of October 1861. His childhood was spent at this place till his fifteenth year, when his parents removed to Christiansaas, where he went to school. He entered Christiania university in 1880, where he made a special study of zoology; in March 1882 he joined the sealing-ship "Viking" for a voyage to Greenland waters. On his return in the same year he was appointed curator of the Bergen Museum, under the eminent physician and zoologist Daniel Cornelius Danielssen (1815-1894). In 1886 he spent a short time at the zoological station at Naples. During this time he wrote several papers and memoirs on zoological and histological subjects, and for one paper on "The Structure and Combination of the Histological Elements of the Central Nervous System" (Bergen, 1887) the Christiania university conferred upon him the degree of doctor of philosophy. But his voyage in the "Viking" had indicated Greenland as a possible field for exploration, and in 1887 he set about preparations for a crossing of the great ice-field which covers the interior of that country. The possibility of his success was discountenanced by many Arctic authorities, and a small grant he had asked for was refused by the Norwegian government, but was provided by Augustin Gamel, a merchant of Copenhagen, while he paid from his private means the greater part of the expenses of the expedition. As companions Nansen had Otto Neumann (overtrup (b. 1855),
Captain O. C. Dietrichson (b. 1856), a third compatriot, and two Lapps. The expedition started in May 1888, proceeding from Leith to Iceland, and there joining a sealing-ship bound for the east coast of Greenland. On the 17th of July Nansen decided to leave the ship and force a way through the ice-belt to the land, about 10 m. distant, but the party encountered great difficulties owing to ice-pressures, went adrift with the ice, and only reached the land on the 29th, having been carried far to the south in the interval. They made their way north again, along the coast inside the drift ice, and on the 16th of August began the ascent of the inland ice. Suffering severely from storms, intense cold, and other hardships, they reached the highest point of the journey (6920 ft.) on the 3th of September, and at the end of the month struck the west coast at the Amearkik Fjord. On reaching the settlement of Godthaab it was found that the party must winter there, and Nansen used the opportunity to study the Eskimos and gather material for his book, *Eskimo Life* (English translation, London, 1893). The party returned home in May 1889, and Nansen's book, *The First Crossing of Greenland* (English translation, London, 1890), demonstrates the valuable scientific results of the journey. A report of the scientific results was published in *Petersmanns Mitteilungen* (Gotha, 1892). On his return from Greenland Nansen accepted the curatorship of the Zoological Museum of Christiania university. In September 1889 he married Eva, daughter of Michael Sars of Christiania university, and a noted singer (d. 1907).

In 1890 he propounded his scheme for a polar expedition before the Norwegian Geographical Society, and in 1892 he laid it before the Royal Geographical Society in London (see "How can the North Polar Region be crossed?" *Geogr. Journal*, vol. i.), by which time his preparations were well advanced. His theory, that a drift-current sets across the polar regions from Bering Strait and the neighbourhood of the New Siberia Islands towards the east coast of Greenland, was based on a number of indications. Doubtless the discovery (1854) of the ice off the south-west coast of Greenland, of relics of the American north polar expedition in the ship "Jeannette," which sank N.E. of the New Siberia Islands in 1851. His intention was therefore to get his vessel fixed in the ice to the north of Eastern Siberia and let her drift with it. His plan was adversely criticized by many Arctic authorities, but it succeeded. The Norwegian parliament granted two-thirds of the expenses, and the rest was obtained by subscription from King Oscar and private individuals. His ship, the "Fram" ("i.e. "Forward"), was specially built of immense strength and peculiar form, being pointed at both ends and having a sloping side, so that the vessel, pressing together, should tend, not to crush, but merely to slip beneath and lift her. She sailed from Christiania on the 24th of June 1893. Otto Sverdrup was master; Sigurd Scott Hansen, a Norwegian naval lieutenant, was in charge of the astronomical and meteorological observations; Henrik Greve Blessing was doctor and botanist; and among the rest was Frederik Hjalmar Johansen, lieutenant in the Norwegian navy, who shipped as fireman. On the 22nd of September the "Fram" was made fast to a floe in 78° 59' N., 138° 37' E.; shortly afterwards she was frozen in, and the long drift began. The pressure of the ice perfectly. During the winter of 1894-1895 it was decided that an expedition should be made northward over the ice on foot in the spring, and on the 14th of March 1895 Nansen, being satisfied that the "Fram" would continue to drift safely, left her in 84° N., 101° 55' E., and started northward accompanied by Johansen. On the 8th of April they turned back from 86° 14' N., the highest latitude then reached by man; and they shaped their course for Franz Josef Land. They suffered many hardships, including shortage of food, and were compelled to winter on Frederik Jackson Island (so named by Nansen) in Franz Josef Land from the 26th of August 1895 to the 19th of May 1896. They were uncertain as to the locality, but, after having reached 80° N. on the south coast of the islands, they were travelling westward to reach Spitsbergen, when, on the 17th of June 1896, they fell in with Frederick Jackson and his party of the Jackson-Harmsworth expedition, and returned to Norway in his ship, the "Windward," reaching Vardø on the 13th of August. After a stay of two months in London ("Fram" returned to Norway in safety. She had drifted north after Nansen had left her, to 85° 57', and had ultimately returned by the west coast of Spitsbergen. An unprecedented welcome awaited Nansen. In England he gave the narrative of his journey at a great meeting in the Albert Hall, London, on the 8th of February 1897, and elsewhere. He received a special medal from the Royal Geographical Society, honorary degrees from the universities of Oxford and Cambridge, and a presentation of books (the "Challenger" Reports) from the British government, and similar honours were paid him in other countries. The English version of the narrative of the expedition is entitled *Northwest Passage* (London, 1897), and the scientific results are given in *The Norwegian North Polar Expedition 1893-1896; Scientific Results* (London, &c., 1900 seq.).

In 1905, in connexion with the crisis between Norway and Sweden, which was followed by the separation of the kingdoms, Nansen for the first time actively intervened in politics. He issued a manifesto and many articles, in which he adopted an attitude briefly indicated by the last words of a short work published later in the year: "Any union in which the one people is restrained in exercising its freedom is and will remain dangerous." (*Norway and the Union with Sweden*, London, 1905). On the establishment of the Norwegian government in 1905, he was appointed minister to England (1906), and in the same year he was created G.C.V.O.; but in 1908 he retired from his post, and became professor of oceanography in Christiania university.

**Nansen, Hans** (1598-1667), Danish statesman, son of the burgher Evert Nansen, was born at Flensburg on the 28th of November 1598. He made several voyages to the White Sea and to places in northern Russia, and in 1621 entered the service of the Danish-icelandic Company, then in its prime. For many years the whole trade of Iceland, which he frequently visited, belonged to the Danes, and he became equally well known at Gläckstadt, then the chief emporium of the Iceland trade, and at Copenhagen. In February 1644, at the express desire of King Christian IV., the Copenhagen burgesses elected him burgomaster. During his northern voyages he had learnt Russian, and was employed as interpreter at court whenever Muscovite embassies visited Copenhagen. His travels had begotten in him a love of geography, and he published in 1633 a "Kosmografi," previously revised by the astronomer Longomontus. During the siege of Copenhagen by the Swedes in 1658 he came prominently forward. At the meeting between the burgess members of the Norwegian department of the States, Nansen urged the necessity of an obstinate defence. It was he who on this occasion obtained privileges for the burgesses of Copenhagen which placed them on a footing of equality with the nobility; and he was the life and soul of the garrison till the arrival of the Dutch fleet practically saved the city. These eighteen months of storm and stress established his influence in the capital once for all and at the same time knitted him closely to Frederick III., who recognized in Nansen a man after his own heart, and made the great burgomaster his chief instrument in carrying through the anti-aristocratic Revolution of 1656. Nansen used all the arts of the agitator with extraordinary energy and success. His greatest feat was the impassioned speech by which, on October 8th, he induced the burgesses to accede to the proposal of the magistracy of Copenhagen to offer Frederick III. the realm of Denmark as a purely hereditary kingdom. How far Nansen was content with the result of the Revolution—absolute monarchy—it is impossible to say. It appears to be pretty certain that, at the beginning, he did not want absolutism. Whether he subsequently regarded the victory of the monarchy and its corollary, the admittance of the middle classes to all offices and dignities, as a satisfactory equivalent for his original demands; or whether he was so overborne by royal favour as to sacrifice cheerfully the political liberties of his country, can only be a matter for conjecture. After the Revolution Nansen continued in high honour, but
he chiefly occupied himself with commerce, and was less and less consulted in purely political matters. He died on the 12th of November 1667.

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NANTERRE, a town of northern France, with a port on the Seine, in the department of Seine, at the foot of Mount Valenier, 8 m. N.W. of Paris on the railway to St Germain. Pop. (1906), town, 11,874; commune, 17,434. The principal manufactures are chemicals, tallow and aluminium; stone quarried in the vicinity; the town is noted also for its cakes. The combined prison and mendicity depot for the department is a large institution, about 2 m. from the town. Nanters (the ancient Nemplidurum or Nematodurum) owes its origin to the shrine of the patron-saint of Paris, whose name is still associated with various places in the town and district. The shrine is the object of a pilgrimage in September.

NANTES, a city of western France, capital of the department of Loire-Inférieure, on the right bank of the Loire, 35 m. above its mouth, at the junction of the Orleans, Western and State railways, 55 m. W.S.W. of Angers by rail. In population (town, 118,244; commune, 153,427, in 1906) Nantes is the first city of Brittany. The Loire here divides into several branches forming islands over portions of which the city has spread. It receives on the left hand the Sèvre Nantaise, and on the right the Erdre. Both rivers hamper the navigation, and the port is consequently not large. The Erdre is navigable by river craft for the whole length of the river. The principal river port is Le Grand-Port. The Nantes Port is situated at the mouth of the Erdre. The Erdre, extending between the island of Nantes and the peninsula of St. Malo, is divided into two branches, the Saint-Félix and the Madeleine. The Erdre and the Loire are navigable for a distance of 27 miles. In the port are two quays, the Port Saint-Nicolas, and the Port Saint-Michel. The Erdre is navigable for 12 miles, and the Loire for 180 miles, above Nantes. Nantes and its port were of considerable importance in the 15th and 16th centuries, and the manufacture of coal (a vast granite building now used as a bonded warehouse) are of interest. Nantes has two great hospitals—St. Jacques on the left bank of the Loire, and the Hotel-Dieu in Gloriette Island. It is the seat of a bishopric and a court of assizes, and headquarters of the XI. army corps; it has tribunals of first instance and of commerce, a board of trade-arbitrators, a chamber of commerce and a branch of the Bank of France. The educational institutions include lycées for both sexes, a training college for girls, schools of medicine and pharmacy and law, a preparatory school for both instruction in letters and science, schools of music, art and navigation, technical and commercial schools, and a school for deaf-mutes and the blind.

Among the more important industries of Nantes are sugar-refining, flour-milling, rice-husking, the manufacture of oil, soap, flour pastes and biscuits, and the preparation of tinned provisions (sardines, vegetables, &c.); the manufacture of tin boxes, tins, chemical manures, acid from chestnut bark, tobacco, leather, wood-pulp for paper, rope, boots and shoes, brushes and glass; saw-milling, shipbuilding, metal founding, and the construction of engineering material; and wool and cotton-spinning, and the manufacture of cotton goods (other fabrics, hosiery and knitted goods). Coal and patent fuel (chiefly from Great Britain) are the most important imports; next come phosphates and pyrites; other imports are timber and pulp-wood. The principal exports are bunker-coal (to French colonies), pyrites, slate, hoops and provisions. In the ten years 1898-1907 the average annual value of the imports was £2,657,000; of the exports £795,000. In 1907 there entered from foreign countries 738 vessels (209 British) with tonnage of 384,350, and cleared 778 with 154,720 tons of cargo, and 458,538 tons of ballast. Reckoning ships carrying cargo only the figures for the first and last years of the decade 1898-1907 were: 1898, ships entered, French 209 (tonnage 75,249), foreign 250 (tonnage 154,936); ships cleared, French 173 (tonnage 32,951), foreign 97 (tonnage 27,836). 1907, ships entered, French 186 (tonnage 127,633), foreign 419 (tonnage 361,002); ships cleared, French 126 (tonnage 81,299), foreign 128 (tonnage 45,181).

Before the Roman occupation Nantes was the chief town of the Namnetes and consisted of Condivodium, lying on the hills away from the river, and of Portus Nonnatum, on the river. Under the Romans it became a great commercial and administrative centre, though its two parts did not coalesce till the 3rd or 4th century. In the middle of the 3rd century Christianity was introduced by St. Clair. Clotaire I. got possession of the city in 560, and placed it under the government of St. Felix the bishop, who executed enormous works to cause the Loire to flow under the walls of the castle. After being several times subdued by Charlemagne, Brittany revolted under his successors, and Nominod, proclaimed king in 842, ordered the fortifications of Nantes to be razed because it had sided with Charles the Bald. The Franks and Bretons met at Nantes in 943, under Charles the Fat. Another time began the rivalry between Nantes and Rennes, whose contests disputed the sovereignty of Brittany. Pierre de Dreux, declared duke of Brittany by Philip Augustus, made Nantes his capital,
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surrounded it with fortifications and defended it valiantly against John of England. During the Breton wars of succession Nantes took part first with Jean de Montfort, but afterwards with Charles of Blois, and did not open its gates to Montfort till his success was assured and his English allies had retired. In 1560 Francis II. granted Nantes a communal constitution. In the course of the 15th and 16th centuries the city suffered from several epidemics. Averse to Protestantism, it joined the League along with the duke of Mercur, governor of Brittany, who helped to raise the country into an independent duchy; and it was not till 1598 that it opened its gates to Henry IV., who granted the city the edict of Nantes at the accession of Henry IV. in 1589 was followed by deep depression, when it was found that not only did he adopt the Roman Catholic faith, but that his efforts to repress their grievances were singularly ineffectual. In 1594 they took determined measures to protect themselves; in 1597, the war with Spain being practically over, long negotiations took place between the king and his representatives, prominent among whom was the historian J. A. de Thou, and at last the edict was drawn up. It consisted of 95 general articles, which were signed by Henry at Nantes on the 15th of September, 1598, and 96 other supplementary articles, signed on the end of May. The main provisions of the edict of Nantes may be briefly summarized under six heads: (1) It gave liberty of conscience to the Protestants throughout the whole of France. (2) It gave to the Protestants the right of holding public worship in those places where they had had it in the year 1576 and in the earlier part of 1577; also in places where this freedom had been granted by the edict of Poitiers (1577) and the treaties of Nérac (1579) and of Félix (1580). The Protestants could also worship in two towns in each bailliage and sub-duchy. The greater nobles could hold Protestant services in their houses; the lesser nobles could do the same, but only for gatherings of not more than thirty people. Regarding Paris, the Protestants could conduct worship within five leagues of the city; previously this prohibition had extended to a distance of ten leagues. (3) Full civil rights were granted to the Protestants. They could trade freely, inherit property and enter the universities, colleges and schools. All official positions were open to them. (4) To deal with disputes arising out of the edict a chamber was established in the parliament of Paris (le chambre de l'édit). This was to be composed of ten Roman Catholic, and of six Protestant members. Chambers for the same purpose, but consisting of Protestants and Roman Catholics in equal numbers, were established in connexion with the provincial parlements. (5) The Protestant pastors were to be paid by the state and to be freed from certain burdens, their position being made practically equal to that of the Roman Catholic clergy. (6) A hundred places of safety were given to the Protestants for eight years, the expenses of garrisoning them being undertaken by the king.

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In many ways the terms of the edict were very generous to the Protestants, but it must be remembered that the liberty to hold public worship was made the exception and not the rule; this was prohibited except in certain specified cases, and in this respect they were less favourably treated than they were under the arrangement made in 1576.

The edict was greatly disliked by the Roman Catholic clergy and their friends, and a few changes were made to conciliate them. The parlement of Paris shared this dislike, and succeeded in reducing the number of Protestant members of the chambre de l'édit from six to one. Then cajled and threatened by Henry, the parlement registered the edict on the 25th of February 1599. After similar trouble it was also registered by the provincial parlements, the last to take this step being the parlement of Rouen, which delayed the registration until 1600.

The strong political position secured to the French Protestants by the edict of Nantes was very objectionable, not only to the ardent Roman Catholics, but also to more moderate persons, and the payments made to their ministers by the state were viewed with increasing dislike. Thus about 1660 a strong movement began for its repeal, and this had great influence with the king. In 1685 another edict was drawn up, which deprived the Protestants of their rights under the edict; their position was rendered intolerable by a series of persecutions which culminated in the dragonnades, and at length an edict of 1683 Louis revoked the edict, thus depriving the Protestants in France of all civil and religious liberty.

This gave a new impetus to the emigration of the Huguenots, which had been going on for some years, and England, Holland and Brandenburg received numbers of thrifty and industrious French families.

The history of the French Protestants, to which the edict of Nantes belongs, is dealt with in the articles FRANCE; HISTORY, and HUGUENOTS. For further details about the edict see the papers and documents published as Le Troisième centenaire de l'édit de Nantes (1898); Arr. Pau, Histoire du Protestantisme français (Paris, 1894); H. M. Baird, The Huguenots and the Revocation of the Edict of Nantes (London, 1895); C. Benoist, La Condition des Protestants sous le règne de l'édit de Nantes et après sa révocation (Paris, 1900); A. Lods, L'édit de Nantes devant le parlement de Paris (1899); and the Bulletin historique et littéraire de la Société de l'Histoire du Protestantisme Français.

NANTEUIL, ROBERT (1623-1675), French line-engraver, was born about 1623, or, as other authorities state, in 1630, the son of a merchant of Reims. Having received an excellent classical education, he studied engraving under his brother-in-law, Nicholas Regnasson; and, his crayon portraits being noticed, he was appointed engraver to the cabinet by Louis XIV. He was also appointed designer and engraver of the cabinet to that monarch. It was mainly due to his influence that the king granted the edict of 1660, dated from St Jean de Luz, by which engraving was pronounced free and distinct from the mechanical arts, and its practitioners were declared entitled to the privileges of other artists. He died at Paris in 1678. The plates of Nanteuil, several of them approaching the scale of life, number about three hundred. In his early practice he imitated the technique of his predecessors, working with straight lines, strengthened, but not curved, in the style of Regnasson; but he then went on in other prints cross-hatching like Regnasson, or stippling in the manner of Jean Boulanger; but he gradually asserted his full individuality, modelling the faces of his portraits with the utmost precision and completeness, and employing various methods of touch for the draperies and other parts of his plates. Among the finest works of his fully developed period may be named the portraits of Pomponne de Bellièvre, Gilles Ménage, Jean Loret, the duc de la Meilleraye and the duchess de Nemours. A list of his works will be found in Dumesnil's Le Peintre-graveur français, vol. iv.

NANTICOKE, a borough of Luzerne county, Pennsylvania, U.S.A., on the North Branch of the Susquehanna river, opposite West Nanticoke, and 8 m. S.W. of Wilkes-Barre. Pop. (1880), 3884; (1890), 10,044; (1900), 12,116, of whom 5955 were foreign-born; (1910 census) 18,877. It is served by the Pennsylvania, the Delaware, Lackawanna & Western and the
Central of New Jersey railways, and by an interurban electric line. Nantucket is situated in the antarctic coal region, is surrounded by mines, and its Industries consist chiefly in mining and shipping coal; it also has various manufacturing establishments, and in 1905 the factory product was valued at $32,500. Nantucket was laid out in 1793, and was incorporated as a borough in 1874. The name is that of a Algonquin tribe of Indians, conspicuous for their dark complexion, who originally lived in Maryland, were conquered by the Iroquois in 1678 and subsequently scattered; the main body removed to lands along the eastern branch of the Susquehanna, where some of them became merged with the Iroquois, and others removed to the Ohio and became merged with the Delaware.

**NANTUCKET** is a city and township (coextensive) of Massachusetts, U.S.A. Its principal part is an island of the same name, 28 m. S. of Cape Cod peninsula; it also includes the island of Tuckernuck, which has an area of 1.97 sq. m., and is used for sheep grazing; Muskeget Island, which has excellent hunting, and of which about one-half is a public park; and the Gravel Islands and other islets. Pop. of the county (1905 state census), 3930; (1910) 2962.

The island, with a minimum length of 15 m., an average width of 2.3 m., and an area of about 47 sq. m., has a coast-line of 88 m. of shore, separated by a narrow channel, but is separated from the mainland by Nantucket Sound, which 2 to 3 m. and has a maximum depth of 50 ft. The surface of Nantucket Island is open, nearly treeless, with a few hills, the highest being 91 ft. above sea-level. The soil is sandy but affords good pasture in some places, and has been farmed with some success; the flora is rich, and includes some rare species. There are a score of fresh-water ponds, the largest being Hummock (320 acres). Copan (21 acres) was, at the time of the first settlement, a bay and the commonly used harbour, but the present harbour (6 m. long) is that formed by Coatue Beach, a long narrow tongue of land, which, with the island, is separated from the mainland. Coatue Beach is known as Coskata Beach, and curves to the N.W.; near its tip is Great Point, where a lighthouse was first built in 1784. There have been many terrible wrecks on the coast, and there are life-saving stations on Muskeget Island, near Maddaket, at Surfside and on Coskata Beach. At the W. end of the island is Tuckernuck Bank, a broad submarine platform, on whose edge are the island of Tuckernuck, on which is a village of the same name, and Muskeget Island. In the S.E. extremity of Nantucket Island is Siasconset (locally 'Sconset'), a summer resort, and it has a station, connecting with incoming steamers, the Nantucket shallop lightship and the mainland. On a bluff on the S. is the small village of Surfside. Other hamlets are Maddaket, at the W. end of the island; and Polpis, Quidnet and Wauwinet (at the head of Nantucket harbour) in its E. part.

The principal settlement and summer resort is the town of Nantucket (on the S.W. end of the harbour), which is served by steamers from New Bedford, Martha's Vineyard and Wood's Hole, and is connected with Siasconset by a primitive narrow-gauge railway. Here there are large summer hotels, old residences built in the prosperous days of whaling, old lean-to houses, old graveyards and an octagonal towered windmill built in 1746. There are two libraries; one founded in 1836, and now a public library in the Athenaeum building; and the other in what is now the School of Industrial and Manual Training (1904), founded in 1827 as a Lancastrian school by Admiral Sir Isaac Coffin (1759-1839), whose ancestors were Nantucketmen. The Jethro Coffin House was built in 1686, according to tradition; the Old North Vestry, the first Congregational meeting-house, built in 1711, was moved within the 19th century, and again in 1834 to its present site on Benjamin Hill. The old South Church Tower, a steeple and clock tower, 144 ft. above sea-level, has a fine Portuguese bell, made in 1810. Another old house, built in 1725, was the home of Elihu Coleman, an anti-slavery minister of the Society of Friends, who were very strong here until the close of the first quarter of the 19th century. Near the old Friends' School is the building of the Nantucket Historical Society, which has a collection of relics. Nantucket was the home of Benjamin Franklin's mother, Abiah, whose father, Peter Folger, was one of the earliest settlers (1663); of Maria Mitchell, and of Lucretia Mott, prominent in the women's rights movement. The northern part of Coskata Island is being used for a whaling museum, and only drift- and shore- or boat-whaling had been carried on—the shore fishery died out about 1760. In 1757 whaling was the only livelihood of the people of Nantucket; and in 1750-1775, although whaling fleets were in repeated danger from French and Spanish privateers, the business, with the allied cooperers and other trades, steadily increased. In 1775 the Nantucket fleet numbered 150, and the population was between 5000 and 6000, about 96% being Quakers; but by 1785 the fleet had been shattered, 134 ships being destroyed or captured during the war. Though Nantucket was a subject for whaling, it had been a point on the Dutch Antwerp-Rotterdam-Hamburg trade, and the British market was closed by a duty of £18 a ton on oil; a bounty offered by the Massachusetts legislature (£5 on white and £3 on yellow or brown spermaceti, and £2 on whale-oil per ton) was of slight assistance. During the war of 1812 the Nantucket fleet was the only one active; it suffered severely during the war, and in the decade 1820-1830 Nantucket lost its primacy to New Bedford, whose fleet in 1830 was twice as large. Nantucket's last whaler sailed in 1869. Subsequently the island has been chiefly important as a summer resort.

Title to Nantucket and the neighbouring islands was claimed under grants of the Council for New England both by William Alexander, Lord Stirling, and by Sir Ferdinando Gorges. Lord Stirling's agent sold them in 1641 to Thomas Mayhew (1592-1682) of Watertown, Mass., and his son Thomas (c. 1616-1657) for £40, and a little later the elder Mayhew obtained another deed for Martha's Vineyard from Gorges. In 1659 the elder Mayhew sold a joint interest in the greater part of the island of Nantucket for £20 and two beaver hats to nine partners; early in the following year the first ten admitted ten others as partners, and the island was divided into 'runs'. Some special grants were made to the runners; but in 1672, after the Revolution, special half-grants were offered to tradesmen. The original twenty proprietors, however, endeavoured to exclude the tradesmen from any voice in the government, and this caused strife. Both factions appealed to the governor of New York, that province having claimed jurisdiction over the islands under the grant to the duke of York in 1664, and, becoming increasingly dissatisfied with that government, sought a union with Massachusetts until the islands were annexed to that province by its new charter of 1691. The town of Nantucket was settled in 1661 and was incorporated in 1711. By order of Governor Francis Lovelace it was named Sherburne in 1673, but in 1755 the present name was adopted. Its original site was Maddaket on the W. end of the island; in 1672 it was moved to its present site, then called Wescooe. When counties were first organized in New York, in 1683, Nantucket and the neighbouring islands were erected into Dukes county, but in 1695, after annexation to Massachusetts, Nantucket Island, having been set apart from Dukes county, constituted Nantucket county, and in 1713 Tuckernuck Island was annexed to it.

NANTWICH—NAPHTHALENE

NANTWICH, a market town in the Crewe parliamentary division of Cheshire, England, 161 m. N.W. of London, on the London & North-Western and Great Western railways. Pop. of urban district (1901) 7772. It lies on the river Weaver, in the upper part of its flat, open valley. The church of St Mary is a remarkable building, containing the Decorated and Perpendicular periods, with a central octagonal tower. The fine old carved stalls are said to have belonged to Vale Royal Abbey, near Winsford in this county. Nantwich retains not a few old timbered houses of the 16th and 17th centuries, but the town as a whole is modern in appearance. The grammar school was founded in 1611. The salt industry, still the staple of several towns lower down the vale of the Weaver, was so important here in the time of Henry VIII. that there were three hundred salt-works. Though this industry has lapsed, there are brine baths, much used in cases of rheumatism, gout and general debility, and the former private mansion of Shrewbridge Hall is converted into a hotel with a spa. Nantwich has tanneries, a manufacture of boots and shoes, and clothing factories; and corn-milling and iron-founding are carried on. The town is one of the best hunting centres in the county, being within reach of several meets.

From the traces of a Roman road between Nantwich and Middlewich, and the various Roman remains that have been found in the neighbourhood, it has been conjectured that Nantwich was a salt-town, and that much of this town was once a salt-works. The Domesday Survey contains a long account of the laws, customs and values of the town at that period, which were by far the most profitable in Cheshire. The town is sometimes divided into the two liberties of Chester and certain resident freemen of the neighbourhood. The name of the town appears variously as Wych Manbank, Wie Malbank, Nantwich, Lache Mauban, Wysmanbank, Wych Manbous, Napatich, Naptewiche. About the year 1190 William Malbedeng or Malbank was created baron of Nantwich, which barony he held of the earl of Chester. In the 13th century the barony fell to three daughters and co-heiresses, and further subdivisions followed. The lands of these heiresses accounts for the large estates belonging to Nantwich as a corporate town. The only town charter is one of 1557-1568, in which Queen Elizabeth confirms an ancient privilege of the town that they should not be upon assizes or juries with strangers, relating to matters outside the town. It is stated that the charter which the right to this privilege had been proved by an inquisition taken in the 14th century, and had then already been held from time immemorial. There was a gild merchant and also a town bailiff, but the latter office was of little real significance and was soon dropped. There is documentary evidence of a castle at Nantwich in the 13th century. There is a weekly market on Saturday, held in the market-place. In 1583 a three-days fair to be held at the feast of St Bartholomew was granted to Robert Burrell, bishop of Bath and Wells (then holder of a share of the barony of Nantwich). The market and fair take place the first week in September. Earl Cholmondeley received a grant of two fairs in 1732. Fairs are now held on the first Thursday in April, June, September and December, and a cheese fair on the first Thursday in each month except January. The salt trade declined altogether in the 18th century, with the exception of one salt-works, which was kept open until 1856. There was a shoe trade in the town as early as the 17th century, and gloves were made from the end of the 16th century until about 1863. Weaving and stocking trades also flourished in the 18th century. The one corn-mill of Nantwich was converted into a cotton factory in 1789, but was closed in 1874. See James Hall, A History of Nantwich or Wich Malbank (1883).

NAOBOJI, DADABHAI (1825-1897), Indian politician, was born at Nasik on the 4th of September 1825, the son of a Parsi priest. During a long and active life, he played many parts: professor of mathematics at the Elphinstone college (1854); founder of the Rast Gafr newspaper; partner in a Parsi business firm in London (1855); prime minister of Baroda (1874); member of the Bombay legislative council (1885); M.P. for Central Finsbury (1892-1895); being the first Indian to be elected to the House of Commons; three times president of the Indian National Congress. Many of his numerous writings are collected in a Festschrift and Un-British Rule in India (1901).

NAP, a soft fibre obtained from the stems, leaves, and fruits of certain plants, and from the milk of sheep and goats. Naphtha, naphthrene, naphta, or napthene is the modern name of this substance. Small samples of it have often been used for the treatment of ulcers, with自称; but the whole power of the word was applied to the roughness on textiles before shaving. "Nap" in this sense appears in many Teutonic languages, cf. Ger. Noppe, Dutch nap, Nor. nopp; the verbal form is noppa or noppa, to trim, cut short. The word nap also means a short sleep or doze (O. Eng. hosepien). In "napkin," a square of damask or other linen, used for wiping the hands and lips or for protecting the clothes at meals, the second part is a common English suffix, sometimes of diminutive force, and the first part is from "nap." 1 Low Lat. naphe, naphe, a corrupt form of nap, table-cloth. Nape still survives in "napery," a name for household linen in general.

NAPHTALI, in the Bible, the name of an Israelite tribe, the "son" of Jacob by Bilhah, Rachel's maid, and the uterine brother of Dan (Gen. xxx. 8). It lay to the south of Dan in the eastern half of upper Galilee (Josh. xix. 32-39), a fertile mountainous district (cf. Gen. xlix. 21; Deut. xxxiii. 23), open to the surrounding influences of Phoenicia and Aram. Apart from its share in the war against Sisera (Judg. iv. seq., see Deborah), little is known of it. It evidently suffered in the bloody conflicts of Damascus with Israel (1 Kings xv. 20), and was depopulated by Tiglath-pileser IV. (2 Kings xv. 29; Isa. ix. 1). Naphtali and Dan are "brothers," perhaps partly on geographical grounds, but Dan also had a seat in the south (south-west of Ephraim), and the name of the "mother" Bilhah is apparently connected with Bilhan, an Edomite and also a Benjamite name (Gen. xxxvi. 27; 1 Chron. vii. 10).

The view connecting Naphtali (perhaps a geographical rather than a tribal term), or rather its Israelite inhabitants, with the south (then Palestine) is discussed by H. W. Hogg, Ency. Bib. iii. col. 3332 seq. with references.

NAPHTHA, a word originally applied to the more fluid kinds of petroleum, issuing from the ground in the Baku district of Russia and in Persia. It is the naphtha of Dioscorides, and the naphtha, or bitumen liquidum candidum of Pliny. By the alchemists the word was used principally to distinguish various highly volatile, mobile and inflammable liquids, such as the ethers, sulphuric ether and acetic ether having been known respectively as naphtha sulphurici and naphtha acetic.

The term is now seldom used, either in commerce or in science, without a distinctive prefix, and we thus have the following:

1. Coal-tar Naphtha.—A volatile commercial product obtained by the distillation of coal tar (see COAL-TAR).

2. Shale Naphtha.—Obtained by distillation from the oil produced by the destructive distillation of bituminous shale (see PARAFFIN).

3. Petroleum Naphtha.—A name sometimes given (e.g. in the United States) to a portion of the more volatile hydrocarbons distilled from petroleum (see PETROLEUM).

4. Wood Naphtha.—Methyl alcohol (q.v.).

5. Bone Naphtha.—Known also as bone oil or Dippel's oil. A volatile product of offensive odour obtained in the carbonization of bones for the manufacture of animal charcoal.

6. Coal-tar or coal-tar naphtha, a volatile product obtained by the destructive distillation of rubber.

(B. R.)

NAPHTHALENE, C₆H₅, a hydrocarbon discovered in the "carbolic" and "heavy oil" fractions of the coal-tar distillate (see COAL-TAR) in 1819 by A. Garden. It is a product of the action of heat on many organic compounds, being formed when the vapours of ether, camphor, acetic acid, ethylene, acetylene, &c., are passed through a red-hot tube (M. Berthelot, Jahresr., 1851), or when petroleum is led through a red-hot tube packed with charcoal (A. Letny, Ber., 1878, 11, p. 1210). It may be synthesized by passing the vapour of phenyl butyline bromide over heated soda line (B. Aronheim, Ann., 1874, 171, p. 219), and by the action of ortho-xylene on sodium ethylene tetrahydroxystyrene see the final distillation of tetrahydroxystyrene. The resulting tetrahydroxystyrene being hydrolysed and heated, when it yields hydroxystyrene diacetyl acid, the silver, salt of which decomposes on distillation into napthylene and other products (A. v. Baeyer and W. H. Perkin, junr., Ber., 1884, 17, p. 515):
It is a colourless solid, which melts at 86°C, and boils at 218°C. It crystallizes in the monoclinic system; it is to be noted that a- and β-naphthol assume almost identical forms, so that these three compounds have been called isomeric naphthols. It is insoluble in water, but is readily soluble in alcohol, and other organic solvents. A characteristic smell, and is very volatile, distilling readily in a current of steam. It acts as a weak antiseptic. It is used for enriching coal gas, as a vermin killer, in the manufacture of certain azo dyes, and in the preparation of phthalic acid (q.v.). When passed through a red-hot tube packed with carbon it yields β-quinonyl (C₆H₄O₂). It forms a crystalline compound with picric acid. It readily forms addition products with chlorine and with hydrogen; the dichloride, C₆H₅Cl₂, is obtained as a yellow liquid by acting with hydrochloric acid and potassium chloride. The solid, formed from C₂H₅OH and C₆H₅Cl, remains when chlorine is passed into naphthalene dissolved in chloroform. Numerous hydrides are known; they are used with red phosphorus and hydriodic acid the hydrocarbon yields mixtures of hydrates of composition C₆H₄H₂ to C₆H₄H₆. Sodium in boiling ethyl alcohol gives the α-dihydrate, C₆H₅OH (E. Bamberger, Ber., 1887, 20, p. 1705); and with boiling amyl alcohol the β-tetrahydric, C₆H₄H₆ (E. Bamberger, Ber., 1890, 23, p. 1501). The α-tetrahydro-naphthalene is formed when naphthalene is heated with phosphoric iodide at 170°-190° (A. v. Bayer). Structurally naphthalene may be represented as a fusion of two benzene nuclei, the hydrogen atoms being numbered as in the inset.

\[
\begin{array}{cccccccc}
1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \\
\end{array}
\]

1-5 or 4-8 di-derivatives are known, whilst 1-8 or 4-5 are peri (see Chemistry, Organic).

α-Nitro-α-naphthylamine, C₆H₅NO₂, is formed by the direct nitration of naphthalene. For further preparation see O. Witt, Die Chemische Industrie, 1887, 10, p. 215. It crystallizes in yellow needles, which melt at 61°C, and are readily soluble in alcohol. By the action of nitro-sulphuric acid it is converted into a mixture of 1,5- and 1,8-dinitronaphthalenes (P. Friedlander, Ber., 1899, 32, p. 3531). When heated with aniline and its salts it yields phenylresorcinol (German patent 67339 (1888)). α-Nitroα-naphthylamine is prepared by acting with ethyl nitrite on an alcoholic solution of 2-nitro-α-naphthylamine in the presence of sulphuric acid (E. Lellmann and A. Remy, Ber., 1886, 19, p. 237), or with freshly prepared potassium cupronitrite on β-naphthalene diazoniun sulphate (A. Hantzsch, Ber., 1895, 28, p. 355). α-Naphthylamine is a crystalline solid which melts at 78°C and is volatile in steam.

**Sulphonic Acids.**—Two monosulphonic acids (α and β) result by acting with sulphuric acid on the hydrocarbon, the α-acid predominating (Essig and coworkers), and the β-acid at higher temperatures (170°-200°C). They are crystalline, hydroscopic compounds and are employed for the manufacture of the naphthols. Numerous di- and tri-sulphonic acids are known. α-Naphthylbenzene-sulphonic acid, C₆H₅C₆H₄-SO₃H, is formed by the oxidation of many α-derivatives of naphthalene with chromic acid. It crystallizes in yellow needles which melt at 125°C. It sublimes readily, is volatile in steam and reduces to the corresponding dihydroxy-naphthalene. β-Naphthoquinone is formed by oxidizing 2-amino-α-naphthol (from β-naphthol-orange by reduction) with ferric chloride. It crystallizes in red needles, which melt at 115°C; it has no smell and is non-volatile (cf. phenantrenequinone). Alizarin black, C₆H₄(OH)-O-Na₂SO₄, the sodium bisulphite compound of 7,8-dioxo-naphthelenedicarboxylic acid (Allen and coworkers), is a dyestuff used for printing on cotton in the presence of a chromium mordant. The naphthoquinone is prepared by the action of zinc and concentrated sulphuric acid on α-dinitronaphthalene. 6-6 sulphonates on oxidizing 2-6-dihydronaphthalene with lead peroxide.

**Naphthols, or Hydroxynaphthalenes,** C₆H₅OH, the naphthalene homologues of the phenols. The hydroxy group is more reactive than in the phenols, the naphthols being converted into naphthylamines by the action of ammonia, and forming ethers and esters much more readily.

α-Naphthol may be prepared by fusing sodium-α-naphthylate sulphonate with caustic soda; by heating α-naphthylamine sulphate with water to 200°C (English Patent 143501 (1892)); and by heating phenyl isocrotonic acid (R. Fitting and H. Erdmann, Ann., 1885, 227, p. 243): C₆H₅CH:CH₂CO₂H = C₆H₅OH + H₂O. It forms colourless needles which melt at 94°C; and is readily soluble in alcohol, ether, chloroform, and caustic alkalis. It is volatile in steam. With ferric chloride it gives a dark-blue precipitate of α-dinitophenol, HO-C₆H₅-C₆H₅-OH. It melts potassium permanganate and oxidizes it to phenyl-glyoxyl-ortho-carboxylic acid, HO₂C-C₆H₅-CO₂H. It is reduced by sodium in boiling amyl alcohol solution to "aromatic" tetrahydro-α-naphthol (reduction occurring in the ring which does not contain the hydroxyl group). When heated with hydrazine hydrate at 160°C it gives α-naphthyl hydrazine, C₆H₅-NH-NH₂ (L. Hoffmann, Ber., 1898, 31, p. 2906). Nitric acid converts it into nitro-compounds, which are occasionally used for dyeing silk and wool.

**Martius yellow,** C₆H₅(NO₂)₂-ONa·H₂O, the sodium salt of 2,6-dinitro-α-naphthol (for notation see *Naphthaleine*), is prepared by the action of nitric acid on α-naphthol-2,4-disulphonic acid. It forms orange-yellow plates and dyes wool a golden yellow (from an acid bath). Naphthylamine, C₆H₅(NH₂)ONa, prepared by the action of nitric acid on α-naphthol-2,4,7-trisulphonic acid, is an orange-yellow powder which dyes wool and silk yellow (from an acid bath).

Numerous mono- and disulphonic acids of β-naphthol are employed in the preparation of azo dyes. The most important is *Neville and Wetnir's acid,* C₆H₅(OH)·SO₃H·(1:4), formed when diazotized naphtholic acid (α-naphthylamine-α-sulphonic acid) is boiled with dilute sulphuric acid (Nevile and Wetnir, Ber., 1880, 13, p. 1949), or when sodium naphtholate is heated with concentrated caustic soda solution under pressure at 240°-260°C (German patent 86550 (1883)). It melts at 170°C, and is readily soluble in water. With ferric chloride it gives a blue coloration.

β-Naphthol, C₆H₅OH, prepared by fusing sodium β-naphthylate sulphonate with caustic soda, crystallizes in plates which melt at 122°C. With ferric chloride it gives a green colouration, and after a time a white flocculent precipitate of a naphthol. With sodium in boiling amyl alcohol solution it mixes a mixture of alicyclic and aromatic tetrahydro-β-naphthols (E. Bamberger, Ber., 1890, 23, p. 197). When heated with ammonium formate to 150°C it forms β-naphthylamine. With nitrosodimethylaniline hydrochloride it forms Meldola's Blue (dimethyldi- or dimethylbenzoxazolyl chloride), C₆H₅N₂Cl (R. Meldola, Ber., 1870, 12, p. 2065).

The β-naphthol sulphonic acids find extensive application in the colour industry. The most important members are shown in the table:

<table>
<thead>
<tr>
<th>Formula</th>
<th>Method of Preparation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-oxysulphonic (Bayer's acid)</td>
<td>From β-naphthol and concentrated sulphuric acid at 50°-60°C C</td>
<td>Sodium salt soluble in hot alcohol.</td>
</tr>
<tr>
<td>2-oxysulphonic (Schaffer's acid)</td>
<td>From β-naphthol and concentrated sulphuric acid at 100°C</td>
<td>Sodium salt insoluble in cold alcohol.</td>
</tr>
<tr>
<td>2-oxysulphonic</td>
<td>By fusion of naphthalene 2-7-dichloridine</td>
<td>Very soluble in water and alcohol.</td>
</tr>
<tr>
<td>2-oxysulphonic</td>
<td>Both R- and G- acid from β-naphthol and concentrated sulphuric acid at 100°-110°C C</td>
<td>The sodium salts separate by crystallization. R-salt insoluble in alcohol; G-salt soluble.</td>
</tr>
<tr>
<td>2-oxysulphonic</td>
<td>2-6-trisulphonic</td>
<td>Alkaline solutions show green fluorescence.</td>
</tr>
</tbody>
</table>

Nitroso-naphthols or nitrosoquinone-oximes, C₆H₅OH(NO)₂ or C₆H₅(NO)₂-ONa·H₂O. Two are known, namely 4-nitroso-α-naphthol or...
NAPHTHYLAMINES—NAPIER, SIR C. J.

**α-naphthoquinone-oxime**, formed by the action of nitrous acid on α-naphthol or of hydroxylamine hydrochloride on α-naphthoquinone (H. Goldschmidt and H. Schmidt, Ber., 1884, 17 p. 2064); and 2-nitro-α-naphthol (β-naphthoquinone-oxime), formed by the action of hydroxylamine hydrochloride on β-naphthoquinone.

**NAPHTHYLAMINES**, or AMINONAPHTHALENES, C₁₈H₁₈N₂, the naphthalene homologues of aniline, in contrast to which they may be prepared by heating the naphthols with ammonium-zinc chloride.

α-**Naphthylamine** is prepared by reducing α-nitronaphthalene with hydrochloric acid at about 70° C., the reaction mixture being neutralized with milk of lime, and the naphthylamine steam-distilled. It may also be prepared (in the form of its acetyl derivative) by heating α-naphthol with sodium acetate, ammonium chloride and acetic acid (A. Calm, Ber., 1882, 15, p. 616); by heating α-naphthol with calcium chloride-ammonia to 270° C.; and by heating pyromuric acid, aniline, zinc chloride and lime to 300° C. (F. Canzonomi and V. Oliveri, Gazz., 1886, 16, p. 493). It crystallizes in colourless needles which melt at 50° C. It possesses a disagreeable faecal odour, sublimes readily, and turns brown on exposure to air. Oxidizing agents (ferric chloride, etc.) give a blue precipitate with solutions of its salts. Chronic conversion converts it into α-napthoquinone. Sodium in boiling amyl alcohol reduces it to aromatic tetrahydro-α-naphthylamine, a substance having the properties of an aromatic amine, for it can be diazotized and does not possess an ammoniacal smell. Since it does not form an addition product with bromine, reduction must have taken place in one of the nuclei only, and on account of the aromatic character of the compound it must be in that nucleus which does not contain the amino group. This tetrahydro compound yields acidic acid, (CH₂)₃(CO₂H), when oxidized by potassium permanganate. The nitro-naphthylamine sulphonates are used for the preparation of azo dyes, these dyes possessing the important property of dyeing unmordanted cotton. The most important is **naphthonic acid**, α-amino-4-sulphonic acid, produced by heating α-naphthylamine and sulphuric acid to 170-180° C. with about 3% of crystallized oxalic acid. It forms small needles, very sparingly soluble in water. With diazotized benzidine it gives Congo red.

β-**Naphthylamine** is prepared by heating β-naphthol with zinc chloride-ammonia to 200-210° (V. Merz and W. Welth, Ber., 1880, 13, p. 130); or in the form of its acetyl derivative. By heating β-naphthol with ammonium acetate to 270-280° C. It forms odourless, colourless plates which melt at 131-132° C. It gives no colour with ferric chloride. When reduced by sodium in boiling amyl alcohol solution it forms alicyclic tetrahydro-β-naphthylamine, which has most of the properties of the aliphatic amines; it is strongly alkaline in reaction, has an ammoniacal odour and cannot be diazotized. On oxidation it yields ortho-sulpho-carboxydicyanimic acid, HO₄C-C₆H₄-CH₂-C₆H₄-CO₂H. Numerous sulphonic acids derived from β-naphthylamine are known, the more important of which are the β- or Badische, the 2- or Døhler, the 2- or Døhler, and the 2- or Døhler. Of these, the β- and Bronner's acid are of more value technically, since they combine with ortho-tetradecydytol to produce fine red dye-stuffs.

**NAPIER, SIR CHARLES** (1786-1860), British admiral, was the second son of Captain the Hon. Charles Napier, R.N., and grandson of Francis, fifth Lord Napier. He was born at Merchiston Hall, near Falkirk, on the 6th of March 1786. He became a midshipman in 1800, and was promoted lieutenant in 1805. He was appointed to the "Courageux" (74), and was present in her at the action in which the squadron under Sir J. B. Warren took the French "Marengo" (60) and "Telle Poupée" (40), on the 13th of March 1806 in the West Indies. After returning home with Warren he went back to the West Indies in the "St George" and was appointed acting commander of the "Pultusk" brig. The rank was confirmed on the 30th of November 1807. In August 1808 he was moved into the "Re- cru" (18), and in her fought an action with the "Diffident" (18), in which his thigh was broken. In April 1809 he took part in the capture of the "Hautpoul" (74), and was promoted acting post captain. His rank was confirmed, but he was put on half-pay, when he came home with a convoy. He spent some time at the university of Edinburgh, and then went to Portugal to visit his cousins in Wellington's army. In 1811 he served in the Mediterranean, and in 1813 on the coast of America, and in the expedition up the Potomac. The first years of his leisure he spent in Italy and in Paris, but speculated so much in a steamboat enterprise that by 1827 he was quite ruined. In that year he was appointed to the "Galatea" (42), and was at the Azores when they were held by the count de Villa Flor for the queen of Portugal. He so much impressed the constitutional leaders that they begged him to take command of the fleet, which offer he accepted in February 1834. With it he destroyed the Miguelite fleet off Cape St Vincent on July 5, and on the demand of France was struck off the English navy list. Continuing his Portuguese services, he commanded the land forces on the successful defense of Lisbon in 1834, when he was made Grand Commander of the Tower and Sword, and Count Cape St Vincent in the peacetime of Portugal. On his return to England he was restored to his former rank in the navy 1836, and received compensation in the form of the "Herald" (44). When the war broke out in Syria he was appointed second in command, and distinguished himself by leading the storming column at Sidon on September 26, 1840, and by other services, for which he was made a K.C.B. He went on half-pay in 1844, and was in 1842 elected M.P. for Marylebone in the Liberal interest, but lost his seat in 1846. He was promoted rear-admiral the same year, and commanded the Channel fleet from 1846 to 1848. On the outbreak of the Russian War he received the command of the fleet destined to act in the Baltic, and hoisted his flag in February 1854. He refused to attack Cronstadt, and a great outcry was raised against him for not obeying the orders of the Admiralty and attempting to storm the key of St Petersburg; but his inaction has been thoroughly justified by posterity. On his return in December 1854 he was not again offered a command. He was elected M.P. for Southwark in February 1855, and maintained his seat, though broken in health, until his death on the 6th of November 1860. Sir Charles Napier was a man of undoubted energy and courage, but of no less eccentricity and vanity. He caused great offence to many of his brother officers by his behaviour to his superior, Admiral Stopford, in the Syrian War, and was embroiled all his life in quarrels with the Admiralty. See Major-General E. Napier's *Life and Correspondence of Admiral Sir Charles Napier, K.C.B.* (2 vols., London, 1862); Napier's own *War in Syria* (2 vols., 1842); *The Navy: its past and present state, in a series of letters, edited by Sir W. F. F. Napier* (1851); and the *Letters on the Battle of the Dardanelles and other matters furnished by Vice-Admiral Sir C. Napier, K.C.B.* (1857). See also *The Life and Exploits of Commodore Napier* (1841); and *Life of Vice-Admiral Sir C. Napier* (1854).

**NAPIER, SIR CHARLES JAMES** (1782-1853), British soldier and statesman, was born at Whitehall, London, in 1782, being the eldest son of Colonel George Napier (a younger son of the fifth Lord Napier), and of his wife, the Lady Sarah Lewin, who had charmed King George III. After the custom of those times Charles Napier had been gazetted an ensign in the 33rd regiment in 1794, and in 1797 his father secured for him the appointment of aide-de-camp to Sir James Duff, commanding the Limerick district. Longing for more active service, Napier obtained a commission as lieutenant in the 95th Manneding's Rifles (Rifle Brigade) in 1800. This newly formed corps was designed to supply a body of light troops for the English army fit to cope with the French voltigeurs and tirailleurs, and was specially trained, at first under the eye of Colonel the Manneding, and then at Shorncliffe under the immediate supervision of Sir John Moore. Moore speedily perceived the military qualities of the Napiers, and inspired the three brothers—Charles of the Rifles, George of the 52nd and William of the 43rd—with an enthusiasm which lasted all their lives; but, though happy in his general, Charles Napier quarrelled bitterly with William Stewart, the lieutenant-colonel, and in 1803 left the regiment to accompany General H. E. Fox to Ireland as aide-de-camp. The great influence of his uncle, the duke of
Richmond, and of his cousins, Charles James Fox and the general, procured him in 1804 a captaincy in the staff corps, and in the beginning of 1806 a majority in the Cape regiment. On his way to the Cape, however, he exchanged into the 50th regiment, with which of the patriot party. From Corfu he went to Lord Cathcart in 1807. Shortly after his return from Denmark the 50th was ordered to Portugal, and in command of it Napier shared all the glories of the famous retreat to Corunna. At the battle of Corunna, one of the last sights of Sir John Moore before he fell mortally wounded was the advance of his own old regiment under the command of Charles Napier and Edward Stanhope, and almost his last words were "Well done, my majors!" The 50th suffered very severely and both the majors were left for dead upon the field. Napier's life was saved by a French drummer nothwithstanding. From Corunna he went to the headquarters of Marshal Soult. Soult treated him with the greatest kindness, and he was allowed by Ney to return to England to his "old blind mother" instead of being interned. After about a year he heard that his exchange had been arranged, and, volunteering for the Peninsula, he joined the light division before Ciudad Rodrigo. As a volunteer he served in the actions on the Coa, and again at Busaco, where he was badly wounded in the face. He was ordered to England, but refused to go, and in March 1811, though barely recovered, he hurried to the front to take part in the pursuit of Masséna. After the battle of Fuentes d'Onor, he received the command of the 12th regiment, which had become entirely demoralized at Botany Bay, and when he joined it at Guernsey in 1811 was one of the worst regiments in the service. When he left it in 1813 it was one of the best. He accompanied it in June 1812 from Guernsey to Bermuda, where he wrought a wonderful change in the spirit both of officers and men. By treating his men as friends he won their love and admiration, and became in a peculiar degree the hero of the British soldiers. After seeing further active service against the United States in September 1813 he exchanged back into the 50th regiment, and in December 1814, believing all chance of an active service to be at an end, went on half-pay. He was gazetted one of the first C.B.'s on the extension of the order of the Bath in 1814, and was present as a volunteer at the capture of Cambrai, but he just missed the great battle of Waterloo. Though an officer of some experience and more than thirty years of age, he now entered the military college at Farnham, and completed his military education. In 1819 he was appointed inspecting field officer at Corfu, in 1820 was sent on a mission to Ali Pasha at Iannina, and in 1821 visited Greece, where he became an ardent supporter of the young nation. He landed at Meeanee in 1822 to Cephalonia, where he remained for eight years as governor and military resident. He was the model of an absolute colonial governor, and showed all the qualities of a benevolent despot. He made good roads and founded great institutions, but everything must be done by him, and he showed himself averse to interference, whether from the high commissioner of the Ionian Islands, whom it was his duty to obey, or from the feudal magnates of his own little colony, over whom it was his duty to exercise strict supervision. An interesting episode in his command was his communication with Lord Byron when he touched at Cephalonia on his way to take part in the Greek War of Independence. Byron sent a letter to the Greek committee in London recommending Napier's appointment as commander-in-chief. But after many negotiations the scheme came to nothing. In 1827 Napier, who had two years before been made a colonel in the army, quarrelled with Sir Frederick Adam, the new high commissioner, and in 1830, when Napier was in England on leave, Adam seized his papers and forbade him to return. Napier thereupon, refusing promotion to the residency of Zante, retired in disgust, living for some years in the south of England and, after the death of his wife in 1833, in Normandy. Here he wrote his work on the colonies, and also an historical romance on William the Conqueror. Another work, entitled Harold, has disappeared. In 1834 he refused the governorship of Australia, still hoping for military employment. In 1837 he was promoted major-general with his brother George, in 1838 he returned to England and was made a K.C.B.; but he was to wait till 1839 before he received an offer of employment. In that year he was made commanding officer in the northern district, and found his command no shewy, owing to the turbulent state of the Chartists and the work of the destruction of the Midland. His behaviour during the tenure of his command is described by William Napier in his life of his brother, and his inability to hold a command which did not carry supreme authority is plainly portrayed. In this particular instance his sympathies were on the popular side, and, though he maintained law and order with the necessary rigour, he resigned as soon as the crisis had passed, and went to India. He was stationed at Poona, and in September 1842, when troubles were expected there, was ordered to Sind. His conduct in Sind from 1842 till August 1847 is the period of his life during which, according to his brother, he made good his title to fame, but his acts, more especially at first, have been most severely criticized. There can be little doubt that from the moment he landed in the province he determined to conquer the amirs, and to seek the first opportunity of doing so. He was to be accompanied by James Outram (q.v.), who had been resident in Sind during the Afghan War, and who felt a great admiration for him, but who had also a warm affection for the amirs, and believed that he could put off the day of their destruction. On the 15th of February 1843, Outram was treacherously assailed at Hyderabad, and on the 17th Napier attacked the Baluch army 50,000 strong with but 2800 men. With these 2800 men, including the 22nd regiment, which would do anything for him, he succeeded in winning the brilliant and decisive victory of Meeanee, one of the most amazing in the history of the British army, in which generals had to fight like privates, and Sir Charles himself engaged in the fray. In the March following, after marching without transport in the most intense heat, he finally destroyed the army of the amirs at the battle of Hyderabad. His success was received with enthusiasm both by the governor-general, Lord Ellenborough, and by the English people, and he was at once made a G.C.B. Whether or not the conquest of Sind at that particular period can be justified, there can be no doubt that Charles Napier was the best administrator who could be found for the province when conquered. Sind, when it came under English rule, was in a state of utter anarchy, for the Baluchis had formed a military government not unlike that of the Mamelukes in Egypt, which had been extremely tyrannical to the native population. This native population was particularly protected by Sir Charles Napier, who bore more respect for their existence than for the Afghan supremacy which he had commenced with the victory of Meeanee. The labour of administration was rendered more difficult by the necessity of repressing the hill tribes, which had been encouraged to acts of lawlessness by the licence which followed the Afghan War. The later years of his administration were made very stormy by the attacks on the policy of the conquest which had been made in England. He left Sind, after quarrelling with every authority of the presidency of Bombay, and nearly every authority of the whole of India, in August 1847, and received a perfect ovation on his return from all the hero-worshippers of the Napiers, of whom there were many in England. His short stay in England was occupied with incessant struggles with the directors of the East India Company; but the news of the indecisive victory of Chillianwalla created a panic in England, and the East India Company was obliged by public opinion to summon the greatest general of the day to command its armies. Sir Charles started almost at a moment's notice, but on reaching India found that the victory of Gujarat had been won and the Sikh War was over. No taint of envy was in his nature, and he rejoiced that he had not had to supersede Lord Gough in the moment of defeat. His restless and imperious spirit was met by one equally imperious in the governor-general, Lord Dalhousie. The two men were good friends until, in the absence of Dalhousie at sea, Napier took upon himself to alter the regulations regarding the allowances to native troops; the occasion was urgent, as the troops were in a state of mutiny, but on his return Dalhousie
reprimanded the commander-in-chief and reversed his decision. Napier immediately handed in his resignation, and when the duke of Wellington supported Lord Dalhousie and repeated the reprimand he returned to England. He had been credited with foreseeing the Mutiny of 1857, and on the whole with justice. On one occasion he wrote that mutiny was "one of the greatest, if not the greatest, danger threatening India—a danger that may come unexpectedly, and if the first symptoms be not carefully treated, with a power to shake Leadenhall." On the march he left behind with his troops the last remaining of it, and handed its colours over to a Gurkh regiment, thus showing that he distrusted the high-class Brahman, and recognized the necessity of relying upon a more warlike and more disciplined race. His constitution was undermined by the Indian climate, especially by his fatiguing command in Sind, and on the 29th of August 1853 he died at Portsmouth. The bronze statue of him by G. G. Adams, which stands in Trafalgar Square, London, was erected by public subscription, by far the greater number of the subscribers being, as the inscription records, private soldiers.

The chief authority for Sir Charles Napier’s life is his Life and Opinions by his brother (1857); consult also MacColl, Career and Character of C. J. Napier (1857); M’Dougall, General Sir C. J. Napier, Conqueror and Governor of Scinde (1866); W. N. Bruce, Sir Charles Napier, K. G., (1875); and Tawse, The British Army in the Crimea and India (1889). His own works are Memoir on the Roads of Ceylon (1852); The Colonies, treating of their value generally and of the Indian. Edinburgh (1853); The Administration of India, by Sir F. Adam (1853); Colonization, particularly in Southern Australia (1853); Remarks on Military Law and the Punishment of Flogging (1857); A Dialogue on the Poor Laws (1858); A Letter on the Defence of England by Corps of Volunteers and Militia (1852); Lights and Shadows of Military Life (trans. from the French, 1849); and A Letter to the Right Honourable Sir J. C. Hobhouse on the Baggage of the Indian Army (1849); Defects, Civil and Military, of the Indian Government (1851); William the Conqueror, a Historical Romance, edited by Sir W. Napier (1858). On Sind, consult primarily Sir W. Napier, The Conquest of Scinde (1843); The Administration of Sind, by Sir W. Napier (1850); and Outram, The Conquest of Scinde, a Commentary (1846). For his command-in-chief, and the controversy about his resignation, consult J. Mawson, Records of the Indian Command of General Sir C. J. Napier (Calcutta, 1851); Minutes on the Resignation of the late General Sir C. J. Napier, by Field-Marshal the Duke of Wellington, &c. (1854); Comments by Sir W. Napier on a Memorandum of the Duke of Wellington (1854); Sir William Napier, General Sir C. Napier and the Conquest of Scinde, Anecdotes of the East India Company (1857); Sir W. Loc. Warner, Life of Lord Dalhousie (1904).

NAPIER, JOHN (1550–1617), Scottish mathematician and inventor of logarithms, was born at Merchiston near Edinburgh in 1550, and was the eighth Napier of Merchiston. The first Napier of Merchiston, "Alexander Napare," acquired the Merchiston estate before the year 1438, from James I. of Scotland. He was provost of Edinburgh in 1437, and was otherwise distinguished. The subject of this article, who succeeded him in 1454, was provost of Edinburgh in 1455, 1457 and 1499; he was knighted and held various important court offices under successive monarchs; at the time of his death in 1473 he was master of the household to James III. His son, John Napier of the Rursky, the third of Merchiston, belonged to the royal household in the lifetime of his father. He also was provost of Edinburgh at various times, and it is a remarkable instance of the esteem in which the lairds of Merchiston were held that three of them in immediate lineal succession repeatedly filled so important an office during perhaps the most memorable period in the history of the city. He married a great-granddaughter of Duncan, 8th earl of Lenvenax (or Lennox), and besides this relationship by marriage the Napiers claimed a lineal male cadency from the ancient family of Lenvenax. His eldest son, Archibald Napier of Edinbelie, the fourth of Merchiston, belonged to the household of James IV. He fought at Flodden and escaped with his life, but his eldest son Alexander, (fifth of Merchiston) was killed. Alexander’s eldest son (Alexander, sixth of Merchiston) was born in 1513, and fell at the battle of Pinkie in 1547. His eldest son was Archibald, seventh of Merchiston, and the father of John Napier, the subject of this article.

In 1549 Archibald Napier, at the early age of about fifteen, married Janet, daughter of Francis Bothwell, and in the following year John Napier was born. In the criminal court of Scotland, the earl of Argyll, hereditary justice-general of the kingdom, sometimes presided in person, but more frequently he delegated his functions; and it appears that in 1561 Archibald Napier was appointed one of the justice-deputies. In the register of the court, extending over 1563 and 1564, the justice-deputies are named as "Archibald Napier of Merchistome, Alexander Bannatyne, burgess of Edinburgh, James Stirling of Keir and Mr Thomas Craig." About 1565 he was knighted at the same time as James Stirling, his colleague, whose daughter John Napier subsequently married. In 1582 Sir Archibald was appointed master of the mint in Scotland, with the sole charge of superintending the mines and minerals within the realm, and this office he held till his death in 1608. His first wife died in 1593, and in 1572 he married a cousin, Elizabeth Mowbray, by whom he had three sons, the eldest of whom was named Alexander.1

As already stated, John Napier was born in 1550, the year in which the Reformation in Scotland may be said to have commenced. In 1563, the year in which his mother died, he matriculated at St. Salvator’s College, St. Andrews. He early became a Protestant champion, and the one extant anecdote of his youth occurs in his address "to the Godly and Christian reader" prefixed to his Plaine Discovery. He writes:

"In my tender yeares, and barneage in Sanct-Androis at the Schools, having, on the one parte, contracted a loving familiaritie with the Archbishop of Edinburgh, and the late Lord Provost of the same City, who, being attentive to the sermons of that worthy man of God, Master Christopher Goodman, teaching upon the Apocalypse, I was so moved in admiration, against the blindnes of Papists, that could not most evidently see their seven armed little Rome, painted out there so lively by Saint John, as the mother of all spiritual whoredome, that not onely bursted I out in continual reasoning against my said familiaritie, but also fromthenceforth, I determined with my selfe (by the assistance of Gods spirit) to employ my studie and diligence to search out the remanent mysteries of that holy Book: as to this houre (praised be the Lorde) I have bin doing at al such times as conveniently I might have occasion."

The names of nearly all Napier’s classfellows can be traced as becoming determinants in 1566 and masters of arts in 1568; but his own name does not appear in the lists. The necessary inference is that his stay at the university was short, and that only the groundwork of his education was laid there. Although there is no direct evidence of the fact, there can be no doubt that he left St. Andrews to complete his education abroad, and that he probably studied at the university of Paris, and visited Italy and Germany. He did not, however, as has been supposed, spend the best years of his manhood abroad, for he was certainly in Scotland by 1571, when he was created one of the Lords of the Privy Council arranged at Merchiston; and in 1572 he married Elizabeth, daughter of Sir James Stirling of Keir. About the end of the year 1570 his wife died, leaving him one son, Archibald (who in 1627 was raised to the peerage by the title of Lord Napier), and one daughter, Jane. A few years afterwards he married again, his second wife being Agnes, daughter of Sir James

1 The descent of the first Napier of Merchiston has been traced to "Johan le Naper del Contele de Dunbretan," who was one of those who swore fealty to Edward I. in 1296 and defended the castle of Levenax against him in 1304; but there is no authority for this genealogy. The legend with regard to the origin of the name Napier was given by Sir Alexander Napier, eldest son of John Napier, in 1625, in these words: "One of the ancient earls of Lennox in Scotland had issue three sons: the eldest, that succeeded him to the earldom of Lennox; the second, whose name was Donald; and the third, named Gilchrist. The then king of Scotland having wars, did convocate his sires to parliament, whereupon Donald was elected in consequence of Lennox, who, keeping his eldest son at home, sent his two sons to serve him with the forces that were under his command. . . . After the battle, as the manner is, every one drawing and setting forth his particulars, the same said Sir Donald said amongst the rest, but there is one amongst you who hath Na-Peer (i.e., no equal); and calling Donald into his presence commanded him, in regard to his worthy service, and in augmentation of his honour, to change his name from Lennox to Napier, and gave him the lands of Gosford and lands in Fife, and made him his own servant, which discourse is confirmed by evidences of mine, wherein we are called Lennox alias Napier."
NAPIER, JOHN

Chisholm of Cromlix, who survived him. By her he had five sons and five daughters.

In 1588 he was chosen by the presbytery of Edinburgh one of its commissioners to the General Assembly.

On the 17th of October 1593 a convention of delegates was held at Edinburgh at which a committee was appointed to follow the advice given to him by Robert, insisting on certain instructions relating to the punishment of the rebellious Popish earls and the safety of the church. This committee consisted of six members, two barons, two ministers and two burgesses—the two barons selected being John Napier of Merchiston and James Maxwell of Calderwood. The delegates found the king at Jedburgh, and the mission, which was a dangerous one, was successfully accomplished. Shortly afterwards another convention was held at Edinburgh, and it was resolved that the delegates sent to Jedburgh should again meet the king at Linlithgow and repeat their former instructions. This was done accordingly, the number of members of the committee being, however, doubled. These interviews took place in October 1593, and on the 29th of the following January Napier wrote to the king the letter which forms the dedication of the Plaine Discovery.

The full title of this first work of Napier's is given below.1 It was written in English instead of Latin in order that "hereby the simple of this Iland may be instructed"; and the author apologizes for the language and his own mode of expression in the following sentences:

"...of certaine things threadst, is here rudely and in base language set downe, I doubt not to be pardoned thereof by all good men, who, considering the necessittie of this time, will esteeme it more meete to make hast to prevent the rising againe of Anti-christian treacheries within this Iland, then to prolong the time in painting of language"; and "I graunt indeede, and am sure, that in the style of words and utterance of language, we shall greatlie differ, for therein I do judge my selfe inferior to all men: so that scarce any of the highest of high matters could I with long deliberation finde words to expresse my minde."2 Napier's Plaine Discovery is a serious and laborious work, to which he had devoted years of care and thought. In one sense it may be said to stand to theological literature in Scotland in something of the same position as that occupied by the Canon Mirificus with respect to the scientific literature; for it is the first published original work relating to theological interpretation, and it was done without a predecessor in its own field. Napier lived in the very midst of fiercely contending religious factions; there was but little theological teaching of any kind, and the work related to what were then the leading political and religious questions of the day.

1 A Plaine Discovery of the whole Ralevation of Saint John: set downe in two treatises: The one searching and proving the true interpretation thereof: The other applying the same paraphrastically and historically in the text. Set forth by John Napier L. of Marchtichtoun youngere, Whereunto are annexed certaine Oracles of Sibylce, agreeing with the Revelation and other places of Scripture. Edinburgh, printed by Robert Walde-grafe, printer to the King's Majestie, 1593. Cam pm 9 Regali.

2 A Dutch translation was published at Middelburg in 1600 and a second edition in 1607. The work was translated into French by George Thomson, a naturalized Scotman residing in La Rochelle, and published by him at that town in 1602, under the title Outserre de tous les secrets de l'Apocalypse. . . . Par Jean Nepure (c. a. d.) Nonpoirel, Sieur de Merchison, reussse par lui-mesme, et mise en Francois par Georges Thomes de L'lle. Five subsequent editions were published in 1603, 1605 and 1607. German translations were published at Gera in 1611 and at Frankfort in 1605 and 1627. The second edition in English appeared at Edinburgh in 1641, and another was published at Edinburgh in 1654, which was a literal translation of the Latin text. A third edition was published in Latin soon after the original publication in 1593, but that, as the work had now been made public by the French and Dutch translations, and the original edition, which was a literal translation of the Latin, was confined to the first two Edinburgh editions, copies were issued bearing the London imprint and dates 1624 and 1611.

After the publication of the Plaine Discovery, Napier seems to have occupied himself with the invention of secret instruments of war, for in the Bacon collection at Lambeth Palace there is a document, dated the 7th of June 1596 and signed by Napier, giving a list of his inventions for the defence of the country against the anticipated invasion by Philip of Spain. The document is entitled "Secret Inventions, professed all time in their days for defence of this Iland, and withstanding of strangers, enemies of God's truth and religion," and the inventions consist of (1) a mirror for burning the enemies' ships at any distance, (2) a piece of artillery destroying everything round an arc of a circle, and (3) a round metal chariot, so constructed that its occupants could move it rapidly and easily, while firing out through small holes in it. It has been asserted (by Sir Thomas Urquhart) that the piece of artillery was actually tried upon a plain in Scotland with complete success, a number of sheep and cattle being destroyed.

In 1614 appeared the work which in the history of British science can be placed as second only to Newton's Principia. The full title is as follows: Mirifici Logarithmorum Canonis descrip,io, Ejusque usus, in utraque Trigonometria; ut etiam in omnis Logistica Mathematica, Amplissimis, Facillimis, & expeditissimis explicationi. Authore ac Inventore Ioanne Nepere, Barone Merchisoni, &c., Scotia. Edinburgi, ex officiis Andreae Hart Bibliopolae, CIO.DC.XIV. This is printed on an ornamental title-page. The work is a small-sized quarto, containing fifty-seven pages of explanatory matter and ninety pages of tables. The nature of logarithms is explained by reference to the motion of points in a straight line, and the principle upon which they are based is that of the correspondence of a geometrical and an arithmetical series of numbers. The table gives the logarithms of sines for every minute to seven figures. This work contains the first announcement of logarithms to the world, the first table of logarithms and the first use of the name logarithm, which was invented by Napier. In 1617 Napier published his Rabdologia;4 a duodecimo of one hundred and fifty-four pages; there is prefixed to it as preface a dedicatory epistle to the high chancellor of Scotland. The method which Napier terms "Rabdologia" consists in the use of certain numerating rods for the performance of multiplications and divisions. These rods, which were commonly called "Napier's bones," will be described further on. The second method, which he calls the "Promptuarium Multiplicationis" on account of its being the most expedite of all for the performance of multiplications, involves the use of a number of lamellae or little plates of metal disposed in a box. In an appendix of forty-one pages he gives his third method, "local arithmetic," in which an abacus or chess-board is employed as a means of the expression of numbers in the scale of radix 2. In the Rabdologia he gives the chronological order of his inventions. He speaks of the canon of logarithms as "a me longo tempore elaboratum." The other three methods he devised for the sake of those who would prefer to work with natural numbers; and he mentions that the promptuary was his latest invention. In the preface to the appendix containing the local arithmetie he states that, while devoting all his leisure to the invention of these abbreviations of calculation, and to examining by what method the toil of calculation might be removed, he addition of the logarithms, rabdologia and promptuary, he had hit upon a certain tabular arithmetic, whereby the more troublesome operations of common arithmetick are performed on an abacus or chess-board, and which may be regarded as an amusement.

4 Rabdologiae seu Numerationis per virgulas Libri duo: Cum Appendice de expeditissimis Multiplicationis promptuariis. Quibus accessor & Arithmeticae Localis Liber unus. Authore & Inventore Ioanne Nepere, Barone Merchisoni, &c., Scotia. Edinburgi, Escu- debel Andreas Hart (1617). Foreign editions were published in Italian at Verona in 1623, in Latin at Leiden in 1626 and 1628, and in Dutch at Gouda in 1626. In 1625 Ursinus published Rabdologiae Neporissa at Berlin, and the rods or bones were described in several other works.
rather than a labour, for, by means of it, addition, subtraction, multiplication, division and even the extraction of roots are accomplished simply by the motion of counters. He adds that he has appended it to the Raddolegio, in addition to the promptuaries, because he did not wish to bury it in silence nor to publish so small a matter by itself. With respect to the calculating rods, he mentions in the dedication that they had already found so much favour as to be almost in common use, and even to have been carried to foreign countries; and that he has been advised to publish his little work relating to their mechanism and use, lest they should be put forth in some one else's name.

Napier died on the 4th of April 1617, the same year as that in which the Raddolegio was published. His will, which is extant, was signed on the fourth day before his death. No particulars are known of his last illness, but it seems likely that death came upon him rather suddenly at last. In both the Canonis descriptio and the Raddolegio, however, he makes reference to his ill-health. In the dedication of the former he refers to himself as "mihi jam morbis penè confecto," and in the "Admonitio" at the end he speaks of his "inha ira valetudo;" while in the latter he says he has been obliged to leave the calculation of Napierian logarithms to others "ob invisam corporis nostris valetudinem."

It has been usually supposed that John Napier was buried in St Giles' church, Edinburgh, which was certainly the burial-place of some of the family, but Mark Napier (Memoirs, p. 246) quotes Professor William Wallace, who, writing in 1832, gives strong reasons for believing that he was buried in the old church of St Cuthbert.

Professor Wallace's words are—

"My authority for this belief is unquestionable. It is a Treatise on Trigonometry, by a Scotsman, James Hume of Godscroft, Berwickshire, a place still in possession of the family of Hume. The title-page of this work is dated Paris, and has the date 1636 on the title-page, but the royal privilege which secured it to the author is dated in October 1635, and it may have been written several years earlier. In his treatise (page 116) Hume says, speaking of logarithms, 'L'inventeur estoit un Seigneur de grande condition, et duquel la posterité est aujourd'hui en possession de grandes dignités dans le royaume, qui estant sur l'age, et grandement trouaillé des gouttes ne pouvait faire autre chose que de se d'adonner aux sciences, et principalement aux mathematiques et à la logistique, à quoy il se plaisoit infiniment, et avec extrême peine, a construit ses Tables des Logarymes, imprimées à Paris en l'an 1614... Il mourut l'an 1616, et fut enterré hors la Porte Occidentale d'Edinbourg, dans l'Eglise de Saint Cudbert."

There can be no doubt that Napier's devotion to mathematics was not due to old age and the gout, and that he died in 1617 and not in 1616; still these sentences were written within eighteen years of Napier's death, and their author seems to have had some special sources of information. Additional probability is given to Hume's assertion by the fact that Mercilston is situated in St Cuthbert's parish. It is nowhere else recorded that Napier suffered from the gout. It has been stated that Napier's mathematical pursuits led him to dissipate his means. This is not so, for his will (Memoirs, p. 427) shows that besides his large estates he left a considerable amount of personal property.

The Canonis Descriptio on its publication in 1614, at once attracted the attention of Edward Wright, whose name is known in connexion with improvements in navigation, and Henry Briggs, then professor of geometry at Gresham College, London. The former translated the work into English, but he died in 1615, and the translation was published by his son Samuel Wright in 1616. Briggs was greatly excited by Napier's invention and visited him at Merchiston in 1615, staying with him a whole month; he repeated his visit in 1616 and, as he states, "would have been glad to make him a third visit if it had pleased God to spare him so long." The logarithms introduced by Napier in the Descriptio are not the same as those now in common use, nor even the same as those now called Napierian or hyperbolic logarithms. The change from the original logarithms to common or decimal logarithms was made by both Napier and Briggs, and the first tables of decimal logarithms were calculated by Briggs, who published a small table, extending to 1000, in 1617, and a large work, Arithmetica Logarithmica, containing logarithms of numbers of 30,000 and from 50,000 to 100,000, in 1624. (See LOGARITHM.)

Napier's Descriptio of 1614 contains no explanation of the manner in which he had calculated his table. This account he kept back, as he himself states, in order to see from the reception met with by the Descriptio, whether it would be acceptable. Though written before the Descriptio it had not been prepared for press at the time of his death, but was published by his son Robert in 1619 under the title Mirifici Logarithmorum Canonis Constructio. In this treatise (which was written before Napier had invented the name logarithm) logarithms are called "artificial numbers."

The different editions of the Descriptio and Constructio, as well as the reception of logarithms on the continent of Europe, and especially by Kepler, whose admiration of the invention almost equalled that of Briggs, belong to the history of logarithms (q.v.). It may, however, be mentioned here that an English translation of the Constructio of 1619 was published by W. R. Macdonald at Edinburgh in 1859, and that there is appended to this edition a translation of Napier's Mirifici Logarithmorum Canonis Constructio, as well as translations of some of the latte's writings,English and foreign, all the works being carefully collated, and references being added to the various public libraries in which they are to be found.

Napier's priority in the publication of the logarithms is unquestioned and only one other contemporary mathematician seems to have conceived the idea on which they depend. There is no anticipation or hint to be found in previous writers, and it is very remarkable that a discovery or invention which was to exert so important and far-reaching an influence on astronomy and every science involving calculation was the work of a single mind.

The more one considers the condition of science at the time, and the state of the country in which the discovery took place, the more wonderful does the invention of logarithms appear. When algebra had advanced to the point where exponents were introduced, nothing would be more natural than that their utility as a means of performing multiplications and divisions should be remarked; but it is one of the surprises in the history of science that logarithms were invented as an arithmetical improvement years before their connexion with exponents was known. It is also surprising that the invention was not the result of any happy accident. Napier deliberately set himself to abbreviate multiplications and divisions—operations of so fundamental a character that it might well have been thought that they were in rerum natura incapable of abbreviation; and he succeeded in devising, by the help of arithmetic and geometry alone, the one

1 The title runs as follows: Arithmetica Logarithmica, sive Logarithmorum chilias undecies triinginta... Hos numeros primus inventi clarissimus vir Iohannes Naperus Baro Merchistonii; eos eum ex usu communi sententia mutavit, corumque eum et usum illustravit Henricus Briggsius... 2 The full title was: Mirifici Logarithmorum Canonis Constructio... Et eorum ad naturales ipsorum numerorum habitudines; una cum Appendice, de alla edique praestantiori Logarithorum species contenta. Quibus accessisse Propositiones ad triangula sphærica factiore calculo resolvendas: Unda cum Annotationibus aliquo doctissimi D. Henrici edque praestantiori Logarithorum species contenta. Edidit... Auctore & Inventore Ioanne Nepere, Barone Merchistonii, &c. Scoto. Edinburghi, Excudebat Andreas Hart, Anno Domino 1619. There is also preceding this title-page an ornamental title-page, similar to that of the Descriptio of 1614; the words are different, however, and run—Mirifici Logarithmorum Canonis Descriptio... Accesserunt Opera Posthuma: Primò, Mirifici ipsiis canonis constructio, & Logarithmorum ad naturales ipsorum numerorum habitudines. Secundò, Appendicem, &c. Tertio, Propositiones quaedam eminensissimæ, ad Triangula sphærica mira facilitate resolvenda... It would appear that this title-page was intended for the first page of the Descriptio of 1614 by those who bound the two books together.

3 The work of Justus Byrgius is described in the article LOGARITHM. In that article it is mentioned that a Scotsman in 1594 in a letter to Tycho Brahe he held out some hope of logarithms; it is likely that the person referred to is John Craig, son of Thomas Craig, who has been mentioned as one of the colleagues of John Napier's father as justice-depute.
NAPIER, JOHN

great simplification of which they were susceptible—a simplification to which nothing essential has since been added.

When Napier published the Canonis Descriptio England had taken no part in the advance of science, and there is no British author of the time except Napier whose name can be placed in the same rank as those of Copernicus, Tycho Brahe, Kepler, Galileo, or Stevin. In England, Robert Recorde's book, where he published his mathematical treatises, but they were of trifling importance and without influence on the history of science. Scotland had produced nothing, and was perhaps the last country in Europe from which a great mathematical discovery would have been expected. Napier lived, too, not only in a wild country, which was in a lawless and unsettled state during most of his life, but also in a cedulous and superstitious age. Like Kepler and all his contemporaries he believed in astrology, and he contended for the existence of a sort of faith in the power of magic, for there is extant a deed written in his own handwriting containing a contract between himself and Robert Logan of Restalrig, a turbulent baron of desperate character, by which Napier undertakes "to serche and sik out, and be al craft and ingyne that he dow, to tempt, tye, and find out" some buried treasure supposed to be hidden in Logan's fortress at Fastcastle, in consideration of receiving one-third part of the treasure found by his aid. Of this singular contract, which is signed, "Robert Logane of Restarlige and ' Jhonne Neper, Fear of Merchiston," and is dated 20 February 1594, a facsimile is given in Mark Napier's Memoirs. As the deed, so singularly described but no is extant, it may be presumed that the terms of it were not fulfilled; but the fact that such a contract should have been drawn up by Napier himself affords a singular illustration of the state of society and the kind of events in the midst of which logarithms had their birth. Considering the time in which he lived, Napier is singularly free from superstition: his Plaine Discovery relates to a method of interpretation which belongs to a later age; he shows no trace of the extravagances which occur everywhere in the works of Kepler; and none of his writings contain allusions to astrology or magic.

After Napier's death his manuscripts and notes came into the possession of his second son by his second marriage, Robert, who edited the Constructio; and Colonel Milliken Napier, Robert's lineal male representative, was still in the possession of many of these private papers at the close of the 18th century. On one occasion when Colonel Napier was called from Paris to London to see the King, these papers, together with a portrait of John Napier and a Bible with his autograph, were deposited for safety in a room of the house at Milliken. When the Colonel went away, there was absence the other's absence the loss of the book burned to the ground, and all the papers and relics were destroyed. The manuscripts had not been arranged or examined, so that the extent of the loss is unknown. Fortunately, however, Robert Napier had abstracted the Logarithmorum Canonis and De Logistica Logarithmica, and the copy escaped the fate of the originals in the manner explained in the following note, written in the volume containing them by Francis, seventh Lord Napier: John Napier of Merchiston, inventor of the logarithms, left his manuscripts to his son Robert, who appears to have caused the following pages to have been written out fair from his father's notes, for Mr Briggs, professor of geometry at Oxford. They were given to Francis, the fifth Lord Napier, by William Napier of Culcreugh, Esq., heir-male of the above-named Robert. Finding them in a neglected state, amongst my family papers, I have bound them together, in order to preserve them entire.—NAPIER, 7th March 1801.

An account of the contents of these manuscripts was given by Mark Napier in the appendix to his Memoirs of John Napier, and the many extracts which they contained were edited by him in 1839 under the title De Arte Logistica Joannis Naperi Merchistonis Baronis Libri qui superstant Impressum Edinburgi M.DCCC.XXII, as one of the publications of the Bannatyne Club.

The treatise occupies one hundred and sixty-two pages, and there is an introduction by Mark Napier of ninety-four pages. The Arithmetica consists of three books, entitled—(1) De Computationibus Quantitatis; (2) De Logistica Logarithmica; (3) De Logistica Arithmetica. The only parts of the logarithm principle contained in the first book of this book occurs the note,—"I could find no more of this geometrical paint amongst all his fragments." The Algebra Joannis Naperi consists of three books, the first of which is De Numeris a Natura Algebrice; the second, De positiva sive cosseca Algebrice parte; and the conclusions with the words, "There is no more of his algebra orderlie set down." The transcripts are entirely in the handwriting of Robert Napier himself, and the two notes that have been quoted prove that they were made from Napier's own papers. The title, which is written on the first leaf, and is also in Robert Napier's writing, runs thus: "The Baron of Merchiston his booke of Arithmetica and Algebra. For Mr Henrie Briggs, Professor of Geometric at Oxford." These treatises were probably composed before Napier had invented the logarithms or any of the apparatuses described in the De Logistica Logarithmica. For the logarithmic straight line, the principle of logarithms, even where we should expect to find such a reference, and the one solitary sentence where the Rabdologia is mentioned ("sive quadratura qua quadrantibus, secundum Rabdologiae nescet") was probably added afterwards. It is worth while to notice that the reference occurs in a chapter "De Multiplicationis et Partitionis comprehendis miscellaneis," which, supposing the treatise to have been written in 1594, and considering the number of copies which may have been held in the public library of the subject over which his subsequent labours were to exert so enormous an influence.

Napier uses abundantes and other forms for positive and negative, distinctus and nominatus as containing no less than nothing ("Abundantes sunt quotitates majores nihil: definitae sunt quotitates minores nihil"). The same definitions occur also in the Canonis Descripti (1614), p. 5: "Logarithmum sinuum, qui semper majores nihil sunt, abundantes vocamus, et hoc signo +, aut minus prae- tamen. Logarithmos autem minores nihilos definitivos vocamus, praenotantes eis hic signum —."

Napier may thus have been the first to use the expression "quantity less than nothing." He uses "radicatum" for power (for root, power, exponent, his words are radix, radicatum, index).

Apart from the interest attaching to these manuscripts as the work of Napier, they possess independent value as affording evidence of the exact state of his algebraical knowledge at the time when logarithms were invented. There is nothing to show whether the logarithms were intended for the purpose of simplification, or whether they were not sent to him. Amongst the papers is a thin quarto volume in Robert Napier's writing containing a digest of the principles of alchemy; it is addressed to his son, and begins with the words, "First let us look out the greatest treasure in our charter-chest and be kept secret except from a few. This treatise and the manuscripts seem to be the only manuscripts which have escaped destruction.

The principle of "Napier's bones" may be easily explained by imagining ten rectangular slips of cardboard, each divided into nine squares. In the top squares of the slips the digits of each number are represented, and each slip contains in its nine squares the first nine multiples of the digit which appears in the top square. With the exception of the top squares, every square is divided into two parts by a diagonal, the units being written to one side and the tens on the other; so that when a multiple consists of two figures they are separated by the diagonal.

Fig. 1 shows the slips corresponding to the numbers 2, 0, 8, 5 placed in contact with each other, and next to them is placed another slip containing, in squares without diagonals, the first nine digits. The slips thus placed still leave the multiples of 0, 8, 5 remaining, and it is in this manner the multiples corresponding to 0, 6, 7, and set down the digits as they are obtained, from right to left, shifting them back one place and adding up the columns as in ordinary multiplication, viz., the figures as written down are:

<table>
<thead>
<tr>
<th>2</th>
<th>0</th>
<th>8</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0</td>
<td>6</td>
<td>2</td>
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<tr>
<td>8</td>
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<td>2</td>
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</tr>
<tr>
<td>6</td>
<td>6</td>
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</tbody>
</table>

Napier's rods or bones consist of ten oblong pieces of wood or other material with square ends. Each of the four faces of each rod contains 18 numbers, such that to the left of the slips just described, the first rod containing the multiples of 0, 1, 9, 8, the second of 2, 3, 9, 7, the third of 3, 6, 9, 6, the fourth of 0, 4, 9, 5, the fifth of 1, 2, 8, 7, the sixth of 3, 7, 8, the seventh of 2, 9, 7, 6, the eighth of 0, 5, 4, 8, the ninth of 1, 8, 9, 5, and the tenth of 3, 4, 6, 5. Each rod therefore contains on two of its faces multiples of digits which are complementary to those on the other face, and the multiples of a digit and of its complement are reversed in position. The arrangement of the numbers on the rods will be evident from fig. 2, which represents the four faces of the fifth rod. The set of ten rods is thus equivalent to four sets of slips as described above, or 2085; for by their means we may multiply every number less than 11,111, and also any number (consisting of course

12510
6255
14959

153460

153460
of not more than ten digits) which can be formed by the top digits of the bars when placed side by side. Of course two sets of rods may be used, and we shall see that the rules may apply equally well with less than 1111111111 and so on. It will be noticed that the rods only give the multiples of the number which is to be multiplied, or of the divisor, when they are used for division, and it is evident that the highest number which can be used for division is less than 1010101010.

In multiplications or divisions of any length it is generally convenient to begin by forming a table of the first nine multiples of the multiplicand or divisor, and Napier's bones at best merely provide such a table, and in an incomparable shape, and in a form in which, after the first, in the same parallelogram have to be performed each time the rods are used. The Rabdologia attracted more general attention than the logarithms, and two more editions, in the same form, as well as a book of the same name in a more digested form, were published, and there were several editions on the Continent. Nothing shows more clearly the rude state of arithmetical knowledge at the beginning of the 17th century than the universal satisfaction with which Napier's invention was welcomed by all classes and regarded as a real aid to calculation. Napier also describes in the Rabdologia two other larger rods to facilitate the extraction of square and cube roots. In the Rabdologia the rods are called "vurgulae," but in the passage quoted above from the manuscript on arithmetic they are referred to as "bones" (ossa).

Besides the logarithms and the calculating rods or bones, Napier's name is attached to certain rules and formulae in spherical trigonometry. Napier's "Circular Sine Rule" is a complete system of formulae for the solution of right-angled triangles may be enunciated as follows. Leaving the right angle out of consideration, the sides including this angle are the circumference of the hypotenuse, and the complements of the other angles are called the circular parts of the triangles. Thus there are five circular parts, a, b, 90° - a, 90° - c, 90° - b, and these are supposed to be arranged in this order, i.e. the order in which they are arranged when round a circle. Selecting any part and calling it the middle part, the two parts next it are called the adjacent parts and the remaining two the opposite parts. The rules then are:

These rules were published in the Canonis Descriptio (1614), and Napier has there given a figure, and indicated a method, by means of which they may be proved directly. The rules are curious and interesting, but of very doubtful utility, as the formulae are best remembered by the practical calculator in their unconnected form.

"Napier's analogies" are the four formulae—

\[
\tan(A + B) = \frac{\sin A \cos B + \cos A \sin B}{\cos A \cos B - \sin A \sin B},
\]

\[
\tan(A - B) = \frac{\sin A \cos B - \cos A \sin B}{\cos A \cos B + \sin A \sin B},
\]

\[
\tan(A + B) = \frac{\sin(A + B)}{\cos(A + B)},
\]

\[
\tan(A - B) = \frac{\sin(A - B)}{\cos(A - B)}.
\]

They were first published after his death in the Constructio among the formulae in spherical trigonometry, which were the results would have been impossible had he attempted to attack this subject in the several analogies is actually given by Napier, the other three being added by Briggs in the remarks which are appended to Napier's results. The work left by Napier is, however, rough and unfinished, and it is uncertain whether he knew of the other formulae or not. They are, however, so simply deducible from the results he has given that all the four analogies may be properly ascribed to his name. An analysis of the formulae contained in the Descriptio and Constructio is given by Delambre in vol. I, of his Histoire de l'Astronomie Moderne.

To Napier seems to be due the first use of the decimal point in arithmetic. Before him, the first figures after the point were denoted by the prefix "significand," but such numerals of which Napier gives an extended use, the division of 860104 by 432. The quotient is written 1993.273 in the work, and 1993.2733 in the text. This single instance of the use of a decimal point in the midst of an arithmetical process, if it stood as a significant departure from the usual way of notation and treatment of fractions, and used it as a permanent notation and not merely in the course of performing an arithmetical operation. The decimal point is, however, used systematically in the Constructio (1619), there being perhaps two hundred decimal points altogether in the book.

The original point is defined on p. 6 of the Constructio in the words: "The point, or period, in this notation, signifies, quicquid post numerum signumificantem, is not the beginning of the cyphris post se, quom significat periodum postumum. Ut 10000000-00 valet idem, quod 10000000.

Item 25.803, idem quod 25.803. Item 9999998-0005021, idem valet quod 9999998. & sic de casibus duorum, trinorum, &c. multipliorum; (2) he used the point after the decimal point and preceding the first significant figure; and (3) he had no objection to a decimal standing by itself without any integer. Napier thus had complete command over decimal fractions and the use of the decimal point. Briggs also used decimals, but in a form not quite so convenient as Napier. Thus he prints 63.0957379 as 630957379. He prints a bar under the decimals, this notation first appears without any explanation in his Logarithmorum Canonis Epitome, 1617, but afterwards he used merely a small line just high enough to fix distinctively which two figures it was intended to separate. Thus he may have written 63,095,7379. The very first use was printed by Oughtred and some of Briggs' successors. It was a long time before decimal arithmetic came into general use, and all through the 17th century exponential marks were in common use. The notation itself little after that point did it follow that a decimal point was used as a decimal separator, and it is curious that the separator which he used, the point, should be that which has been ultimately adopted, and is now the universal one.

The hereditary office of king's poulterer (Pultris Regis) was for many generations in the family of Merichston, and descended to John Napier. The office, Mark Napier states, is repeatedly mentioned in the family proofs that the family has been near the village of Dene in the shire of Linlithgow. The duties were to be performed by the possessor or his deputy; and the king was expected to give the yearly homage of a present of poultry from the feudal holder. The charter was granted by John Napier in 1610 for 1700 marks. With the exception of the outbuildings all the estates he inherited descended to his posteriority.

Napier was entrusted to the production of the tables, and it is certain that among the manuscript papers there exist a great many documents signed by John Napier. His usual signature was "Jhone Nepur," but in a letter written in 1608, and in all deeds signed after that date, he wrote "Jhone Nepair." His letter to the Constructio Briggs seems to have used the notation all his life, but in writing it, as appears from manuscripts of his, he added also a small vertical line just high enough to distinguish between these two figures it was intended to separate, thus he may have written 63,095,7379. The very first use was printed by Oughtred and some of Briggs' successors. It was a long time before decimal arithmetic came into general use, and all through the 17th century exponential marks were in common use. The notation itself little after that point did it follow that a decimal point was used as a decimal separator, and it is curious that the separator which he used, the point, should be that which has been ultimately adopted, and is now the universal one.

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Napier's last letter to the Constructio Briggs seems to have used the notation all his life, but in writing it, as appears from manuscripts of his, he added also a small vertical line just high enough to distinguish between these two figures it was intended to separate, thus he may have written 63,095,7379. The very first use was printed by Oughtred and some of Briggs' successors. It was a long time before decimal arithmetic came into general use, and all through the 17th century exponential marks were in common use. The notation itself little after that point did it follow that a decimal point was used as a decimal separator, and it is curious that the separator which he used, the point, should be that which has been ultimately adopted, and is now the universal one.

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Napier's three mathematical works are reprinted by N. L. W. A. Gravelhau in Verhandelingen der Kon. Akad. van Wet te Amsterdam, 1. sectie, deel 6 (1899).

NAPIER, SIR WILLIAM FRANCIS PATRICK (1785-1860), British soldier and military historian, third son of Colonel George Napier (1751-1804), and brother of Sir Charles James Napier (see above), was born at Celbridge, near Dublin, on the 17th of December 1785. He became an ensign in the Royal Irish Artillery in 1800, but at once exchanged into the 62nd, and was put on half-pay in 1802. He was afterwards made a cornet in the Blues by the influence of his uncle the duke of Richmond, and for the first time did actual military duty in this regiment, but he soon fell in with Sir John Moore's suggestion that he should exchange into the 52nd, which was about to be trained in the famous camp of Shorncliffe. Through Sir John Moore he soon obtained a company in the 43rd, joined that regiment at Shorncliffe and became a great favourite with Moore. He served in Denmark, and was present at the engagement of Kjoge, and, his regiment being shortly afterwards sent to Spain, he bore himself nobly through the retreat to Corunna, the hardships of which permanently impaired his health. In 1809 he became
aide-de-camp to the duke of Richmond, Lord Lieutenant of Ireland, but joined the 43rd when that regiment was ordered again to Spain. With the light brigade (the 43rd, 2nd, and 9th), under the command of General Craufurd, he marched to Talavera in the famous forced march which he has described in his History, and had a violent attack of pleurisy on the way. He, however, refused to leave Spain, was wounded on the Coa, and shot near the spine at Cazal Nova. His conduct was so conspicuous during the pursuit of Masséna after he left the lines of Torres Vedras that he was almost overshadowed himself. He became major, and was commissioned to review his soldiers before General Soult. He lived when and as he wished, and his career was a model of energy, determination, and the brevet majority. He became brigade major, was present at Fuentes d'Onor, but had so bad an attack of ague that he was obliged to return to England. In England he married Caroline Amelia Fox, daughter of General Henry Fox and niece of the statesman Fox. Three weeks after his marriage he again started for Spain, and was present at the storming of Badajoz, where his great friend Colonel M’Leod was killed. In the absence of the new lieutenant-colonel he took command of the 43rd regiment (he was now a substantive major) and commanded it at the battle of Salamanca. After a short stay at home he again joined his regiment in the Pyrenees, and did his greatest military service at the battle of the Nivelle, where, with instinctive military insight, he secured the most strongly fortified part of Soult’s position, practically without orders. He served with his regiment at the battles of the Nive, where he received two wounds, Orthes, and Toulouse. For his services he was made brevet lieutenant-colonel, and one of the first C.B.’s. Like his brother Charles he then entered the military college at Farnham. He commanded his regiment in the invasion of France after Waterloo, and remained in France with the army of occupation until 1819, when he retired on half-pay. As it was impossible for him to live on a major’s half-pay with a wife and family, he determined to become an artist, and took a house in Sloane Street, where he studied with George Jones, the academican.

The years he had spent in France he had occupied in improving his general education, for, incredible as it seems, the author of the History of the War in the Peninsula could not spell or write respectable English till that time. But his career was to be great in literature, not in art. The tendency appeared in an able review of Jomini’s works (Edinburgh Rev.) in 1821, and in 1823 Mr Bickersteth (afterwards Lord Langdale) suggested to him the desirability of writing the Peninsula. Mr Bickersteth, at some time he did not take kindly to the suggestion, but at last determined to become an author in order to defend the memory of Sir John Moore, and to prevent the glory of his old chief being overshadowed by that of Wellington. The duke of Wellington himself gave him much assistance, and handed over to him the whole of Joseph Bonaparte’s correspondence which had been taken at the battle of Vittoria; this was all in cipher, but Mrs Napier, with great patience, discovered the keys. Marshal Soult also took an active interest in the work and arranged for the French translation of Maitche Dumas. In 1828 the first volume of the History appeared. The publisher, John Murray, indeed, was disappointed in the sale of the first volume and published the remainder himself. But it was at once seen that the great deeds of the Peninsula War were about to be fitly commemorated. The excitement which followed the appearance of each volume is proved by the innumerable pamphlets issued by those who believed themselves to be attacked, and by personal altercation with many distinguished officers. But the success of the book was proved still more by the absence of competition than by those bitter controversies. The histories of Southey and Lord Lonsderry fell still-born, and Sir George Murray, Wellington’s quartermaster-general, who had determined to produce the history, gave up the attempt in despair. This success was due to a combination of qualities which have justly secured for Napier the title of being the greatest military historian England has produced. When in 1840 the last volume of the History was published, his fame not only in England but in France and Germany was safely established.

His life during these years had been chiefly absorbed in his History, but he had warmly sympathised with the movement for political reform which was agitating England. The Radicals of Bath and many other cities and towns pressed him to enter parliament, and Napier was actually invited to become the military chief of a national guard to obtain reforms by force of arms. He refused the dangerous honour on the ground that he was in bad health and had a family of eight children. In 1830 he had been promoted colonel, and in 1842 he was made a major-general and given the lieutenant-governorship of Guernsey. Here he found plenty of occupation in controlling the relations between the soldiers and the inhabitants, and in working out proposals for a complete scheme of reform in the government of the island. While he was at Guernsey his brother Charles had conquered Sind, and the attacks made on the policy of that conquest brought William Napier again into the field of literature. In 1845 he published his History of the Conquest of Scinde, and in 1853 the corresponding History of the Administration of Scinde—books which in style and vigour rivalled the great History, but which, being written for controversial purposes, were not likely to maintain enduring popularity. In 1847 he resigned his government appointment, and in 1853 was made a K.C.B. and chaplains at Scinde House, Clapham Park. In 1851 he was promoted lieutenant-general. His time was fully occupied in defending his brother, in revising the numerous editions of his History which were being called for, and in writing letters to The Times on every conceivable subject, whether military or literary. His energy is the more astonishing when it is remembered that he never recovered from the effects of the wound he had received at Cazal Nova, and that he often had to lie on his back for months together. His domestic life was shadowed by the incurable affliction of his only son, and when his brother Charles died in 1853 the world seemed to be darkening round him. He devoted himself to writing the life of that brother, which appeared in 1857, and which is in many respects his most characteristic book. In the end of 1853 his younger brother, Captain Henry Napier, R.N., died, and in 1855 his brother Sir George (see below). Inspired by his work, he lived on till the year 1860, when, broken by trouble, fatigue and ill-health, he died (February 12) at Clapham. Four months earlier he had been promoted to the full rank of general.

As a military historian Sir William Napier is incomparably superior to any other English writer, and his true competitors are Thucydides, Caesar and Livy. All four had been soldiers in the wars they describe; all four possessed a peculiar insight into the feelings of actual combatants, and all four approached a peculiar and inimitable style. Napier always had a fire blazing in his heart, and he was bursting with an inextinguishable desire to express what he was feeling, which gives his style a peculiar spontaneity, and yet he never lost the balance of his History, no less than six times. His descriptions of sieges and of battles are admirable by themselves, and his analyses of the peculiarly intricate Spanish intrigues are even more remarkable, while the descriptions and analyses are both lit up with flashes of political wisdom and military insight. It is to be noted that he displays the spirit of the partisan, even when most impartial, and defends his opinions, even when most undoubtedly true, as if he were arguing some controversial question. If his style was modelled on anything, it was on Caesar’s commentaries, and a thorough knowledge of the writings of the Roman general will often explain allusions in Napier’s. The portraits of Sir John Moore and John M’Leod are admirable; the last paragraphs descriptive of the storming of Badajoz, may be taken as examples of his great natural eloquence.

His brother, SIR GEORGE THOMAS NAPIER (1784-1859), entered the army in 1800, and served with distinction under Moore and Wellington in the Peninsula—and lost his right arm at the storming of Badajoz. He became major-general in 1837, K.C.B. in 1838 and lieutenant-general in 1846. He was governor and commander-in-chief of Malta, and during the time the abolition of slavery and the expulsion of the Boers from Natal were the chief events. He was offered, but declined, the chief command in India after Chillianwalla, and also that of the Sardinian army in 1849. He became full general in 1854. He died at Geneva on the 16th of September 1855. His autobiography, Passages in the Early Military Life of General Sir G. T. Napier, was published by his surviving son, General W. C. E. Napier (the author of an important work on outpost duty), in 1855.
NAPIER AND ETTRICK—NAPIER OF MAGDALA

The youngest brother, Henry Edward Napier (1759–1853), served in the navy during the Napoleonic wars, retired as a captain, and wrote a learned Florilegium Historiae from the earliest authentic Records to the Accession of Ferdinand III. of Tuscany (1846–1847).

For Sir William Napier's life, see his Life and Letters, edited by the Right Honourable H. A. Bruce (Lord Aberdare) (2 vols., 1862).

NAPIER AND ETTRICK, FRANCIS NAPIER, BARON (1819–1878), was born in Edinburgh on 18 March 1819, second son of John, 3rd Lord Napier of Merchiston, and Ettrick, youngest son of Alexander Napier (d. c. 1473) being the elder son of Alexander Napier (d. c. 1454), provost of Edinburgh, who obtained lands at Merchiston early in the 15th century. Sir Alexander was comptroller of the household of the king of Scotland, and was often sent to England and elsewhere on public business. Of his descendants one Napier of Merchiston was killed at Sauchieburn, another fell at Flodden and a third at Pinkie. The seventh Napier of Merchiston was Sir Archibald Napier (1534–1668), master of the Scottish mint, and the eighth was John Napier (q.v.) the inventor of logarithms. John's eldest son, Sir Archibald Napier (c. 1576–1645), was treasurer-depute of Scotland from 1622 to 1631, and was created Lord Napier of Merchiston in 1627. He married Margaret Graham, sister of the great marquis of Montrose, whose cause he espoused, and he wrote some Memoirs which were published in Edinburgh in 1703. His son Archibald, the 2nd lord (1625–1638), fought under Montrose at Auldearn, at Alford, at Kilsyth and at Philippaugh, and was afterwards with his famous uncle on the continent of Europe. His son, Archibald, the 3rd lord (d. 1683), was succeeded by his grandson Sir Robert Napier (1697–1765), who married Margaret Nicolson (1669–1686), a son of his sister Jean and her husband Sir Thomas Nicolson, Bart. (d. 1670), and then by his sister Margaret (d. 1706), the widow of John Brisbane (d. 1684). The 6th lord was Margaret's grandson Francis Scott (c. 1702–1773), a son of Sir William Scott, Bart., of Thirlestane (d. 1725). Francis Scott, who took the additional name of Napier, had a large family, his sons including William, the 7th lord, and Colonel George Napier (1751–1804). His famous grandsons are dealt with above. Another literary member of the family was Mark Napier (1798–1870), called by Mr. Andrew Lang "the impetuous biographer of Montrose," who wrote Memoirs of John Napier of Merchiston (1834), Memoirs of Montrose and the Covenanters (1838), Memoirs of Montrose (1856), Memoirs of Graham of Claverhouse (1859–1862), and a valuable legal work, The Law of Prescription in Scotland (1839 and again 1854). William, 7th Lord Napier (1730–1775), was succeeded as 8th lord by his son Francis (1732–1832), who, after serving in the English army during the American War of Independence, was lord high commissioner to the general assembly of the Church of Scotland, and compiled a genealogical account of his family which is still in manuscript. His son William John, the 9th lord (1786–1834), who was present at the battle of Trafalgar, was the father of Francis Napier, Lord Napier and Ettrick.

Born on the 15th of September 1819 Francis entered the diplomatic service in 1840, and was employed in successive posts at Vienna, Constantinople, Naples, Washington and the Hague. During this time he earned the highest opinions both at home and abroad. In 1860 he became ambassador at St. Petersburg, and in 1864 at Berlin. In 1866 he was appointed governor of Madras, and was at once confronted with a serious famine in the northern districts. In dealing with this and other problems he showed great activity and practical sense, and he encouraged public works, particularly irrigation. In 1872 he acted for a few months as Viceroy, after Lord Mayo's assassination; and on Lord Northbrook's appointment to the office he returned to England, being created a baron of the United Kingdom (Baron Ettrick of Ettrick) for his services. He continued, both in England and in Scotland, to take great interest in social questions. He was for a time a member of the London School Board, and he was chairman of the Crofters' Commission in 1883, the result of which was the appointment of a permanent body to deal with questions affecting the Scottish crofters and cottars. He died at Florence, on the 19th of December 1898, leaving a widow and three sons, the eldest of whom, William John George (b. 1846), succeeded to his titles.

NAPIER OF MAGDALA, ROBERT CORNELIS NAPIER, 1ST BARON (1810–1890), British field-marshall, son of Major Charles Frederick Napier, who was wounded at the storming of Meester Cornelis (Aug. 26, 1810) in Java and died some months later, was born at Colombo, Ceylon, on the 6th of December 1810. During his youth he was joined by Bengal Engineers from Addiscombe College in 1826, and after the usual course of instruction at Chatham, arrived in India in November 1828. For some years he was employed in the irrigation branch of the public works department, and in 1838 he laid out the new hill station at Darjeeling. Promoted captain in January 1841, he was appointed to Sirhind, where he laid out covenants on a new principle—known as the Napier system—for the troops returning from Afghanistan. In December 1845 he joined the army of the Sutlej, and commanded the Engineers at the battle of Musulki, where he had a horse shot under him. At the battle of Perozeshah on the 31st December he again had his horse shot under him, and joining the 31st Regiment on foot, was severely wounded in storming the entrenched Sikh camp. He was present at the battle of Sobraon on 11th February 1846, and in the advance to Lahore; was mentioned in despatches for his services in the campaign, and received a brevet majority. He was chief engineer at the reduction of Kot-e-Kargar by Brigadier-General Wheeler in May 1846, and received the thanks of government. He was then appointed consulting engineer to the Punjabs and Afrs, and was present at the passage of the Jhelum, the surrender of the Sikh army, and the surprise of Attock. For his services he was mentioned in despatches and received a brevet lieutenant-colonelcy. At the close of the war Napier was appointed civil engineer to the board of administration of the annexed Punjab province, and carried out many important public works during his tenure of office. In December 1852 he commanded a column in the first Hazara expedition, and in the following year against the Bories; and for his services in these campaigns was mentioned in despatches, received the special thanks of government and a brevet-colonelcy. He was appointed military secretary and adjutant-general to Sir James Outram's force for the relief of Lucknow in the Indian Mutiny in 1857, and was engaged in the actions which culminated in the first relief of Lucknow. He directed the defence of Lucknow until the second relief, when he was severely wounded in crossing a very exposed space with Outram and Havelock to meet Sir Colin Campbell. He was chief of the staff to Outram in the defence of the Ambagh position, and drew up the plan of operations for the attack of Lucknow, which was approved by Sir Colin Campbell and carried out by Napier, as brigadier-general commanding the engineers, in March 1858. On the fall of Lucknow Napier was most favourably mentioned in despatches, and made C.B. He joined Sir Hugh Rose as second-in-command in his march on Gwalior, and commanded the and brigade at the action of Morar on the 16th June. On the fall of Gwalior he was entrusted with the task of pursuing the enemy. With only 700 men he came up with Tantia Topi and 12,000 men on the plains of Jaora Alipur, and completely defeated him, capturing all his guns (29), ammunition and baggage. On Sir Hugh Rose's departure he took command of the Gwalior division, captured Paori in August, routed Ferozeshah, a prince of the house of Delhi, at Ranode in December, and, in January 1859, succeeded in securing the surrender of Man Singh and Tantia Topi, which ended the war. For his services Napier received the thanks of parliament and of the Indian government, and was made C.B.
In January 1860 Napier was appointed to the command of the 2nd division of the expedition to China under Sir Hope Grant, and took part in the action of Sinho, the storm of the Pelio forts, and the entry to Peking. For his services he received the thanks of parliament, and was promoted major-general for distinguished services. In the Bay of Naples the next four years Napier was military member of the council of the governor-general of India and, on the sudden death of Lord Elgin, for a short time acted as governor-general, until the arrival of Sir W. T. Denison from Madras. In January 1865 he was given the command of the Bombay army, in March 1867 he was promoted lieutenant-general, and, later in that year, appointed to command the expedition to Abyssinia, selecting his own troops and making all the preparations for the campaign. He arrived at Annesley Bay in the Red Sea early in January 1868, reached Magdalna, 420 m. from the coast, in April; stormed the stronghold, freed the captives, razed the place to the ground, returned to the coast, and on the 18th June the last man of the expedition had left Africa. He received for his services the thanks of parliament, a pension, a peerage, the G.C.B. and the G.C.S.I. The freedom of the cities of London and Edinburgh was conferred upon him, with presentation swords, and the universities bestowed upon him honorary degrees. In 1869 he was elected a fellow of the Royal Society. He held the command-in-chief in India for six years from 1870, during which he did much to benefit the army and to encourage good shooting. He was promoted general in 1871, and appointed the last commanding officer of the Royal Engineers. In 1876 he was the guest of the German crown prince at the military manœuvres, and from that year until 1883 held the government and command of Gibraltar.

In the critical state of affairs in 1877 he was nominated command-in-chief of the force which it was proposed to send to Constantinople. In 1879 he was a member of the royal commission on army organization, and in November of that year he represented Queen Victoria at Madrid as ambassador extraordinary on the occasion of the second marriage of the king of Spain. On the 1st of January 1883 he was promoted to field marshal, and in December 1886 appointed Constable of the Tower of London. He died in London on the 14th of January 1890. His remains received a state funeral, and were buried in St Paul's Cathedral on the 21st of January. He was twice married, and left a large family by each wife, his eldest son, Robert William (b. 1843), succeeding to his barony. A statue of him on horseback by Boehm was erected at Calcutta when he left India, and a replica of it was afterwards set up to his memory in Waterloo Place, London.

Naples.

The south-eastern point of North Island, New Zealand, capital of the provincial district of Hawke's Bay, 200 m. by rail N.E. of Wellington. Pop. (1906) 9454. The main portion of the town stretches along the flat shoreland of Hawke's Bay, while the suburbs extend over the hills to the north. The site consists of a picturesque peninsula known as Scinde Island. The harbor (Port Ahuriri) is sheltered by a breakwater. The cathedral church of St John (1888) for the bishopric of Waiapu, is one of the finest ecclesiastical buildings in New Zealand, imitating the Early English style in brick. An asylum, a small hospital, a lunatic asylum, a philosophical society and association, and a number of other public institutions. The town (named after Sir Charles James Napier) is under municipal government, and returns a member to the New Zealand House of Representatives. The district is agricultural, and large quantities of wool and tinned and frozen meats are exported. There is railway communication with Wellington, New Plymouth, and the Wairarapa, Wanganui and Manawatu districts. Numerous old native pa or fortified villages are seen in the neighbourhood.

NAPLES (Ital. Napoli, and Lat. Neapolis), formerly the capital of the kingdom of the Two Sicilies, and since 1860 the chief town of the province which bears its name, the smallest province in the kingdom of Italy. It is the largest city in the country, containing 547,593 inhabitants in 1901. It is a prefecture; the see of a cardinal archbishop; the residence of the general commanding the tenth Army Corps and of the admiralty commanding the second Naval Department of Italy; and it possesses also an ancient and important university.

Naples disputes with Constantinople the claim of occupying the most beautiful site in Europe. It is situated on the northern coast of the Bay of Naples, at the mouth of the river Stagno, in 40° 52' N., 14° 15' 45" E., as taken from the lighthouse on the point. By rail it is distant 151 m. from Rome, but the line is circuitous, and a direct electric line was contemplated in 1907, to run nearer the coast and shorten the distance from the capital by more than 30 m. (For map, see ITALY.) The circuit of the bay is about 35 m. from the capo di Miseno on the north-west to the Punta della Campanella on the south-east, or more than 52 m. if the islands of Ischia, at the north-west, and of Capri, at the south entrance, are included. At its opening between these two islands it is 14 m. broad; while another 4 m. separates Capri from the mainland at the Punta della Campanella, and from the opening to its head at Portici the distance is 15 m. It affords good anchorage, with nearly 7 fathoms of water, and is well sheltered, except from winds which blow from points between south-east and south-west. In the latter winds Sorrento should be especially avoided, as no safe anchorage can be found there at less than 15 fathoms, and the same remark applies to Capri with winds from S.W. to N.W. There is a perceptible tide of nearly 0 in.

On the north-east shore east of Naples is an extensive flat, forming part of the ancient Campania Felix, and walled by the small stream Sinus Parus, of the entrance of which the modern town of Portici is the port of Pompeii. From this flat, between the sea and the range of the Apenines, rises Mount Vesuvius, at the base of which, on or near the modern town of Sorrento, are the ruins of the ancient city of Herculaneum and Pompeii.

The south-east extremity of the plain, 3 m. beyond the outlet of the Sarno, a great town was formerly built, the Apenines, branching from the main range near the sea, and projecting as a peninsula more than 12 m. west, divides the Bay of Naples from the bay of Salerno (Sinus Paestanus), and ends in the bold promontory of the Punta della Campanella (Promontorium Posilippo), separated by the island of Ischia, from which there is a fine view of the city. On the north slope of this peninsula, where the plain ends and the coast abruptly bends to the west, stands the town of Castellammare, the site of Stabiae, the seat of Monte Sant' Angelo, which rises suddenly from the sea to a height of 472 ft. Further west, and nearly opposite to Naples across the bay, are Vico, Meta, Sorrento, Massa and many villages.

The north-west shore to the west of Naples is more broken and irregular. The promontory of Posilippo, which projects due south, divides this part of the bay into two smaller bays—the eastern, with the city of Naples, and the western, or Bay of Baia, which is sheltered by the island of Procida, a small island 2244 ft. long, and in some places as much as 70 ft. high, possibly constructed by Marcus Agrippa in 27 B.C., forms the so-called grotto of the Sirens, and is known by the name of Lunga. Beyond Posilippo is the small island of Nisida (Nesis); and at a short distance inland are the extinct craters of Solfatara and Astroni, and the lake of Agnano. Further west, on the coast, and provided with a convenient harbour, stands Pozzuoli (Pulei), a city containing many Roman remains, but now chiefly remarkable for the large works erected by Messrs Armstrong & Co.; and beyond it, round the Bay of Baiae, are Monte Nuovo, a hill thrown up in a single night in September 1538; the classic site of Baiae; the Lucrin or Lake; Lake Avernus; the Lake of Fusaro (Acherusia Palus); the Elysian Fields; and the port and promontory of Misenum. Still farther to the south-west lies the islands of Procida (Prociceus) and Ischia (Pithecusae, Aenaria or Inarime), which divide the Bay of Naples from the extensive Bay of Gaeta. All this country was comprised in classical times under the title of the Phlegrean Fields, and was cursed then more especially with volcanic eruptions, although the severe shock of earthquake which occurred in the island of Ischia in 1883 completely destroyed Casamicciola, and did serious damage to Forio, Lacco Ameno and Serrara Fontana, shows that there is great seismic activity in the locality. The whole region abounds with fissures from which steam highly charged with hydrochloric acid is continually issuing, and in many places boiling water is found at the surface.

The city of Naples is built at the base and on the slopes of a range of volcanic hills, and rising from the shore like an amphitheatre, is seen to best advantage from the sea. From the summit occupied by the castle of St Elmo a transverse ridge runs south to form the promontory of Pizzofalcone, and divides the city into two natural crescents. The western crescent, known as the Chiaja ward, though merely a long narrow strip between the sea
NAPLES

Naples is the see of a Roman Catholic archbishop, always a cardinal. The cathedral has a chapter of thirty canons, and of the numerous religious houses formerly existing very few have in whole or in part survived the suppression in 1868. The city is divided into fifty parishes purely for ecclesiastical purposes, and there are 237 Roman Catholic churches and 57 chapels.

The city is remarkable rather for richness in internal decoration than for architectural beauty, and is dedicated to St. Januarius, occupying the site of temples of Apollo and Neptune, and still containing some of their original granite columns, was built by the popes of Nicolaus II., and Gregory X. Owing to frequent restorations occasioned by earthquakes, it now presents an incongruous mixture of different styles. The general plan is that of a basilica with a nave and two (Gothic vaulted) aisles, and is divided by a series of arcades which was completed in 1606. Beneath the high altar is a subterranean chapel containing the tomb of St. Januarius (San Gennaro), the patron saint of the city; in the right aisle there is a chapel (Cappella del Tesoro) built between 1668 and 1673 in popular recognition of his having saved Naples in 1527 "from famine, war, plague, and the fire of Vesuvius"; and in a silver tabernacle behind the high altar of this chapel are preserved the two phials partially filled with his blood, the periodical liquefaction of which forms a prominent feature in the religious life of the city. Accessible by a door in the left aisle of the cathedral is the church of Sta Restituota, a basilica of Carolingian origin, which contains the tombs of Charlemagne and Pepin II. (901). Of the church of the Certosa (Carthusian monastery) of San Martino, on the hill below St. Elmo's castle, has now become in name, as so many of the churches are in reality, a museum. Dating from the 14th century and restored by Fossega in the 17th, it is a building of extraordinary richness of decoration, with paintings and sculpture by Guido Reni, Lanfranco, Caravaggio, D'Arpino, Solimene, Luca Giordano and notably a "Descent from the Cross" by Ribera, considered the finest work of this master. The monastery has been transformed into a medieval museum, where many pictures illustrating the modern history of Naples may be studied, and some of the sanatoriums of the monks are available for patients to be inspected. The view from the south-western balcony is incomparable. The marble cloister by Fossega, though rather flamboyant in character, is one of the finest of its kind in existence. Other churches of great architectural interest include the Santa Maria della Mercede, dating from 1311 by Guerello Origlia, which contains some splendid marble sculpture, especially Rosello's "Nativity" in the Cappella Piccola. The church of the Annunziata is the chief rival of the church of San Lorenzo (at Pozzuoli), the joint work of Donattello and Michelozzo, San Giovanni a Carbonara, built in 1344 and enlarged by King Ladislaus in 1400, which contains among much other remarkable sculpture the tomb of the king, the masterpiece of Domenico di Bartolo (1414), and that of Sergianni Caracciolo, the favourite of Joanna II., who was murdered in 1432 (the chapel in which it stands is paved with one of the earliest majolica pavements in Italy); San Lorenzo (1234), the Royal Church of the House of Anjou; and, for purely archaeological interest, the Church of Sant' Aspro, thought to be the oldest Christian church in Italy, in the crypt of the new Borsa or exchange. The church of Sant' Anna is also visited in the excavations at the back of the church of S. Maria Donna Regina and those in the cloister of S. Severino and Sossio. A more ancient Christian monument than any of the convents or churches is the catacombs, a great underground complex and in many respects finer than those at Rome. The entrance is at the Ospizio dei Poveri di San Gennaro (see Schulze's monograph, Jena, 1877).

Of the secular institutions in Naples none is more remarkable than the National Museum, formerly known as the Museo Borbonico. The building, begun in 1586 for vice-regeal stables, and remodelled in 1615 for the university, was put to its present use in 1790, when Ferdinand IV. proclaimed it his private property independently of the crown, placed in it the Farnese collection which had been acquired by his father, and the library of Count Ercole von Herculaneum, Pompéi, Stabia, Tarquinia, Paestum, &c., which till then had been housed in the palace at Portici, and gave it the name of Real Museo Borbonico. In 1860...
Garibaldi, when dictator at Naples, proclaimed the museum and the territory devoted to excavation to be the property of the nation, since which time it has been called the National Museum. Vast numbers of specimens have since been added to it both by purchase and from excavations, and it is now unique as a treasure house of Italo-Greek and Roman antiquities, besides containing a fine library and an important collection of coins.

A large additional space for exhibits was made in 1904, when the western half of the second floor was added, and the building as now arranged contains the large bronze and statues on the ground floor; a gallery of Pompeian frescoes in the exedra; the library, picture gallery, and richly adorned bronze vases, and four excellent stucco and painting exhibits of them being the seated Mercury and the dancing Faun; the marbles reckon among their vast number the Psyche, the Capuan vases, the portraits of Homer and Julius Caesar, as well as the huge group called the Torso Farnese (Amphion and Zethus dying Iris to its horns), the Farnese Hercules, the excellent though late statues of the Balbi on horseback and a very fine collection of ancient portrait busts.

Modern Buildings.—The Galleria Umberto I. is a large nucleus formed by the building erected in 1880, in which there is greatly an octagon in the centre, with a cupola. It is thus highly ornamented with gilt and stucco. A music-hall occupies the basement. The Galleria Principe di Napoli is in a smaller arcade opposite to the National Museum, mainly occupied by shops where reproductions from the museum are sold. The Galleria Vittoria, opened in 1907, is a circular building with a handsome dome, situated near the main entrance of the Villa Communale. It is in great part occupied by offices and shops. The Anglican church in Vico San Pasquale was built in 1862 on land given to the British community by Garibaldi when dictator. It was the first Protestant church erected in Italy. Since the granting of religious liberty, evangelical churches have been built by the Presbyterians, Wesleyans, French, Germans and Italians. A Greek church and a Jewish synagogue have also been opened. The Borsa (or exchange) is a fine building in the Piazza of the same name, built over the remains of the very ancient church of Sant' Aspreno, which are still preserved in the crypt. In front of it is the fine 16th-century Fontana Medina.

The National Library of Naples is one of the oldest in Italy, having been founded by Frederick II. in the first half of the 13th century. It had fallen to insignificance under the Bourbons, but since 1860 it has rapidly recovered. It contains 300,000 volumes (apart from the medical, scientific and technical) and is well equipped with zoological, mineralogical and geological museums, a physiological instrument, a cabinet of anthropology, and botanical gardens. Of particular interest is the herbarium of the Society of Sciences, which contains more than 30,000 specimens. The national art gallery and museums are regarded as the best work of Marco di Pino; the quadrangle, surrounded by a simple but effective peristyle, contains statues of the two patron saints of the town, Thomas Aquinas and Giordano Bruno. The new building, the shell of which was completed in 1906, faces the Rettifilo, a wide street which leads from the Borsa in a straight line to the railway station; at the back it joins the former building, which is at a higher level. On the other or north side of the ancient building, and at the back of the Strada Constantinopoli, a very long gallery of ancient works is attached, at which foundling boys are educated and taught trades. The principal hospitals are the Incurabili, Gesu Maria, Santa Maria della Pace and a hospital for poor priests, which are all under the direction of the Jesuits. The Meteorological Institute of Naples, of which the director is the very able Professor Pasquale Gennaro, is also a national hospital for the treatment of others than Italians, which was built by Lady Harriet Bentinck and is managed by an international committee; a German hospital; and a hospital erected by the representatives of Baron Adolph de Rothschild. There are two public lunatic asylums in the city, and another at the neighbouring town of Aversa; and many private asylums, among which those of Donatello, Miano and Pons-Rossi may be mentioned.

Harbour.—At a very early date the original harbour at Naples, now known in its greatly reduced state as Porto Piccolo, and fit only for boats and lighters, became too small. In 1302 Charles II. of Anjou and his wife, by extending the embankments of the old town from the southern end of the mole of Molo Grande or San Gennaro, which stretched eastward into the bay, and was terminated by a lighthouse in the 15th century. By the addition of a new pier running north-east from the lighthouse, the entrance of the Tiber was formed, and the city of Naples was but it was not until 1884 that the growth of the city and the width of the entrance were much increased by the laying out of Vigna Romana, and the formation of the new kingdom of Italy attention was called to the insufficiency of the harbour for modern wants; and new works were begun in 1862. Besides the lengthening of the Molo San Vincenzo, a new mole was carried out as a canal. The whole work has been executed with great rapidity, and the new and spacious Capitaneria di Porto, on the eastern side of which is a new
harbour used mainly for the coal trade, and piers such that the largest liner can lie alongside the jetty. The outer mole of this harbour runs out from the Castel del Carmine towards the south for some 1,500 ft, and a breakwater was constructed in 1906 in which the breakwater was completed in 1906 fell in on the farther side, and had to be reconstructed. The depth of this new harbour is from 25 to 30 ft. There are two projecting moles, one to the inner harbour and the second to the dry dock. In 1910 the total tonnage of 5,397,918 tons was reported to have been loaded and unloaded, and the French 245,206 tons in 161 vessels. Naples is the principal port for emigration, chiefly to North and South America; 261 emigrant ships sailed in 1905, carrying 216,103 emigrants. The annual revenue from the port is about £3,676,805. The articles dealt in are wine, oil, spirits, drugs, tobacco, chemicals, hemp, cotton, wool, silk, timber, paper, leather and hides, metal, glass, earaes and live animals. The largest export was to the United States (264,562), the next to Great Britain (£701,387), while the largest imports were from Great Britain (£1,253,410) and the United States (£807,564). The speciality of the port is macaroni, and the imports of which amounted to 1,200,000 lbs. in 1906.

Water Supply.—Since 1884 Naples has had as fine a water supply as any city in Europe. It is derived from the hills in the neighbourhood of Avellino, and is thought to be the effluent of an underground lake. It rushes out from the hillside and is received in a cove, and again spills down into the bay, until it meets five enormous reservoirs constructed just opposite to the entrance gate of the royal palace at Capodimonte. Hence it comes by natural gravitation into the city. It was carried by pipelines and through an asphalt conduit to the most distant parts of the city. It supplies the highest parts of the town with abundant water. The water is so cold that in the hottest summer the most perishable articles can be preserved by merely securing them in a closed vessel and allowing the water to drip upon it. The supply was brought into the town just after the terrible cholera outbreak of 1884, and as each new standpipe was erected in the streets every well within 200 yds. of it was closed, so that in a short time no well remained in the town, and thus a fertile source of infection was eliminated. Every house in the town and suburbs is now supplied with a constant supply of pure water. The effect on the health of the city has been extraordinary. About 110,000 people can be frequently seen attached to it, and it has become things of the past, and there is now abundant water for public fountains, washing the streets and watering gardens both public and private. The old sewers were found quite inadequate to carry off the large increase of water, and besides they all led directly into the bay, causing a terrible odour and rendering the water near the town unwholesome for bathing. This has been remedied by a system of sewers, which after passing by a tunnel through the hill of Posilipo across the plain beyond and discharge their contents into the open sea on the deserted coast of Cumae, 17 m. from the city of Naples. The old aqueduct, which was constructed in the 17th century by Cardinal Spada and supplied water to Goli, is still available to a certain extent, but its water was never very wholesome, and as it was not laid on to houses but only supplied fountains and house eisterns which have since been filled up, no account is taken of it. The only modern public fountains are those which supplied drinking water to the west end of the town, has been dry for many years.

Modern Growth.—Naples, the most densely peopled city in Europe, has increased in modern times at an enormous rate. On the large areas reclaimed from the sea, vast hotels and mansions let in flats have been erected. The gardens at the west end of the town are all built over. The Vomero, once merely a scattered village, is now an important suburb, and a large workmen's quarter has sprung up beyond the railway station to house the populace which was turned out from the centre of the town when the works of the risanamento were undertaken. The increase in population between the census of 1881, when it was 461,069, and the census in 1901 was 85,521. The commune, which includes not only the urban districts (sezioni) of San Ferdinando, Chiaia, San Giuseppe, Monte Calvario, Avvocata, Stella, Massimo, Posillipo, Fuorigrotta, San Martino, San R. Villarosa, San Giorgio a Nilo, Posillipo and Porto, but also the suburban districts of Vomero, Posilipo, Fuorigrotta, Miano and Piscinola, has been built over in every direction, one great incentive being the creation of an industrial zone to the eastward of the city. This zone has been set aside for the purpose of industrial development, and all persons or companies who set up industrial concerns on it have grants of land at a nominal price, are free of taxes for ten years and have electric force supplied to them at a very low figure. The law came into force in 1906, and was immediately followed by the erection of a large number of factories, for spinning silk, cotton, jute and wool, and the making of railway plant, automobiles, the building of ships, and in fact almost every kind of industry. After the cholera epidemic of 1884, M. Depretis, then premier, visited Naples, and in the course of a public speech gave vent to the famous dictum “Bisogni sventare Napoli.” “Naples must be disembowelled!” Plans were at once made to pull down all the worst slums, and as these lay between the centre of the town and the railway station, a wide street was planned along the course of the town. On each side of it were to be cleared to afford building sites for shops and offices. The funds for this vast undertaking were found partly by the state, which voted £5,000,000, and as to the rest by the Risanamento Company, which had a capital of £1,250,000. Before beginning operations demolition was obviously necessary to provide homes for the poor people who would be turned out, and a large working-class quarter was erected to the north and beyond the railway station. This quarter has wide airy streets and lofty houses, and though perhaps the houses were let at prices which were beyond the purses of the lowest class, the result of their erection was to cause a number of the poorer houses in the old town to be vacated, thus giving an opportunity to the lowest class to be at any rate better housed than they were before. The quarter described above is known as the Rione Vasto. There are also new middle-class quarters at Santa Lucia, Vomero Nuovo and Sant' Efremo, and better houses in the Via Sirignano, on the Riviera di Chiaja, Via Elena and Via Caracciolo at Mergellina, Via Partenope near the Chiatamone, and an aristocratic quarter in the large extensions made in the Rione Amedeo. The narrow alleys of Porto, Pendino and Mercato have nearly all disappeared, and old Naples has been vanishing day by day. One notable result of the widening of the streets has been the spread of the electric tramways, which traverse the town in various directions and are admirably served by a Belgian company. The city is mainly lighted by electricity, which has found its way into all the public edifices and most private houses.

Folk-lore.—The attention of antiquarians to the charms against the Evil Eye used by the inhabitants of the Neapolitan provinces was first drawn in 1888, when it was observed that they were all derived from the survival of ancient classical legends which had sprung from various sources in connexion with classical sites in the neighbourhood. These may be divided into three classes: first, the charms which are in use in the southern half of the peninsula in the towns of Campi Phlegraei, which refer to the worship of Diana, whose shrine at Capua was of considerable importance; secondly, the serpent charms, which formed part of the worship of Aesculapius, and were no doubt derived largely from the ancient island of Surrentum, and which are derived from the legends of the Sirens. A special caution is given in this case, as the Siren is represented mounted on her sea-horse crossing the Styx upon the vase of Pilo and Prospero in the collection of the Naples Museum. This vase dates about 250 B.C., and the Siren represents her in the same way, but usually mounted on two sea-horses. The sea-horse and the Siren alone are commonly found as charms; the Siren being sometimes in her fashial form and sometimes in the form of a harpy.

History.—All ancient writers agree in representing Naples as a Greek settlement, though its foundation is obscurely and differently narrated. The earliest Greek settlement in the neighbourhood was at Pithecusa (Ischia), but the colonists, being driven out of the island by the frequent earthquakes, settled on the mainland at Cumae, where they found a natural acropolis of great strategic value. From Cumae they colonized Dikearchia (Pozzuoli) and probably subsequently Palearopoli. The site of Palearopoli has given rise to much discussion, but the present view is that they sprang from the colony of Euboeans and seem to be the correct solution of the problem. He places Palearopoli at Gaia Point and has discovered the remains of the harbour, the town hall and various other rudiments of the ancient city. This site, moreover, corresponds with Livy's testimony, and would account for his statement that the towns of Palearopoli and Neapolis were near together and identical in language and government. This opinion about the site of Palae-ropoli has been based on the very considerable alterations which are known to have taken place in the level of the land, and the
extensive submerged foundations of buildings off the southern ex-

tremity of Posilipo have been identified with those of the old city.

Parthenope, as well as Dikearchia, was formed as a new colony
from Cumae, and was so called from a legendary connexion of
the locality with the siren of that name, whose tomb was still
shown in the time of Strabo. Parthenope was situated where
Naples now stands, upon the splendid natural acropolis formed
by the hill of Pizzofalcone, and defended on the land side by a
fosse which is now the Strada di Chiaja, and a massive wall, of
which remains may still be traced at the back of the existing
houses. handfuls of Parthenope there came afterwards
considerable addition from Athens and Chalcis, and they
built themselves a town which they called Neapolis, or the “new
city,” in contradistinction to the old settlement, which in con-
sequence was styled Palaeopolis or the “old city.” The name of
Parthenope became lost, and the city of Palaeopolis fell into
gradual decadence.

In 326 B.C. the Palaeopolitans having provoked the hostility
of Rome by their incursions upon her Campanian allies, the
council Publilius Philo marched against them, and having taken
their garrison between the old and the new city, laid regular siege
to Palaeopolis. By the aid of a strong Samnite garrison which
they received, the Palaeopolitans were long able to withstand
the attacks of the consul; but at length the city was betrayed into
the hands of the Romans by two of her citizens. Neapolis
possibly surrendered to the consul without any resistance, as it
was received on favourable terms, had its liberties secured by a
采购， and obtained the chief authority, which previously
seems to have been enjoyed by the older city. From that time
Palaeopolis totally disappeared from history, and Neapolis
became an allied city (federata civitas)—a dependency of Rome,
whose alliance it retained constantly faithful, even in the most
trying circumstances. In 82 B.C. Pyrrhus unsuccessfully
attacked its walls; and in the Second Punic War Hannibal was
deterred by their strength from attempting to make himself
master of the town. During the civil wars of Marius and Sulla
a body of partisans of the latter, having entered it by treachery
(82 B.C.), made a general massacre of the inhabitants; but
Neapolis soon recovered, as it was again a flourishing city in the
time of Cicero. It became a municipium after the passing of the
lex Julia; under the empire it is noticed as a colonia, but the
time when it first obtained that rank is uncertain—possibly
under Claudius.

Though a municipal town, Neapolis long retained its Greek
culture and institutions; and even at the time of Strabo it
had gymnasia and quinquennial games, and was divided into
phratriae after the Greek fashion. When the Romans became
masters of the world, many of their upper classes, both before
the close of the republic and under the empire, from a love of
Greek manners and literature or from indolent and effeminate
habits, resorted to Neapolis, either for the education and the
cultivation of gymnastic exercises or for the enjoyment of music
and of a soft and luxurious climate. Hence we find carols
variously styled—by Horace olima Neapolis, by Martial docta
Parthenope, by Ovid in otia natum Parthenopen. It
was the favourite residence of many of the emperors; Nero made his
first appearance on the stage in one of its theatres; Titus assumed
the office of its archon; and Hadrian became its demarch. It
was chiefly at Neapolis that Virgil composed his Georgics; and
he was buried on the hill of Paestum, the modern Posilipo, in
its neighbourhood. It was also the favourite residence of the
poets Statius (d. 99) and Silius Italicus (A.D. 25), the former of
whom was a Neapolitan by birth.

After the fall of the Roman Empire, Neapolis suffered severely
during the Gothic wars. Having espoused the Gothic cause in
the year 536, it was taken, after a protracted siege, by Belisarius,
who turned aside an aqueduct, marched by surprise into the city
through its channel, and put many of the inhabitants to the
sword. In 542 Totilla besieged it and compelled it to surrender,
but being soon after recovered by Narses, it remained long a
dependency of the exarchate of Ravenna, under the immediate
government of a duke, appointed by the East Roman emperors.

When the Lombards invaded Italy and pushed their conquests
in the southern provinces, the limits of the Neapolitan duchy
were considerably narrowed. In the beginning of the 8th century,
at the time of the iconoclastic controversy, the emperor Leo
the Isaurian having forced compliance to his edict against the
worshiping of images, the Neapolitans, encouraged by Pope
Gregory III., threw off their allegiance to the Eastern emperors,
and established a republican form of government under a duke
of their own appointment. Under this régime Neapolis retained
independence for nearly four hundred years, though constantly
struggling against the powerful Lombard dukes of Benevento, who
twice unsuccessfully besieged it. In 1027, however, Pandulph IV.,
the Lombard prince of Capua, succeeded in making himself
master of it; but he was expelled in 1030 by Duke Sergius,
chieflly through the aid of a few Norman adventurers. The
Normans, in their turn, gradually superseded all powers, whether
Greek, Lombard or republican, which had previously divided
the south of Italy, and furthermore checked the Saracens in the
advances they were making through Apulia.

From the date at which the south of Italy and Sicily were
subjugated by the Normans, the fortunes of Naples cease to be
an integral part of the history of a republic or a city, and becomes that of a kingdom,
sometimes separate, sometimes merged, with the kingdom
of Sicily, in that of the Two Sicilies. The city of Naples hence-
forth formed the metropolis of the kingdom to which it gave its
name, owing this pre-eminence to its advantageous position on
the side of Italy towards Sicily, and to the favour of successive
princes (see NAPLES, KINGDOM OF).

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NAPLES, KINGDOM OF, the name conventionally given to
the kingdom of Sicily on the Italian mainland (Sicily beyond the
Pharos), to distinguish it from that of Sicily proper (Sicily on
this side of the Pharos, i.e. Messina), the title of “King of
Naples” having only actually been borne by Philip II., of Spain
in the 16th century (“King of England and Naples”) and by
Joseph Bonaparte and Joachim Murat in the 19th. The history
of the Kingdom of Naples is intimately interwoven with that of
Sicily, with which for long periods it was united as the kingdom
of the Two Sicilies.

For the earlier history of Naples and its territory, as a republic
and a dukedom, see NAPLES above, and for the coming of the
Normans see SICILY and NORMANS. It is sufficient here to state
that the leaders of the house of Hauteville, Robert Guiscard and
Richard of Aversa, in 1059 did homage to Pope Nicholas II. (q.v.)
for all conquests they had made both in the island and upon the
mainland, and that in 1130 Roger de Hauteville (Roger II. as
“great count” of Sicily) assumed the style of king as Roger I.
In this way the south of Italy, together with the adjacent island
of Sicily, was converted into one political body, which, owing to
the peculiar temper of its Norman rulers and their powerful
organization, assumed a more feudal character than any other
part of the peninsula. The regno, as it was called by the Italians,
constituted a state apart, differing in social institutions, foreign
relations, and type of home government, from the commonwealths
and tyrannies of upper Italy. The indirect right acquired by
the popes as lords paramount over this vast section of Italian
territory gave occasion to all the most serious disturbances of
Italy between the end of the 13th and the beginning of the 16th
centuries, by the introduction of the house of Anjou into Naples
and the disputed succession of Angevin and Aragonese princes.

Roger I. was succeeded in 1154 by William I. “the Bad,”
who died in 1166, being succeeded by his son William II. “the
Good,” on whose death in 1189 the crown passed to his illegitimate son Tancred. After the death
of Tancred the emperor Henry VI., of the house of
Hohenstaufen, who by his marriage with Constance
or Costanza d'Altaiva, daughter of Roger I. (d. 1154), was

The

Hohen- staunese.
Tancred's rival for the kingdoms of Naples and Sicily, descended into Italy in 1194. He easily conquered both the mainland and the island, and Tancred's only son William III, surrendered the crown to him. But with the excuse of a pretended plot he put a number of the most conspicuous persons in the kingdoms to death, and had William himself blinded. He then returned to Germany, and during his absence an agitation broke out, propped by the cruelty of his lieutenants and encouraged by his Norman wife. He hurried back to Italy, and repressed the movement with his usual ferocity, but died in 1197. Costanza then had her son Frederick (b. 1194) proclaimed king, and obtained the support of the Holy See on condition that the kingdom should be once more recognized as a fief of the church. The whole history of the ensuing period of south Italian history turns on the claims of the papacy over the kingdoms of Naples and Sicily, based on the recognition of papal suzerainty in 1053. The Hohenstaufen kings refused to admit this claim; hence the persistent hostility of the popes and the calling in of foreign potentates and armies. Costanza died in 1198, leaving Pope Innocent III. regent and tutor to her son; the pope's authority was contested by many nobles, but in 1200 Frederick married Costanza, daughter of the king of Aragon, with whose help he succeeded in reducing a large part of Sicily to obedience. Two years later he was elected king of the Romans at the diet of Nuremberg in opposition to Otto IV., and in 1220 he was crowned emperor in Rome by pope Honorius III., but continued to reside in Sicily. He quelled a rising of Sicilian barons and Saracens, and confined 60,000 of the latter at Luccara in Capitulacum, where they were borne by a mere levée en masse. After the death of Frederick's wife Pope Innocent III. arranged a marriage for him with Yolande, daughter of John of Brienne (1225). But in 1227 Gregory IX. excommunicated him because he delayed the crusade which he had promised to undertake; and although he sailed the following year, and concluded a treaty with the sultan of Egypt whereby the kingdom of Jerusalem was re-established, the pope was not satisfied and sent an army into Neapolitan territory. On his return Frederick defeated the pontificals, and in 1230 peace was made at San Germano and the excommunication withdrawn. In 1231 he issued the celebrated Constitutions of the Sicilian fiefs, by which he reduced the pope to an actual vassal of the crown, and regulated the parliament of Melia. He had further quarrels with successive pontiffs, and was excommunicated more than once. In 1246 a number of his own barons and officials of the mainland conspired against his rule, but were crushed with great ferocity, and even his faithful secretary, Pietro della Vigna, fell a victim to the emperor's suspicions. Frederick's last years were embittered by the hostilities following on the crusade which the pope proclaimed against him and by rebellions in Naples and Sicily. He died in 1250. His policy was anti-feudal and tended to concentrate power into his own hands; hence the frequent risings of the barons. His court at Palermo had been one of the most brilliant in Europe, and attracted learned men from all over the then known world; his somewhat pagan philosophy was afterwards regarded as marking the beginnings of modern rationalism. He opened schools and universities, and he himself wrote poetry in Sicilian dialect.

His son Conrad IV. succeeded to the empire, while to his illegitimate son Manfred he left the principality of Taranto and the regency of the southern kingdom, to be held in Conrad's name. By his political sagacity and moderation Manfred won from a strong nation to Sicily his land, and Conrad to subjugate the rebellious barons. The emperor died in 1254, leaving an infant son, Conradin (b. 1252), and Manfred was appointed vicar-general during the latter's minority. Manfred, too, encountered the hostility of the popes, against whom he had to wage war, generally with success, and of some of the barons whom the popacy encouraged to rebel; and in 1258, on a rumour of Conradin's death, he was offered and accepted the crown of Naples and Sicily. The rumour proved false, but he retained the crown, promising to leave the kingdom to his death and to defend his rights. He now became head of the Gibellines or Imperialists of Italy, and his position was strengthened by the marriage of his daughter Costanza to Peter, son of King James of Aragon. But he met with opposition from the turbulent nobility and the clergy, who had been deprived of many privileges, and he failed to conciliate the communions, which were oppressed by taxes and beginning to aspire to autonomy. Innocent IV., in his determination to crush the Hohenstaufens, offered the kingdom in turn to Richard, earl of Cornwall, to Edward, son of Henry III. of England, and to Charles of Anjou, son of the last French monarch. After long negotiations with successive popes, Charles was finally induced by Clement IV. to come to Italy in 1265, agreeing to accept the kingdom of the Two Sicilies as a fief of the church, and in 1266 he marched southward with the privileges of a crusader (see Charles I., king of Naples and Sicily).

The defection of many cities and nobles facilitated his task, and Manfred was forced to retire on Benevento, where, on the 26th of February, owing to the treachery of a part of his troops, he was defeated and killed. As a result of this victory Charles was soon master of almost the whole kingdom, and he entered Naples, which now became the capital instead of Palermo. He persecuted the nobles who had sided with Manfred, and established a military despotism which proved more oppressive than that of the Hohenstaufen. But Charles I. rose to the head of a small army collected in Germany, and he found many supporters; but King Charles on hearing of his arrival abandoned the siege of Lucera and came to intercept him. A battle took place at Tagliacozzo (August 23rd, 1268), in which the Imperialists were defeated, and Conradin himself was subsequently caught and handed over to Charles, who had him tried for high treason and beheaded at Benevento, August 12th, 1266. All who had assisted the unfortunate youth were cruelly persecuted, and the inhabitants of Agosta put to the sword. Thus ended the power of the Hohenstaufen. Although the picturesque figures of Manfred and Conradin awakened sympathy among the people of the kingdom, their authority was never really consolidated and their German knights were hated; which facts rendered the enterprise of another foreigner like the Angevin comparatively easy.

In Sicily, however, Charles's government soon made itself odious by its exactions, the insolence and cruelty of the king's French officials and favourites, the depreciation of the currency, and the oppressive personal services, while the nobles were incensed at the violation of their feudal constitution. Just as Charles was contemplating an expedition to the East, the Sicilians rose in revolt, massacring the French throughout the island. The malcontents were led by the Salernitan noble Giovanni da Procida, a friend of the emperor Frederick and of Manfred, who had taken refuge at the court of Peter III. of Aragon, husband of Manfred's daughter Costanza. He had induced Peter to make good his somewhat shadowy claims to the crown of Sicily, but while preparations were being made for the expedition, the popular rising known as the Sicilian Vespers, which resulted in the massacre of nearly all the French in the island, broke out at Palermo on Easter Day 1282. Peter reached Palermo in September, and by the following month had captured Messina, the last French stronghold. Pope Martin IV. now proclaimed a crusade against the Aragonese, and the war continued for many years. The Sicilian fleet under Ruggiero di Lauria defeated that of the Angevins at Malta in 1283, and 1284 in the Bay of Naples, where the king's son, Charles the Lame, was captured. Charles I. died in 1286, and, his heir being a prisoner, his grandson, Charles
Martel (d. 1295), assumed the regency. Peter died the same year, leaving Aragon to his son Alphonso III, and Sicily to his son James, who was consecrated king in spite of the interdict. The war went on uninterrupted, for the popes had died in attempts to arrive at an understanding, as they were determined that the rights of the church should be fully recognized. Charles the Lame, who had been liberated in 1288, having renounced his rights on Sicily, was absolved from his oath by Pope Nicholas IV., who crowned him king of the Two Sicilies and excommunicated Alphonso. The latter's successor James made peace with Boniface VIII. by renouncing Sicily (in exchange for Sardinia and Corsica and the hand of Charles's daughter) and promising to help the Angevins to reconquer the island. But the Sicilians, led by James's brother, Frederick III., who had been governor of the island and was now proclaimed king, determined to resist. The war went on with varying success, until Charles of Valois, summoned by the pope to conduct the campaign, landed in Sicily and, his army being decimated by disease, made peace with Frederick at Caltabellotta (1302). The Angevins renounced Sicily in favour of Frederick, who was recognized as king of Trinacria (a name adopted so as not to mention that of Sicily), and he was to marry Leonora, daughter of Charles of Valois; at his death the island was to revert to the Angevins, but his children would receive compensation elsewhere. In 1305 the pope unwillingly ratified the treaty. (See CHARLES II., king of Naples and Sicily, and FREDERICK III., king of Sicily.)

Charles II. died in 1309 and was succeeded by his second son Robert. (His eldest son had predeceased him, leaving a son, Charles Robert, of Caroberto, at this time king of Hungary.) Robert now became leader of the Guelphs in Italy, and war between Naples and Sicily broke out once more, when Frederick allied himself with the emperor Henry VII. on his death in 1313, and his illegitimate son Robert, his heir to the throne. Robert led or sent many devastating expeditions into Sicily, and hostilities continued under King Peter even after Frederick's death in 1337. Peter died in 1342, leaving an infant son Louis; but just as Robert was preparing for another expedition he too died in the same year. Robert had been a capable ruler, a scholar and a friend of Petrarch, but he lost influence as a Guelph leader owing to the rise of other powerful princes and republics, while in Naples itself his authority was limited by the rights of a turbulent and rebellious baronage (see Charles of Valois). At his death the island passed to Louis, his son by Leonora, who died in 1328 and he was succeeded by his granddaughter Joanna, wife of Andrew of Hungary, but the princes of the blood and the barons stirred up trouble, and in 1345 Andrew was assassinated by order of Catherine, widow of Philip, son of Charles II., and of several nobles, not without suspicion of Joanna's complicity.

Andrew's brother Louis, king of Hungary, now came to Italy to make good his claims on Naples and avenge the murder of Andrew. With the help of some of the barons he drove Joanna and her second husband, Louis of Taranto, from the kingdom, and murdered Charles of Durazzo; but as Pope Clement refused to recognize his claims he went back to Hungary in 1348, and the fickle barons recalled Joanna, who returned and carried on desultory warfare with the partisans of Louis of Hungary. Louis of Taranto and Joanna were crowned at Naples by the pope's legate in 1352, but Niccolò Acciaiuoli, the sensual, became the real master of the kingdom. In 1374 Joanna made peace with Frederick of Sicily, recognizing him as king of Trinacria on condition that he paid her tribute and recognized the pope's suzerainty; at his death she nominated Louis of Anjou her heir, but while the latter was recognized by the antipope Clement VII., Pope Urban VI. declared Charles of Durazzo (great-grandson of Charles II.) king of Sicily at di quaolo del Faro [i.e. of Naples]. Charles conquered the kingdom and took Joanna prisoner in 1381, and had her murdered the following year. Louis, although assisted by Amadeus VI. of Savoy, failed to drive out Charles, and died in 1384. Charles III. died two years later and the kingdom was plunged into anarchy once more, part of the barons siding with his own favourite year-old son Ladislas, and part with Louis II. of Anjou. The latter was crowned by the antipope Clement, while Urban regarded both him and his rival as usurpers. On Urban's death in 1389 Boniface IX. crowned Ladislas king of Naples, who by the year 1400 had expelled Louis and made himself master of the kingdom. In 1407 he occupied Rome, which Gregory XII. could not hold. But Alexander V., elected pope by the council of Pisa, turned against Ladislas and recognized Louis. Ladislas was defeated in 1411 and driven from Rome, but reoccupied the city on Louis's return to France. He died in 1414, and was succeeded by his sister Joanna II. (q.v.), during whose reign the kingdom sank to the lowest depths of degradation. In 1415 Joanna married James of Bourbon, who kept his wife in a state of semi-confinement, murdered her lover, Pandolfo Alopo, and imprisoned her chief captain, Sforza; but his arrogance drove the barons to rebellion, and they made him renounce the royal dignity and abandon the kingdom. The history of the next few years is a maze of intrigues between Joanna, Sforza, Giovanni Visconti, Aragon (who occupied Sicily), and the Valois; Joanna adopted as her heir, and Louis III. of Anjou, whom she had pitted against each other in every possible combination. Louis died in 1434 and Joanna in 1435 (see JOANNA II., queen of Naples). The succession was disputed by René of Anjou and Alphonso, but the former eventually renounced his claims and Alphonso was recognized as king of Naples by Pope Eugenius IV. in 1443.

Under Alphonso, surnamed "the Magnanimous," Sicily was once more united to Naples and a new era was inaugurated, for the king was at once a brilliant ruler, a scholar and a patron of letters. He died in 1456, leaving Naples and Sicily to his illegitimate son Alphonso (q.v.), and died in 1458. The latter was crowned king of Naples and Sicily, Sardinia and Aragon to his brother John. Ferdinand found, however, that Alphonso had not really consolidated his power, and he had practically to reconquer the whole country. By 1464 he was master of the situation, in spite of the attempt of Pope Callixtus III. to enforce the claims of the papacy, and that of John of Anjou to enter into the heritage of his ancestors. In alliance with Pope Sixtus IV. and the Milanese he waged war on Lorenzo de' Medici in 1479; but that astute ruler, by recognizing Alfonso and his illegitimate brother Ferdinand of Spain, made peace (1479). In 1485 the disaffection of the barons, due to the king's harshness and the arrogance and cruelty of his son, found vent in a revolt led by Roberto Sanseverino and Francesco Coppola, which was crushed by means of craft and treachery. Ferdinand died in 1494 full of forebodings as to the probable effects of the invasion of Charles VIII. of France, and was succeeded by Alphonso (see FERDINAND I., king of Naples). The French king entered Italy in September 1495, and conquered the Neapolitan kingdom without much difficulty. Alphonso abdicated, his son Ferrandino and his brother Frederick withdrew to Ischia, and only a few towns in Apulia still held out for the Aragonese. But when the pope, the emperor, Spain and Venice, alarmed at Charles's progress, formed a defensive league against him, he quitted Naples, and Ferrandino, with the help of Ferdinand II. of Spain, was able to reoccupy his dominions. He died much regretted in 1496 and was succeeded by Frederick. The country was torn by civil war and brigandage, and the French continued to press their claims; and although Louis XII. (who had succeeded Charles VIII.) concluded a treaty with Ferrandino of Spain for the partition of Naples, France and Spain fell out in 1502 over the division of the spoils, and with Gonzalo de Cordoba's victory on the Garigliano in December 1502, the whole kingdom was in Spanish hands.

On the death of Ferdinand in 1516, the Habsburg Charles became king of Spain, and three years later was elected emperor as Charles V.; in 1522 he appointed John de Lannoy viceroy of
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Naples, which became henceforth an integral part of the Spanish dominions. The old divisions of nobility, clergy and people were maintained and their mutual rivalry encouraged; the nobles were won over by titles and by the splendour of the viceregal court, but many persons of low birth who showed talent were raised to high positions. The viceroy was assisted by the Collateral Council and the Sacred College of Santa Chiara, composed of Spanish and Italian members, and there was an armed force of the two nationalities. Spanish rule in the whole was oppressive and tyrannical, and based solely on the idea that the dependencies must pay tribute to the dominant kingdom. During the rule of Don Pedro de Toledo (one of the best viceroyes) Naples became the centre of a Protestant movement which spread to the rest of Italy, but was ultimately crushed by the Inquisition. In Sicily Spanish rule was absolute, for the island had not been conquered, but had given itself over voluntarily to the Aragonese; and the parliament, formed by the three braccì or orders (the militare consisting of the nobility, the ecclesiasticà, of the clergy, and the demanìale, of the communes), imposed certain limitations on the viceroy, who had to pay the three in exchange for each other. But the oppressive character of the government provoked several rebellions. In 1598 an insurrection, headed by the philosopher Tommaso Campanella, broke out in Calabria, and was crushed with great severity.

In 1647, during the viceroyalty of the marquis of Los Leros in Sicily, bread riots in Palermo became a veritable revolution, and the people, led by the goldsmith Giovanni d'Alessio, drove the viceroy from the city; but the nobles, fearing for their privileges, took the vicerey's part and turned the people against d'Alessio, who was murdered, and Los Leros returned. On the 7th of July 1647, tumults occurred at Naples in consequence of a new fruit tax, and the viceroy, Count d'Arcos, was forced to take refuge in the Castelnuovo. The populace, led by Amalfi fisherman, known as Masaniello (g.o.), obtained arms, erected barricades, and, while professing loyalty to the king of Spain, demanded the removal of the oppressive taxes and murdered many of the nobles. D'Arcos came to terms with Masaniello; but in spite of this, and of the assassination of Masaniello, whose arrogance and ferocity had made him unpopular, the disturbances continued, and again the viceroy had to retreat to Castelnuovo and make new braccì against them. Even at the arrival of reinforcements from Spain failure to restore order, and the new popular leader, Gennaro Annese, now sought assistance from the French, and invited the duke of Guise to come to Naples. The duke came with some soldiers and ships; but failed to effect anything; and after the recall of d'Arcos the new viceroy, Count d'Ognate, having come to an arrangement with Annese and got Guise out of the city, proceeded to punish all who had taken part in the disturbances, and had Annese and a number of others beheaded.

In 1670 the insurrection broke out at Messina. They began with a riot between the nobles and the burghers, but ended in an anti-Spanish movement; and while the inhabitants called in the French, the Spaniards, who could not crush the rising, called in the Dutch. Louis XIV. sent a fleet under the duc de Vivonne to Sicily, which defeated the Dutch under de Ruyter in 1676. But at the peace of Nimwegen (1679) Louis treacherously abandoned the Messinese, who suffered cruel persecution at the hands of the Spaniards and lost all their privileges. An anti-Spanish conspiracy of Neapolitan nobles, led by Macchia, with the object of proclaiming the archduke Charles of Austria king of Naples, was discovered, but in 1707 an Austrian army conquered the kingdom, and Spanish rule came to an end after 203 years, during which it had succeeded in thoroughly demoralizing the people.

In Sicily the Spaniards held their own until the peace of Utrecht in 1713, when the island was given over to Duke Victor of Savoy, who assumed the title of king. In 1718 he had to hand back his new possession to Spain, who, in 1720, surrendered it to Austria and gave Sardinia to Victor Amadeus. In 1733 the treaty of the Escurial between France, Spain and Savoy against Austria was signed. Don Carlos of Bourbon, son of Philip V. of Spain, easily conquered both Naples and Sicily, and in 1738 he was recognized as king of the Two Sicilies, Spain renouncing all her claims.

Charles was well received, for the country now was an independent kingdom once more. With the Tuscan Bernardo Tanucci as his minister, he introduced many useful reforms, improved the army, which was thus able to repel an Austrian invasion in 1744, embellished the city of Naples and built roads. In 1749 Charles III. having succeeded to the Spanish crown, abdicated that of the Two Sicilies in favour of his son Ferdinand, who became Ferdinand IV. of Naples and III. of Sicily. Being only eight years old, a regency under Tanucci was appointed, and the young king's education was purposely neglected by the minister, who wished to dominate him completely. The regency ended in 1767, and the following year Ferdinand married the masterful and ambitious Maria Carolina, daughter of the empress Maria Theresa. She had Tanucci dismissed and set herself to the task of making Naples a great power. With the help of John Acton, an Englishman whom sympathized with the plains of Tanucci, she freed Naples from Spanish influence and secured a rapPROCUREMENT with England and Austria.

On the outbreak of the French Revolution the king and queen were not at first hostile to the new movement; but after the fall of the French monarchy they became violently opposed to it, and in 1793 joined the first coalition against France, instituting severe persecutions against all who were remotely suspected of French sympathies. Republicanism, however, gained ground, especially among the aristocracy. In 1796 peace with France was concluded, but in 1798, during Napoleon's absence in Egypt and after Nelson's victory at Aboukir, Maria Carolina induced Ferdinand to go to war with France once more. Nelson arrived in Naples in September, where he was enthusiastically received. He, after a somewhat farcical occupation of Rome, which had been evacuated by the French, hurried back to Naples as soon as the French attacked his troops, and although the lazaroni (the lowest class of the people) were devoted to the dynasty and ready to defend it, he fled with the court to Palermo in a panic on board Nelson's ships. The wildest confusion prevailed, and the lazaroni massacred numbers of persons suspected of being friends of the crown, and the soldiers and the clergy, finding themselves abandoned by their king in this cowardly manner, began to contemplate a republic under French auspices as their only means of salvation from anarchy. In January 1799 the French under Championnet reached Naples, but the lazaroni, ill-armed and ill-disciplined as they were, resisted the enemy with desperate courage, and it was not until the 20th that the invaders were masters of the city. On the 23rd the Papal republic was proclaimed. The Republicans were men of culture and high character, but doctrinaire and impractical, and they knew very little of the lower classes of their own country. The government soon found itself in financial difficulties, owing to Championnet's demands for money; it failed to organize the army, and met with scant success in its attempts to "democratize" the provinces. Meanwhile the court at Palermo sent Cardinal Fabrizio Ruffo, a wealthy and influential prelate, to Calabria, to organize a counter-revolution. He succeeded beyond expectation, and with his "Christian army of the Holy Faith" (Esercito Cristiano della Santa Fe) consisting of brigands, convicts, peasants and some soldiers, marched through the kingdom plundering, burning and slaughtering. An English squadron approached Naples and occupied the island of Procida, but after a few engagements with the Republican fleet commanded by Caracciolo, an ex-officer in the Bourbon navy, it was recalled to Palermo, as the Franco-Spanish fleet was expected. Ruffo, with the addition of some Russian and Turkish allies, now marched on the capital, whence the French, save for a small force under Méluzin, withdrew. The scattered Republican detachments were defeated, only Naples and Pescara holding
out. On the 13th of June Ruffo and his horses reached Naples, and after a desperate battle at the Ponte della Maddalena, entered the city. For weeks the Calabresi and lazararoni continued to pillage and massacre, and Ruffo was unable, even if willing, to restrain them. But the Royalists were not masters of the city, for the French in Castel Sant' Elmo and the Republicans in Castelnuovo and Castel dell' Uovo still held out and bombarded the streets, while the Franco-Spanish fleet might arrive at any moment. Consequently Ruffo was desperately anxious to come to terms with the Republicans for the evacuation of the castles, in order to prepare the way for the appearance of the Russian and Turkish commandants and by the British captain Foote, it must be respected, and on Nelson's refusal he said that he would not help him to capture the castles. On the 26th Nelson changed his attitude and authorized Sir William Hamilton, the British minister, to inform the cardinal that he (Nelson) would do nothing to break the armistice; while Captains Bell and Troubridge wrote that they had Nelson's authority to state that the latter would not oppose the embarkation of the Republicans. Although these expressions were equivocal, the Republicans were satisfied and embarked on the vessels prepared for them. But on the 28th Nelson received despatches from the court (in reply to his own), in consequence of which he had the vessels brought under the guns of his ships, and many of the Republicans were arrested. Caracciolo, who had been caught whilst attempting to escape from Naples, was tried by a court-martial of Royalist officers under Nelson's auspices on board the admirals' flagship, condemned to death and hanged at the yard-arm. For the part played by Nelson in these transactions see the articles CARACCILO and NELSON.

On the 8th of July, King Ferdinand arrived from Palermo, and the state trials, conducted in the most arbitrary fashion, resulted in wholesale butchery: hundreds of persons were executed, including some of the best men in the country, such as the philosopher Mario Pagano, the scientist Cirillo, Manthoné, the minister of war under the republic, Massa, the defender of Castel dell' Uovo, and Ettore Caraffa, the defender of Pescara, who had been captured by treachery, while thousands of others were immured in horrible dungeons or exiled.

War with France continued until March 1801, when peace was made, and after the peace of Amiens in 1802 the court returned to Naples, where it was well received. But when the European war broke out again in the following year, Napoleon (then first consul) became very exacting in his demands on King Ferdinand, who consequently played a double game, appearing to accede to these demands while negotiating with England. After Austerlitz Napoleon revenged himself by declaring that "the Bourbon dynasty had ceased to reign," and sent an army under his brother Joseph to occupy the kingdom.

Ferdinand and Maria Carolina fled to Palermo in January 1805; in February 1806 Joseph Bonaparte entered Naples as king, and cultivated, well-meaning, as this not very intellligent man, he introduced many useful reforms on a basis of benevolent despotism, abolished feudalism and built roads, but the taxes and forced contributions which he levied proved very burdensome. Joseph's authority did not exist throughout a large part of the kingdom, where royalist risings, led by brigand chiefs, maintained a state of anarchy, and a British force under Sir John Stuart, which landed in Calabria from Sicily, defeated the French at Maida (July 6th, 1806). Both the French and the royalists committed atrocities, and many conspirators in Naples were tried by the French state courts and shot.

In 1808 Napoleon conferred the crown of Spain on Joseph, and appointed Joachim Murat king of Naples. Murat continued Joseph's reforms, swept away many old abuses and reorganized the army; and although he introduced the French codes and conferred many appointments and estates on Frenchmen, his administration was more or less native, and he favoured the abler Neapolitans. His attempts to attack the English in Sicily ended disastrously, but he succeeded in crushing brigandage in the Calabrian and Sicilian mountains, and then, after several failures, had to resort to methods of severity in order to do so. The king, owing to his charm of manner, his handsome face, and his brilliant personality, gained many sympathes, and began to aspire to absolute independence. He gradually became estranged from Napoleon, and although he followed him to Russia and afterwards took part in the German campaign, he secretly opened negotiations with Austria and Great Britain. In January 1814 he signed a treaty with Austria, each power guaranteeing the dominions of the other, while Sicily was to be left to Ferdinand. The following month he proclaimed himself King of Naples and Sicily and as Ferdinand VII, and March 1814, he re-entered Naples. Ferdinand and Maria Carolina had continued to reign in Sicily, where the extravagance of the court and the odious Neapolitan system of police espionage rendered their presence a burden instead of a blessing to the island. The king obtained a subsidy from Great Britain and allowed British troops to occupy Messina and Agosta, so that they might operate against the French on the mainland. A bitter conflict broke out between the court and the parliament, and the British minister, Lord William Bentinck, favoured the opposition, forced Ferdinand to resign his authority and appoint his son regent and introduced many valuable reforms. The queen perpetually intrigued against Bentinck, and even negotiated with the French, but in 1812 a more liberal constitution on British lines was introduced, and a Liberal ministry under the princes of Castelnuovo and Belmonte appointed, while the queen was exiled in the following year. But after the fall of Napoleon Sicily ceased to have any importance for Great Britain, and Bentinck, whose reputation is still cherished in the island, departed in 1814. Ferdinand succeeded in getting a reactionary ministry appointed, and dissolved parliament in May 1815, after concluding a treaty with Austria—now freed by Murat's defection from her engagements with him— for the recovery of his mainland dominions by means of an Austrian army paid for by himself. On the 9th of June Ferdinand re-entered Naples and bound himself in a second treaty with Austria not to introduce a constitutional government;1 but at first he abstained from persecution and received many of Murat's old officers into his army on a broad and noble scale. In October 1815 Murat, believing that he still had a strong party in the kingdom, landed with a few companions at Pizzo

1 The secret article of the treaty of June 12, 1815, runs as follows: "H.M. the King of the Two Sicilies, in re-establishing the government of the kingdom, will not agree to any changes irreconcilable either with the ancient institutions of the monarchy or with the principles adopted by H.I. and R. Austrian Majesty for the governmental régime of his Italian provinces." It is to be noted that this did not involve the obligation of interfering with the ancient constitution of Sicily, which Metternich desired to see remain undisturbed.

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di Calabria, but was immediately captured by the police and the peasantry, court-martialed and shot.

Ferdinand to some extent maintained French legislation, but otherwise reorganized the state with Metternich's approval on Bourbon lines; he proclaimed himself king of the Two Sicilies at the congress of Vienna, incorporating Naples and Sicily into one state, and abolished the Sicilian constitution (December 1816). In 1818 he concluded a Concordat with the Church, by which the latter renounced its suzerainty over the kingdom, but was given control over education, the censorship and many other privileges. But there was much dissatisfaction throughout the country, and the Carbonarist lodges, founded in Murat's time with the object of freeing the country from foreign rule and obtaining a constitution, had made much progress (see CARBONARI). The army indeed was honeycombed with Carbonari, and General Pepe, himself a member of the society, organized them on a military basis.

In July 1820 a military mutiny broke out at Caserta, led by two officers and a priest, the mutineers demanding a constitution although professing loyalty to the king. Ferdinand, feeling himself helpless to resist, acceded to the demand, appointed a ministry composed of Murat's old adherents, and entrusted his authority to his son. The ultra-democratic single-chamber Spanish constitution of 1812 was introduced, but proved utterly unworkable. The new government's first difficulty was Sicily, where the people had risen in rebellion demanding their own charter of 1812, and although the Neapolitan troops quelled the Outbreak of cholera in 1837 led to disorders in Sicily, which, having assumed a political character, were repressed by Del Carrubia, the great minister. As the government became more and more autocratic and to rely wholly on the all-powerful police, the spies and the priests; and, although the king showed some independence in foreign affairs, his popularity waned; the desire for a constitution was by no means dead, and the survivors of the old Carbonari gathered round Carlo Poerio, while the Giovane Italia society (independent of Mazzini), led by Benedetto Musolino, took as its motto "Unity, Liberty and Independence." But as yet the idea of unity made but little headway, for southern Italy was too widely separated by geographical conditions, history, tradition and custom from the rest of the peninsula, and the majority of the Liberals—their majority of the population—merely aspired to a constitutional Neapolitan monarchy, possibly forming part of a confederation of Italian states. The attempt of the Giovane Italia to bring about a general revolution in 1843 only resulted in a few sporadic outbreaks easily crushed. The following year the Venetian brothers Bandiera, acting in concert with Mazzini, landed in Calabria, believing the whole country to be in a state of revolt; they met with little local support and were quickly captured and shot, but their death saved the revolution, which was of high significance as being the first attempt made by north Italians to promote revolution in the south. In 1847 a pamphlet by L. Settembrini, entitled "A Protest of the People of the Two Sicilies," appeared anonymously and created a deep impression as a most scathing indictment of the government; and at the same time the election of Pius IX., a pope who was believed to be a Liberal, caused widespread excitement throughout Italy. Conspiracy was now rife both in Naples and Sicily, but as yet there was no idea of deposing the king. Many persons were arrested, including Carlo Poerio, who, however, was not arrested. On the 12th of January 1848 a revolution under the leadership of Ruggiero Settimo broke out at Palermo to the cry of "independence or the 1812 constitution," and by the end of February the whole island, with the exception of Messina, was in the hands of the revolutionists. These events were followed by demonstrations at Naples; the king summoned a meeting of generals and members of his family on the 27th of January, and on the advice of Filangieri (q.v.), who said that the army was not to be relied upon, he assumed the Piamonte ministry and Del Canto, and summoned the duke of Serracapriola to form another administration. On the 28th he granted the constitution, and the Liberals Bazzoni and Carlo Poerio afterwards joined the cabinet. The
popular demand was now that Naples should assist the Lombards in their revolt against Austria, for a feeling of Italian solidarity was growing up. The ministry of Carlo Troya succeeded to that of Serracapriola, and after the parliamentary elections, in which many extreme Radicals were elected, Ferdinand declared war against Austria (April 7th, 1848). After considerable delay a Neapolitan army under General Pepe marched towards Lombardy in May, while the fleet sailed for Venice. But a dispute between the king and the parliament concerning the form of the royal dynasty arising, a group of demagogues with criminal folly provoked disturbances and erected barricades (May 14th). The king refused to open parliament unless the barricades were removed, and while the moderate elements attempted to bring about conciliation, the ministry acted with great weakness. A few shots were fired—it is not known who fired first—on the 15th, the Swiss regiments stormed the barricades and street fighting lasted all day. By the evening the Swiss and the royalists were masters of the situation. A new ministry under Prince Carati was appointed. Parliament was dissolved, the National Guard disbanded, and when the Neapolitans from the Po. Fresh elections were held and the new parliament met on the 15th of July, but it had the king, the army and the mob against it, and anti-constitutionalist demonstrations became frequent. After a brief session it was prorogued to the 1st of February 1849, and when it met on that date a deadlock between king and parliament occurred. The Austrian victories in Lombardy had strengthened the court party, or Camarilla as it was called, and on the 13th of March the assembly was again dissolved, and never summoned again. The king was at Gaeta, whether the grand-duke of Tuscany and Pius IX. had also repaired to escape from their rebellious subjects, and the city became the headquarters of Italian reaction.

In Sicily the revolutionists were purely insular in their aspirations and bitterly hostile to the Neapolitans, and the attempts at conciliation, although favoured by Lord Minto, failed, for Naples wanted one constitution and one parliament, whereas Sicily wanted two, with only the king in common. The Sicilian assembly met in March 1848, and Settimo in his inaugural speech declared that the Bourbon dynasty had ceased to reign, that the throne was vacant and that Sicily united her destinies to those of Italy. Settimo was elected president of the government, but the administration was lacking in statesmanship, the treasury was empty, and nothing was done to raise an army. After the Austrian victories King Ferdinand sent a Neapolitan army of 20,000 men under Filangieri to subjugate the island. The troops landed at Messina, of which the citadel had been held by the royalists throughout, and after three days' desperate fighting the city itself was captured and sacked. The British and French admirals imposed a truce with a view to conciliation, and the king offered the Sicilians the Neapolitan constitution and a separate parliament, which they refused. The Sicilian troops were now levied throughout the island and the chief command given to the Pole Mierslawski, but it was too late. Filangieri marched forward taking town after town, and committing many atrocities. In April he reached Palermo while the fleet appeared in the bay; tumults having broken out within the city, the government surrendered on terms which granted amnesty for all except Settimo and forty-two others.

For a few months after the dissolution of the Neapolitan parliament the government abstained from persecution, but with the crushing of the Italian revolution its bands were free; and when the commission on the affair of the 15th of May had completed its labours the state trials and arrests began. The arrest of S. Faucitano for a demonstration at Gaeta led to the discovery of the Unita Italiana society, whose object was to free Italy from domestic tyranny and foreign domination. Thousands of respectable citizens were thrown into prison, such as L. Settembrini, Carlo Poerio and Silvio Spaventa. The trials were conducted with the most scandalous contempt of justice, and moral and physical torture was applied to extort confessions. The abominable conditions of the prisons in which the best men of the kingdom were immured, linked to the vilest common criminals, was made known to the world by the famous letters of W. E. Gladstone, which branded the Bourbon régime as "the negation of God erected into a system of government." The merest suspicion of unorthodox opinions, the possession of foreign newspapers, the wearing of a beard or an anonymous denunciation, sufficed for the arrest and condemnation of a man to years of imprisonment, while the attiders, or persons under police surveillance liable to arrest on any charge were numerous. The Neapolitan government numbered 50,000.

The remembrances of Great Britain and France met with no success. Ferdinand strongly resented foreign interference, and even rejected the Austrian proposal for a league of the Italian despots for mutual defence against external attacks and internal disorder. In 1856 his life was unsuccessfully attempted by a soldier, and the same year Baron Bentivegna organized a revolt near Palermo, which was quickly suppressed. In 1857 Carlo Piscacane, an ex-Neapolitan officer who had taken part in the defence of Rome, fitted out an expedition, with Mazzini's approval, from Genoa, and landed at Napo in Calabria, where he hoped to raise the flag of revolution; but the local police assisted by the peasantry attacked the band, killing many, including Piscacane himself, and capturing most of the rest. The following year, at the instance of Great Britain and France, Ferdinand commuted the sentences of some of the political prisoners to exile. (See FERRANDINO II., king of the Two Sicilies).

In May 1859 Ferdinand died, and was succeeded by his son, Francis II., who came to the throne just as the Franco-Sardinian victories in Lombardy were sounding the death-knell of Austrian predominance and domestic despotism in Italy (see ITALY: HISTORY). But although there was much activity and plotting among the Liberals, there was as yet no revolution. Victor Emmanuel, king of Sardinia, wrote to the new king proposing an alliance for the division of Italy, but Francis refused. In June part of the Swiss Guard mutinied because the Bernese government not having renewed the convention with Naples the troops were deprived of their cantonal flag. The mutinous regiments, however, were surrounded by loyal troops and shot down; and this affair resulted in the disbanding of the whole force—the last support of the autocracy. Political amenities were now decreed, and in September 1859 Filangieri was made prime minister. The latter favoured the Sardinian alliance and the granting of the constitution, and so did the king's uncle, Leopold, count of Syracuse. But Francis rejected both proposals and Filangieri resigned and was succeeded by A. Statella. In April 1860 Victor Emmanuel again proposed an alliance whereby Naples, in return for help in expelling the Austrians from Venetia, was to receive the Marche, while Sardinia would annex all the rest of Italy except Rome. But Francis again refused, and in fact was negotiating with Austria and the Pope for a simultaneous invasion of Modena, Lombardy and Romagna.

In the meantime, however, events in Sicily were reaching a crisis destined to subvert the Bourbon dynasty. The Sicilians, unlike the Neapolitans, were thoroughly alienated from the Bourbons, whom they detested, and after the peace of Villafranca (July 1859) Mazzini's emisaries, F. Crispi and R. Pilo, had been trying to organize a rising in favour of Italian unity; and although they merely succeeded in raising a few squadre, or armed bands, in the mountainous districts, they persuaded Garibaldi (q.v.), without the magic of whose personal prestige they knew nothing important could be achieved, that the revolution which he knew to be imminent had broken out. The authorities at Palermo, learning of a projected rising, attacked the convent of La Gangia, the headquarters of the rebels, and killed most of the inmates; but in the meanwhile Garibaldi, whose hesitation had been overcome, embarked on the 5th of May 1860, at Quarto, near Genoa, with 1000 picked followers on board two steamers, and sailed for Sicily. On the 11th the expedition reached Marsala and landed without opposition. Garibaldi was somewhat coldly received by the astonished population; but he set forth at once for
Garibaldi on the mainland. He continued his march towards Palermo, where the bulk of the 30,000 Bourbon troops were concentrated, gathering numerous followers on the way. On the 15th he attacked and defeated 3000 of the enemy under General Landi at Calatafimi; the news of this brilliant victory revived the revolutionary agitation throughout the island, and Garibaldi was joined by Pilo and his bands. By a cleverly devised ruse he avoided General Colonna's force which expected him on the Monreale road, and entering Palermo from Milisirri received an enthusiastic welcome. The Bourbonists, although they bombarded the city from the citadel and the warships in the harbour, gradually lost ground, and after three days' street fighting their commander, General Lanza, not knowing that the Garibaldians had scarcely a cartridge left, asked for and obtained a twenty-four-hours' armistice (May 30th).

Garibaldi went on board the British flagship to confer with the Neapolitan generals Letizia and Chrétién; Letizia's proposal that the municipality should make a humble petition to the king was ignominiously rejected by Garibaldi, who visited the citizens daily to the extension of the armistice until next day. Then he informed the citizens by means of a proclamation of what he had done, and declared that, knowing them to be ready to die in the ruins of their city, he would renew hostilities on the expiration of the armistice. Although unarmed, the people rallied to him as one man, and Lanza became so alarmed that he asked for an unconditional extension of the armistice, which Garibaldi granted. The dictator now had time to collect ammunition, and the Neapolitan government having given Lanza full powers to treat with him, 15,000 Bourbon troops embarked for Naples on the 7th of June, leaving the revolutionists masters of the situation.

The Sardinian Admiral Persano's salute of nineteen guns on the occasion of Garibaldi's official call constituted a practical recognition of his dictatorship by the Sardinian (Piedmontese) government. In July further reinforcements of volunteers under Cosenz and Medici, assisted by Cavour, arrived at Palermo with a good supply of arms furnished by subscription in northern Italy. Garibaldi's forces were now raised to 12,000 men, besides the Sicilian squadre. Cavour's attempt to bring about the annexation of Sicily to Sardinia failed, for Garibaldi wished to use the island as a base for an invasion of the mainland and the alliance now been evacuated by the Bourbonists, but Messina and a few other points still held out, and when the Garibaldians advanced eastward they encountered a force of 4000 of the enemy under Colonel Bosco at Milazzo; on the 20th of July a desperate battle took place resulting in a hard-won Garibaldian victory. The Neapolitan government then decided on the evacuation of the whole of Sicily except the citadel of Messina, which did not surrender until the following year.

The news of Garibaldi's astonishing successes entirely changed the situation in the capital, and on the 25th of June 1860 the king, after consulting the ministers and the royal constitution, granted a constitution, and appointed A. Spinelli prime minister. Disorders having taken place between Liberals and reactionaries, Libero Romano was made minister of police in the place of Aiosa. Sicily being lost, the king directed all his efforts to save Naples; he appealed to Great Britain and France to prevent Garibaldi from crossing the Straits of Messina, and only just failed (for this episode see under La CARRIA, G.). Victor Emmanuel himself wrote to Garibaldi urging him to abandon his attack on Naples, but Garibaldi refused to obey, and on the 10th of August he crossed with 4500 men and took Reggio by storm. He was soon joined by the rest of his troops, 15,000 in all, and although the Neapolitan government had 30,000 men in Calabria alone, the army collapsed before Garibaldi's advance, and the people rose in his favour almost everywhere. Francis offered Garibaldi a large sum of money if he would abstain from advancing farther, and 30,000 men to fight the Austrians and the pope; but it was too late, and on the 6th of September the king and queen sailed for Gaeta. The 40,000 Bourbon troops between Salerno and Avellino fell back panic-stricken, and on the 7th Garibaldi entered Naples alone, although the city was still full of soldiers, and was received with delirious enthusiasm. On the 11th a part of the royalists capitulated and the rest retired on Capua. Cavour now decided that Sardinia must take part in the liberation of southern Italy, for he feared that Garibaldi's followers might induce him to proclaim the republic and attack Rome, which would have provoked French hostility; consequently a Piedmontese army left the Marches and Umbria, and entered Neapolitan territory with Victor Emmanuel as its head. On October 2nd and 2nd of October 1860 a battle was fought on the Volturino victory between 20,000 Garibaldians, many of them raw Emmanuels and levies, and 35,000 Bourbon troops, and although the first a Garibaldian division under Turré was repulsed, Garibaldi himself arrived in time to turn defeat into victory. On the 26th he met Victor Emmanuel at Teano and hailed him king of Italy, and subsequently handed over his conquests to him. On the 3rd of November a plebiscite was taken, which resulted in an overwhelming majority in favour of union with Sardinia under Victor Emmanuel. Garibaldi departed for his island home at Caprera, while L.C. Farini was appointed viceroy of Naples and M. Cordero viceroy of Sicily. The last remnant of the Bourbon army was concentrated at Gaeta, the siege of which was begun by Cialdini on the 5th of November; on the roth of January 1861 the French fleet, which Napoleon III. had sent to Gaeta to delay the inevitable fall of the dynasty, was withdrawn at the instance of Great Britain; and although the garrison fought bravely and the king and queen showed considerable courage, the fortress surrendered on the 14th of February 1861, the royal family dejected by sea. (See FRANCIS II., King of the Two Sicilies.) The citadel of Messina capitulated a month later, and Civitella del Tronto on the 21st of March. On the 18th of February the first Italian parliament met at Turin and proclaimed Victor Emmanuel king of Italy. Thus Naples and Sicily ceased to be a separate political entity and were absorbed into the united Italian kingdom.

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NAPOLEON I. (1769–1812), Emperor of the French. Napoleon Bonaparte (or Buonaparte, as he almost always spelt the name down the year 1796) was born at Ajaccio in Corsica on the 15th of August 1769. The date of his birth has been disputed, and certain curious facts have been cited in proof of the assertion that he was born on the 7th of January 1768, and that his brother Joseph, who passed as the eldest surviving son, was in reality his younger brother. The late Voltairine de Cleyre, however, explained his information about that a son born on the earlier date received the name Napolione (Napoleon). The father, Carlo Maria de Buonaparte (Charles Marie de Bonaparte), had resolved to call his three first sons by the names given by his great-grandfather to his sons, namely Joseph, Napoleon and Lucien. This was done; but on the death of the eldest (Joseph) the child first baptized Napolione received the name Joseph; while the third son (the second surviving son) was called Napoleon. The baptismal register of Ajaccio leaves no doubt as to the date of his birth as given above. For his parents and family see Buonaparte. The fathers literate, Napoleon was a descendant of the Ramolino and Pietra Santa families; the force reappeared in Napoleon, who, however, derived from his mother Letizia (a descendant of the Ramolino and Pietra Santa families) the force of will, the power of forming a quick decision and of maintaining it against all odds, which made him so terrible an opponent both in war and in diplomacy. The stern strain in the mother’s nature may be traced to intermarriage with the families of the wild interior of Corsica, where the vendetta was the unwritten but omnipotent law of the land. The Bonapartes, on the other hand, had long concerned themselves with legal affairs at Ajaccio or in the coast towns of the island. They traced their descent to ancestors who had achieved distinction in the political life of medieval Florence and Sarzana; Francesco Buonaparte of Sarzana migrated to Corsica early in the 16th century. What is equally noteworthy, as explaining the characteristics of Napoleon, is that his descent was on both sides distinctly patrician. He once remarked that the house of Bonaparte dated from La cour d'état de Brumaire (November 1799); but it is certain the de Buonapartes had received the title of nobility from the republic of Genoa which, during the 18th century, claimed to exercise sovereignty over Corsica.

It was in the midst of the strife resulting from those claims that Napoleon Bonaparte saw the light in 1769. His compatriots had already freed themselves from the yoke of Genoa, thanks to Pasquale Paoli; but in 1764 that republic appealed to Louis XV. of France for aid, and in 1768 a bargain was struck by which the French government succeeded to the nearly bankrupt sovereignty of Genoa. In the campaigns of 1768–69 the French gradually overcame the fierce resistance of the islanders; and Paoli, after sustaining a defeat at Ponte-Novò (30th of May 1769), fled to the mainland, and ultimately to England. Napoleon’s father was at first sided with Paoli, but after the disaster of Ponte-Novò he went over to the conquerors, and thereafter solicited places for himself and for his sons with a skill and persistence which led to a close union between the Bonapartes and France. From the French governor of Corsica, the comte de Marbeuf, he procured many favours, among them being the nomination of the young Napoleon to the military school at Brienne in the east of France.

Already the boy had avowed his resolve to be a soldier. In the large playroom of the house at Ajaccio, while the others amused themselves with ordinary games, Napoleon delighted most in beating a drum and wielding a sword. His elder brother, Joseph, a mild and dreamy boy, had to give way before him; and it was a perception of this difference of temperament which decided the father to send Joseph into the church and Napoleon into the army. Seeing that the younger boy was almost entirely ignorant of French, he took him with Joseph to the college at Autun at the close of the year 1778. After spending four months at Autun, Napoleon entered the school at Brienne in May 1779. The pupils at Brienne, far from receiving a military education, were grounded in ordinary subjects, and in no very efficient manner, by brethren of the order, or society, of Minims. The moral tone of the school was low; and Napoleon afterwards spoke with contempt of the training of the “monsks” and the manner of life of the scholars. Perhaps his impressions were too gloomy; his whole enthusiasm had been for the Corsicans, who still maintained an unequal struggle against the French; he deeply resented his father’s espousal of the French cause; and dislike of the conquerors of his native island made him morose and solitary. Apart from decided signs of proficiency in mathematics, there was no hint of genius or ability. Languages he disliked, but he spent much of his spare time in reading history, especially Plutarch. The firmness of character which he displayed caused him to be recommended in 1782 for the navy by one of the inspectors of the school; but a new inspector, who was appointed in 1783, frustrated this plan. In October 1784 Bonaparte and three other Briennais were authorized, by a letter signed by Louis XVI., to proceed as gentlemen cadets to the military school at Paris. There the education was more thorough, and the discipline stricter, than at Brienne. Napoleon applied himself to the study of mathematics, and so speedily qualifying himself for the artillery. In this he succeeded; and the result of an examination conducted in September 1785 by Laplace, Bonaparte was included among those who entered the army without going through an intermediate stage.

At the end of October 1785 he closed a scholastic career which had been creditable but not brilliant. He now entered the artillery regiment, La Fère, quartered at Valence, and went through all the duties imposed on privates, and thereafter those of a corporal and a sergeant. Not until January 1786 did he actually serve as junior lieutenant. A time of furlough in Corsica from September 1786 to September 1787 served to strengthen his affection for his mother, and for the island which he still hoped to free from the French yoke. The father having died of cancer at Montpellier in 1785, Napoleon felt added responsibilities, which he zealously discharged. In order to push forward a claim which Letizia urged on the French government, he proceeded to Paris in September 1787, and toyed for a time with the pleasures of the Palais Royal, but failed to make good the family claim.

After gaining a further extension of leave of absence from his regiment he returned to Ajaccio and spent six months more in the midst of family and political affairs. Rejoining his regiment, then in the garrison at Auxonne, after a furlough of twenty-one months, the young officer went through a time of much privation, brightened only by the study of history and cognate subjects. Many of the notes and essays written by him at Auxonne bear witness to his indomitable resolve to master all the details of his profession and the chief facts relating to peoples who had struggled successfully to achieve their liberation. Enthusiasm for Corsica was a leading motive prompting him to this prolonged exertion. His notes on English history (down to the time of the revolution of 1688) were especially detailed. Of Cromwell he wrote: "Courageous, clever, decisive, distorting his early principles of lofty republicanism yielded to the devouring flames of his ambition; and having tasted the sweets of power, he aspired to the pleasure of reigning alone." At Auxonne, as previously at Valence, Napoleon commanded a small detachment of troops sent to put down disturbances in neighbouring towns, and carried out his orders unflinchingly. To this period belongs his first crude literary effort, a polemic against a Genevese pastorc who had criticized Rousseau.

In the latter part of his stay at Auxonne (June 1788–September 1789) occurred the first events of the Revolution which was destined to mould anew his ideas and his career. But his preoccupation about Corsica, the privations to which he and his family were then exposed, and his bad health, left him little energy to expend on purely French affairs. He read much of the pamphlet literature then flooding the country, but he still preferred the more general studies in history and literature, Plutarch, Caesar, Corneille, Voltaire and Rousseau being his favourite authors. The plea of the last named on behalf of Corsica served
to enlist the sympathy of Napoleon in his wider speculations, and so helped to bring about that mental transformation which merged Buonaparte the Corsican in Bonaparte the Jacobin and Napoleon the First Consul and Emperor.

Family influences also played their part in this transformation. On proceeding to Ajaccio in September 1789 for another furlough, he found his brother Joseph enthusiastic in the democratic cause and acting as secretary of the local political club. Napoleon seconded his efforts, and soon they had the help of the third brother, Lucien, who proved to be most eager and eloquent. Thanks in part to the exertions of Saliceti, one of the two deputies sent by the tiers état of Corsica to the National Assembly of France, that body, on the 30th of November 1789, declared the island to be an integral part of the kingdom with right to participate in all the reforms then being decreed. This event decided Napoleon to give his adhesion to the French or democratic party; and when, in July 1790, Paoli returned from exile in England (receiving on his way the honours of the sitting by the National Assembly) the claims of nationality and democracy seemed to be identical, though the future course of events disappointed these hopes. But before his return, in the early weeks of 1791 he indited a letter inveighing in violent terms against Matteo Buattafooco, deputy for the Corsican noblesse in the National Assembly of France, as having betrayed the cause of insular liberty in 1768 and as plotting against it again.

The experiences of Bonaparte at Auxonne during his second stay in garrison were again depressing. With him in his poorly furnished lodging was Louis Bonaparte, the fourth surviving son, whom he carefully educated and for whom he predicted a brilliant future. For the present their means were very scanty, and, as the ardent royalist of his brother officers lived at the social circle, he plunged into work with the same ardour as before, frequently studying fourteen or fifteen hours a day. Then it was, or perhaps at a slightly later date, that he became interested in the relations subsisting between political science and war. From L’Esprit des lois of Montesquieu he learnt suggestive thoughts like the following: "L’objet de la guerre, c’est la victoire; celui de la victoire, la conquête; celui de la conquête, l’occupation." Machiavelli taught him the need of speed, decision and unity of command, in war. From the Traité de tactique (1772) of Guibert he caught a glimpsing of his power which a patriotic and fully armed nation might gain amidst the feeble and ill-organized governments of that age.

External events served to unite him more closely to France. The reorganization of the artillery, which took place in the spring of 1791, brought Bonaparte to the rank of lieutenant in the regiment of Grenoble, then stationed at Valence. He left the regiment La Fère with regret on the 14th of June 1791; but at Valence he renewed former friendships and plunged into politics with greater ardour. Most of his colleagues refused to take the oath of obedience to the Constituent Assembly, after the attempted escape of Louis XVI. to the eastern frontier at midsummer. Bonaparte took the oath on the 4th of July, but said later that the Assembly ought to have banished the king and proclaimed a regency for Louis XVII. In general, however, his views at that time were republican; he belonged to the club of Friends of the Constitution at Valence, spoke there with much acceptance, and was appointed librarian to the club.

At Valence also he wrote an essay for a prize instituted by his friend and literary adviser, Raynal, at the academy of Lyon. The subject was "What truths and sentiments is it most important to inculcate to men for their happiness?" Bonaparte’s essay bore signs of study of Rousseau and of the cult of Lycurgus which was coming into vogue. The Spartans were happy, said the writer, because they had plenty of good, suitable clothing and lodging, robust women, and were able to meet their requirements both physical and mental. Men should live according to the laws and dictates of nature, not forgetting the claims of reason and sentiment. The latter part of the essay is remarkable for its fervid presentiment of the charms of scenery and for vigorous declamation against the follies and crimes of ambitious men. The judges at Lyons placed it fifteenth in order of merit among the sixteen essays sent in.

Thanks to the friendly intervention of the maréchal du camp, baron Duteuil, Bonaparte once more gained leave of absence for three months and reached Corsica in September 1791. Opinion there was in an excited state, the priests and the populace being inflamed against the anti-clerical decrees of the National Assembly of France. Paoli did little to help on the Bonapartes; and the advancement of Joseph Bonaparte was slow. Napoleon’s admiration for the dictator also began to cool, and began to attempt to get the republic deposed. Lucien Bonaparte, the recognized head of the family, having placed property at the disposal of the sons, they bought a house, which became the rendezvous of the democrats and of a band of volunteers whom they raised. In the intrigues for the command of this body Napoleon had his rival, Morati, carried off by force—his first coup d’état. The incident led to a feud with the supporters of Morati, among whom was Pozzo di Borgo (destined to be his life-long enemy), and opened a breach between the Bonapartes and Paoli. Bonaparte’s imperious nature also showed itself in all matters, which he ruled with a high hand. No one, said his younger brother Lucien, liked to thwart him.

Further discords naturally arose between so masterful a lieutenant as Bonaparte and so autocratic a chief as Paoli. The beginnings of this rupture, as well as a sharp affray between his volunteers and the townsfolk of Ajaccio, may have quickened Bonaparte’s resolve to return to France in May 1792, but there were also personal and family reasons for this step. Having again exceeded his time of furlough, he was liable to the severe penalties attaching to a deserter and an émigré; but he saw that the circumstances of the time would help to enforce the appeal for reinstatement which he resolved to make at Paris. His surmise was correct. The Girondin ministry then in power had brought Louis XVI. to declare war against Austria (20th of April 1792) and against Sardinia (15th of May 1792). The lack of trained officers was such as to render the employment and advancement of Bonaparte probable in the near future, and on the 30th of August, Servan, the minister for war, issued an order appointing him to be captain in his regiment and to receive arrears of pay. During this stay at Paris he witnessed some of the great “days” of the Revolution; but the sad plights of his sister, Elisa, and Marianne Élisa, on the dissolution of the convention of St Cydr, where she was being educated, compelled him to escort her back to Corsica shortly after the September massacres.

His last time of furlough in Corsica is remarkable for the failure of the expedition in which he and his volunteers took part, against la Maddalena, a small island off the coast of Sardinia. The breach between Paoli and the Bonapartes now rapidly widened, the latter having now definitely espoused the cause of the French republic, while Paoli, especially after the execution of Louis XVI., repudiated all thought of political appeal with the regicides. Ultimately the Bonapartes had to flee from Corsica (11th of June 1793), an event which clinched Napoleon’s decision to identify his fortunes with those of the French republic. His ardent democratic opinions rendered the change natural when Paoli and his compatriots declared for an alliance with England.

The arrival of the Bonapartes at Toulon coincided with a time of acute crisis in the fortunes of the republic. Having declared war on England and Holland (1st of February 1793), and against Spain (4th of March), France was soon girdled by foes; and the forces of the first coalition invaded her territory at several points. At first the utmost efforts of the republic failed to avert disaster; for the immensely royalist district of la Vendée, together with most of Brittany, burst into revolt, and several of the northern, central and southern departments rose against the Jacobin rule. The struggle which the constitutionalists and royalists of Marseilles made against the central government furnished Bonaparte with an occasion for writing his first important political pamphlet, entitled "Le Souverain de Beauchu.

It purports to be a conversation at the little town of Beauchu
NAPOLEON I.

between a soldier (obviously the writer himself) and three men, citizens of Marseilles, Nîmes and Montpellier, who oppose the Jacobinical government and hope for victory over its forces. The officer points out the folly of such a course, and the certainty that the republic, whose troops had triumphed over those of Prussia and Austria, will speedily disperse the untrained levies of Provence. The pamphlet closes with a passionate plea for national unity.

He was now to further the cause of the republic one and indivisible in the sphere of action. The royalists of Toulon had admitted British and Spanish forces to share in the defence of their stronghold (29th of August 1793). To bring the republican cause was most serious: for from Toulon as a centre the royalists threatened to raise a general revolt throughout the south of France, and Pitt cherished hopes of dealing a death-blow to the Jacobins in that quarter. But fortune now brought Bonaparte to blight those hopes. Told off to serve in the army of Nice, he was detained by a special order of the commissioners of the Convention, Saliceti and Gasparin, who, hearing of the severe wound sustained by Dommartin, the commander of the artillery of the republican forces before Toulon, ordered Bonaparte to go and procure a surgeon for him. He set off for Toulon, and, finding his way into the chief battery quarters, then at Ollioules on the north-west of Toulon, on the 16th of September; and it is noteworthy that as early as September 19th the commissioners had seen the need of attacking the allied fleet and had paid some attention to the headland behind l’Eguillette, which commanded both the outer and the inner harbour. But there is no doubt that Bonaparte brought to bear on the execution of this as yet vague and general proposal powers of concentration and organization which ensured its success. In particular he soon put the artillery of the besiegers in good order. Carteaux, an ex-artist, at first held the supreme command, but was superseded on the 23rd of October. Doppet, the next commander, was little better fitted for the task; but his successor, Dugommier, was a brave and experienced soldier who appreciated the merits of Bonaparte. Under their direction steady advance was made on the side which Bonaparte saw to be all important; a sortie of part of the British, Spanish and Neapolitan forces on the 30th of November was beaten back with loss, General O’Hara, their commander, being severely wounded and taken prisoner. On the night of the 16th–17th December, Dugommier, Bonaparte, Victor and Muiron headed the sortie, Bonaparte, who fitted its way into the chief battery, threw up by the besieged on the height behind l’Eguillette; and on the next day Hood and Langara set sail, leaving the royalists to the vengeance of the Jacobins. General du Teil, the younger, who took part in the siege, thus commented on Bonaparte’s services: “I have no words in which to describe the merit of Bonaparte: much science, as much intelligence and too much bravery... It is for you, Ministers, to consecrate him to the glory of the republic.” At Toulon Bonaparte made the acquaintance of men who were to win renown under his leadership—Desaix, Junot, Marmont, Muiron, Suchet and Victor.

It is often assumed that the fortunes of Bonaparte were made at Toulon. This is an exaggeration. True, on the 22nd of December 1793 he was made general of brigade for his services; and in February 1794 he gained the command of the artillery in the French army about to invade Italy; but during the preliminary work of fortification along the coast he was placed under arrest for a time owing to his reconstruction of an old fort at Marseilles which had been destroyed during the Revolution. He was soon released owing to the interposition of the younger Robespierre and of Saliceti. Thereafter he resided successively at Toulon, St Tropez and Antibes, doing useful work in fortifying the coast and using his spare time in arduous study of the science of war. This he had already begun at Auxonne under the inspiring guidance of the baron du Teil. General du Teil, younger brother of the baron, had recently published a work, L’Usage de l’Artillerie nouvelle; and it is now known that Bonaparte derived from this work and from those of Guibert and Bourcet that leading principle, concentration of effort against one point of the enemy’s line, which he had advocated at Toulon and which he everywhere put in force in his campaigns.

On or about the 20th of March 1794 he arrived at the headquarters of the army of Italy. At Colmars, on the 21st of May 1794, he drew up the first draft of his Italian plan of campaign for severing the Piedmontese from their Austrian allies and for driving the latter out of their Italian provinces. A secret mission to Genoa enabled him to inspect the pass north of Savona, and the knowledge of the peculiarities of that district certainly helped him in maturing his plan for an invasion of Italy, which he put into execution in 1796. For the present he experienced a sharp blow of fortune, when he met with his usual misfortune: he was suddenly placed under arrest owing to intrigues or suspicions of the men raised to power by the coup d’état of Thermidor 9-10 (July 27–28) 1794. The commissioners sent by the Convention, Albitte, Laporte and Salicet, suspected him of having divulged the plan of campaign, and on the 6th of August ordered his arrest as being the “maker of plans” for the younger Robespierre. On a slighter accusation than this many had perished; but an examination into the details of the mission of Bonaparte to Genoa and the new instructions which arrived from Carnot, at once confirmed his innocence. It was, in fact, his time to enable him to share in the operations of the French army against the Austrians that led to the battle of Dego, north of Savona (21st of September), a success largely due to his skillful combinations. But the decline in the energies of the central government at Paris and the appointment of Schérer as commander-in-chief of the army of Italy frustrated the plans of a vigorous offensive which Bonaparte continued to develop and advocate.

Meanwhile he took part in an expedition fitted out in the southern ports to drive the English from Corsica. It was a complete failure, and for a time his prospects were overclouded. In the spring of 1795 he received an order from Paris to proceed to la Vendée in command of an infantry brigade. He declined on the score of ill-health, but set out for Paris in May, along with Marmont, Junot and Louis Bonaparte. At the capital he found affairs quickly falling back into the old ways of pleasure and luxury. “People,” he wrote, “remember the Terror only as a dream.” That he still pursued his studies of military affairs is shown by the compilation of further plans for the Italian campaign. The news of the ratification of peace with Spain brought at once the thought that an offensive plan of campaign in Italy was thenceforward inevitable. Probably these plans gained for him an appointment (20th of August) in the topographical bureau of the committee of Public Safety. But, either from weariness of the life at Paris, or from disgust at clerical work, he sought permission to go to Turkey in order to reorganize the artillery of the Sultan. But an inspection of his antecedents showed the many irregularities of his conduct as officer and led to his name being erased from the list of general officers (September 15th).

Again the difficulty of the republic was to be his opportunity. The action of the Convention in perpetuating its influence by the imposition of two-thirds of its members on the next popularly elected councils, aroused a storm of indignation in Paris, where the “moderate” and royalist reaction was already making headway. The result was the massing of some 30,000 National Guards to coerce the Convention. Confronted by this serious danger, the Convention entrusted its defence to Barras, who appointed the young officer to be one of the generals assisting him. The vigour and tactical skill of Bonaparte contributed very largely to the success of the troops of the Convention over the Parisian malcontents on the famous day of 15 Vendémiaire (October 5th, 1793), when the defenders of the Convention, sweeping the quays and streets near the Tuileries by artillery and musketry, soon paralysed the movement at its headquarters, the church of St Roch. The results of this day were out of all proportion to the comparatively small number of casualties. With the cost of about 200 killed on either side, the Convention crushed the royalist or malcontent reaction, and imposed on France a form of government which ensured the perpetuation of
democracy though in a bureaucratic form—the first of those
features which paved the way to power for Bonaparte. For
the constitution of the year 1795 which inaugurated the period of
the Directory (1795-1799) see FRENCH REVOLUTION. Here we
may notice that the perpetuation of the republic by means of
the armed forces tended to exalt the army at the expense of the
civil authorities. The repetition of the same tactics by Bonaparte
in Fructidor, 1797, served still more decidedly to tilt the balance
in favour of the sword, with results which were to be seen at the
coup d'état of Brumaire 1799.

The events which helped the disgraced officer of August 1795
to win his bold and brilliant campaign in November 1799 now claim
attention. The services which he rendered to the republic at
Vendémiaire brought as their reward the hand of Josephine de
Beauharnais. The influence of Barras with this fashionable lady helped on the match. At the outset she felt some repugnance
for the thin sallow-faced young officer, and was certainly terrified
by his ardour and by the imperious egoism of his nature; but
she consented to the union, especially when she received the
promise of the command of the French army of Italy. The story
that he owed this promotion solely to the influence of Barras and
Josephine is, however, exaggerated. It is true that he had
drawn up for that army which had enlisted the far more influential support of Carnot on his behalf. In January 1796 he drew up another plan for the
conquest of Italy, which gained the assent of the Directory.
Vendémiaire and the marriage with Josephine (9th of March
1796) were but stepping-stones to the attainment of the end
which he had kept steadily in sight since the spring of the year
1794. For the events of this campaign in Italy see FRENCH
REVOLUTIONARY WARS. The success at the bridge of Lodri (10th of
May) seems first to have inspired in the young general dreams of a
greater career than that of a successful general of the Revolution;
while his narrow escape at the bridge of Arcola in November
strengthened his conviction that he was destined for a great
future. The means whereby he engaged the energies of the
Italians on behalf of the French Republic and yet refrained from
persecuting the Roman Catholic Church in the way only
too common among revolutionary generals, bespoke political
insight of no ordinary kind. From every dispute which he had
with the central authorities at Paris he emerged victorious;
and he took care to assure his ascendancy by sending presents
to the Directors, large sums to the nearly bankrupt treasury;
and works of art to the museums of Paris. Thus when, after
the crowning victory of Rivoli (14th of January 1797), Mantua
surrendered and the Austrian rule in Italy for the time collapsed,
Bonaparte was virtually the idol of the French nation, the
master of the Directory and potentially the protector of the
Holy See.

It may be well to point out here the salient features in Bonaparte's conduct towards the states of northern Italy. While
avoiding the enthusiasm of their inhabitants on behalf of France,
he in private spoke contemptuously of them, mercilessly sup-
pressed all outbreaks caused by the exactions and plundering
of his army, and carefully curbed the factions which the new
political life soon developed. On his first entry into Milan
(15th of May 1796) he received a rapturous welcome as the
liberator of Italy from the Austrian yoke; but the instructions of
the Directory allowed him at the outset to do little more than
effect the organization of consultative committees and national
guards in the chief towns of Lombardy. The successful course
of the campaign and the large sums which he sent from Italy to
the French exchequer served to strengthen his hold over the
Italians. His constructive policy grew more decided;
Thus, when the men of Reggio and Modena overthrew the rule
of their duke, he at once accorded protection to them, as also to
the inhabitants of the cities of Bologna and Ferrara when they
broke away from papal authority. He even allowed the latter
to send delegates to confer with those of the duchy at Modena,
with the result that a political union was decreed in a state
called the Cispadane Republic (16th of October 1796). This
action was due in large measure to the protection of Bonaparte.

The men of Lombardy, emboldened by his tacit encouragement,
prepared at the close of the year to form a republic, which
assumed the name of Transpadane, and thereafter that of
Cisalpine. Its constitution was drawn up in the spring of 1797 by committees appointed, and to some extent supervised,
by him; and he appointed the first directors, deputies and chief
administrators of the new state (July 1797). The union of these
republics took place on the 15th of July 1797. The bounds of the thus enlarged Cisalpine Republic were afterwards ex-
tended eastwards to the banks of the Adige by the terms of the
treaty of Campo Formio; and in November 1797 Bonaparte
(formed by the district of the Valtelline, north-east of Lake Como, to its territory. Much of this work of reorganiza-
tion was carried on at the castle of Montebello, or Mombello,
near Milan, where he lived in almost viceroyal pomp (May–July,
1797). Taking advantage of an outbreak at Genoa, he over-
threw that ancient oligarchy, replaced it by a form of government modelled on that of France (June 6th); and subsequently it
adopted the name of the Ligurian Republic.

Concurrently with these undertakings, he steadily prepared to
strengthen his position in the political life of France; and it
will be instructive to discuss the methods by which he ensured the defeat of the royalists in France and the propping up of his
reign in the coup d'état of Fructidor 1797. The unrest in France in the years 1795–1797 resulted mainly from the harshness, incom-
petence and notorious corruption of the five Directors who,
after the 13th of Vendémiaire 1795, practically governed France.
All those who wished for peace and orderly government came
degrees to oppose the Directors; and, seeing that the latter clung
to Jacobinical catchwords and methods, public opinion tended
to become "moderate" or even royalist. This was seen in the
elections for one-third of the 750 members composing the two
councils of the nation (the Anciens and the Council of Five
Hundred); they gave the moderates a majority alike in that
of the older deputies and in that of the younger deputies (April
1797), and that majority elected Barthélémy, a well-known
moderate, as the fifth member of the Directory. Carnot, the
ablest administrator, but not the strongest man, soon joined
Barthélémy in opposing their Jacobinical colleagues—Barras,
Rewbell and La Farellevière-Lépaulx. Time was on the side of
the moderates; they succeeded in placing General Pichegru,
already known for his tendencies towards constitutional monarchy,
in the presidential chair of the Council of Five Hundred; and
they proceeded to agitate, chiefly through the medium of a
powerful club founded at Clichy, for the repeal of the revolu-
tionary and persecuting laws. The three Jacobinical Directors
thereupon intrigued to bring to Paris General Lazare Hoche
and his army destined for the invasion of Ireland for the purpose of
courting their opponents; but these, perceiving the danger,
ordered Hoche to Paris, rebuked him for bringing his army
nearer to the capital than was allowed by law, and dismissed
him in disgrace.

The failure of Hoche led the three Directors to fix their hopes
on Bonaparte. The commander of the ever-victorious army of
Italy had recently been attacked by one of the moderates in the
councils for proposing to hand over Venice to Austria. This
cession was based on political motives, which Bonaparte judged
to be of overwhelming force; and he now decided to support
the Directors and overthrow the moderates. Prefacing his action
by a violent tirade against the royalist conspirators of Clichy,
he sent to Paris General Augereau, well known for his brusque
behaviour and demagogic Jacobinism. This officer rushed to
Paris, breathing out threats of slaughter against all royalists,
and entered into close relations with Barras. In order to dis-
court the chances of failure, Bonaparte warned the three Directors
that Augereau was a turbulent politician, not to be trusted over-
much. Events, indeed, might readily have gone in favour of
the moderates had Carnot acted with decision; but he relapsed
into strange inactivity, while Barras and his military tool
prepared to coerce the majority. Before dawn of September
the 4th (18 Fructidor) Augereau with 2000 soldiers marched
against the Tuileries, where the councils were sitting, dispersed
their military guards, arrested several deputies and seized Barthélemy in his bed. Carnot, on receiving timely warning, fled from the Luxembourg palace and made his way to Switzerland. The remembrance of the fatal day of Vendémiaire 1795 perhaps helped to paralyse the majority. In any case, exile, and death in the prisons of Cayenne, now awaited the timid champions of law and order; while parliamentary rule sustained a shock from which it never recovered. The Councils allowed the elections to be annulled in forty-nine departments of France, and re-enacted some of the laws of the period of the Terror, notably those against non-juring priests and returned émigrés. The electors, for the accumulation of power, were to elect the Directors, in place of Carnot and Barthélemy, gave to that body a compactness which enabled it to carry matters with a high hand, until the hatred felt by Frenchmen for this soulless rebuilding of a moribund Jacobinism gradually endowed the Chambers with life and strength sufficient to provoke a renewal of strife with the Directory. These violent oscillations not only weakened the fabric of the Republic, but brought about a situation in which Bonaparte easily paralysed both the executive and the legislative powers so ill co-ordinated by the constitution of the year 1795.

In the sphere of European diplomacy, no less than in that of French politics, the results of the coup d'état of Fructidor were momentous. The Fructidorian Directors contemptuously rejected the overtures for peace which Pitt had recently made through the medium of Lord Malmesbury at Lille; and they further illustrated their desire for war and plunder by initiating a forward policy in central Italy and Switzerland which opened up a new cycle of war. The coup d'état was favourable to Bonaparte; it ensured his hold over the Directors and enabled him to impose his own terms of peace on Austria; above all it left him free for the prosecution of his campaign in a field of action which now held the first place in his thoughts—the Orient. Having rivalled the exploits of Caesar, he now longed to follow in the steps of Alexander the Great.

At the time of his first view of the Adriatic (February 1797) he noted the importance of the port of Ancona for intercourse with the Sultan's dominions; and at that city fortune placed in his hands Russian despatches relative to the designs of the Tsar Paul on Malta. The incident reawakened the interest which had early been aroused in the young Corsican by converse with the savant Volney, author of Les Ruines, ou méditation sur les révolutions des empires. The intercourse which he had with Monge, the physicist and ex-minister of marine, during the negotiations with Austria, served to emphasize the orientation of his thoughts. This explains the eagerness with which he now insisted on the acquisition of the Ionian Isles by France and the political extinction of their present possessor, Venice. That city had given him cause for complaint, of which he made the most uncourteous use. Thanks to the blind complaisance of its democrats and the timid subserviency of its once haughty oligarchs, he became master of its fleet and arsenal (10th of May 1797). Already, as may be seen by his letters to the Directory, he had laid his plans for the barring away of the Queen of the Adriatic to Austria; and throughout the lengthy negotiations of the summer and early autumn of 1797 which he conducted with little interference from Paris, he adhered to his plan of gaining the fleet and the Ionian Isles; while the house of Habsburg was to acquire the city itself, together with all the mainland territories of the Republic as far west as the River Adige. In vain did the Austrian envoy, Cobenzl, resist the cession of the Ionian Isles to France; in vain did the Directors intervene in the middle of September with an express order that Venice must not be ceded to Austria, but must, along with Friuli, be included in the Cisalpine Republic. To the subtle tenacity of Cobenzl he opposed a masterful violence: he checkmated the Directors, when they sought to thwart him in this and in other directions, by sending in once more his resignation with a letter in which he accused them of "horrible ingratitude." He was successful at all points. The Directors feared a rupture with the man to whom they owed their existence; and the house of Austria was lain to make peace with the general rather than expose itself to harder terms at the hands of the Directory.

The treaty of Campo Formio, signed on the 17th of October 1797, was therefore pre-eminently the work of Bonaparte. Already at Cherasco and Leoben he had dictated the preliminaries of peace to the courts of Turin and Vienna quite independently of the French Directory. At Campo Formio he showed himself the first diplomatist of the age, and the arbiter of the destinies of Europe. The terms were on the whole unexpectedly favourable to Austria. In Italy she was to acquire the Venetian lands already named, along with Dalmatia and Venetian Istria. The territories occupied by the French army (the Cisalpine Republic, the Lombard and the Adige) went to the newly constituted Cisalpine republic; France gaining the Ionian Isles and the Venetian fleet. The Emperor Francis renounced all claims to his former Netherland provinces, which had been occupied by the French since the summer of 1794; he further ceded the Breisgau to the dispossessed duke of Modena, agreed to summon a congress at Rastatt for the settlement of German affairs, and recognized the independence of the Cisalpine republic. In secret articles the emperor bound himself to use his influence at the congress of Rastatt in order to procure the cession to France of the Germanic dominions of the Rhine, while France promised to help him to acquire the archbishopric of Salzburg and a strip of land on the eastern frontier of Bavaria.

After acting for a brief space as one of the French envoys to the congress of Rastatt, Napoleon returned to Paris early in December and received the homage of the Directors and the acclaim of the populace. The former sought to busy him by appointing him commander-in-chief of the Army of England, the island power being now the only one which contested French supremacy in Europe. In February 1798 he inspected the preparations for the invasion of England and then proceeded to the northern point. He found that they were wholly inadequate, and summed up his views in a remarkable letter to the Directory (23rd of February), wherein he pointed out two possible alternatives to an invasion of England, namely, a conquest of the coast of the north-west of Germany, for the cutting off of British commerce with central Europe, or the undertaking of an expedition to the Orient which would be equally ruinous to British trade. The inference was inevitable that, as German affairs were about to be profitably exploited by France in the bargains then beginning at Rastatt, she must throw her chief energies into the Egyptian expedition. One of the needful preliminaries of the enterprise had already received his attention. In November 1797 he sent to Malta Pousssielgue, secretary of the French legation at Genoa, on business which was ostensibly commercial but (as he informed the Directory) "in reality to put the last touch to the design that we have on that island." The intrigues of the French envoy in corrupting the knights of the order of St John were completely successful. It remained, however, to find the funds needful for the equipment of a great expedition. Here the difficulties were great. The Directory, after the coup d'état of Fructidor, had acknowledged a state of bankruptcy by writing off two-thirds of the national debt in a form which soon proved to be a thin disguise for repudiation. The return of a large part of the armed forces from Italy and Germany, where they had lived on the liberated inhabitants, also threw new burdens on the Republic; and it was clear that French money alone would not suffice to fit out an armada. Again, however, the financial situation was improved by conquest. The occupation of Rome in February 1798 enabled Berthier to send a considerable sum to Paris and to style himself "treasurer to the chest of the Army of England." The invasion of Switzerland, which Bonaparte had of late persistently pressed on the Directory, proved to be an equally lucrative device, the funds in several of the cantonal treasuries being transferred straightway to Paris or Toulon. The conquest of north and central Italy also placed great naval resources at the disposal of France, Venice alone providing nine sail of the line and twelve frigates (see Bonaparte's letter of the 15th of November 1797), Genoa, Spezzia, Leghorn, Civita Vecchia and Ancona also supplied their quota in warships, transports,
stores and sailors, with the result that the armada was ready for sea by the middle of May 1798. The secrecy maintained as to its destination was equally remarkable. The British government inclined to the belief that it was destined either for Ireland or for Naples. As the British fleet had abandoned the Mediterranean since November 1796 and had recently been disorganized by two serious mutinies, Bonaparte's plan of conquering Egypt was by no means so rash as has sometimes been represented.

The ostensible aims of the expedition, as drawn up by him, and countersigned by the Directory on the 12th of April, were the seizure of Egypt, the driving of the British from all their possessions in the East, and the establishment of an Egyptian republic. Apart from these public aims there were private motives which weighed with Bonaparte. His relations to the Directors were most strained. They feared his ability and ambition; while he credited them with the design of poisoning him. Shortly before his starting, an open rupture was scarcely averted; and he and his brothers allowed the idea to get abroad that he was being virtually banished from France. It is certain, however, that his whole heart was in the expedition, which appealed to his love of romance and of the gigantic. His words to Joseph Bédet to kindle by entertaining the masses of Paris with the tales of a republic were youthful illusions. Since the 9th of Thermidor, the republican instinct has grown weaker every day. To-day all eyes are on me: to-morrow they may be on another. . . . I depart for the Orient with all the means of success at my disposal. If my country needs me, if there are additions to the number of those who share the opinion of Talleyrand, Sieyès and Roederer, that war will break out again and that it will be unsuccessful for France, I will return, more sure of the feeling of the nation."

He added, however, that if France waged a successful war, he would remain in the East, and do more damage to England than by mere demonstrations in the English Channel. But the Toulon fleet set sail on the 19th of May; and when the other contingents from the ports of France and Italy joined the flag, the armada comprised thirteen sail of the line, fourteen frigates, many smaller warships and some three hundred transports. An interesting feature of the expedition was the presence on board of several savants who were charged to examine the antiquities and develop the resources of Egypt. The chief had lately become a member of the Institute, and did his utmost to inculcate in France that love of art and science which he had helped to kindle by enunciating the mandate of the Republic with the treasures of Italy. By good fortune the armada evaded Nelson and arrived safely off Malta. Thanks to French intrigues, the Knights of Malta offered the stamest defence of their capital. During the week which he spent there, Bonaparte displayed marvellous energy in endowing the city with modern institutions; he even arranged the course of studies to be followed in the university. Setting sail for Egypt on the 19th of June, he again had the good fortune to elude Nelson and arrived off Alexandria on the 2nd of July. For an account of the Egyptian and Syrian campaigns see French Revolutionary Wars. But here we may point out the influence of the expedition on Egypt, on European politics and on the fortunes of Bonaparte. The chief direct result in the life of the Egyptian people was the virtual destruction of the governing caste of the Mamelukes, the Turks finding it easy to rid themselves of their surviving chiefs and to re-establish the authority of the Sultan. As for the benefits which Bonaparte and his savants helped to confer on Egypt, they soon vanished. The great canal was not begun; irrigation works were started but were soon given up. The letters of Kitchin and Menou (the successors of Bonaparte) show that the expenditure on public works had been so recklessly that the colony was virtually bankrupt at the time of Bonaparte's departure; and William Hamilton, who travelled through Egypt in 1802, found few traces, other than military, of the French occupation. The indirect results, however, were incalculably great. Though for the present the Sultan regained his hold upon Egypt, yet in reality Bonaparte set in motion forces which could not be stayed until the ascendency of one or other of the western maritime powers in that land was definitely decided.

The effects of the expedition in the sphere of world-politics were equally remarkable and more immediate. The British government, alarmed by Bonaparte's attempt to intrigue with Tippoo Sahib, put forth all its strength in India and destroyed the power of that ambitious ruler. Nelson's capture of Malta (5th of September 1800) also secured for the time a sure base for British fleets in the Mediterranean. A Russo-Turkish fleet wrested Corfu from the French; and the Neapolitan Bourbon, emboldened by the news of the battle of the Nile, began hostilities with France which precluded the war of the Second Coalition. In the domain of science the results of the expedition were of the highest importance. The British Museum furnished the key to Egyptian hieroglyphics; and archaeology, no less than the more practical sciences, acknowledges its debt of gratitude to the man who first brought the valley of the Nile into close touch with the thought of the West.

Finally, it should be noted that, amid the failure of the national aims which the Directory and Bonaparte set forth, his own desires received a startlingly complete fulfilment. The war of the Second Coalition having brought about the expulsion of the French from Italy, the Directors were exposed to a storm of demonstrations demanding the restoration of the Bourbons. A Stone furnished the key to Egyptian hieroglyphics; and archaeology, no less than the more practical sciences, acknowledges its debt of gratitude to the man who first brought the valley of the Nile into close touch with the thought of the West.

In order to understand the sharp swing of the political pendulum back from republicanism to autocracy which took place at Brumaire, it is needful to remember that the virtual failure of the Egyptian Expedition was then unknown. The news of Bonaparte's signal victory over the Turkish army at Aboukir on the 2nd of July had been relayed with all speed through the Empire, and it was commonly understood that the experiment had foundered. With the success of the expedition, his policy was scarcely noticeable in the eyes of men. The Directory had been the instrument brought into existence by the revolution of 1789; the re-establishment of the Ancients was ready to support Sieyès and make drastic changes in the constitution; but in the Council of Five Hundred the prevalent feeling was democratic or even Jacobinical. The aim of Sieyès was to perpetuate the republic, but in a bureaucratic or autocratic form. With this aim in view he sought to find a man possessing ability in war and probity in civil affairs, who would act as figure-head to his long projected constitution. For a time affairs moved as he wished. The Jacobin Club was
closed, thanks to the ability of Fouché, the new minister of Police; but the hopes of Sieyès were dashed by the death of General Joubert, commander of the Army of Italy, at the disastrous battle of Novi (15th of August). The deaht of army among the generals left in France (Kléber and Desaix were in Egypt) was now painfully apparent. Moreau was notoriously lethargic in civil affairs. Bernadotte, Jourdan and Augereau had chibletly lost themselves by close association with the Jacobins. The soldiery had never forgiven Masséna his peculations after the capture of Rome. One name, and one alone, leaped to men's thoughts, that of Bonaparte.

He arrived from Egypt at the psychological moment, and his journey from Fréjus to Paris resembled a triumphant procession. Nevertheless he acted with the utmost caution. A fortnight passed before he decided to support Sieyès in effecting a change in the constitution; and by then he had capitivated all men except Bernadotte and a few intrusissigeni Jacobins. Talleyrand, Roederer, Cambacérès and Réal were among his special confidants, his brothers Joseph and Lucien also giving useful advice. Of the generals, Murat, Berthier, Lannes and Leclerc were those who prepared the way for the coup d'état. Fouché, pulling the wires through the police, was an invaluable helper. The conduct of Barras was known to depend on material considerations.

All being ready, the Ancients on the 18 Brumaire (9th of November) decreed the transference of the sessions of both Councils to St Cloud, on the plea of a Jacobin plot which threatened the peace of Paris. They also placed the troops in Paris and its neighbourhood under the command of Bonaparte. Thereupon Sieyès and Ducos resigned office. Barras, after a calculating delay, followed suit. Gohier and Moulin, on refusing to retire, were placed under a military guard; and General Moreau showed his political incapacity by discharging this duty, for the benefit of Bonaparte.

Nevertheless the proceedings of St Cloud on the day following bade fair to upset the best-laid schemes of Bonaparte and his coadjutors. The Five Hundred, meeting in the Orangerie of the palace, had by this time seen through the plot; and, on the entrance of the general with four grenadiers, several deputies rushed at him, shook him violently, while others vehemently demanded a decree of outlawry against the new Cromwell. He himself lost his nerve, staggered, nearly fainted, and was dragged out by the soldiers in a state of mental and physical collapse. The situation was saved solely by the skill of his brother Lucien, then president of the Council. He refused to put the vote of outlawry, uttered a few passionate words, cast off his official robes, declared the session at an end, and made his way out under protection of a squad of grenadiers. The coup d'état seemed to have failed. But Bonaparte saw in the episode the moment for striking on the other side. Stung to action by some words of Sieyès, Bonaparte appealed to the troops of the line in terms which provoked a ready response. Imprecations uttered by Lucien against the brigands and traitors in the pay of England decided the grenadiers of the Council to march against the deputies whom it was their special duty to protect. Drums beat the charge. Murat led the way through the corridors of the palace to the Orangerie, and levelled bayonets ended the existence of the Council. Within the space of ten and a half years from the summoning of the States-General at Versailles (May 1789), parliamentary government fell beneath the sword.

Lucien now consolidated the work of the soldiery by procuring from the Ancients a decree which named Bonaparte, Sieyès and Ducos as provisional consuls, while a legislative commission was appointed to report on necessary changes in the constitution. Lucien also gathered together a small group of the younger deputies to throw the cloak of legality over the events of the day. The Rump proceeded to expel sixty-one Jacobins from the Council of Five Hundred, adjourned its sessions until the 19th of February 1800, and appointed a commission of twenty-five members with power to act in the meantime. Clearly the success of the coup d'état of Brumaire was due in the last resort to Lucien Bonaparte.

The Parisians received the news of the event with joy, believing that freedom was now at last to be established on a firm basis by the man whose name was the synonym for victory in the field and disinterestedness in civil affairs. "People are full of mirth" (wrote Madame Reinhard, wife of the minister for Foreign Affairs, four days later) "believing that they have regained liberty." She added that all the parties except the Jacobins were full of confidence; and that the nobles now cherished hopes of a reaction, seeing that the reduction of the number of rulers from five to three pointed towards monarchy. Her comment on this delusion is instructive. Three consuls had been appointed, she remarked, precisely in order that power might not be vested in the hands of one man.

Only by degrees did the events of the 19th of Brumaire stand out in their real significance; for the new consuls, installed at the Luxembourg palace, and somewhat later at the Tuileries, took care that the new constitution, which they along with the two constitutional acts had secretly drawn up, should not be promulgated until Paris and France had settled down to the ordinary life of pleasure and toil. In the meantime they won credit by popular measures such as the abolition of forced loans and of the objectionable habit of seizing hostages from the districts of the west where the royalist ferment was still strongly working.

The feelings of surprise at the clemency and moderation with which the victors used their powers predisposed men everywhere to accept their constitution. Sieyès now sketched its outlines in vaguely republican forms; thereupon Bonaparte freely altered them and gave them strongly personal touches. The theorist laid before the joint commission his projet, the result of five years of cogitation, only to have it ridiculed by the great soldier. In one respect alone did it suit him. While restoring the principle of universal suffrage, which had been partially abrogated in 1795, Sieyès rendered this system of election practically a nullity. The voters were to choose one-tenth of their number (notabilities of the commune); one-tenth of these would form the notabilities of the department; while by a similar decimal sifting, the notabilities of the nation were selected. The final and all-important act of selection from among these men was, however, to be made by a personage, styled the proclamateur-électeur, who chose all the important functionaries, and, jointly with the notabilities of the nation, chose the members for the Council of State (wielding the chief executive powers), the Tribunate and the Senate. The latter body would, however, have the power to "absorb" the head of the state if he showed signs of ambition. Against this power of absorption Bonaparte declined vehemently, asserting also that the proclamateur-électeur would be a mere cocohen à l'engraiss. In vain did Sieyès propound schemes for infusing some principle of liberty into the chief executive powers for war, the other for peace. This division of powers was equally distasteful to Bonaparte: he formed a kind of cabal within the joint commission, and there intimidated the theorist, with the result already foreseen by the latter. Sieyès, conscious that his political mechanism would merely winnow the air, until the profoundly able and forceful man at his side adapted it to the work of government, relapsed into silence; and his resignation of the office of consul, together with that of Ducos, was announced as imminent. Bonaparte further brushed aside a frankly democratic constitution proposed by Daunou, and intimidated his opponents in the joint commission by a threat that he would himself draft a constitution and propose it to the people in a mass vote.

This was what really happened. They looked on helplessly while he refashioned the scheme of Sieyès. Keeping the electoral machinery almost unaltered (save that the lists of notables were to be permanent) Bonaparte entirely altered the upper parts of the constitutional pyramid reared by the philosophes. Improving upon the procedure of the Convention in Vendémiaire 1795, Bonaparte procured the nomination of three consuls in an article of the new constitution; they were the first Consul (First Consul), Cambacérès and Lebrun. The latter two, uniting with the two retiring consuls, Sieyès and Ducos, were to form the
nucleus of the senate and choose the majority among its full complement of sixty members, the minority being thereafter chosen by co-optation. To the senate, thus chosen "from above," was allotted the important task of supervising the constitution, and of selecting, from among the notabilities of the nation, the members of the Corps Législatif and the Tribunate. These two bodies nominally formed the legislature, the Tribunate merely discussing the bills sent to it by an important body, the Council of State; while the Corps Législatif, sitting in silence, heard them declared by councillors of state and criticized by members of the body; its new constitution was promulgated on the 15th of December 1799 and in a plébiscite held during January 1800 it received the support of 3,011,007 voters, only 1,552 persons voting against it. The fact that the three new consuls had entered upon office and set the constitutional machinery in motion fully six weeks before the completion of the plébiscite, detracts somewhat from the impressiveness of the vox populi on that occasion.

Bonaparte selected his ministers with much skill. They were Talleyrand, Foreign Affairs; Berthier, War; Abrial, Justice; Launay, Bouche, members of local administrative bodies and ex-commissioners of government attached to the tribunals. He names all the judges for criminal and civil cases, other than the juges de paix (magistrates) and the judges of the Cour de cassation, without having the power to discharge them."—As for the second and third consuls, their functions were almost entirely consultative and formal, their opposition being recorded, but having no further significance against the fiat of the First Consul. Bonaparte's powers were subsequently extended in the years 1802, 1804 and 1807, but it is clear that autocracy was practically established by his own action in the secret commission of 1799. This constitution was promulgated on the 15th of December 1799 and in a plébiscite held during January 1800 it received the support of 3,011,007 voters, only 1,552 persons voting against it. The fact that the three new consuls had entered upon office and set the constitutional machinery in motion fully six weeks before the completion of the plébiscite, detracts somewhat from the impressiveness of the vox populi on that occasion.

In our survey of the career of Napoleon, we have now reached the time of the Consulate (November 1799-May 1804), which marks the zenith of his mental powers and creative activity. Externally, and in a personal sense, the period falls into two parts. The former of these extends to August 1802, when the powers of the First Consul, which had been decreed for ten years, were prolonged to the duration of his life. But in another and wider sense the Consulate has a well-defined unity; it is the time when France gained most of her institutions and the essentials of her machinery of government.

For an article FRANCE (Law and Institutions) for the information respecting the various codes dating from this period, and to the article CONCORDAT for the famous measure which Napoleon re-established official relations between the state and the church in France. More pressing even than that question was the regulation of local government. Bonaparte's action in this matter was so characteristic as to deserve close attention. Under the Old Regime the government was divided into districts, departments, cantons, divisions, districts, and finally the arrondissements of the Empire, namely, the Legion of Honour (19th of May 1802), Napoleon intended it as a protest against the spirit of equality which pervaded revolutionary thought. In one respect the new institutions marked an enormous advance on titles of nobility, which had been granted nearly always for warlike exploits, or merely as a mark of the favour of the sovereign. The First Consul, on the
other hand, sought to recognize and reward merit in all walks of life. Nevertheless his proposal met with strong opposition in the Corps Législatif and Tribunate, where members saw that it portended a revival of the despotic tendency which had been abated by the Constituent assembly, titles of nobility were virtually restored by Napoleon in 1806 and legally in 1808. Side by side with them there continued to exist the Legion of Honour. It was organized in futuro as a means of rewarding officers, members of the Constituent assembly, thirty officers and 350 legionaries. A stipend, ranging from 3000 francs a year to 250 francs, was attached to each grade of the institution. The benefits attaching to membership were numbered, and were increased during the Empire, when the average number somewhat exceeded thirty thousand. Napoleon's aim of bidding for the support of all able men is disagreeably prominent in this part of his career. The advantages the government offered were summed up by Moreau in his address to Hohenlinden (December 2nd, 1800) brought the court of Vienna to a state of despair. By the treaty with Austria, signed by Joseph Bonaparte at Lunéville on the 9th of February 1801, France regained all that she had won at Campo Formio, much of which had been lost for a time in the war of the Second Coalition. True, she now agreed to recognise the independence of the Cispitane, Ligurian, Helvetic and Batavian (Dutch) republics; but the masterful acquisitiveness of the First Consul and the weak conduct of Austrian and British affairs at that time soon made that clause of the treaty a dead letter. Bonaparte meanwhile, by dexterous behaviour to Paul I. of Russia, had won the friendship of that potentate, whose resentment against his former allies, Austria and England, facilitated a re-grouping of the Powers. The new Franco-Russian entendre helped on the formation of the Armed Neutrality League and led to the concession of schemes for the driving of the British from India. But these undertakings were thwarted in March–April 1801 by the murder of the tsar Paul and by Nelson's victory at Copenhagen. The advent of the more peaceful and Angliophile tsar, Alexander I. (q.v.), brought about the dissolution of the League, and the abandonment of the oriental schemes which Bonaparte had so closely at heart. Another disappointment befell him in the same quarter, the surrender of the French forces in Egypt to the British expedition commanded first by General Abercromby and afterwards by General John Hely-Hutchinson (30th of August 1801). These events disposed both Bonaparte and the British cabinet towards peace. He was all powerful on land, they on the sea; and for the present each was powerless to harm the other. Bonaparte in particular discerned the advantages which peace would bring in the consolidation of his position. The beginning of negotiations had been somewhat facilitated by the resignation of Pitt (4th of February 1801) and the advent to office of Henry Addington. Bonaparte, perceiving the weakness of Addington, both as a man and as a minister, pressed him hard; and both the Preliminaries of Peace, concluded at London on the 1st of October 1801, and the terms of the treaty of Amiens (27th of March 1802) were such as to spread through the United Kingdom a feeling of annoyance. In everything which related to the continent of Europe and to the resumption of trade relations between Great Britain and France, Bonaparte had his way; and he abated his demands only in a few questions relating to India and Newfoundland.

The terms of the treaty of Amiens may be thus summarized: Great Britain restored to France the colonial possessions (almost the whole of the French colonial empire) conquered in the late war. Of their many maritime conquests the British retained only the Spanish island of Trinidad and the Dutch settlements in Ceylon. Their other conquests at the expense of these allies of France were restored to them, including the Cape of Good Hope, the Dutch East Indies, and also the recognition of the integrity of the Turkish Empire and promised an indemnity to the House of Orange exiled from the Batavian (Dutch) Republic since 1794. She further agreed to evacuate the papal states, Taranto and other towns in the Mediterranean coasts which she had occupied. The independence of the Ionian Isles (now reconstituted as the Republic of the Seven Islands) was guaranteed. As to Malta, the United Kingdom was to restore it to the order of St John (its possessors previous to 1798) when the Great Powers had guaranteed its independence. It was to receive a Neapolitan garrison for a year, and, if necessary, for a longer time.

No event in the life of Bonaparte was more auspicious than the conclusion of this highly advantageous bargain. By retaining nearly all the continental conquests of France, and by recovering every one of those which the British had made at her expense beyond the seas, he achieved a feat which was far beyond the powers even of Louis XIV. The gratitude of the French for this triumph found expression in a proposal, emanating from the Tribunate, that the First Consul should receive a pledge of the gratitude of the nation. When referred to the senate, the matter underwent secret manipulation, largely through the influence of Cambacérès; but the republican instinct even in the senate was sufficiently strong to thwart the intrigues of the second consul; and that body on the 8th of May merely re-elected Bonaparte for a second term of ten years after the expiration of the first decennial term for which he was chosen. This fell far short of his desires, and he now dexterously referred the whole question to the nation at large. The Council of State, acting on a suggestion made by Cambacérès, now intervened with telling effect. It altered the wording of the senatorial proposal in such a way that the nation was asked to vote on the question: "Is Napoleon Bonaparte to be made Consul for Life?" France responded by an overwhelming affirmative, 3,568,885 votes being cast for the proposal and only 8374 against it.

Napoleon (who now used his Christian name instead of the surname Bonaparte) thereupon sent proposals for various changes in the constitution, which were at once registered by the obsequious Council of State and the Senate on the 4th of August (16 Thermidor) 1802. Besides holding his powers for life, he now gained the right of nominating his successor. He alone could ratify treaties of peace and alliance, and on his nomination fifty-four senators were added to the senate, which thereafter numbered one hundred and twenty members appointed by him alone. This body received the right of deciding by senatus consulto all questions not provided for by the constitution; the Corps Législatif and Tribunate might also thenceforth be dissolved at its bidding. In short, the First Consul now became the irresponsible ruler of France, governing the country through the ministry, the Council of State and the Senate. As for the chambers, based avowedly on universal suffrage, their existence thenceforth was ornamental or sepulchral. The constitutional changes of August 1802, initiated solely by Bonaparte, made France an absolute monarchy, while that of the Empire was not adopted until nearly two years later; but the change then brought about was scarcely more than titular.

In order to understand the utter inability of the old republican party to withstand these changes, it is needful to retrace our steps and consider the skilful use made by Bonaparte of plots and disturbances as they occurred. As was natural, when he sought to steer a clear course between the two elements of reaction, the Jacobins and the Girondins, disturbances were to be expected on both sides of the consular ship of state. The first of these was an unimportant affair, probably nurtured by the agents provocateurs of Fouche's ubiquitous police. It purported to be an undertaking entered into by a few
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Jacobins, among them Aréna, a Corsican, for the murder of Bonaparte, which act caused his dismissal from the legislative body (10th of October 1800); and that was virtually the beginning and the end of the plot. Far more serious was the danger to be apprehended from the royalists. Enraged by Bonaparte’s contemptuous reference to the Directory as a “turn of the screw,” the royalists began to compass the death of the man whom they had at first naïvely looked on as a potent General Monk to their Charles II. These royalists, called the “royalists,” brought to a head plans long talked over by the confidants of the Comte d’Artois (the future Charles X. of France) in London. The outcome of it was the despatch on 4 November of an expert French surgeon to Paris, that gentleman having explored an internal machine close to Bonaparte’s carriage in the narrow streets near the Tuileries (3rd of November 1800). Bonaparte and Josephine escaped unharmed, but several bystanders were killed. The vendetta was ended at a stroke.

On 21st of April 1802 he issued a decree which constituted Piedmont as a military district dependent on France; for various reasons he postponed the final act of incorporation to the 21st of September 1802. The Genoese republic a little earlier undertook to act at his hands changes which made its doge all-powerful in local affairs, but a mere puppet in the hands of Bonaparte. For three years Italy the influence of the First Consul was paramount; for in 1802 he transformed the monarchy of the kingdom of Etruria for the duke of Parma; and, seeing that that promotion added lustre to the fortunes of the duchess of Parma (a Spanish infant), Spain consented lamely enough to the cession of Louisiana to France. The effect of these extraordinary changes, then, was the carrying out of Napoleon’s satrapies in the north and centre of Italy in a way utterly inconsistent with the treaty of Lunéville; and the weakness with which the courts of London and Vienna looked on at these singular events confirmed Bonaparte in the belief that he could do what he would with neither courting states. The policy of the French revolution had been to surround France with free and allied republics. The policy of the First Consul was to transform them into tributaries which copied with chameleonic fidelity the political fashions he himself set at Paris.

Of all these interventions the most justified and beneficial, perhaps, was that which related to the Swiss cantons. Whether his agents did, or did not, pour oil on the flames of civil strife, which he thereupon quenched by his Act of Mediation, 1st of February 1803, is a complex question. The settlement which he, having purchased the claims, made was, in every way excellent, but it was dearly purchased by the complete disappearance of Bonaparte in all important affairs, and by the claim for the services of a considerable contingent of Swiss troops which he thereafter rigorously enforced.

The re-occupation of Switzerland by French troops in October 1802 wrought English opinion to a state of indignation against the autocrat who was making conquests more quickly in time of peace than he had done by his sword; and the irritation increased when, on the 29th of January 1803, he publicly stated: “It is recognized by Europe that Italy and Holland, as well as Switzerland, are provinces of France, and France has said at that time made still more strongly for war. On the 30th of January he caused the official French paper, the Moniteur, to publish in extenso a confidential report sent by Colonel Bastiani describing his so-called commercial mission to the Levant. In it there occurred the threatening phrase: “Six thousand French would at present be enough to conquer Egypt.” An equally significant hint, that the Ionian Isles might easily be regained by France, further helped to open the eyes of the purblind Addington ministry to the resolve of Napoleon to make the Mediterranean a French lake. Ministers were also deeply concerned at the continued occupation of Holland by French troops, which made that country and, therefore, the Cape of Good Hope, absolutely dependent on France. They accordingly resolved not to give up Malta unless Lord Whitworth, the British ambassador at Paris, “received a satisfactory explanation.”
relative to the Sebastiani report. Napoleon's refusal to give this, and his complaint that Great Britain had neglected to comply with some of the provisions of the treaty of Amiens, brought Anglo-French relations to an acute phase. By great dexterity he succeeded in turning public attention almost solely to the fact that Britain had not evacuated Malta. This is probably the new government in which he may interpret his misfortunes in that land. Lord Whitworth at the diplomatic circle on the 13th of March. While not using threats of personal violence, as was generally reported at the time, his language was threatening and offensive. Annoyed by Whitworth's imperturbable demeanour, he ended with these words: "You must respect treaties, then: woe to those who do not respect treaties. They shall answer for it to all Europe." The news of the strengthening of the British army and navy lately announced in the king's speech had perhaps annoyed him; but seeing that his outbursts of passion were nearly always the result of calculation—he once stated, pointing to his chin, that temper only mounted that high with—his design, doubtless, was to set men everywhere talking about the perfidy of Albion. If so, he succeeded. His own violations of the treaties of Lunéville and Amiens were overlooked; and in particular men forgot that the weakening of the Knights of St John by the recent confiscation of their lands in France and Spain, and the protracted delay of Russia and Prussia to guarantee their tenure of power in Malta, furnished England with good reasons for keeping her hold on that island. On the 4th of April the Addington government proposed a new and more compromising view of counsels. In return for the great accession of power to France since the treaty of Amiens (Elba, it may be noted, was annexed in August 1802) Great Britain was to retain Malta for ten years and to acquire the small island of Lampedusa in perpetuity. French troops were also required to withdraw from Holland and Switzerland, as well as the British government sent a secret offer to withdraw from Malta as soon as the French evacuated Holland. To this also Napoleon demurred. The rupture, therefore, took place in the middle of May; and on a flimsy pretext the First Consul ordered the detention in France of all English persons. The reasons for his annoyance are now well known. It is certain that he was preparing to renew the struggle for the mastery of the seas and of the Orient, which must break out if he held to his present resolve to found a great colonial empire. But he needed time in order to build a navy and to prepare for the execution of the schemes for the overthrow of the British power in India, which he had lately outlined to General Decaen, the secretary of war. He hastened during the spring to the same and sailed Decaen's squadron early in March 1803 had alarmed the British ministers and doubtless confirmed their resolve to have the question of peace or war settled speedily. Whitworth also warned them on the 20th of April that "the chief motives for delay are that they (the French) are totally unprepared for a naval war." This was quite correct. Napoleon wished to postpone the rupture for fully eighteen months, as is shown by his secret instructions to Decaen. The British government did not know the whole truth; but, knowing the character of Napoleon, it was easy to guess his secret intentions. The British government knew that the British government was aware of the proposals of the 4th of April in order to test the sincerity of his recent offer of compensation to England. He refused them, mainly, it would seem, because he could not believe that the British consular ministry could be firm; and in his rage at the discovery of his error he revenged himself ignobly on British tourists and traders in France. He now threw all his energies into the task of marshalling the forces of France and his vassal states for the overthrow of "perfidious Albion." Naval preparations went on apace at all the dockyards, and numbers of flat-bottomed boats were built or repaired at the northern harbours. Disregarding the neutrality of the Germanic System, Napoleon sent a strong French corps to overrun Hanover, while he despatched General Gouvion St Cyr to occupy Taranto and other dominating positions in the south-east of the kingdom of Naples. Exactions at the expense of Hanover and Naples helped to lighten the burdens of French finance; Napoleon's sale of Louisiana to the United States early in 1803 for 60,000,000 francs brought further relief to the French treasury; and by pressing hard on his ally, Spain, he compelled her to exchange the armed help which she had given in 1800, for an indemnity of 3,000,000. Through Spain he then threatened Portugal with extinction unless she too paid a heavy subsidy, a demand with which the court of Lisbon was fain to comply.

Thus the first months of the war served to differentiate the two belligerents. England made short work of the French squadrons and colonies, particularly in the West Indies, while Napoleon became more than ever the master of central and southern Europe. The whole course of the war was to emphasize this distinction between the Sea Power and the Land Power; and in this fact lay the success of Napoleon's ascendancy in France and neighbouring lands, as also of his final overthrow.

Napoleon's utter disregard of the neutrality of neighbouring states was soon to be revealed in the course of a royalist plot which helped him to the imperial title. Georges Cadoudal, General Pichegru and other devoted royalists had concocted with the comte d'Artois (afterwards Charles X. of France) in London a scheme for the kidnapping (or more probably the murder) of the First Consul. The French police certainly knew of the plot, allowed the conspirators to come to Paris, arrested or straightened them to the house of the comte d'Artois, to the house of the young duc d'Enghien, to the house of General Moreau, with whom Pichegru had two or three secret conferences. This was much; for Moreau, though indolent and incapable in political affairs, was still immensely popular in the army (always more republican than the civilians) and might conceivably head a republican movement against the autocrat. But far more was to follow. Falling through his police to lure the comte d'Artois to land in Normandy, Napoleon punched on a scion of the House of Bourbon who was within his reach. The young duc d'Enghien was then residing at Ettenheim in Baden near the bank of the Rhine. He had served in the army of his grandfather, the prince of Conde, during the recent war; and Bonaparte believed for a time that he was an accomplice to the Cadoudal-Pichegru plot. He therefore sent orders to have him seized by French soldiers and brought to Vincennes near Paris. The order was skillfully obeyed, and the prince was hurried before a court-martial hastily summoned at that castle. Before they passed the verdict, Napoleon came to see that his victim was innocent of any participation in the plot. Nevertheless he was executed (21st of March 1804). It is noteworthy that though Napoleon at times sought to shift the responsibility for this deed on Talleyrand and on the military, the court adjourned and this so in his will, he frankly avowed his responsibility for it and asserted that in the like circumstances he would do the same again.

The horror aroused by this crime did not long deaden the feeling, at least in official circles, that something must be done to introduce the principle of heredity, as the surest means of counteracting the aims of conspirators. The senate, as usual, took the lead in suggesting some such change in the constitution; and it besought Napoleon to complete his work by rendering it, as his glory, immortal." Other official addresses of the same kind were made to him, but he had a right to return the last speech. He made it clear that the imperial dignity should be hereditary in the family of Bonaparte (3rd of May). Napoleon thereupon invited the senate to "make known to him its thoughts completely." The senate and the tribunate each appointed a commission to deal with the matter, with the result which every one foresaw. Carnot alone in the tribunate protested against the measure. The other councils adopted it almost unanimously. The Senatus Consultum of the 18th of May 1804 awarded to Napoleon the title of emperor, the succession (in case he had no heir) devolving in turn upon the descendants of Joseph and Louis Bonaparte (Lucien and Jerome were for the present excluded from the succession owing to their having contracted marriages displeasing to Napoleon). In a plébiscite taken on the subject of the imperial title and the law of succession, there were
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3,572 affirmative votes and only 2569 negatives. In this vote lay the justification of the acts of the First Consul and the pledge for the greatness of the emperor Napoleon. The republics in nearly every case voted for him: and it is significant of the curious trend of French thought that the new imperial constitution of the 18th of May 1804 opened with the words: "The government of the Republic was transferred to an emperor, who took the title Emperor of the French."

The changes brought about by this constitution were mainly titular. Napoleon's powers as First Consul for Life were so wide as to render much extension both superfluous and impossible: but we have seen that the Senate, at its second session, gained a further accession of authority at the expense of the two legislative bodies; and practically legislation rested with the emperor, who sent his decrees to the senate to be registered as laws. Napoleon's empire was also divided into three sections, dealing with legislation, home affairs and finance—a division which precluded its entire suppression in 1807. More important were the titular changes. Napoleon, as we have seen, did not venture to create an order of nobility until 1808, but he at once established an imperial hierarchy. First came the French princes, namely, the brothers of the emperor; six grand imperial dignities were also instituted, viz. those of the grand elector (Joseph Bonaparte), arch-chancellor of the empire (Cambacérès), arch-chancellor of state (Eugène de Beauharnais), arch-treasurer (Lebrun), grand master of the order of the empire, and grand marshal (Ségur). Next came the marshals, namely, Berthier, Murat, Masséna, Augereau, Lannes, Jourdan, Ney, Soult, Brune, Davout, Bessières, Moncey, Mortier and Bernadotte. Four generals—Kellermann, Lefebre, Marmont and René de Robefroy—held the titles of grand marshals. Next came dignities of a slightly lower rank, such as those of grand almoner (Fesch), grand master of the palace (Duroc), grand chamberlain (Talleyrand), grand master of the horse (Caualier), grand master of the court of admirals (Talleyrand), grand master of the court of cancer (Ségur). These with a host of lesser dignities built up the imperial hierarchy and enabled the court quickly to develop on the lines of the old monarchy, so far as rules of etiquette and self-conscious efforts could reproduce the courtly graces of the ancien régime.

Meanwhile Napoleon was triumphing over the last of the republican generals. Moreau's trial for treason promised to end with an acquittal, but the Bonapartists were determined to win the judges (one of whom he dismissed), with the result that the general was declared guilty of participating in the royalist plot. Thereupon Napoleon, in order to give the new régime a firmer act of regency, had the constable Moreau, it is understood, that he must leave France. He left immediately for the United States. Sentence of death was passed on the royalist conspirators. On Josephine's entreaties, the emperor commuted the sentence for eight of the well-connected among them; Cadoudal and others of lower extraction were executed on the 24th of June. The brave Breton peasant thus summed up the results of his plot: We meant to give France a king and we have given her a consul. Thereupon, since really true, the field were not more effective in consolidating Napoleon's power than were his own comp d'état and the supremely skilful use which he made of conspiracies directed against him. He naturally seduced the enemies's suspicion and succeeded in exploiting the royalist plot of 1803-1804 by reconstituting the ministry of police and bestowing on it upon him. Thenceforth plots were few. Would-be plotters resorted either to the power of his and his intimate friends, or to a conviction that conspiracies redounded to his advantage.

Napoleon was now able by degrees to dispense with all republican forms (the last to go was the Republican Calendar, which ceased on the 1st of January 1806), and the scene at the coronation in Notre Dame on the 2nd of December 1804 was frankly imperial in splendour and in the egotism which led Napoleon to wave aside the pope, Pius VII., at the supreme moment and crown himself. It is worthy of note that Josephine then won a triumph over Joseph Bonaparte and his sisters, who had been intriguing to effect a divorce. Napoleon, though he did not bar the door absolutely against such a proceeding, granted her her heart's desire by secretly going through a religious ceremony on the evening before the coronation. It was performed by Fesch, now a cardinal; but Napoleon could afterwards urge the claim that all the legal formalities had not been complied with; and the motive for the marriage may probably be found in the refusal of the pope to appear at the coronation unless the former civil contract was replaced by the religious rite.

As happened at every stage of Napoleon's advancement, the coup d'état of 1804 enabled him to raise an army, request a new constitution, and to grant the establishment of a new order of merit. The most important of these was the erection of monarchy in North Italy. The Italian republic (formerly the Cisalpine republic) became the kingdom of Italy.

At first Napoleon desired to endow Joseph, or, on his refusal, Louis, with the crown of the new kingdom. They, however, refused to place themselves out of the line of direct succession in France, as Napoleon required, in case they accepted this new dignity. Finally, he resolved to take the title himself. The obsequious authorities at Milan at once furthered his design by sending an address to him, by requesting the establishment of his own crown, and on the 15th of March 1805 by offering the crown to him. On the 26th of May he crowned himself in the cathedral at Milan with the iron crown of the old Lombard kings, amidst surroundings of the utmost splendour. On the 7th of June he issued a decree conferring the dignity of viceroy on Eugène de Beauharnais, his stepson; but everything showed that Napoleon's will was to be law; and the great powers at once saw that Napoleon's promise to keep the crowns of France and Italy separate was meaningless. The matter was of international importance; for by the treaty of Lunéville (February 1801) he had bound himself to respect the independence of the two republics of North Italy, the Cisalpine and the Ligurian. The defiance to Austria was emphasized when, on the 4th of June, he promised a deputation from Genoa that he would grant their request (prompted by his agents) of incorporating the Genoese (or Ligurian) republic in the French empire. In the same month he erected the republic of Lucca into a principality for Bacciochi and his consort, Elisa Bonaparte.

These actions proclaimed so unmistakably Napoleon's intention of making Italy an annexe of France as to convince the great powers that the barrier of Italy was a barrier of no avail. The tsa in, as protector of the German System, had already been so annoyed by the seizure of the duc d'Enghien on German territory, and by other high-handed actions against the Hanse cities, as to recall his ambassador from Paris. Napoleon showed his indifference to the opinion of the tsar by ordering the seizure of the British envoy at Hamburg, Sir George Bumbold (24th of October); but set him free on the remonstrance of the king of Prussia, with whom he then desired to remain on friendly terms. Nevertheless, the general trend of his policy was such as powerfully to help in the formation of the Third Coalition against France—a compact which Pitt (who returned to power in May 1804) had found it very difficult to arrange. Disputes with Russia respecting Malta and the British maritime code kept the two states apart for nearly a year; and Austria was too timid to move. But Napoleon's actions, especially the annexation of Genoa, at last brought the three powers to accord, with the general aim of re-establishing the status quo ante in Germany, Holland, Switzerland and Italy, or, in short, of restoring the balance of power which Napoleon had completely uprooted.

Military affairs in this period are dealt with under NAPOLEONIC CAMPAIGNS. But it is here an alternative was then the bloody days which Napoleon spent at the camp of Boulogne in the second and third weeks of August 1805, uncertain whether to risk all in an attack on England in case Villeneuve should arrive, or to turn the Grand Army against Austria, the only step which he took to avert a continental war was the despatch of General Duroc to Berlin to offer Hanover to Prussia on consideration of her framing a close alliance with France. It was very unlikely that that peace-loving Court would take up arms against its powerful neighbours on behalf of Napoleon, and his proceedings had in the previous months been so recklessly provocative as to arouse doubts whether he intended to invade England and did not welcome the outbreak of a continental war. But in the case of a man so intensely ambitious, determined and egotistic as Napoleon, a decision on this interesting question is hazardous. Little reliance can be placed on his subsequent statements (as, for instance, to Metternich in 1810) that the huge preparations at Boulogne and the long naval campaign of Villeneuve were a mere ruse whereby to lure the Austrians into a premature declaration of war. It is, however, highly probable that he meant to strike at London if naval affairs went well, but that he was forced to abandon his maritime plan by military counterblasts. If so, he succeeded. His habit was, as he said, faire son theme en deux fagon, and he
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now took the second alternative. On or about the 25th-27th of August he resolved to strike at Austria. He did so with masterly skill and swiftness, and the triumphs of Ulm and Austerlitz hid from view the disaster of Trafalgar; and the only official reference to that crushing defeat was couched in these terms: "Storms caused us to lose some ships of the line after a fight imprudently engaged" (speech to the Legislature, 2nd of March 1806).

The glamour of Austerlitz had very naturally dazzled all France. Its results indeed were not only astounding at the time, but were such as to lead up to a new cycle of wars. By the peace of Presburg (26th of December 1805) Napoleon compelled Austria to recognize all the recent changes in Italy, and further to cede Venetia, Istria and Dalmatia to the new kingdom of Italy. The Swabian lands of the Habsburgs went to the South German states (allies of Napoleon), while Bavaria also received Tirol and Vorarlberg. The Electors of Bavaria and Württemberg were recognized as kings.

Nor was this all. Napoleon pressed almost equally hard upon Prussia. That power had been on the point of offering her armed mediation in revenge for his violation of her territory of Anspach; but she was fain to accept the terms which he offered at the sword's point. When modified in February 1806, after Prussia's demobilization, they comprised the occupation of Hanover by Prussia, with the proviso, however, that she should exclude British ships and goods from the whole of the north-west coast of Germany. To this demand (the real commencement of the "Continental System") the Berlin government had to accede, though at the cost of a naval war with England, and the ruin of its maritime trade. Anspach and Bayreuth were also to be handed over to Bavaria, it now being the aim of Napoleon to aggrandize the South German princes who had fought on his side in the late war. In order to strengthen this compact, he arranged a marriage between the daughter of the king of Bavaria and Eugène Beauharnais; and he united the daughter of the Elector of Württemberg in marriage to Jerome Bonaparte, who had now divorced his wife, formerly Miss Paterson of Baltimore, at his brother's behests. Stéphanie de Beauharnais, niece of Josephine, was also betrothed to the son of the duke (now grand duke) of Baden. By these alliances the new Charlemagne seemed to have founded his supremacy in South Germany on sure foundations.

Equally striking was his success in Italy. The Bourbons of Naples had broken their treaty engagements with Napoleon, though in this matter they were perhaps as much sinned against as sinning. After Austerlitz the conqueror fulfilled against them, and sent southwards a strong column which compelled an Anglo-Russian force to sail away and brought about the flight of the Bourbons to Sicily (February 1806). This event opened a new and curious chapter in the history of Europe, that of the fortunes of the *Napoleoni*, i.e., to his Corsican instinct of attachment to the family, and contempt for legal and dynastic claims, he now began to plant his brothers and other relatives in what had been republics established by the French Jacobins. Eugène Beauharnais had been established at Milan. Joseph Bonaparte was now advised to take the throne of Naples, and without any undue haggling as to terms, for "those who will not rise with me shall no longer be of my family. I am making a family of kings attached to my federative system." At the end of March 1806 Joseph became king of the Two Sicilies. A little later the emperor bestowed the two papal enclaves of Benevento and Ponte-Corvo on Talleyrand and Bernadotte respectively, an act which emphasized the hostility which had been growing between Napoleon and the papacy. Because Pius VII. declined to exclude British goods from the Papal States, Napoleon threatened to reduce the pope to the level merely of bishop of Rome. He occupied Ancona and seemed about to annex the Papal States outright. That doom was postponed; but Catholics everywhere saw with pain the harsh treatment accorded to a defenceless old man. The prestige which the First Consul had gained by the Concordat was now lost by the overweening emperor.

But it was on the banks of the Rhine that the Napoleonic system received its most signal developments. The duchy of Berg, along with the eastern part of Cléves and other annexes, now went to Murat, brother-in-law of Napoleon (March 1806); and that melodramatic soldier at once began to round off his eastern boundary in a way highly offensive to Prussia. She was equally concerned by Napoleon's behaviour in the Dutch Netherlands, where her influence used to be supreme. On the 5th of June 1806 the Batavian republic completed its chrysalis-like transformation into a kingdom, with Louis Bonaparte as king. "Never cease to be a Frenchman" was the pregnant advice which he gave to his younger brother in announcing the new dignity to him. In that sentence lay the secret of all the disagreements between the two brothers. Louis resolved to govern for the good of his subjects. Napoleon determined that he, like all the Bonapartist rulers, should act merely as a Napoleonic satrap. They were to be to him what the counts of the marches were to Charlemagne, warlike feudatories defending the empire or overawing its prospective foes.

For Russia served to show the extent of his ambition. She was to be conquered. On the 17th of July Napoleon signed at Paris a decree that reduced to subservience the Germanic System, the chaotic weakness of which he had in 1797 foreseen to be highly favourable to France. He now grouped together the princes of south and central Germany in the Confederation of the Rhine, of which he was the protector and practically the ruler in all important affairs. The logical outcome of this proceeding appeared on the 1st of August, when Napoleon declared that he no longer recognized the existence of the Holy Roman Empire. The head of that venerable organism, the emperor Francis II., bowed to the inevitable and announced that he thenceforth confined himself to his functions as Francis I., hereditary emperor of Austria, a title which he had taken just two years previously. This tame acquiescence of the House of Habsburg in the reorganization of Germany seemed to set the seal on Napoleon's work. He controlled all the lands from the Elbe to the Pyrenees, and had Spain and Italy at his beck and call. Power such as this was never wielded by his prototype, Charlemagne.

But now came a series of events which transcended all that the mind of man had conceived. As the summer of 1806 wore on, his policy perceptibly hardened. Negotiations with England and all the efforts of Austria to extricate itself from the Napoleonic System, which had been induced to take part in the war by the emperor Francis II., had come to nothing. His secret offer to the British Hanover (that gilded hook by which he caught her eagles in the year) was now resolved to avenger was the last of several insults. Napoleon was surprised by the news of Prussia's mobilization; he had come to regard her as a negligible quantity, and now he found that her unexpected sensitiveness on points of honour was about to revive the Third Coalition against France.

The war which broke out early in October 1806 (sometimes known as the war of the Fourth Coalition) ran a course curiously like that of 1805 in its main outlines. For Austria we may read Prussia; for Ulm, Jena-Auerstädt; for the occupation of Vienna, the Battle of Trafalgar; for Ligny, Friedland, which again was disposed of the belated succour given by Russia. The parallel extends even to the secret negotiations; for, if Austria could have been induced in May 1807 to send an army against Napoleon's communications, his position would have been fully as dangerous as before Austerlitz if Prussia had taken a similar step. Once more he triumphed owing to the timidity of the central power which had the game in its hands; and the folly which marked the Russian tactics at Friedland (14th of June 1807), as at Austerlitz, enabled him to close the campaign in a blaze of glory and shiver the coalition in pieces.
Now came an opportunity far greater than that which occurred after Austerlitz. The Peace of Presburg was merely continental. That of Tilsit was of world-wide importance. But before referring to its terms we must note an event which indicated the lines on which Napoleon's policy would advance. After occupying the Prussian capital he launched against England the famous Berlin Decree (12th of November 1806), declaring her coasts to be in a state of blockade, and prohibiting all commerce with them. No ship coming thence was to be admitted into French or allied harbours; ships transgressing the decree were to be good prize of war; and British subjects were liable to imprisonment if found in French or allied territories. This decree is often called the basis of the Continental System, whereby Napoleon proposed to ruin England by ruining her commerce. But even before Trafalgar he had begun to strike at that most vulnerable form of wealth, as the Jacobins had done before him. Nelson's crowning triumph rendered impossible for the present all other means of attack on those elusive foes; and Napoleon's sense of the importance of that battle may be gauged, not by his public utterances on the subject, but by his persistence in forcing Prussia to close Hanover and the whole coastline of north-west Germany against British goods. That proceeding, in February 1806, constitutes the basis of the Continental System. The Berlin Decree gave it a wide extension. By the mighty blow of Friedland and the astonishing diplomatic triumph of Tilsit, the conqueror hoped speedily to overwhelm the islanders; but from the mass of the world's opposition Napoleon at Tilsit resembles Polyphemus seeking to destroy Ulysses. The crags which he flung at Britannia did indeed graze the stern and graze the prow of her craft.

The triumph won at Friedland marks in several respects the climax of Napoleon's career. The opportunity was unique; and he now put forth his utmost endeavours to win over to his side the conquered but still formidable tsar. In their first interview, held on a raft in the middle of the river Niemen at Tilsit on the 25th of June, the French emperor, by his mingled strength and suppleness of intellect, gained an easy mastery over the impressionable young potentate. Partly from fear of a national Polish rising which Napoleon held in reserve as a last means of coercion, and partly from a subtle resolve to use the French alliance as a means of securing rich domains at the expense of Turkey, Prussia, Sweden and England, Alexander decided to throw over his allies, Prussia and England, and to seize the spoils to which the conqueror pointed as the natural sequel of a Franco-Russian alliance. Napoleon, therefore, had Prussia completely at his mercy; and his conditions to that power bore witness to the fact. The prayers of Queen Louisa of Prussia failed to prevent the Russian monarch rescinding his former tariff request for Magdeburg. At a later time he reproached himself for not having dethroned the Hohenzollerns outright; but it is now known that Alexander would have forbidden this step, and that he dissuaded Napoleon from withdrawing Silesia from the control of the House of Hohenzollern. Even so, Prussia was bereft of half of her territories; those west of the river Elbe went to swell the dominions of Napoleon's vassals or to form the new kingdom of Westphalia for Jerome Bonaparte; while the spoils which the House of Hohenzollern had won from Poland in the second and third partitions were now to form the duchy of Warsaw ruled over by Napoleon's ally, the elector (now king) of Saxony. Danzig became nominally a free city, but was to be occupied by a French garrison until the peace. The tsar, after acquiring a frontier district from Prussia, recognized the changes brought about by Napoleon in Germany and Italy, and agreed by a secret article that the Cattaro district on the east coast of the Adriatic should go to France. Equally important was the secret treaty of alliance between France and Russia signed on that same day. By it Napoleon brought the tsar to agree to make war on England in case that power did not accept the tsar's mediations. England was now in the Russian ally's, the elector's, and Napoleon's, the great man of the hour's, power; and other changes placed in high standing men who were remarkable for docility rather than originality and power. Napoleon also suppressed the Tribunate; and in the year 1808 instituted an order of nobility. During the course of a tour in Italy in December 1807 he gave a sharp turn to that world-compelling screw, the Continental System. By the Milan Decree of the 17th of December 1807, he ordained that every ship which submitted to the right of search now claimed by Great Britain would be considered a lawful prize. The imperious terms in which this decree was couched and its misleading title of antipathy against India had recently occupied his thoughts. Napoleon may have believed in the imminent collapse of his sole remaining enemy. This was natural. Britain, it was true, acting on the initiative of George Canning, had seized the Danish fleet, thus forestalling
an action which Napoleon certainly contemplated; but on the other hand Denmark now allied herself with him; and while in Lombardy he heard of the triumphant entry of his troops into Lisbon—an event which seemed to prelude his domination in the Iberian Peninsula and thereafter in the Mediterranean.

The occupation of Lisbon, which led on to Napoleon's intervention in Spanish affairs, resulted naturally from the treaty of Tilsit. The coercion of England's oldest ally had long been one of Napoleon's most cherished aims, and was expressly provided for in that compact. To this scheme he turned with a zeal whetted by consciousness of his failure respecting the Danish fleet. On the 27th of October 1807 he signed with a Spanish envoy, his brother-in-law Godoy, a secret convention for the partition of Portugal between France and Spain. Another convention of the same date allowed him to send 28,000 French troops into Spain for the occupation of Portugal, an enterprise in which a large Spanish force was to help them; 40,000 French troops were to be cantonned at Bayonne to support the first corps. Seeing that Godoy, the all-powerful minister at Madrid, had given mortal offence to Napoleon early in the Prussian campaign of 1806 by calling on Spain to arm on behalf of her independence, it passes belief how he could have placed his country at the mercy of Napoleon at the very moment of his defeat. The emperor, however, successfully gilded the hook by awarding Algarve, the southern province of Portugal, to Godoy. The north of Portugal was to go to the widow of the king of Etruria (a Spanish Infanta); her realm now passing into the hands of Napoleon. Thus Portugal in 1807, like Venice in 1797, was to provide the means for wideely extending the operations of his statecraft.

The natural result followed. Portugal was easily overrun by the allies; but Junot's utmost efforts failed to secure the Portuguese fleet, which, under the protection of a British squadron, sailed away to Brazil with the royal family, the Spanish ministers and chief grandees of the realm. In other respects all went well. The French reinforcements which entered Spain managed to secure some of the strongholds of the northern provinces; and the disgraceful feuds in the royal family left the country practically at the emperor's mercy.

The situation was such as to tempt Napoleon on to an undertaking on which he had probably set his heart in the autumn of 1806, that of dethroning the Spanish Bourbons and of replacing them by a Bonaparte. Looking at the surface of the life of Spain, he might well believe in its decay. At the death of Charles IV., the throne devolved on his son Ferdinand, a man of weak character; and thereupon the antagonism to the interests of Spain and the Indies was likely to bring about an event which might disinherit Charles's brother, José, who was titular king of Portugal at this time. Napoleon, already a year or more engaged in the partition of Spain, might now make a bold dash for Portugal.

The emperor would clear up the situation. The same prospect was held out to Charles IV.; the queen and Godoy, with the threat that the rivals for the throne proceeded to the north of Spain to meet the arbiter of their destinies. Napoleon journeyed to Bayonne and remained there. The claimants, each not knowing of the movements of the other, crossed the Pyrenees, and Ferdinand on his arrival at Bayonne found himself to be virtually a prisoner in the hands of the emperor. Napoleon had little difficulty in disposing of the father, whose rage against his son blunted his senses in every other direction. As for Ferdinand, the emperor, on hearing the news of a rising in Madrid on the 2nd of May, overwhelmed him with threats, until he resigned his crown to his son, who had already bargained it away to Napoleon in return for a pension (5th of May 1808). Princely abodes in France and annuities (the latter to be paid by Spain)—such was the price at which Napoleon bought the crown of Spain and the Indies. Naturally nothing more was heard of the partition of Portugal. According to outward appearance nothing was wanting to complete the emperor's triumph. He is said to have remarked with an oath after Jena that he would make the Spanish Bourbons pay for their recent bellicose proclamation. If the story is correct, his acts at Bayonne and Madrid show that he might well have pursued on his schemes regardless of everything in order to take an overwhelming revenge. That the sense of a Corsican notary should have been able to dispose of the Spanish Bourbons in this contemptuously easy way is one of the marvels of history.

But even in this crowning triumph the crumbling egoism of his nature—a mental vice which now grew on him rapidly—fatally narrowed his outlook and led him to commit an irretrievable blunder. In his contempt for the rulers of Spain he forgot the Spanish people. In all the genuine letters of the spring of 1808—that of March 20th to Murat, no. 13,666 of the French archives—there is not one that he regarded the Spaniards as of any account. On the 27th of March he offered the crown of Spain to his brother Louis, king of Holland, in these terms: "The climate of Holland does not suit you; besides Holland can never rise from its ruins. I think of you for the throne of Spain. You will be the sovereign of a generous nation of eleven millions of men and of important colonies." On Louis declining the honour, it devolved on Joseph, king of Naples, who vacated that throne for the benefit of Murat—a source of disappointment and annoyance to both. The emperor pressed on his schemes regardless of everything. The first signs of the rising ferment in Spain were wasted on him. He believed that the arrival of so benevolent a king as Joseph, and the promulgation of a number of useful reforms based on those of the French Revolution, would soothe any passing irritation. If not, then his troops could deal with it as Murat had dealt with the men of Madrid on the 2nd of May. He, therefore, pressed on the march of a corps of French and Swiss troops under Dupont towards Cadiz, in order to take possession of the French sail of the line, five in number, which had been in that harbour since Trafalgar. The importance which he was assigned to naval affairs appears in many letters of the months May to June 1808. He intended that Spain should very soon have ready twenty-eight sail of the line—"ce qui est certes bien peu de chose"—so as to drive away the British squadrons, and then he would strike "de grands coups" in the autumn. Evidently then the Spanish dockyards and warships (when vigorously organized) were to count for much in the schemes for assuring complete supremacy in the Mediterranean and the ultimate overthrow of the British and Turkish empires, which he then had closely at heart.

The Spanish rising of May—June 1808 ruined these plans irretrievably. The men of Cadiz compelled the French warships to surrender, and the levies of Andalusia, closing around Dupont, compelled him and some 23,000 men to lay down their arms at Baylen (23rd of July). This disaster, the most serious suffered by the French since Rossbach, sent a thrill through the Napoleonic vassal states and aroused in Napoleon transports of anger against Dupont. "Everything is connected with this event,"
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he wrote on the 2nd of August: "Germany, Poland, Italy." Indeed, along with other serious checks in Spain, which involved the conquest of that land, it cut through the wide meshes of his policy both in Levantine, Central European and commercial affairs. The partition of Turkey had to be postponed; the financial collapse of England could not be expected now that she framed an alliance with the Spanish patriots and had their markets and those of their colonies opened to her; and the discussions with the tsar Alexander, which had not gone quite smoothly, now took a decidedly unfavourable turn. The tsar saw his chance of improving on the terms arranged at Tilsit; and obviously Napoleon could not begin the conquest of Spain until he felt sure of the conduct of his fortress of the Oder. At the latter place was the prospect of Sir Arthur Wellesley with a British force landed in Portugal, gained the battle of Vimeiro (21st of August), and brought the French commander, Junot, by the so-called convention of Cintra, to agree to the evacuation of the country by all the French troops. The sea power thus gained what had all along been wanting, a sure basis for the exercise of its force against the land power, Napoleon. Still more important, perhaps, was the change in moral which the Spanish rising brought about. Napoleon's perfidy at Bayonne was so flagrant as to strip him the mask of a champion of popular liberty which had previously been worth the world Emperor of all the world as an unscrupulous aggressor; moral force, previously marshallled on the side of France, now began to pass to the side of his opponents. The value of that unseen ally he well knew; "Once again, let me tell you," he wrote to General Clarke on the 10th of October 1809, "in war moral and opinion are more than half of the reality."

Such were the discouraging conditions which weighed him down at the time of the interview with the tsar at Erfurt (September 27th-October 12th, 1809). That event was so important as to require some preliminary explanation of some circumstances among the two emperors that had been exchanging their views as to the future of the world. Stated briefly they were these. Napoleon desired to press on the partition of Prussia, Alexander that of Turkey. The tsar, however, was determined to save Prussia if he could; and Napoleon after the first disasters in Spain saw it to be impossible to uproot the Hohenzollerns; while it was clearly in his interest to postpone the partition of Turkey until he had conquered Spain and Sicily. Austria meanwhile had begun to arm as a precautionary measure; and Napoleon, shortly after his return from Bayonne to Paris, publicly declared vain, if her ministers went on, he would wage against her a war of extermination. The threat naturally did not tend to reassure statesmen at Vienna; and the tsar now resolved to prevent the total wreck of the European system by screening the House of Habsburg from the wrath of his ally. For the present Napoleon's ire fell upon Prussia. A letter written by the Prussian statesman, Baron vom Steim, had fallen into the hands of the French and revealed to the emperor the ferment produced in Germany by news of the French reverses in Spain. In that letter Stein urged the need of a national rising of the Germans similar to that of the Spaniards, whom the inevitable struggle ensued between Napoleon and Austria. The revenge of the autocrat was characteristic. Besides driving Stein from office, he compelled Prussia to sign a convention (8th of September) for the payment to France of a sum of 140,000,000 francs, and for the limitation of the Prussian army to 42,000 men.

Apart from this advantage, placed in his hands by the imprudence of Stein, Napoleon was heavily handicapped at the Erfurt interview. In vain did he seek to dazzle the tsar by assembling about him the vassal kings and princes of Germany; in vain did he overawe all intellectual gifts which he had captivated the tsar at Tilsit; in vain did he conjure up visions of the future conquest of the Orient; external display, diplomatic finesse, varied by one or two outbursts of calculated violence—all was useless. The situation now was utterly different from that which obtained at Tilsit. Alexander had succeeded in pacifying Finland, and his troops held the Danubian provinces of Turkey—a pledge, as it seemed, for the future conquest of Constantinople. Napoleon, on the other hand, had utterly failed in his Spanish enterprise; and the tsar felt sure that his rival must soon withdraw French garrisons from the fortresses of the Oder to the frontier of Spain. These facts, and not, as has often been assumed, the treachery of Talleyrand, decided Alexander to assume at Erfurt an attitude of jealous reserve. He refused to join Napoleon in any proposal for the coercion of Austria or the limitation of her armaments. Finally he agreed to join his ally if he (Napoleon) were attacked by the Habsburg power. Napoleon on his side succeeded in adjourning the question of the partition of Turkey; but he awarded the Danubian provinces and Finland to his ally and agreed to withdraw the French garrisons from the fortresses of the Oder as soon as the war with Spain was concluded. Both of these nationalities opened an appeal to George III. to accord peace to the world on the basis of uti possidetis. Canning asssented, provided that envoy of all the states and peoples concerned took part in the negotiations. Whereupon a reply came from Paris (28th of November) that the French emperor refused to admit the envos of "the king who reigns in Brazil, the king who reigns in Sicily or the king who reigns in Sweden." The "Spanish insurgents" were equally placed out of court. Clearly, then, Napoleon's desire for peace was conditional on his being allowed to dictate terms to the rulers and peoples concerned.

Already he had shown that the sword must decide affairs in Spain. After spending a short time in Paris in order to supervise the transfer of his forces from Germany to the Pyrenees, he journeyed swiftly southwards, burst upon the Spaniards, and on the 3rd of December received the surrender of Madrid. There, on the 14th of December, he issued a decree (omitted from the official Correspondence) declaring le nommé Stein an enemy of France and confiscating his property in the lands allied to France. The great statesman barely succeeded in escaping to Austria, a land in which his hopes of German power were to be encouraged by the sympathy of all patriotic Germans and the newly found energy of its own subjects, the House of Habsburg now began to prepare for war. Napoleon was then in the midst of operations against Sir John Moore, whose masterly march on Sahagun (near Valladolid) had thwarted the emperor's plans for a general "drive" to Lisbon. Hoping to punish Moore for his boldness, Napoleon struck quickly north at Astorga, but found that he was too late to catch his foe. At that town he also heard news of the 1st of January 1809, which portended trouble in Germany and perhaps also at Paris. Austria was continuing to arm and the emperor perceived that the diplomatic failure at Erfurt was now about to entail on him another and more serious struggle. His anxiety was increased by news of sinister import respecting frequent interviews between those former rivals, Talleyrand and Fouché, in which Murat was said to be concerned. Handing over the command to Soult, he hurried back to Paris to trample on the seeds of sedition and to overwhelm Austria by the blows which he showered upon her in the valley of the Danube. Sir John Moore and the statesmen of Austria—the heroic Stadion at their head—failed in their enterprise; but at least they frustrated the determined effort of Napoleon to stamp out the national movement in the Iberian Peninsula. Thereafter he never entered Spain; and the French operations suffered incalculably from the want of one able commander-in-chief.

In the Danubian campaign of 1809 he succeeded; but the stubborn defence of Austria, the heroic efforts of the Tiroleses and the spasmodic efforts which forebode a national rising in Germany, showed that the whole aspect of affairs was changing; even in central Europe, where rulers and peoples had hitherto been as wax under the impress of his will. The peoples, formerly so apathetic, were now the centre of resistance, and their efforts failed owing to the timidity or sluggishness of governments and the incompetence of some of their military leaders. The failure of the archduke John to arrive in time at Wagram (5th of July), the lack of support accorded by the Spaniards to Wellesley before and after the battle of Talavera (28th of July), and the slowness with which the British government sent forth its great armada against Flushing and Antwerp, a fortnight after
Austria sued for an armistice from Napoleon, enabled that superb organizer to emerge victorious from a most precarious situation. The hatred felt for him by Germans found expression in a daring attempt to murder him made by a well-bred youth named Staps on the 12th of October.

Two days later Napoleon, by means of unworthy artifices, hurried the Austrian plenipotentiaries into signing the treaty of peace at Schönbrunn. The House of Habsburg now ceded Salzburg and the Inn-Viertel to Napoleon (for his ally, the king of Bavaria); a great portion of the spoils which Austria had torn from Poland in 1795 went to the grand duchy of Warsaw, or Russia; and the cession of her provinces Carnithia, Carniola and Istria to the French empire cut her off from all access to the sea. After imposing these harsh terms on his enemy, the conqueror might naturally have shown clemency to the Tirolean leader, Andreas Hofer; but that brave mountaineer, when betrayed by a friend, was sentenced to death at Munich in order to the arrival of a special message to that effect from Napoleon.

In other quarters he achieved for the present a signal success. It was his habit to issue important decrees from the capitals of his enemies; and on the 17th of May 1809 he signed at Vienna an edict abolishing the temporal power of the pope and annexing the Papal States, which the French troops had occupied early in the previous year. On the 6th of July 1809 Fius VII. was arrested at Rome for presuming to excommunicate the successor of Charlemagne, and was deported to Grenoble and later on to Savona. The same year witnessed the downfall of Napoleon's puppetland, are now known to have been insincere. Fouche, for meddling in the negotiations through an agent of his own, was promptly disgraced; and, when neither England was moved by diplomatic cajolery nor Louis Bonaparte by threats, French troops were sent against the Dutch capital. Louis fled from his kingdom, and on the 9th of July 1810 Holland became part of the French empire. In the next months Napoleon promulgated a series of decrees for effecting the ruin of British commerce, and in December 1810 he decreed the annexation of the north-west coast of Germany, as also of Canton Valais, to the French empire. This was followed by the evacuation of Brest, the cession of Istria and Carinthia to the Habsburgs; while another arm (only nominally severed from the empire by the Napoleonic kingdom of Italy) extended down the eastern shore of the Adriatic to Ragusa and Cattaro, threatening the Turkish empire with schemes of partition always imminent but never achieved.

It is time now to notice two important events in the life of the emperor, namely his divorce of Josephine and his union with Marie Louise of Austria. The former of these had long been foreseen. The Bonapartes had intrigued for it with their usual persistence; and Napoleon was careful never to make it impossible. His triumph over Austria in 1809, and especially the attempt of Staps to murder him, clinched his determination to found a dynasty in his own direct line. From Josephine he could not expect to have an heir. Accordingly, on his return to Paris he caused the news to be broken to her that reasons of state of the most urgent kind compelled him to divorce her. An affecting scene took place between them on the 30th of November 1809; but Napoleon, though moved by her distress, remained firm; and though the clergies made a difficulty about dissolving the religious marriage of the 1st of December 1804, the formalities of which were complete save that the parish priest was absent, yet the emperor instituted a chancery for the archbishop of Paris, with the result that that body pronounced the divorce (January 1810). Josephine retired to her private abode, Malmaison, where her patience and serenity won the admiration of all who saw her.

Meanwhile the deliberations respecting the choice of her successor had already begun. Opinions were divided in the emperor's circle between a Russian and an Austrian princess; but the marked coolness with which overtures for the hand of the tsar's sister were received at St Petersburg, and the skill with which Count Metternich, the Austrian chancellor, let it be known that a union with the archduchess, Marie Louise, would be welcomed at Schönbrunn, helped to decide the matter. The reasons why the emperor Francis acquiesced in the marriage alliance are well known. Only so could his empire survive. A marriage between Napoleon and a Russian princess would have implied the permanent subjection of Austria. By the proposed step he would weaken the Franco-Russian alliance. But why did Napoleon fix his choice on Vienna rather than St Petersburg? Mainly, it would seem, because he desired hurriedly to screen the marriage, which now might be expected, under the appearance of a voluntary choice of an Austrian archduchess. Further, an alliance with the House of Habsburg might be expected to weaken the Germans from all thought of gaining succour from that quarter. The wedding was celebrated first at Vienna by proxy, and at Notre Dame by the emperor in person on the 2nd of April. Though based on merely political grounds, the union was for the time a happy one. He advised his courtiers to marry Germans—"they are the best wives in the world, good, naive and fresh as roses." Metternich, on visiting Campagne and Paris, found the emperor thoroughly devoted to his bride. Napoleon told him that he was now beginning to live, that he had always longed for a home and now at last had one. Metternich thereupon wrote to his master: "He (Napoleon) has possibly more weaknesses than many other men, and if the empress continues to play upon them, as she begins to realize the possibility of doing, she can render the greatest services to herself and all Europe." The surmise was too hopeful. Napoleon, though he never again worked as he had done, soon freed himself from complete dependence on Marie Louise; and he never allowed it to intrude into political affairs, for which, indeed, she had not the least aptitude. His real concern for her was evidently before the birth of their son, the king of Rome, when he gave orders that if the life of both mother and child could not be saved, that of the mother should be saved if possible (20th of March 1811). This event seemed to place Napoleon's fortunes on a sure basis; but already they were being undermined by events. The marriage negotiations of 1809-1810 had somewhat offended the emperor Alexander; his resentment increased when, at the close of 1810, Napoleon dethroned the duke of Oldenburg, brother-in-law of the tsar; and the breach in the Franco-Russian alliance was repaired when the French emperor was promised the Russian penance to the duke or to give to the Russian government an assurance that the kingdom of Poland would never be reconstituted. The addition of large territories to the grand duchy of Warsaw after the war of 1809 aroused the fears of the tsar respecting the Poles; and he regarded all Napoleon's actions as inspired by hostility to Russia. He, therefore, despite Napoleon's repeated demands, refused to subject his empire to the hardships imposed by the Continental System; at the close of the year 1810 he virtually allowed the entry of colonial goods (all of which were really British borne) and little by little broke away from Napoleon's system. These actions implied war between France and Russia, unless Napoleon allowed such modifications of his rules (e.g. under the license system) as would
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avert ruin from the trade and finance of Russia; and this he refused to do.

The campaign of 1812 may, therefore, be considered as resulting, firstly, from the complex and cramping effects of the Continental System on a northern land which could not deprive itself of colonial goods; secondly, from Napoleon's refusal to mitigate the anxiety of Alexander on the Polish question; and thirdly, from the annoyance felt by the tsar at the family matters noticed above. Napoleon undoubtedly entered on the struggle with reluctance. He spoke about it as one that lay in the course of destiny. In one sense he was right. If the Continental System, which was the inevitable war with Russia was inevitable. But that struggle may more reasonably be ascribed to the rigidity with which he carried out his commercial decrees and his diplomacy. He often prided himself on his absolute consistency, and we have Chaptal's warrant for the statement that, after the time of the Consulate, his habit of following his own opinions and rejecting all advice, even when he had asked for it, became more and more pronounced. It was so now. He took no heed of the warnings uttered by those wise counsellors, Cambrézec and Talleyrand, against an invasion of Russia, while "the tsar's fury" was supporting the strength of the empire at the other extremity. He encased himself in fatalism, with the result that in two years the mightiest empire reared by man broke under the twofold strain. His diplomacy before the war of 1812 was less successful than that of Alexander, who skilfully ended his quarrel with Turkey and gained over to his side Sweden. That state, where Bernadotte had latterly been chosen as crown prince, decided to throw off the yoke of the Continental System and join England and Russia, gaining from the latter power the promise of Norway at the expense of Denmark.

Napoleon on his side coerced Prussia into an offensive alliance and had the support of Austria and the states of the Rhenish Confederation. At Dresden he held court for a few days in May 1812 with Marie Louise: the emperor Francis, the king of Prussia and a host of lesser dignitaries were present—a sign of the power of the modern Charlemagne. It was the last time that he figured as master of the continent.

The military events of the years 1812-1814 are described under NAPOLEONIC CAMPAIGNS; and we need therefore note here only a few details personal to Napoleon or some considerations which influenced his policy. Firstly we may remark that the Austrian alliance and had the support of Austria and the states of the Rhenish Confederation. At Dresden he held court for a few days in May 1812 with Marie Louise: the emperor Francis, the king of Prussia and a host of lesser dignitaries were present—a sign of the power of the modern Charlemagne. It was the last time that he figured as master of the continent.

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considered as a definitive treaty, and on the 2nd of April gave
instructions that the one of the refractory cardinals should be
carried off nightly by night from Fontainebleau, while the pontiff
was to be guarded more closely than before. On these facts
becoming known, a feeling of pity for the pope became wide-
spread; and the opinion of the Roman Catholic world gradually
turned against the emperor while he was fighting to preserve
his supremacy in Germany. "I am following the course of
events: I have always marched with them." Such were his
words uttered shortly before his departure from Paris (15th of
April). They proved that he misread events and misunderstood
his own position.

So far Napoleon's ensuing campaigns was to reveal the harden-
ing of his mental powers. Early in April he sought to gain the
help of 100,000 Austrian troops by holding out to Francis of
Austria the prospect of acquiring Silesia from Prussia. The offer
met with no response, Austria having received from the allies
vaguely alluring offers that she might arrange matters as she
desired in Italy and South Germany. Napoleon began to suspect
his father-in-law, and still more the Austrian chancellor,
Metternich; but instead of humouring them, he resolved to
stand firm. The Austrian demands, first presented to him on the
16th, were the addition of the Confederation of the Rhine
(1), the evacuation of Paris (2), and the cession of France from the
lands of north-west Germany annexed in 1810 and (3) the cession to Austria of the Illyrian provinces
wrested from her in 1809. Other terms were held in reserve to
be pressed if occasion admitted; but these were all that were
put forward at the moment. On this basis Austria was ready to
offer her armed mediation to the combatants. Napoleon would
not hear of the terms. "I will not have your armed mediation.
You are only confusing the whole question. You say you cannot
act for me; you are strong, then, only against me." This out-
burst of temper was a grave blunder. His threats alarmed the
Austrian court. At bottom the emperor Francis, perhaps also
Metternich, wanted peace, but on terms which the exhaustion
of the combatants would enable them to dictate. Yet during the
armistice which ensued (June 4th–July 20th; afterwards pro-
longed to August 10th) Napoleon did nothing to soothe the
Viennese government, and that, too, despite the encouragement
which the allies received from the news of Wellington's victory
at Vittoria and the entry of Bernadotte with a Swedish con-
tingent on the scene. Austria now proposed the terms named above, and, as Napoleon showed that the Confederation of the
Rhine must be dissolved, and that Prussia should be placed in a position
as good as that which she held in 1805, that is, before the
campaign of Jena. On the 27th of June she promised to join
the allies in case Napoleon should not accept these terms.

He was now at the crisis of his career. Events had shown
that, even after losing half a million of men in Russia, he was
a match for her and Prussia combined. Would he now accept
the Austrian terms and gain a not disadvantageous peace, for
which France was yearning? These terms, it should be noted,
would have kept Napoleon's empire intact except in Illyria;
while the peace would have enabled him to reorganize his army
and recover a host of French prisoners from Russia. His
signing of the armistice seemed to promise as much. To give
his enemies a breathing space when they were hard pressed was an
insane proceeding unless he meant to make peace. But there is
nothing in his words or actions at this time to show that he
desired peace except on terms which were clearly antipathetic.
His letters breathe the deepest resentment against Austria, and
show that he burned to chastise her for her "perfidy as a
betrayed friend". His enemy was reorganized. His actions at this time
have been ascribed to righteous indignation against Metternich's
double-dealing; and in a long interview at the Marcolini palace
at Dresden on the 26th of June he asked the chancellor point
blank how much money England had given him for his present
conduct. As for himself he cared little for the life of a million of
men. He had married the daughter of the emperor: it was a
mistake, but he would bury the world under the ruins. Talk in this Ossian-like vein showed that Napoleon's brain no
longer worked clearly; it was a victim to his egotism and passion.
July and the first decade of August came and went, but brought
no sign of pacification. The emperor's last efforts were directed to
influence his son-in-law through Marie Louise. It was in vain.
Nothing could bend that cast iron will. Nothing remained but
to break it. On the expiration of the armistice at midnight of
August 10th-11th Austria declared war.

After the disastrous defeat of Leipzig (17th–19th October
1813), when French domination in Germany and Italy vanished
like an exhalation, the allies gave Napoleon another opportunity
to come to terms. The overtures known as the Frankfort terms
were ostensibly an answer to the request for information which
was conveyed by Maret to Napoleon (20th of March) that, having
attained the tsar and the king of Prussia to make a declaration that the
allies would leave to Napoleon the "natural boundaries" of
France—the Rhine, Alps, Pyrenees and Ocean. The main object
of the Austrian chancellor probably was to let Napoleon once
more show to the world his perversity obstinacy. If this was his
aim, he succeeded. Napoleon on his return to St Cloud inveighed
against his ministers for talking so much about peace and declared
that he would never give up Holland; France must remain
a great empire, and not sink to the level of a mere kingdom. He
the discussion at the Congress of Frankfort by a blunder.
It would be a grave blunder that, having
the dykes and give back that land to the sea. Accordingly on the
16th of November he sent a vague and unsatisfactory reply to the
allies; and though Caulaincourt (who now replaced Maret as foreign minister) was on the 2nd of December charged
to give a general assent to their terms, yet that assent came
too late. The allies had now withdrawn their offer. Napoleon
certainly believed that the offer was insincere. Perhaps he was
right; but even in that case he should surely have accepted
the offer so as to expose their insincerity. As it was, they were
able to contrast their moderation with his wrongheadedness,
and thereby seek to separate his cause from that of France.
In this they only partially succeeded. Murat now joined the
allies; Germany, Switzerland and Holland were lost to Napoleon;
but when the allies began to invade Alsace and Lorraine, they
found the French staunch in his support. He was still the
peasants' emperor. The feelings of the year 1792 began to revive.
Never did Napoleon and France appear more united than in
the campaign of 1814.

Nevertheless it led to his abdication. Once more the allies
consented to discuss the terms of a general pacification; but at
the Congress of Frankfort (2nd of March) Murat's declaration
(19th of March) had no result except to bring to light a proof
of Napoleon's insincerity. Thereupon the allies resolved to have
no more dealings with him. As his chances of success became
more and more desperate, he ventured on a step whereby he
hoped to work potently on the pacific desires of the emperor
Francis. Leaving Paris for the time to its own resources, he
struck eastwards in the hope of terrifying that potentate and of
detaching him from the coalition. The move not only failed, but it had the fatal effect of uncovering Paris to the northern
forces of the allies. The surrender of the capital, where he had
centralized all the governing powers, was a grave disaster. Equally fatal was the blow struck at him by the senate, his own
favoured creation. Convoked by Talleyrand on the 1st of
April, it pronounced the word abdication on the morrow. For this
Napoleon cared little, provided that he had the army behind
him. But now the marshals and generals joined the civilians.
The defection of Marshal Marmont and his soldiery on the 4th
of April rendered further thoughts of resistance futile. To
continue the strife when Wellington was firmly established on
the line of the Garonne, and Lyons and Bordeaux had been
restored the Bourbon fleur de lys, was seen by all but Napoleon to be sheer
madness; but it needed the pressure of his marshals in painful
interviews at Fontainebleau to bring him to reason.

At last, on the 11th of April, he wrote the deed of abdication.
On that night he is said to have tried to end his life by poison.
The evidence is not convincing; and certainly his recovery
was very speedy. On the 20th he bade farewell to his guard
and set forth from Fontainebleau for Elba, which the powers
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had very reluctantly, and owing to the pressure of the tsar, awarded to him as a possession. He was to keep the title of emperor. Marie Louise was to have the duchy of Parma for herself and her son. She did not go with her consort. Following the advice of her father, she repaired to Vienna along with the little king of Rome. As for France, she received the Bourbons, along with the old frontiers.

Meanwhile Napoleon, after narrow escapes from royalist mobs in Provence, was conducted in the British cruiser "Undaunted," to Vienna. In July, on the 14th, he spent ten months in unhealthy retirement, watching with close interest the course of events in France. As he foresaw, the shrinkage of the great empire into the realm of old France caused infinite disgust, a feeling fed every day by stories of the tacitless way in which the Bourbon princes treated veterans of the Grand Army. Equally threatening was the general situation in Europe. The demands of the tsar Alexander were for a time so exorbitant as to bring the powers at the congress of Vienna to the verge of war. Thus, everything portended a renewal of Napoleon's activity. The return of French princes from Russia, Germany, England, etc., and the powerful new French army with which he had risen to fame in 1814, so threatening were the symptoms that the royalists at Paris and the plenipotentiaries at Vienna talked of deposing him to the Azores, while others more than hinted at assassination.

He solved the problem in characteristic fashion. On the 26th of February 1815, when the English and French guardships were absent, he slipped away from Porto Ferrajo with some 1,000 men and landed near Antwerp on the 1st of March. Except in royalist Provence he received everywhere a welcome which attested the attractive power of his personality and the popularity of the Bourbons. Firing no shot in his defence, his little troop swelled until it became an army. Ney, who had said that Napoleon ought to be brought to Paris in an iron cage, joined him with 6,000 men on the 14th of March; and five days later the emperor entered the capital, whence Louis XVIII. had recently fled.

Napoleon was not misled by the enthusiasm of the provinces and Paris. He knew that love of novelty and contempt for the gouty old king and his greedy courtiers had brought about this bloodless triumph; and he felt instinctively that he had to deal with a new France, which would not tolerate despotism. On his way to Paris he had been profuse in promises of reform and constitutional rule. It remained to make good those promises and to disarm the fear and jealousy of the great powers. This was the work which he set before himself in the Hundred Days (19th of March to 22nd of June 1815). Were his powers, physical as well as mental, equal to the task? This is doubtful. Certainly the evidence as to his health is somewhat conflicting. Some persons (as, for instance, Carnot, Pasquier, Lavalette and Thiébault) thought him prematurely aged and enfeebled. Others again saw no marked change in him; while Mollien, who knew the emperor well, attributed the lassitude which now and then came over him to a feeling of perplexity caused by his changed circumstances. This explanation seems to furnish a correct clue. The autocrat felt cramped and chafed on all sides by the necessity of posing as a constitutional sovereign; and, while losing something of the old rigidity, he lost very much of the old energy, both in thought and action. His mind was that worked wonders in well-worn grooves and on facts that were well understood. The necessity of devising compromises with men who had formerly been his tools fretted him both in mind and body. But when he left parliamentary affairs behind, and took the field, he showed nearly all the power both of initiative and of endurance which marked his masterpiece, the campaign of 1814. To date his decline, as Chaptal does, from the cold of the Moscow campaign is clearly incorrect. The time of lethargy at Elba seems to have been more unfavourable to his powers than the cold of Russia. At Elba, as Sir Neil Campbell noted, he became inactive and proportionately corpulent. There, too, as sometimes in 1815, he began to suffer intermittently from ischury, but to no serious extent. On the whole it seems safe to assert that it was the change in France far more than the change in his health which brought about the manifest constraint of the emperor in the Hundred Days. His words to Benjamin Constant—"I am growing old. The repose of a constitutional king may suit me. It will more surely suit my son"—show that his mind seized the salient facts of the situation; but his instincts struggled against them. Hence the malaise both of mind and body.

The attempts of the royalists gave him little concern: the duc d'Angoulême raised a small force for Louis XVIII. in the south, but at Valence it melted away in front of Grouchy's command; and at Lyons, given at last as a convention whereby they received a free pardon from the emperor. The royalists of la Vendée were later in moving and caused more trouble. But the chief problem centred in the convention. At Lyons, on the 13th of March, Napoleon had issued an edict dissolving the existing chambers and ordering the convocation of a national mass meeting, or Champ de Mai, for the purpose of modifying the constitution of the Napoleonic empire. That work was carried out by Benjamin Constant in concert with the emperor. The resulting Acte additionel (supplementary to the constitutions 26th of June) was set out for the future frontier. His peers and a chamber of representatives elected by the "electoral colleges" of the empire, which comprised scarcely one hundredth part of the citizens of France. As Châteaubriand remarked, in reference to Louis XVIII.'s constitutional charter, the new constitution—La Benjamine, it was dubbed—was merely a slightly improved charter. Its incompleteness displeased the liberals; only 1,532,527 votes were given for it in the plebiscite, a total less than half of those of the plebiscites of the Consulate.

Not all the gorgeous display of the Champ de Mai (held on the 1st of June) could hide the discontent at the meagre fulfilment of the promises. Napoleon ended his speech with the words: "My will is that of the people: my rights are its rights." The words rang hollow, as was seen when, on the 3rd of June, the deputies chose, as president of their chamber, Lanjuinais, the staunch liberal who had so often opposed the emperor. The latter was with difficulty dissuaded from quashing the election. Other causes of offence arose, and Napoleon in his last communication to them warned them not to imitate the Greeks of the later Empire, who engaged in subtle discussions when the ram was battering at their gates. On the morrow (1st of June) he set out for the northern frontier. His spirits rose at the prospect of rejoining the army. At St Helena he told Gourgaud that he intended in 1815 to dissolve the chambers as soon as he had won a great victory.

In point of fact, the sword alone could decide his fate, both in internal and international affairs. Neither France nor Europe took seriously his rather vague declaration of his contentment with the rôle of constitutional monarch of the France of 1815. No one believed that he would be content with the "ancient limits." So often had he declared that the Rhine and Holland were necessary to France that every one looked on his present assertions as a mere device to gain time. So far back as the 13th of March, six days before he reached Paris, the powers at Vienna declared him an outlaw; and four days later Great Britain, Russia, Austria and Prussia bound themselves to put 150,000 men into the field to end his rule. Their recollection of his conduct during the congress of Châtillon was the determining fact at this crisis; his professions at Lyons or Paris had not the slightest effect; his efforts to detach Austria from the coalition, as also the feelers put forth tentatively by Fouché at Vienna, were fruitless. The coalitions, once so brittle as to break at the first strain, had now been hammered into solidity by his blows. If ever a man was condemned by his past, Napoleon was so in 1815.

On arriving at Paris three days after Waterloo he still clung to the hope of concerted national resistance; but the temper of the chambers and of the public generally forbade any such attempt. The autocrat and Lucien Bonaparte were almost alone in believing that by dissolving the chambers and declaring himself dictator, he could save France from the armies of the powers now converging on Paris. Even Davout, minister of war, advised him that the destinies of France rested solely with
the chambers. That was true. The career of Napoleon, which had lured France far away from the principles of 1789, now brought her back to that starting-point; just as, in the physical sphere, his campaigns from 1796-1814 had at first enormously swollen her bulk and then subjected her to a shrinkage still more potenti-
ous. Clearly it was time to safeguard what remained; and that could best be done under Talleyrand's shield of legiti-
macy. Napoleon himself at last divined that truth. When Lucien pressed him to "dare," he replied "Alas, I have dared only too much already." On the 22d of June he abdicated in favour of his son, well knowing that that was a mere form, as his son was in Austria. On the 25th of June he received from Napoleon III. the suggestion of the appointment of him to an advisory government, an intimation that he must leave Paris. He retired to Malmaison, the home of Josephine, where she had died shortly after his first abdication. On the 29th of June the near approach of the Prussians (who had orders to seize him, dead or alive), caused him to retire westwards towards Rochefort, whence he hoped to reach the United States. But the passports which the provisional government asked from Wellington were refused, and as the country was declaring for the Bourbons, his position soon became precarious. On his arrival at Rochefort (3rd July), and in the face of cruisers cut off his hope of escape. On the 9th of July he received a note from the provisional government at Paris to leave France within twenty-four hours. After wavering between various plans, he decided on the 13th of July to cast himself on the generosity of the British govern-
ment, and dictated a letter to the prince regent in which he com-
pared himself to Themistocles seating himself at the hearth of his enemy. His counsellor, Las Cases, strongly urged that step and made overtures to Captain Maitland of H.M.S. "Bellerophon." That officer, however, was on his guard, and, while offering to convey the emperor to England declined to pledge himself in any way as to his reception. It was on this understanding (which Las Cases afterwards misrepresented) that Napoleon on the 15th of July mounted the deck of the "Bellerophon." No other course remained. Further delay after the 15th of July would have led to his capture by the royalists, who were now every-
where in the ascendant. In all but name he was a prisoner of Great Britain, and he knew it.

The rest of the story must be told very briefly. The British government, on hearing of his arrival at Plymouth, decided to send him to St Helena, the formation of that island being such as to give him the freedom of the world. The British government had no idea of sacrificing any of its ships to the adventure of 1815, with none of the perils for the world at large which the tsar's choice, Elba, had involved. To St Helena, then, he pro-
ceeded on board of H.M.S. "Northumberland." The title of emperor, which he enjoyed at Elba, had been forfeited by the adventure of 1815, and he was now treated officially as a general. Nevertheless, during his last voyage he enjoyed excellent health even in the tropics, and seemed less depressed than his associates, Bertrand, Gourgaud, Las Cases and Montholon. He landed at St Helena on the 17th of October. He resided first at the "Briars" with the Balcombes, and thereafter at Longwood, when that residence was ready for him. The first governor of the island, General Wilks, was soon superseded, it being judged that he was too amenable to influence from Napoleon; his successor was Sir Hudson Lowe.

Napoleon's chief relaxations at St Helena were the dictation of his memoirs to Montholon, and the compilation of monographs on military and political topics. The memoirs (which may be accepted as mainly Napoleon's, though Montholon undoubtedly touched them up) range over most of the events of his life from Toulon to Marengo. The military and historical works comprise pièces of the wars of Julius Caesar, Turenne and Frederick the Great. He began other accounts of the campaigns of his own age; but they are marred by his having had few trustworthy documents and statistics at hand. On a lower level as regards credibility stands the Mémorial de Sainte- Helène, compiled by Las Cases from Napoleon's conversations with the obvious aim of creating a Napoleonie legend. Never-
theless the Mémorial is of great interest—e.g. the passage (iv. 431-454) in which Napoleon reflects on the ruin wrought to his cause by the war in Spain, or that (iii. 190) dealing with the instructions he gave in the joint commission "in marrying an Austrian princess." There I stepped on to an abyss covered with flowers"; or that again (iii. 79) where he represented himself as the natural arbiter in the immense struggle of the present against the past, and asserted that in ten years' time Europe would be either Cossack or republican. It is noteworthy that in Gourgaud's Journal de Ste. Hélène there are very few reflections of this kind and the emperor appears in a guise far more life-like. But in the works edited by Montholon and Las Cases, where the political aim constantly obtrudes itself, the Napoleon reappears again and again to embroider on the theme that he had always been the true champion of orderly freedom. This was the mot d'ordre at Longwood to his companions, who set themselves deliberately to propagate it. The folly of the monarchs of the Holy Alliance in Europe gained for the writings of Montholon and Las Cases (that of Gourgaud was not published till 1899) a ready reception, with the result that Napoleon reappeared in the literature of the ensuing decades wielding an influence scarcely less potent than that of the grey-coated figure into whose arms France flung herself on his return from Elba. All that he had done in his last years was to have himself repeatedly declared insane, to have himself drunk poisoned wine, to have apparently procured his own execution—his tyrannical, his shocking waste of human life, his deliberate persistence in war when France and Europe called for a reasonable and last-

ing peace—all this was forgotten; and the great warrior, who died of cancer on the 4th of May 1821, was thereafter looked upon as a Prometheus condemned to a lingering agony for his devotion to the cause of humanity. It was this perversity of fact which rendered possible the career of Napoleon III. But it is not necessary in an introduction such as this to dwell on the personal qualities of "the Pineapple," the man, to show that the "Histoire de la Révolution françoise et de l'Empire" (many editions in French and English); *P. Lanfrey, Histoire de Napoleon I. (5 vols., Paris, 1867-1875) (incomplete); Sir A. Alison, History of Europe, 1789-1815 (14 vols., London, 1833-1842); J. Holland Rose, The Life of Napoleon I. (2 vols., London; 3rd ed., 1905); A. Fournier, Napoleon de la première restauration (3 vols., Prague and Vienna, 1889); W. M. Sloane, Napoleon a History (4 vols., London, 1896-1897); O'Connor Morris, Napoleon (New York, 1893); E. Lavisse and A. N. Rambaud, La Révolution française, 1775-1799. *Napoléon, Vols. VIII., and IX. of the Histoire générale: The Cambridge Modern History, vol. V. (Cambridge, 1904); G. Trederick Briars, "St Helena, Napoleon and his Death." (3 vols., London, 1903); H. Quinet, Les origines de la première restauration (1894 and 1896); W. Oncken, Das Zeitalter der Revolu-

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tion, des Kaiserreichs, und der Befreiungskriege (2 vols., Berlin, 1889); A. T. Mahan, Influence of Sea Power on the French Revolution and Empire (London, 1900); H. B. Morse, Napoleon (La masson, Histoire de la Révolution française et de l'Empire, Befreiungskriege, (Paris, 1894 and 1896); W. Oncken, Das Zeitalter der Revolu-


NAPOLEON II.—NAPOLEON III.


III. The Consulat and Empire (December 1799—April 1814). (a) The family of Napoleon and his court. George B. Miller, Bonaparte and his Times (London, 1891; New York, 1898); E. Boller, Le Rambaud, the *Lettres B. 1810 (Paris, 1893). *Napoléon et les femmes (3 vols., Paris, 1893—1895), Napoleon and his family (Paris, 1867); *Lettres de Napoléon à Joséphine (Paris, 1895); Napoléon et ses enfants politiques (3 vols., Paris, 1895); *A. Lévy, Napoléon intime (Paris, 1893); Baron C. F. de Ménestral, Napoléon et Marie Louise (3 vols., Paris, 1895); Baron A. du Casse, Les Rots, frères de Napoléon (Paris, 1891—1893); W. Le Bas, Memoirs of the Tuileries, as the official historians state. He was the third son of Louis Bonaparte (see Bonaparte), brother of Napoleon I., and from 1806 to 1810 king of Holland, and of Hortense de Beauharnais, daughter of General (de) Beauharnais and Josephine Tascher de la Pagerie, afterwards the empress Josephine; hence he was at the same time the nephew and the adopted grandson of the great emperor. Of the two other sons of Louis Bonaparte and Hortense, the elder, Napoleon Charles (1802—1807), died of typhoid at The Hague; the second, Napoleon Louis (1804—1841), was interred at the Monastery of St. Magno, leaving no children. Doubts have been cast on the legitimacy of Louis Napoleon; for the discord between Louis Bonaparte, who was ill, restless and suspicious, and his pretty and capricious wife was so violent and open as to justify all conjectures. But definite evidence, in the shape of letters and references in memoirs, enables us to deny that the Dutch Admiral Verhewel was the father of Louis Napoleon, and there is strong evidence of resemblance in character between King Louis and his third son. He early gave signs of a grave and dreamy character. Many stories have been told about his childhood, for example the remark which Napoleon I. is said to have made about him: "Who knows whether the future of my race may not lie in this child?" It is certain that, after the abdication and exile of Louis, Hortense lived in France with her two children, in close relation with the imperial court. During the Hundred Days, Louis Napoleon, then a child of seven, witnessed the presentation of the eagles to 50,000 soldiers; but a few weeks later, before his departure for Rochefort, the defeated Napoleon embraced him for the last time, and his mother had to receive Frederick William III. of Prussia and his two sons at the château of Saint-Leu; here the victor and the defeated spread the feast of Sedan met for the first time, and probably played together.

After Waterloo, Hortense, suspected by the Bourbons of having arranged the return from Elba, had to go into exile. The exiled Louis, who now lived at Florence, had compelled her by a scandalous law-suit to give up to him the elder of her two children. With her remaining child she wandered, under the name of duchesse de Saint-Just, from Geneva to Aix, Carlsruhe and Augsburg. In 1817 she bought the castle of Arenenburg, in the canton of Turgau, on a wooded hill looking over the Lake of Constance. Hortense supervised her son’s education in person, and tried to form his character. His tutor was Philippe Le Bas, son of the well-known member of the Convention and founder of Robespierre, an able man, imbued with the ideas of the Revolution, while Vieillard, who instructed him in the rudiments, was a democratic imperialist also inspired with the ideal of nationalism. The young prince also studied at the gymnasium at Augsburg, where his love of work and his mental qualities were gradually revealed; he was less successful in mathematics than in literary subjects, and he became an adept at physical exercises, such as fencing, riding and swimming. It was at this time that he acquired the slight German accent which he never lost. Those who educated him never lost sight of the future; but it...
was above all his mother, fully confident of the future destiny of the Bonapartes, who impressed on him the idea that he would be king, or at any rate, that he would accomplish some great works. "With your name," she said, "you will always count for something, Romans, in the old world of Europe or in the new." If we may believe Mme Cornu, he already at the age of twelve had dreams of empire.

In 1823 he accompanied his mother to Italy, visiting his father at Florence, and his grandmother Letitia at Rome, and dreaming with Le Bas on the banks of the Rubicon. He returned to Arenenberg to complete his military education under Colonel Armand and Colonel Dufour, who instructed him in artillery and military engineering. At the age of twenty he was a "Liberal," an enemy of the Bourbons and of the treaties of 1815; but he was dominated by the cult of the emperor, and for him the liberal ideal was confused with the Napoleonic.

The July revolution of 1830, of which he heard in Italy, roused all his young hopes. He could not return to France, for the law of 1816 banishing all his family had not been abrogated. But the liberal revolution knew no frontiers. Italy shared in the agitation. He had already met some of the conspirators at Arenenberg, and it is practically established that he now joined the associations of the Carbonari. Following the advice of his friend the Count Arese and of Menotti, he and his brother were among the revolutionaries who in February 1831 attempted a rising in Romagna and the expulsion of the partisans of Rome. They distinguished themselves at Civita Castellana, a little town which they took; but the Austrians arrived in force, and during the retreat Napoleon Louis, the elder son, took cold, followed by measles, of which he died. Hertoure hurried to the spot and took steps which enabled her to save her second son from the Austrian prisons. He escaped into France, where his mother, on the plea of his illness, obtained permission from Louis Philippe for him to stay in Paris. But he intrigued with the republicans, and Casimir-Périer insisted on the departure of all the non-commissioned officers. In May 1831, they went to London, and afterwards returned to Arenenberg.

For a time he thought of responding to the appeal of some of the Polish revolutionaries, but Warsaw succumbed (September 1831) before he could set out. Moreover the plans of this young and visionary enfant du siècle were becoming more definite. The duke of Reichstadt died in 1832. His uncle, Joseph, and his father, Louis, showing no desire to claim the inheritance promised them by the constitution of the year XII., Louis Napoleon henceforth considered himself as the accredited representative of the family. Those who ever knew him noticed a transformation in his character; he tried to hide his natural sensibility under an impassive exterior, and concealed his political ambitions. He became indeed "doux entête" (gentle but obstinate) as his mother called him, persistent in his ideas and always ready to return to them, though at the same time yielding and drawing back before the force of circumstances. He endeavoured to define his ideas, and in 1833 published his Réveries politiques, suivies d'un projet de constitution, and Considerations politiques et militaires sur la Suisse; in 1836, as a captain, in the Swiss service, he published a Manuel d'artillerie, in order to win popularity with the French army.

A phrase of Montesquieu, placed at the head of this work, sums up the views of the young theorist: "The people, possessing the supreme power, should do for itself all that it is able to do; what it cannot do well, it must do through its elected representatives." The supreme authority entrusted to the elect of the people was always his essential idea. But the problem was how to realize it. Louis Napoleon could feel vaguely the state of public opinion in France, the longing for glory from which it suffered, and the deep-rooted discord between the nation and the king. Louis Philippe, who though sprung from the national revolution against the treaties of 1815, was yet a partisan of peace at any price. Both Châteaubriand and Carrel had praised the prince's first writings. Bonapartists and republicans found common ground in the glorious tradition sung by Béranger. A military conspiracy like those of Berton or the sergeants of La Rochele, seemed feasible to Napoleon. A new friend of his, Fialin, formerly a non-commissioned officer and a journalist, an energetic and astute man and a born conspirator, spurred him on to action.

With the aid of Fialin and Eléonore Gordon, a singer, who is supposed to have been his mistress, and with the co-operation of certain officers, such as Colonel Vaudrey, an old soldier of the Empire, commanding the 4th regiment of artillery, and Lieutenant Laity, he tried to bring about a revolt of the garrison of Strassburg (October 30, 1836). The conspiracy was a failure, and Louis Philippe, fearing lest he might make the pretender popular either by the glory of an acquittal or the aureole of martyrdom, had him taken to Lorient and put on board a ship bound for America, while his accomplices were brought before the court of assizes and acquitted (February 1837). During his trial he was set free in New York in April; by the aid of a false passport he returned to Switzerland in August, in time to see his mother before her death on the 3rd of October 1837.

At any other time this attempt would have covered its author with ridicule. Such, at least, was the opinion of the whole of the family of Bonaparte. But his confidence was unshaken, and in the woods of Arenenberg the romantic-minded friends who remained faithful to him still honoured him as emperor. And now the government of Louis Philippe, by an evil inspiration, began to act in such a way as to make him popular. In 1838 the Court of Peers to five years' imprisonment for a pamphlet which he had written to justify the Strassburg affair; then it demanded the expulsion of the prince from Switzerland, and when the Swiss government resisted, threatened war. Having allowed the July monarch to commit himself, Louis Napoleon at the last moment left Switzerland voluntarily. All this served to encourage the mystical adventurer. In London, where he had taken up his abode, together with Arese, Fialin (says Persigny), Doctor Conneau and Vaudrey, he was at first well received in society, but his fondly entertained hopes of Napoleon I., in May 1839, he went to London, and afterwards returned to Arenenberg.

To cover the expenses of his various enterprises, and the large number of followers ("sacrificed to the cause") living on his bounty, he published his book: Des Idées napoléoniennes, a curious mixture of Bonapartism, socialism and pacifism, which he represented as the tradition of the First Empire. He also followed attentively the fluctuations of French opinion.

Since 1838 the Napoleonic propaganda had made enormous progress. Not only did certain newspapers, such as the Capitole and the Journal du Commerce, and clubs, such as the Culottes de peau carry it zealously; but the diplomatic humiliation of France at the affair of Magenta (May 4, 1849.) in 1840, with the outburst of patriotism which accompanied it, followed by the concessions made by the government to public opinion, such as, for example, the bringing back of the ashes of Napoleon I., all helped to revive revolutionary and Napoleonic memories.

The pretender, again thinking that the moment had come, formed a fresh conspiracy. With a little band of fifty-six followers he attempted to provoke a rising of the 42nd regiment of the line at Boulogne, hoping afterwards to draw General Magnan to Lille and march upon Paris. The attempt was made on the 6th of August 1840, but failed; he saw several of his supporters fall on the shore of Boulogne, and was arrested together with Montholon, Persigny and Conneau. This time he was brought before the Court of Peers with his accomplices; he entrusted his defence to Berryer and Marie, and took advantage of his trial to appeal to the supremacy of the people, which he alleged,
had been disregarded, even after 1830. He was condemned to detention for life in a fortress, his friend Aladenize being deported, and Montholon, Parquin, Lombard and Fialan being each condemned to detention without any of the crimes for which they had been condemned in 1814. The 15th of December, the very day that Napoleon's ashes were deposited at the Invalides, he was taken to the fortress of Ham. The country seemed to forget him; Lamartine alone foretold that the honours paid to Napoleon I. would shed lustre on his nephew. His prison at Ham was unhealthy, and physical inactivity was painful to the prince, but on the whole the régime imposed upon him was mild, and his captivity was lightened by Alexandrine Vergeot, "la belle saboteuse," or Mlle Badinquet (he was later nicknamed Badinguet by the republicans). His more intellectual friends, such as Mme Comn, also came to visit him and assisted him in his studies. He corresponded with Louis-Georges Sand and Proudhon, and collaborated with the journalists of the Left, Degeorge, Penauger and Souplet. For six years he worked very hard "at this University of Ham," as he said. We wrote some Fragments historiques, studies on the sugar-question, and on the recruiting of the army, and finally, in the Progrès du Peu-de-Calais, a series of articles on social questions which were later embodied in his Extinction du paupérisme (1844). But, resigned to this idea under the influence of his own conscience, he more closely the body is confined, he wrote, "the more the mind is disposed to indulge in flights of imagination, and to consider the possibility of executing projects of which a more active existence would never perhaps have left it the leisure to think."

On the 25th of May 1846 he escaped to London, giving as the reason for his decision the dangerous illness of his father. On the 27th of July his father died, before he could accomplish a journey undertaken in spite of the refusal of a passport by the representative of Tuscany.

He was again well received in London, and he "made up for his absence during the last years by multiplying his various pursuits of pleasure." The duke of Brunswick and the banker Ferrère interested themselves in his future, and gave him money, as did also Miss Howard, whom he later made comtesse de Beauregard, after restoring to her several millions. He was still full of plans and new ideas, always with the same end in view; and for this reason, in spite of his various enterprises, which were sometimes ridiculous, sometimes unpleasant in their consequences, and his unscrupulousness as to the means and ends he employed, he always had a kind of greatness. He always retained his faith in his star, his "meaning," his "plan," his work, and his "cats and dogs." He started to Taglioni the dancer; and again to Lady Douglas, who was counselling resignation, he replied, "Though fortune has twice betrayed me, yet my destiny will none the less surely be fulfilled. I wait." He was not to wait much longer.

As he well perceived, the popularity of his name, the vague "legend" of a Napoleon who was at once a democrat, a soldier and a revolutionary hero, was his only strength. But by his abortive efforts he had not yet been able to win over this immense force of tradition and turn it to his own purposes. The events which occurred from 1848 to 1852 enabled him to do so. He behaved with extraordinary skill, displaying in the heat of the conflict the all the abilities of an experienced conspirator, knowing, "like the snail, how to draw in his horns as soon as he met with an obstacle" (Thiers), but supple, resourceful and unscrupulous as to the choice of men and means in his obstinate struggle for power.

At the first symptoms of revolutionary disturbance he returned to France; on the 25th of February he offered his services to the Provisional Government, but, on being requested by it to depart at once, he turned himself to this course. But Persigny, Mocquard and all his friends devoted themselves to an energetic propaganda in the press, by pictures and by songs. After the 25th of May he had already shaken the strength of the young republic, he was elected in June 1848 by four departments, Seine, Yonne, Charente-Inférieure and Corsica. In spite of the opposition of the executive committee, the Assembly ratified his election. But he had learnt to wait. He sent in his resignation from London, merely hazard-
NAPOLEON III.

In fact, while trying to compass the destruction of the republican movement of the Left, he was taking careful steps to gain over all classes. "Prince, altesse, monsieur, monseigneur, citoyen" (he was called by all these names indifferently at the Elysée), he appeared as the candidate of the most incompatible interests, flattering the clergy by his compliments and formal visits, distributing cigars and sausages to the soldiers, promising the prosperous bourgeois "order in the street" and business, while repudiated as the "father of the workers," and on the hearts of the peasants. At his side were his accomplices, men ready for anything, whose only hopes were bound up with his fortunes, such as Morny and Rouher; his paid publicists, such as Romieu the originator of the "red spectre"; his cudgel-bearers, the "Ratapoll" immortalized by Daumier, who terrorized the republicans. From the Elysée by means of the mass of officials whom they had at their command, the conspirators extended their activities throughout the whole country.

He next entered upon that struggle with the Assembly, now discredited, which was to reveal to all the necessity for a change, and a change in his favour. In January 1851 he deprived Changarnier of his command of the garrison of Paris. "The Empire has come," said Thiers. The pretender would have preferred, however, that it should be brought about legally, the first step being his re-election in 1852. The Constitution forbade his re-election; therefore the Constitution must be revised. On the 19th of July the Assembly threw out the proposal for revision, thus signing its own death-warrant, and the coup d'état was resolved upon. He prepared for it systematically. The cabinet of the 26th of October 1851 gave the ministry for war to his creature Saint-Arnaud. All the conspirators were at their posts—Maupas at the prefecture of police, Magnan at the head of the troops in Paris. At the Elysée, Morny, adulterine son of Hortense, a hero of the Bourse and successful gambler, supported his half-brother by his energy and counsels. The ministry proposed to arrogate the electoral law of 1850, and restore universal suffrage; the Assembly by refusing made itself still more unpopular. By proposing to allow the president of the Assembly to call in armed force, the questioners revealed the Assembly's plans for defence, and gave the Elysée a weapon against it ("donnez-hure contre elle à l'Elysée"). The proposition was rejected (November 17), but Louis-Napoleon saw that it was time to act. On the 2nd of December he carried out his coup d'état.

But affairs developed in a way which disappointed him. By dismissing the Assembly, by offering the people "a strong government," and re-establishing "a France regenerated by the Revolution of '89 and organized by the emperor," he had hoped for universal applause. But both in Paris and the provinces he met with the resistance of the Republicans, who had re-organized in view of the elections of 1852. He struck at them by mixed commissions, deportations and the whole range of police measures. The décrets-lois of the year 1852 enabled him to prepare the way for the new institutions. On the 1st of December 1852 he became in name what he was already in deed, and was proclaimed Emperor of the French. He was then 44 years old. "The impassibility of his face and his lifeless glance" showed observers that he was still the obstinate dreamer that he had been in youth, absorbed in his Idea. His unshaken conviction of his mission made him conscious of the responsibility which rested on him, but hid from him the hopeless defect in the coup d'état. On carried out his conviction, he had still only a timid will, working through petty expedients; but here again his confidence in the future made him bold. In a people politically decimated and wearied, he was able to develop freely all the Napoleonic ideals. Rarely has a man been able to carry out his system so completely, though perhaps in these first years he had to take more disciplinary measures than he had intended against the Reds, and granted more favours than was fitting to the Catholics, his allies in December 1848 and December 1852.

The aim which the emperor had in view was, by a concentration of power which should make him "the beneficent motive force of the whole social order" (constitution of the 14th of January 1852; administrative centralization; subordination of the elected assemblies; control of the machinery of universal suffrage) to unite all classes in "one great national party" attached to the dynasty. His success, from 1852 to 1856, was almost complete. The nation was submissive, and a few scattered plots alone showed that republican ideas persisted among the masses. As "restorer of the overthrown altars," he won over the "men of God" among them Morny, chancellor of the "Uniter," and allowed them to get the University into their hands. By the aid of former Orleanists, such as Billault, Fould and Morny, and Saint-Simonians such as Talabot and the Pericres, he satisfied the industrial classes, extended credit, developed means of communication, and gave a strong impetus to the business of the nation. By various measures, such as subsidies, charitable gifts and foundations, he endeavoured to show that "the idea of improving the lot of those who suffer and struggle against the difficulties of life was constantly present in his mind." His was the government of cheap bread, great public works and holdings. The imperial court was brilliant. The emperor, having failed to obtain the hand of a Vasa or Hohenzollern, married, on the 29th of January 1853, Eugénie de Montijo, comtesse de Téba, aged twenty-six and at the height of her beauty.

France was "satisfied" in the midst of order, prosperity and peace. But a glorious peace was required; it must not be said that "France is bored," as Lamartine had said when the Napoleonic legend began to spread. The foreign policy of the Catholic party, by the question of the Holy Places and the Crimean War (1853-1856), gave him the opportunity of winning the glory which he desired, and the British alliance enabled him to take advantage of it. In the spring of 1855, as a definite success was still slow to come, he contemplated for a time the lead of the expedition in person, but his advisers dissuaded him from doing so, for fear of a revolution. In January 1856 he had the good fortune to win a diplomatic triumph over the new tsar, Alexander II. It was at Paris (February 25-March 30) that the conditions of peace were settled.

The emperor was now at the height of his power. He appeared to the people as the avenger of 1840 and 1848, and the birth to him of a son, Eugène Louis Jean Joseph, on the 16th of March 1856, assured the future of the dynasty. It was then that, strong in the esteem and admiration with which he was surrounded, and foreseeing a future full of hope for France, he dreamed of realizing the Napoleonic ideal in its entirety. This disciple of the German philologists, this crowned Carbonaro, the friend of the archaeologists and historians who were to help him to write the Histoire de César, dreamed of developing the policy of nationalism, and of organizing the peoples of all countries to enfranchise themselves.

From 1851 to 1856 he devoted his attention to the Rumanian nationality, and supported Alexander Cuza. But it was above all the deliverance of Italy which haunted his imagination. By this enterprise, which his whole tradition imposed upon him, he reckoned to flatten the amour-propre of his subjects, and rally to him the liberals and even the republicans, with their passion for propaganda. But the Catholics feared that the Italian national movement, when once started, would entail the downfall of the papacy; and in opposition to the emperor's Italian advisers, Arise and Prince Jerome Napoleon, they pitted the empress, who was frivolous and capricious, but an ardent Catholic. Napoleon III was under his wife's influence, and could not openly combat her resistance. It was the Italian Orsini who, by attempting to assassinate him as a traitor to the Italian nation on the 14th of January 1858, gave him an opportunity to impose his will indirectly by convincing his wife that in the interests of his own security he must "do something for Italy." Events followed each other in quick succession, and now began the difficulties in which the Empire was to be irrevocably involved. Not only did the Italian enterprise lead to strained relations with Britain, the alliance with whom had been the emperor's chief support in Europe, and compromised its credit; but the claims of parties and classes again began to be heard at home.
The Italian war aroused the opposition of the Catholics. After Magenta (June 4, 1859), it was the fears of the Catholics and the messages of the empress which, even more than the threats of Prussia, checked him in his triumph and forced him into the armistice of Villafranca (July 11, 1859). But the spread of the Italian revolution and the movement for annexation forced him again to intervene. He appealed to the Left against the Catholics, by the amnesty of the 17th of April 1859. His consent to the annexation of the Central Italian states, in exchange for Savoy and Nice (Treaty of Turin, March 24, 1860) exposed the emperor to the charge of selling out his uncle's slave he had practically been since 1848. At the same time, the free-trade treaty with Great Britain (January 5, 1860) aroused a movement against him among the industrial bourgeoisie.

Thus at the end of 1866, the very time when he had hoped that his personal policy was to rally round him once for all the whole of France, and assure the future of his dynasty, he saw, on the contrary, that it was turning against him his strongest supporters. He became alarmed at the responsibilities which he saw would fall upon him, and imagined that by an appearance of resilience he could be shifted on to others the responsibility for any errors he might commit. Hence the decrees of the 24th of November 1866 (right of address, ministers without portfolio) and the letter of the 14th of November 1861 (financial reform). From this time onward, in face of a growing opposition, anxiety for the future of his régime occupied the first place in the emperor's thoughts, and paralysed his initiative.

Placed between his Italian counsellors and the empress, he was ever of two minds. His plans for remodelling Europe had a certain grandeur and grandeur; but internal difficulties forced him into endless manoeuvre and temporization, which led to his ruin. Thus in October 1862, after Garibaldis attack on Rome, the clerical côte of the Tulleries triumphed. But the replacing of M. Thouvenel by M. Drouin de Lhuys did not satisfy the more violent Catholics, who in May 1863 joined the united opposition. Thirty-five opponents of the government were appointed, Republicans, Orleanists, Legitimists or Catholics. The emperor dismissed Persigny, and summoned moderate reformers such as Duruy and Béhic. But he was still possessed with the idea of settling his throne on a firm basis, and uniting all France in some glorious enterprise which should appeal to all parties equally, and "group them under the mantle of imperial glory." From January to June 1863 he sought this appearance of glory in Poland, but only succeeded in embroiling himself with Russia. Then, after Syria and China, it was the "great inspiration of his reign," the establishment of a Catholic and Latin empire in Mexico, enthusiasm for which he tried in vain from 1863 to 1867 to communicate to the French.

But while the strength of France was wasting away at Puebla or Mexico, Bismarck was founding German unity. In August 1864 the emperor, held back by French public opinion, which was favourable to Prussia, and by his idea of nationality, allowed Prussia and Austria to seize the duchies of Schleswig and Holstein. After his failure in Poland and Mexico and in face of the alarming presence of Germany, only one alliance remained possible for Napoleon III., namely with Italy. He obtained this by the convention of the 15th of September 1863 (involving the withdrawal of the French troops from Rome). But the Catholic party redoubled its violence, and the pope sent out the encyclical Quanta Curta and the Syllabus, especially directed against France. In vain the emperor sought in German affairs a definitive solution of the Italian question which should appeal to all parties equally, and the Franco-Prussian alliance of April 1866; and hoped to become, to his greater glory, arbiter in the tremendous conflict which was about to begin. But suddenly, while he was trying to rouse public opinion against the treaties of 1815, the news of the battle of Königgrätz came as a bolt from the blue to ruin his hopes. French interests called for an immediate intervention. But the emperor was ill, weary and aged by the life of pleasure which he led side by side with his life of work (as is proved by the letters to M'dlle Bellanger); he was suffering from a first attack of his bladder complaint. He knew, moreover, the insufficiency of his troops. After days of terrible suffering, he resigned himself to the annexation by Prussia of northern Germany.

"Now," said M Drouin de Lhuys, "we have nothing left but to weep."

Henceforth the brilliant dream, a moment realized, the realization of which he had thought durable, was at an end. The Empire had still an uncertain and troubled brilliancy at the Exhibition of 1867. But Berezowski's pistol shot, which accentuated the estrangement from the tsar, and the news of the death of a great friend at Quetetaró, cast a gloom over the latter fêtes. In the interior the industrial and socialist movement, born of the new industrial development, added fresh strength to the Republican and Liberal opposition. The moderate Imperialists felt that some concessions must be made to public opinion. In opposition to the absolutist "vice-emperor" Rouher, whose influence over Napoleon had become stronger and stronger since the death of Morny, Émile Ollivier grouped the Third Party. Anxious, changeable and distraught, the emperor made the Liberal concessions of the 10th of January 1867 (right of interpretation), and then, when Ollivier thought that his triumph was complete, exhorted him to "grant the promised laws concerning the press and public meetings till 1868. The opposition gave him no credit for these tardy concessions. There was an epidemic of violent attacks on the emperor; the publication of the Lanterne and the Baudin trial, conducted by Gambetta, were so many death-blows to the régime. The Internationale developed its propaganda. The election of May 1869 resulted in 4,438,000 votes for the government, and 3,355,000 for the opposition, who also gained 90 representatives.

The emperor, disappointed and hesitating, was slow to return to a parliamentary régime. It was not till December that he instructed Ollivier to "form a homogeneous cabinet representing the majority of the Corps Législatif" (ministry of the 2nd of January 1870). But, embarrassed between the Arcadiens, the partisans of the absolute régime, and the Republicans, Ollivier was unable to guide the Empire in a constitutional course. At the Tulleries Rouher's counsel still triumphed. It was he who inspired the ill and wearied emperor, now without confidence or energy, with the idea of resorting to the plebiscite.

To do away with the risk of a Revolution," "to place order and liberty upon a firm footing," "to ensure the transmission of the crown to his son," Napoleon III. again sought the approbation of the nation. He obtained it with brilliant success, for the last time, by 7,438,786 votes against 1,571,939, and his work now seemed to be consolidated.

A few weeks later it crumbled irrevocably. Since 1866 he had been pursuing an elusive appearance of glory. Since 1866 France was calling for "revenge." He felt that he could only rally the people to him by procuring them the satisfaction of their national pride. Hence the mishaps and imprudences of which Bismarck made such an insulting use. Hence the negotiations of Nikolsburg, the "note d'autochair" (innkeeper's bill) claiming the left bank of the Rhine, which was so scornfully rejected; hence the plan for the invasion of Belgium (August 1866), the Luxembourg affair (March 1867), from which M. de Moustier's diplomacy effected such a skilful retreat; hence the final folly which led this government into the war with Prussia (July 1870).

The war was from the first doomed to disaster. It might perhaps have been averted if France had had any allies. But Austria, a possible ally, could only join France if satisfied as regards Italy; and since Garibaldi had threatened Rome (Mentana, 1867), Napoleon III., yielding to the anger of the Catholics, had again sent troops to Rome. Negotiations had taken place in 1865. The emperor, bound by the Catholics, had refused to withdraw his troops. It was as a distant but inevitable consequence of his agreement of December 1848 with the Catholic party that in 1870 the emperor found himself without an ally.

His energy was now completely exhausted. Successive attacks of stone in the bladder had ruined his physique; while his hesitation and timidity increased with age. The influence of the empress over him became supreme. On leaving the
NAPOLeON—NAPOLEONIC CAMPAIGNS

council in which the war was decided upon the emperor threw himself, weeping, into the arms of Princess Mathilde. The empress was delighted at this war, which she thought would secure her son's inheritance.

On the 28th of July father and son set out for the army. They found it in a state of utter disorder, and added to the difficulties by their presence. The emperor was suffering from stone and could hardly sit his horse. After the defeat of Reichshoffen, when Bazaine was thrown back upon Metz, he wished to retreat upon Paris. But the empress represented to him that if he retreated it would be the end of a revolution. An advance was decided upon which ended at Sedan. On the 2nd of September, Napoleon III. surrendered with 80,000 men, and on the 4th of September the Empire fell. He was taken as a prisoner to the castle of Wilhelmshöhe, near Cassel, where he stayed till the end of the war. After the intrigues of Bazaine, of Bismarck, and of the empress, the Germans having held negotiations with the Republic, he was de facto deposed. On the 1st of March the assembly of Bordeaux confirmed this deposition, and declared him " responsible for the ruin, invasion and dismemberment of the Empire."

Restored to liberty, he retired with his wife and son to Chislehurst in England. Unwilling even now to despair of the future, he still sought to rally his friends for a fresh propaganda. He had at his service publicists such as Cassagnac, J. Amigues and Hugelmann. He himself also wrote unsigned pamphlets justifying the campaign of 1870. It may be noted that, true to his ideas, he did not attempt to throw upon others the responsibility which he had always claimed for himself. He dreamed of his son's future. But he no longer occupied himself with any definite plans. He interested himself in pensions for workmen and in remunerative stools. At the end of 1872 his disease became more acute, and a surgical operation became necessary. He died on the 4th of January 1873, leaving his son in the charge of the empress and of Rouher. The young prince was educated at Woolwich from 1872 to 1875, and in 1875 took part in the English expedition against the Zulus in South Africa, in which he was killed. By his death vanished all hope of renewing the extraordinary fortune which for twenty years placed the descendant of the great emperor, the Carbonaro and dreamer, at once obstinate and hesitating, on the throne of France.

BIBLIOGRAPHY.—The Générals de Napoléon III have been published in four volumes (1854—1857) and his Histoire de Jules César in two volumes (1865—1886); this latter work has been translated into English by T. Wright. Another preliminary book, Napoléon III. und sein Hof (1891—1894); H. Thiers, Napoléon III. avant l'Empire (1895); Sylvain-Blot, Napoléon III. (1899); Giraudou, Napoléon III. intime (1898); Sir W. A. Fraser, Napoléon III. (London, 1895); A. H. du Guesclin, Le Roi des Napoléon (1897). A. Duban, Les trois coups d'état de Louis Napoléon Bonaparte (1906); Louis Napoléon Bonaparte et la révolution de 1848 (1908); and F. A. Simpson, The Rise of Louis Napoléon (1899). General works which may be consulted are Taxile-Delord, Histoire du second Empire (1868—1875); P. de La Gorce, Histoire du second Empire (1894—1905); A. Thomas, Le Second Empire (1907); and E. Ollivier, L'Empire libéral (14 vols., 1890—1899).

NAPOLéON, a round game of cards (known colloquially as "Nap"). Any number may play. The cards rank as at whist, and five are dealt to each player. The deal being completed, the player to the dealer's left looks at his hand and declares how many tricks he would play to win against all the rest, the usual rule being that more than one must be declared; in default of declaring he says "I pass," and the next player has a similar option of either declaring to make more tricks or passing, and so on around. A declaration of five tricks is called "going Napoleon." The declaration is made to the banker to make them, and the others, but without consultation, to prevent him. The declaring hand has the first lead, and the first card he leads makes the trump suit. The players, in rotation, must follow suit if able. If the declarer succeeds in making at least the number of tricks he stood for he wins whatever stakes are played for; if not he loses. If the player declaring Nap wins he receives double stakes all round; if he loses he only pays single stakes all round. Sometimes, however, a player is allowed to go "Wellington" over "Nap," and even "Blucher" over "Wellington." In these cases the caller of "Wellington" wins four times the stake and loses twice the stake, the caller of "Blucher" receives six times and loses three times the stake. Sometimes a player is allowed to declare mièdre, i.e. no tricks. This ranks, as a declaration, between three and four, but the player pays double stake on three, if he wins a trick, and receives a single on three if he takes none.

NAPOLéONIC CAMPAIGNS.—1. The era of the Revolutionary and Napoleonic Wars falls into two main divisions, the first of which (1792—1801) is dealt with under the heading FRENCH REVOLUTIONARY WARS. In the present article are described the campaigns of the French army in 1812. The second division of the wars, that of the Restoration and the Empire, as Napoleon assumed the latter title in 1804, begins with the invasion of Italy in 1805. Henceforth the campaigns of the period are known as the Napoleonic Wars. The reader is referred to WATERLOO CAMPAIGN.

The campaigns described below are therefore:

(a) The Austrian War of 1809 (Ulum and Austerlitz).
(b) The Conquest of Prussia and the Polish Campaign (Jena, Auerstedt, Eylau and Friedland).
(c) The Austrian War of 1809 (Eckmühl, Aspern and Wagram).
(d) The Russian War of 1812 (Borodino and the retreat from Moscow).
(e) The German "War of Liberation," culminating in the Battle of the Nations around Leipzig.
(f) The last campaign of Napoleon, 1814.

The naval history of 1803—1815 includes the culmination and the sequel of the struggle for command of the sea which began in 1793 and reached its maximum intensity on the day of Trafalgar.

2. The Campaign of 1805 may be regarded as a measure of self-defence forced upon Napoleon by the alliance of Russia (April 11th), Austria (August 9th) and other powers with Great Britain. The first possible threat to the emperor's position had been the Empire under his son, and his intention in that event to march straight on Vienna by the valley of the Danube is clearly indicated in his reply (November 27th, 1803) to a Prussian proposal for the neutralization of the South German states. In this he says, "It is on the road from Strassburg to Vienna that the French must force peace on Austria, and it is this road which you wish us to renounce." When, therefore, on the 25th of August 1805, he learnt definitely that Villeneuve (see Naval operations below) had failed in his purpose of securing the command of the Channel, which was the necessary preliminary to the invasion of England, it was but the affair of a few hours to dictate the dispositions necessary to transfer his whole army to the Rhine frontier as the first step in its march to the Danube. On this date the army actually lay in the following positions:

I. Corps

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<tr>
<th>Corps</th>
<th>Camp or Location</th>
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<tbody>
<tr>
<td>Bernadotte</td>
<td>Hanover (Göttingen)</td>
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<tr>
<td>Marmont</td>
<td>Holland</td>
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<tr>
<td>Davout</td>
<td>Camp of Boulogne and other points on the English Channel</td>
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<tr>
<td>Soult</td>
<td>Guard Besières</td>
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<td>Lannes</td>
<td>Paris</td>
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<td>Ney</td>
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<td>Bessières</td>
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The corps were, however, by no means fit for immediate service. Bernadotte's corps in Hanover was almost in the position of a beleaguered garrison, and the marshal could only obtain his transport by giving out that he was ordered to withdraw to France. Marmont and Davout were deficient in horses for cavalry and artillery, and the troops in Boulogne, having been drawn together for the invasion of England, had hardly any transport at all. As it was considered this want could be readily supplied on landing. The composition of the army, however, was excellent. The generals were in the prime of life, had not yet learnt to distrust one another, and were accustomed to work under the emperor and with one another. The regimental officers had all acquired their rank before the enemy and knew how to manage their men, and of the men themselves nearly two-thirds had seen active service. The strength of the army lay in its infantry, for both cavalry and artillery were short of horses, and the latter had not yet acquired mobility and skill.
in manœuvring. Napoleon's determination to undertake the invasion of England had often been disputed, but it is hard to imagine what other operation he contemplated, for the outbreak of hostilities with his continental enemies found him ill-supplied with intelligence as to the resources of the country he had then to traverse. To remedy this, Murat and other general officers as well as minor agents were sent ahead and instructed to travel through South Germany in plain clothes with a view to collecting information and mastering the topography. The emperor was, moreover, imperfectly acquainted with the degree of preparation of his adversaries' designs, and when he dictated his preliminary orders he was still unaware of the direction the Austrian army was about to take.

On the 26th of August, however, he learnt that 100,000 Russians were about to enter Bohemia thence to unite with an Austrian army of 80,000 near the junction of the Inn and Danube, and this information compelled him to alter the general direction of his advance so as to traverse the defiles of the Black Forest north of the Neckar, cavalry only observing the passes to the south.

3. Austrian Army.—The Austrians after the defeats of 1800 had endeavoured to reorganize their forces on the French model, but they were soon to learn that in matters of organization the spirit is everything, the letter very little. They had copied the organization of the French corps, but could find no corps commanders fit to assume the responsibility for these commands. As always in such conditions, the actual control of the smallest movements was still centralized in the hands of the army commanders, and thus the rate of marching was incredibly slow. They had decided that in future their troops in the field should live by requisition, and had handed over to the artillery, which needed them badly, a large number of horses thus set free from the transport service, but they had not realized that men accustomed to a regular distribution of rations cannot be transformed into successful marauders and pillagers by a stroke of the pen; and they had sent away the bulk of their army, 120,000 under their best general, the archduke Charles, into Italy, leaving Lieut. Field Marshal Mack von Leibnitz in Germany, nominally as chief of the staff to the young Prince Ferdinand, but virtually in command, to meet the onset of Napoleon at the head of his veterans. Mack was a man of unusual attainments. He had risen from the ranks in the most caste-ridden army in Europe, and had an adversary, was at any rate the outcome of the wrongs which were correct in principle, and needed only time to develop. It was his fate to be made the scapegoat for the disasters which followed, though they need no further explanation than that, at the head of 80,000 men and exercising only restricted powers of command, he was pitted against the greatest strategist of all ages who was responsible to no overlord and commanded, in the fullest sense of the term, an army considerably more than twice as strong.

4. The March on Ulm.—The outbreak of the campaign was hastened by the desire of the Austrian government to feed their own army and leave a bare country for Napoleon by securing the resources of Bavaria. It was also hoped that the Bavarians with their army of 25,000 men would join the allies. In the latter hope they were deceived, and the Bavarians under General Wrede slipped away to Bamberg in time. In the former, however, they were successful, and the destination they left in their wake almost wrecked Napoleon's subsequent combinations. Mack's march to Ulm was therefore a necessity of the situation, and his continuation in this exposed position, if foolishly, was an adversary against such an adversary, was at any rate the outcome of the high resolve that even if beaten he would inflict crippling losses upon the enemy. Mack knew that the Russians would be late at the rendezvous on the Inn. By constructing an entrenched camp at Ulm and concentrating all the available food within it, he expected to compel Napoleon to invest and besiege him, and he anticipated that in the devastated country his adversary would be compelled to separate and thus fall an easy prey to the Russians. For that blow he had determined to make his own army the anvil. But these views obviously could not be published in army orders, hence the discontent and opposition he was destined to encounter.

5. Movements of the French.—It was on the 21st that Napoleon learnt of Mack's presence in Ulm. On that date his army had crossed the Rhine and was entering the defiles of the Black Forest. It was already beginning to suffer. Boots were worn out, greatcoats deficient, transport almost unattainable and, according to modern ideas, the army would have been considered incapable of action.

<table>
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<tr>
<th>Sept. 28</th>
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brought over the river. Mack on the 8th had determined to commence his withdrawal, but fortune now favoured the French. The weather during the whole of October had been unusually wet, the swollen Danube overflowed the low ground and the roads had become quagmires. On the south bank, owing to better natural drainage and a drier subsoil, movement was fairly easy, but the Austrians found it almost impossible. On the 11th of October, when they began their march, the road along the Danube was swept into the river, carrying with it several guns and teams, and hours were consumed in passing the shortest distances. At length in the afternoon they suddenly fell upon Dupont’s isolated division at Albeck, which was completely surprised and severely handled. The road now lay completely open, but the Austrian columns had so opened out owing to the state of the roads that the leading troops could not pursue their advantage—Dupont rallied and the Austrians had actually to fall back towards Ulm to procure food.

8. Elchingen.—For three more days Mack struggled with an unwilling staff and despondent men to arrange a further advance. During these very three days, through a succession of staff blunders, the French failed to close the gap, and on the morning of the 14th of October both armies, each renewing their advance, came in contact at the bridge of Elchingen. This bridge, all but a few road-bearers, had been destroyed, but now the French gave an example of that individual gallantry which was characteristic of the old revolutionary armies. Running along the beams under a close fire a few gallant men forced their way across. The floor of the bridge was rapidly relaid, and presently the whole of the VI. corps was deploying with unexampled rapidity on the farther side. The Austrians, still in their quagmire, could not push up reinforcements fast enough, and though Mack subsequently alleged deliberate obstruction and disobedience on the part of his subordinates, the state of the roads alone sufficed to explain their defeat. Only the right column of the Austrians was, however, involved; the left under General Werneck, to whom some cavalry and the archduke Ferdinand attached themselves, did indeed succeed in getting away, but without trains or supplies. They continued their march, famished but unmolested, until near Heidenheim they suddenly found themselves confronted by what from the diversity of uniforms they took to be an overwhelming force; at the same time the French cavalry sent in pursuit appeared in their rear. Utterly exhausted by fatigue, Werneck with his infantry, some 8000 strong, surrendered to what was really a force of disembowed dragoons and foot-sore stragglers improvised by the commanding officer on the spot to protect the French treasure chests, which at
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that moment lay actually in the path of the Austrians. The young archduke with some cavalry escaped.

9. Mack surrounded.—The defeat at Elchingen on the 14th of October sealed the fate of the Austrians, though Mack was still determined to endure a siege. As the French columns came up from the south and west gradually surrounded him, he drew his troops under shelter of the fortress and its improvised entrenched camp, and on the 15th he found himself completely surrounded. On the 16th the French field-guns fired into the town, and Mack realized that his troops were no longer under sufficient control to endure a siege. When, therefore, next morning, negotiations were opened by the French, Mack, still feeling certain that the Russians were at hand, agreed to an armistice and undertook to lay down his arms if within the next twenty-one days no relief should arrive. To this Napoleon consented, but hardly had the agreement been signed than he succeeded in introducing a number of individual French soldiers into the fortress, who began rioting with the Austrian soldiery. Then, sending in armed parties to restore order and protect the inhabitants, he caused the guards at the gates to be overpowered, and Mack was thus forced into an unconditional surrender.

On the 22nd of October, the day after Trafalgar, the remnant of the Austrian army, 23,000 strong, laid down its arms. About 5000 men under Jellachich had escaped to Tirol, 2000 cuirassiers with Prince Ferdinand to Eger in Bohemia, and about 10,000 men under Werneck, had surrendered at Heilbronn. The losses in battle having been insignificant, there remain some 36,000 to account for—most of whom probably escaped individually by the help of the inhabitants, who were bitterly hostile to the French.

10. Napoleon's Advance to Vienna.—Napoleon now hastened to rejoin the group of corps he had left under Bernadotte in observation towards the Russians, for the latter were nearer at hand than even Mack had assumed. But hearing of his misfortune they retreated before Napoleon's advance along the right bank of the Danube to Krems, where they crossed the river and withdrew to an entrenched camp near Olmütz to pick up fresh Austrian reinforcements. The siege of Krems continued (near Krems) on the 11th, and of Hollabrunn on the 16th of November, in which Napoleon's marshals learned the tenacity of their new opponents, and the surprise of the Vienna bridge (November 14) by the French, were the chief incidents of this period in the campaign.

11. Campaign of Austerlitz.—Napoleon continued down the right bank to Vienna, where he was compelled by the condition of his troops to call a halt to refit his army. After this was done he continued his movement to Brühl. Thither he succeeded in bringing only 55,000 men. He was again for a time thrown back by heavy frost and his plan for cover of Murat's cavalry. The allies now confronted him with upwards of 86,000 men, including 16,000 cavalry. About the 20th of November this force commenced its advance, and Napoleon concentrated in such a manner that within three days he could bring over 80,000 French troops into action around Brühl, besides 17,000 or more Bavarians under Wrede. On the 28th Murat was driven in by the allied columns. That night orders were despatched for a concentration on Brühl in expectation of a collision on the following day; but hearing that the whole allied force was moving, the emperor ordered Murat to concentre south-east of Brühl, covering his front by cavalry on the Pratzen heights. Meanwhile he had also prepared a fresh line of retreat towards Bohemia, and, certain now of having his men in hand for the coming battle, he quietly awaited events.

The allies were aware of his position, and still adhering to the old "linear" system, marched to turn his right flank (see Austerlitz). As soon as their strategic purpose of cutting him off from Vienna became apparent, the emperor moved his troops into position, and in the afternoon issued his famous proclamation to his troops, pointing out the enemy's mistake and his plan for defeating them. At the same time he issued his orders for his first great battle as a supreme commander. The battle of Austerlitz began early next morning and closed in the evening with the thorough and decisive defeat of the allies.

12. Jena, 1806.—Around the Prussian army, and particularly the cavalry, the prestige of Frederick the Great's glory still lingered; but the younger generation had little experience of actual warfare, and the higher commanders were quite unable to grasp the changes in military tactics and in the conduct of operations which had grown out of the necessities of the French Revolution. The individual officers of the executive staff were the most highly trained in Europe, but there was no great leader to co-ordinate their energies. The total number of men assigned to the field army was 110,000 Prussians and Saxons. They were organized in corps, but their leaders were corps commanders only in name, for none were allowed any latitude for individual initiative. Ill-judged economies had undermined the whole efficiency of the Prussian army. Two-thirds of the infantry and half of the cavalry were allowed furlough for from ten to eleven months in the year. The men were unprovided with greatcoats. Most of the muskets had actually seen service in the Seven Years' War, and their barrels had worn so thin with constant polishing that the use of full charges at target practice had been forbidden. Above all, the army had drifted entirely out of touch with the civil population. The latter, ground down by feudal tradition and law, and at the same time permeated by the political doctrines of the late 18th century, believed that war concerned the governments only, and formed no part of the business of the "honest middle class." This idea of separation, which protected the civilian against the soldier, and forbade even in war-time the requisitioning of horses, provisions and transport, without payment. Up to the night of the battle of Jena itself, the Prussian troops lay starving in the midst of plenty, whilst the French everywhere took what they wanted. This alone was a sufficient cause for all the misfortunes which followed.

13. Outbreak of the War.—During the campaign of Austerlitz Prussia, furious at the violation of her territory of Anspach, had mobilized, and had sent Haugwitz as ambassador to Napoleon's headquarters. But on the 30th of November, and Napoleon, pleading business, put off his official reception till after the battle of Austerlitz. Of course the ultimatum was never presented, as may be imagined; Haugwitz returned and the king of Prussia demobilized at once. But Napoleon, well knowing the man he had to deal with, had determined to force a quarrel upon Prussia at the earliest convenient opportunity. His troops therefore, when withdrawn from Austria, were cantoned in south Germany in such a way that, whilst suspicion was not aroused in minds unacquainted with Napoleonic methods, they could be concentrated by a few marches behind the Thuringian forest and the upper Naab, and were thus in a position to use the Rhine valley. Having done this, the Grand Army was left to itself to recuperate and assimilate its recruits, and it is characteristic of the man and his methods that he did not trouble his corps commanders with a single order during the whole of the spring and summer.

As the diplomatic crisis approached, spies were sent into Prussia, and simultaneously with the orders for preliminary concentration the marshals received private instructions, the path of which cannot be better expressed than in the following two quotations from Napoleon's correspondence:—

"Mon intention est de concentrer toutes mes forces sur l'extrémité de ma droite en laissant tout l'espace entre le Rhin et Bamberg entièrement dégarni, de manière à avoir près de 200,000 hommes réunis sur un même champ de bataille; mes premières marches mentent le cœur de la monarchie prussienne." (No. 10,929.

"Avec cette immense supériorité de forces réunis sur un espace si étroit, vous sentez que je suis dans la volonté de ne rien hasarder et de me préparer à un ennemi qui me voue ses espérances à l'issue, que ce serait une belle affaire que de se porter sur cette place (Dresden) en un bataillon carré de 200,000 hommes." (Soul, No. 10,941).

14. Advance of the Grande Armée.—On the 7th of October the Grande Armée lay in three parallel columns along the roads leading over the mountains to Hof, Schleiz and Kronach; the right flank, composed of the Grand Army (Ney), moving on the B.M., took its cavalry in rear, and behind these the VI. corps (Ney) at Pegasus; in the centre, Bernadotte's I. corps from Nordhalben, with the
III. corps (Davout) Lichtenfels; Guard and headquarters, Bamberg. The left column was composed of the V. (Lannes)

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at Hemmendorf, with the VII. (Augereau) extending south to the Main at Burgebrach.

Napoleon's object being surprise, all the cavalry except a few vedettes were kept back behind the leading infantry columns and these latter were ordered to advance, on the signal being given, in "masses of manoeuvre," so as to crush at once any outpost resistance which was calculated upon the time required for the deployment of ordinary marching columns. This order has never since found an imitator, but deserves attentive study as a masterpiece (see H. Bonnal, Manœuvre d'Iena).

To meet the impending blow the Prussians had been extended in a cordon along the great road leading from Mainz to Dresden, Blücher was at Erfurt, Rüchel at Gotha, Hohenlohe at Weimar, Saxons in Dresden, with outposts along the frontier. An offensive move into Franconia was under discussion, and for this purpose the Prussian staff had commenced a lateral concentration about Weimar, Jena and Naumburg when the storm burst upon them. The emperor gathered little from the confused reports of their purposeless manoeuvres, but, secure in the midst of his "battalion square" of 200,000 men, he remained quite indifferent, well knowing that an advance straight on Berlin must force his enemy to concentrate and fight, and as they would bring at most 127,000 men on to the battlefield the result could hardly be doubtful. On the 9th of October the cloud burst. Out of the forests which clothe the northern slopes of the Thuringer Wald the French streamed forth, easily overpowering the resistance of the Prussian outposts on the upper Saale, 1 and once the open country was reached the cavalry under Murat trotted to the front, closely followed by Bernadotte's corps as "general advance guard." The result of the cavalry scouting was however unsatisfactory. On the night of the ioth, the emperor was still unaware of the position of his principal foe, and Murat with Bernadotte behind him was directed on Gera for the 11th, the remainder of the army continuing along the roads previously assigned to them.

In the meanwhile, however, the Saxons had been moving from Naumburg through Gera on Jena, Hohenlohe was near Weimar, and all the other divisions of the army had closed in a march eastwards, the idea of an offensive to the southward which Napoleon had himself attributed to them having already disappeared.

Reaching Gera at 9 A.M. Murat reported the movement of the Saxons on the previous day, but admitting he could not follow them up on his own strength in pursuit. The traces of the Saxons were therefore lost, and Napoleon, little satisfied with his cavalry, authorized Lasalle to offer up to 6000 frs. reward for information of the Prussian point of concentration. At 1 A.M. of the 12th Napoleon issued his orders. Murat and Bernadotte via Zeitz to Naumburg; Davout (III. corps and a dragoon division) also to Naumburg; Lannes to Jena, Augereau following; Soult to Gera.

15. Prussian Movements.—In the meantime the Prussians were effecting their concentration. Rüchel, who with 15,000 men had been sent into the mountains as an advanced guard for the projected offensive, was recalled to Weimar, which he reached on the 13th. The main body were between Weimar and Apoklia during the 12th, and the Saxons duly effected their junction with Hohenlohe in the vicinity of Vierzehnheiligen, whilst the latter had withdrawn his troops all but some outposts from Jena to the plateau about Capellendorf, some 4 m. to the N.W. The whole army, upwards of 120,000 men, had been concentrated against Lannes and Augereau by the afternoon of the 13th, whilst Soult could only have intervened very late in the day, and Davout and Bernadotte were still too distant to reach the battlefield before the 14th. All the French corps, moreover, were so exhausted by their rapid marches over bad roads that the emperor actually ordered (at 1 A.M. on the 13th) a day of rest for all except Davout, Bernadotte, Lannes and Murat.

The Prussian headquarters, however, spent the 12th and 13th in idle discussion, whilst the troop commanders exerted themselves to obtain some alleviation for the suffering of their starving men. The defeats undergone by their outpost detachment had profoundly affected the nerves of the troops, and on the afternoon of the 11th, on the false alarm of a French approach, a panic broke out in the streets of Jena, and it took all the energy of Hohenlohe and his staff to restore order. On the morning of the 12th the Saxon commanding officers approached Hohenlohe with a statement of the famishing condition of their men, and threatened to withdraw them again to Saxony. Hohenlohe pointed out that the Prussians were equally badly off, but promised to do his best to help his allies. Urgent messages were sent off to the Commissary von Goethe (the poet), at Weimar for permission to requisition food and firewood. These requests, however, remained unanswered, and the Prussians and Saxons spent the night before the battle shivering in their miserable bivouacs.

16. The 13th of October.—During the early morning of the 13th the reports brought to Napoleon at Gera partially cleared up the situation, though the real truth was very different from what he supposed. However, it was evident that the bulk of the Prussians lay to his left, and instructions were at once despatched to Davout to turn westward from Naumburg towards Kösen and to bring Bernadotte with him if the two were still together. The letter, however, ended with the words "but I hope he is already on his way to Dornburg." Now Bernadotte
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had neglected to keep the emperor informed as to his whereabouts. He was still with Davout, but, concluding that he had missed an order directing him to Dornburg, he thought to conceal his error by assuming the receipt of the order evidently alluded to in the last words, and as a result he marched towards Dornburg, and his whole corps was lost to the emperor at the crisis of the next day's battle.

On the road from Gera to Jena Napoleon was met by intelligence from Lannes announcing his occupation of Jena and the discovery of Prussian troops to the northward. Knowing the emperor's methods, he wisely restrained the ardour of his subordinates and asked for instructions whether to attack or wait. The emperor rode forward rapidly, reached Jena about 3 P.M., and with Lannes proceeded to the Landgrafenberg to reconnoitre. From this point his view was, however, restricted to the immediate foreground, and he only saw the camps of Hohenlohe's left wing. At this moment the Prussians were actually on parade and ready to move off to attack, but just then the "evil genius" of the Prussian army, von Massenbach, an officer of the Headquarters Staff, rode up and claiming to speak with the authority of the king and commander-in-chief, induced Hohenlohe to order his troops back to camp. Of all this Napoleon saw nothing, but from all reports he came to the conclusion that the whole Prussian army was actually in front of him, and at once issued orders for his whole army to concentrate towards Jena, marching all night if need be. Six hours earlier his conclusion would have been correct, but early that morning the Prussians had been alarmed for the safety of their line of retreat on Berlitz by the presence of the French in Naumburg, decided to leave Hohenlohe and Rüchel to act as rear-guard, and with the main body to commence their retreat towards the river Unstrutt and the Eckhardtsberge where Massenbach had previously reconnoitred an "ideal" battlefield. This belief in positions was the cardinal principle of Prussian strategy in those days. The troops had accordingly commenced their march on the morning of the 13th, and now at 3 P.M. were settling down into bivouac; they were still but a short march from the decisive field.

17. Battle of Jena.—On the French side, Lannes' men were working their hardest, under Napoleon's personal supervision, to make a practicable road up to the Landgrafenberg, and all night long the remaining corps struggled through darkness towards the rendezvous. By daybreak on the 14th, the anniversary of Elchingen, upwards of 60,000 men stood densely packed on the narrow plateau of the mountain, whilst, below in the ravines on either flank, Soult on the right, and Augereau on the left, were getting into position. Fortunately a dense fog hid the helpless masses on the Landgrafenberg from sight of the Prussian gunners. Hohenlohe had determined to drive the French into the ravine at daybreak, but had no idea as to the numbers in front of him. For want of room, only a few Prussian battalions were sent forward, and these, delaying their advance till the fog had sufficiently lifted, were met by French skirmishers, and small columns, who rapidly overlapped their flanks and drove them back in confusion. Hohenlohe now brought up the remainder of his command, but in the meanwhile the French had poured across the neck between the Landgrafenberg and the main plateau, and the troops of Soult and Augereau were working up the ravines on either hand. In view of these troops the Prussian line, which had advanced faultlessly as if on parade, halted to prepare its bayonet attack by fire, and, once halted, it was found impossible to get them to go on again. The French who had thrown themselves into houses, copes, &c., picked off the officers, and the flanks of the long Prussian lines swayed and got into confusion. The rival artillery held each other too thoroughly to be able to spare attention to the infantry, whilst the Prussian cavalry, which had forgotten how to charge in masses of eighty or more squadrons, flitted away their strength in isolated efforts. By 10 A.M. the fourteen battalions which had initiated this attack were outnumbered by three to one, and drifted away from the battlefield. Their places were taken by a fresh body, but this was soon outnumbered and outflanked in its turn. By 2 P.M. the psychic moment had come, and Napoleon launched his guards and the cavalry to complete the victory and initiate the pursuit. Rüchel's division now arrived and made a most gallant effort to cover the retreat, but their order being broken by the torrent of fugitives, they were soon overwhelmed by the tide of the French victory and all organized resistance had ceased by 4 P.M.

Briefly summarized, the battle came to this—in four successive efforts the Prussians failed because they were locally outnumbered. This was the fault of their leaders solely, for, except for the last attack, local superiority was in each case attainable. Organization and tactics did not affect the issue directly, for the conduct of the men and their junior officers gave abundant proof that in the hands of a competent leader the "linear" principle of delivering one shattering blow would have proved superior to that of a gradual attrition of the enemy here, as on the battlefields of the Peninsula and at Waterloo, and this in spite of other defects in the training of the Prussian infantry which simultaneously caused its defeat on the neighbouring field of Auerstedt.

18. Battle of Auerstedt.—Here the superiority of French mobility, a consequence of their training and not necessarily of their system, showed its value most conclusively. Davout in obedience to his orders of the previous morning was marching over the Saale to Kösen, when his advanced guard came in contact with that of the Prussian main army. The latter with at least 50,000 men was marching in two columns, and ought therefore to have delivered its men into line of battle twice as fast as the French, who had to deploy from a single issue, and whose columns had opened out in the passage of the Kösen defile and the long ascent of the plateau above. But the Prussians
attacked at the old regulation speed of seventy-five paces to the minute, and the French manoeuvred at the quick or double of 120 or 150. The consequence was that the French always succeeded in reinforcing their fighting line in time to avert disaster. Nevertheless by mid-day their strength was well-nigh exhausted, whilst the Prussian reserve, eighteen battalions of guards under Kalckreuth, stood intact and ready to engage. But at the critical moment the duke of Brunswick fell mortally wounded, and Scharnhorst, his chief of the staff, was at the time absent on another part of the field. Meanwhile rumours from the battle-field at Jena, magnified as usual, began to reach the Prussians. For these the French had gathered from Kalckreuth, for when appealed to to attack with his eighteen battalions and win the day, he declined to move without the direct order of the commander-in-chief to do so, alleging that it was the duty of a reserve to cover the retreat and he considered himself personally responsible to the king for the guards entrusted to his care. Even then the day might have been saved had Blücher been able to find even twenty squadrons accustomed to gallop together, but the Prussian cavalry had been dispersed amongst the infantry commands, and at the critical moment it proved impossible for them to deliver a united and decisive attack.

Seeing further efforts hopeless, Scharnhorst in the duke's name initiated the retreat and the troops withdrew N.W. towards Buttelstedt, almost unmolested by the French, who this day had put forth all that was in them, and withstood victoriously the highest average punishment any troops of the new age of warfare had as yet endured. So desperate had been their resistance that the Prussians unanimously stated Davout's strength at double the actual figure. Probably no man but Davout could have got so much out of his men, but why was he left unsupported?

Bernadotte, we have seen, had marched to Dornburg, or rather to a point overlooking the ford across the Saale at the village of that name, and reached there in ample time to intervene on either field. But with the struggle raging before him he remained undecided, until at Jena the decision had clearly fallen, and then he crossed the river and arrived with fresh troops too late for their services to be required.

19. Prussian Retreat.—During the night the Prussians continued their retreat, the bulk of the main body to Sömmerda, Hiller's movement towards Nordhausen. The troops had got much mixed up, but as the French did not immediately press the pursuit home, order was soon re-established and a combined retreat was begun towards the mouth of the Elbe and Lübeck. Here help was expected to arrive from England, and the tide might yet have turned, for the Russian armies were gathering in the east. It was now that the results of a divorce of the army from the nation began to be felt. Instead of seizing all provisions and burning what they could not remove, the Prussian generals enforced on their men the utmost forbearance towards the inhabitants, and the fact that they were obeyed, in spite of the habits unchangeable and these may possibly have influenced the conduct of the campaign. Bernadotte's orders were re-established, and the French marched in pursuit were received with open arms, the people even turning their own wounded out of doors to make room for their French guests. Their servility awakened the bitterest contempt of their conquerors and forms the best excuse for the unparalleled severity of the French yoke. On the 26th of October Davout reached Berlin, having marched 166 m. in twelve days including two sharp rearguard actions, Bernadotte with his fresh troops having fallen behind. The inhabitants of Berlin, led by their mayor, came out to meet him, and the newspapers lavished adulation on the victors and abuse on the beaten army. On the 28th Murat's cavalry overtook the remnant of Prince Hohenlohe's army near Prenzlau (N. of Berlin) and invited its capitulation. Unfortunately the prince sent Massenbach to discuss the situation, and the latter completely lost his head. Murat boasted that he had 100,000 men behind him, and on his return Massenbach implored his chief to submit to an unconditional surrender, advice which the prince accepted, though as a fact Murat's horses were completely exhausted and he had no infantry whatever within call. Only Blücher now remained in the field, and he too was driven at length into Lübeck with his back to the sea.

20. Campaigns in Poland and East Prussia.—Hitherto the French had been operating in a rich country, untouched for half a century past by the ravages of war, but as the necessity for a campaign against the Russians confronted the emperor, he realized that his whole supply and transport service must be put on a different footing. After the wants of the cavalry and artillery had been provided for, there remained but little for horses and transport work. Executive orders to organize the necessary trains were duly issued, but the emperor seems to have had no conception of the difficulties the tracks—there were no metalled roads—of Poland were about to present to him. Moreover, it was one thing to issue orders, but quite another to ensure that they were obeyed, for they entailed a complete transformation in the mental attitude of the French soldier towards all that he had been taught to consider his duties in the field. Experience only can teach the art of packing wagons and the care of draught animals, and throughout the campaign the French troops and East Prussians learned these discipines for the first time. Horse fodder was broken down by thousands from over loading and unskilful packing.

21. The Russian Army formed the most complete contrast to the French that it is possible to imagine. Though clad, armed and organized in European fashion, the soldiers retained in a marked degree the traditions of their Mongolian forerunners, their transport wagons were in type the survival of ages of experience, and their care for their animals equally the result of hereditary habit. The intelligence of the men and regimental officers was very low, but on the other hand service was practically for life, and the regiment the only home the great majority had ever known. Hence obedience was instinctive and irrational almost undreamt of. Moreover, they were essentially a war-trained army, for even in peace time their long marches to and fro within the empire had most thoroughly inured them to hardship and privation. Napoleon might have remembered his own saying, "La misère est l'école du bon soldat." In cavalry they were weak, for the Russian does not take kindly to equitation and the horses were not equal to the accepted European standard of weight, while the Cossack was only formidable to strangers and wounded. Their artillery was numerous and for the most part of heavy calibre—18- and 24-pounders were common—but the strength of the army lay in its infantry, with its incomparable tenacity in defence and its blind confidence in the bayonet in attack. The traditions of Suvarov and his victories in Italy (see French Revolutionary Wars) were still fresh, but there was no longer a Suvarov to lead them.

22. Advance to the Vistula.—Napoleon had from the first been aware of the secret alliance between Prussia and Russia, sworn by their respective sovereigns over the grave of Frederick the Great, and this knowledge had been his principal reason for precipitating hostilities with the former. He remained, however, in complete ignorance of the degree of preparation attained on the Russian side, and since the seizure of Warsaw together with the control of the resources of Poland in men and material its occupation would afford, was the chief factor in his calculation, he turned at once to the eastward as soon as all further organized resistance in Prussia was ended by the surrender of Prenzlau and Lübeck. Scarcely leaving his troops time to restore their worn-out footgear, or for the cavalry to replace their jaded horses from captured Prussian resources, he set Davout in motion towards Warsaw on the 2nd of November, and the remainder of the army followed in successive echelons as rapidly as they could be despatched.

The cavalry, moving well in advance, dispersed the Russian depots and captured their horses, as far as the line of the Vistula, where at last they encountered organized resistance from the outposts of Lestocq's little corps of 15,000 men—all that was left of Frederick the Great's army. These, however, gave way before the threat of the advancing French and after a few trifling skirmishes. Davout entered Warsaw on the 30th of
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November, being followed by the V., IV. and Guard corps during the succeeding fortnight, whilst the VI. and VII. were echeloned to their left, and the VIII. (Mortier) and IX. (Jerome Napoleon) and X. (Lefebvre), all new formations since the outbreak of the war, followed some marches in the rear. Jerome's corps was composed of the Bavarians, Wurttembergers and Badeners. Behind these all Prussia was overrun by newly formed units, (3rd and 4th battalions) raised from depot companies, conscripts for 1807, and old soldiers rejoicing after sickness or wounds. Napoleon caused these to be despatched to the front immediately after their formation. He had much territory to occupy, and in the long march of an average 85 days, he considered that they could be organized, equipped and drilled en route.

23. Pultusk.—The Russians meanwhile had been moving slowly forward in two bodies, one under Bennigsen (50,000), the other under Buxhowden (25,000), and the French being at this time in Warsaw, they took up threatening positions about Pultusk, Plock and Prassnitz. From this triangle they harried the French communications with Berlin, and to secure a winter's rest for his men Napoleon determined to bring them to action. On the 23rd of December operations were commenced, but the difficulties of securing information and maintaining communication between the respective columns, so unlike what any of the French had previously encountered, led to a very partial success. The idea had been to induce the Russians to concentrate about Pultusk and, turning their position from its left, ultimately to cut them off from Russia, and if possible to surround them. But in this new and difficult country the emperor found it impossible to time his marches. The troops arrived late at their appointed positions, and after a stubborn rearguard action at Pultusk itself and indecisive fighting elsewhere (Soldau-Golyn) the Russians succeeded in retreating beyond the jaws of the French attack, and Napoleon for the first time found that he had exceeded the limit of endurance of his men. Indeed, the rank and file bluntly told him as much as he rode with the marching columns. Yielding to the inevitable, but not forgetting to announce a brilliant victory in a bulletin, he sent his troops into winter quarters along the Passarge and down the Baltic, enjoining on his corps commanders most strictly to do nothing to disturb their adversary.

24. Campaign of Eylau.—Bennigsen, now commanding the whole Russian army which with Lestocq's Prussians amounted to 100,000, also moved into winter quarters in the triangle Deutsch-Eylau-Osterode-Allenstein, and had every intention of remaining there, for a fresh army was already gathering in Russia, the 1st corps of which had reached Nur about 50 m. distant from the French right.

Unfortunately, Ney with his VI. corps about Gilgenberg had received the most poverty-stricken district in the whole region, and to secure some alleviation for the sufferings of his men he cautiously extended his cantonments till they came in contact with the Russian outposts. Apparently seeing in this movement a recommencement of hostilities, Bennigsen concentrated his troops towards his right and commenced an advance westwards towards Danzig, which was still in Prussian hands. Before his advance both Ney and Bernadotte (the latter, between Ney and the Baltic, covering the siege of Danzig) were compelled to fall back. It then became necessary to disturb the repose of the whole army to counter the enemy's intentions. The latter by this movement, however, uncovered his own command with Russia, and the emperor was quick to seize his opportunity. He received the information on the 28th of January. His orders were at once issued and compiled with with such celerity that by the 31st he stood prepared to advance with the corps of Ney, Ney's reserve and Auxonne, the Guard and the reserve cavalry (80,000 men on a front of 60 m.) from Myssenieck through Wollenberg to Gilgenberg; whilst Lannes on his right towards Ostrolenka and Lefebvre (X.) at Thorn covered his outer flank.

Bernadotte, however, was missing, and this time through no fault of his own. His orders and the despatch conveying Napoleon's instructions fell into the hands of the Cossacks, and just in time Bennigsen's eyes were opened. Rapidly renouncing his previous intentions, he issued orders to concentrate on Alletzen, but this point was chosen too far in advance and he was anticipated by Murat and Soult at that place on the 1st of February. He then determined to unite his forces at Jukendorf, but again he was too late. Soult and Murat attacked his rearguard on the 3rd, and learning from his Cossacks that the French corps were being directed so as to swing round and enclose him, he withdrew by a night march and ultimately succeeded in getting his whole army, with the exception of von Lestocq's Prussians, together in the strong position along the Alle, the centre of which is marked by Preussisch-Eylau. The opportunity for this concentration he owed to the time gained for him by his rearguard and Augereau, but for a day's delay was just long enough to induce the French columns to swing in to surround him, and the next day was thus lost to the emperor as his corps had to extend again to their manoeuvring intervals. The truth is that the days were too short and the roads too bad for Napoleon to carry out the full purpose his "general advanced guard" was intended to fulfil. It was designed to hold the enemy in position by the vigour of its attack, thus neutralizing his independent will power and compelling him to expend his reserves in the effort to rescue the troops engaged. But in forests and snowdrifts the French made such slow progress that no sufficient deployment could be made until darkness put a stop to the fighting. Thus, when late on the 7th of February 1807 Murat and Soult overtook the enemy near Eylau (g.r.) the fighting was severe but not prolonged. This time, however, Bennigsen, with over 60,000 men in position and 15,000 Prussians expected to arrive next morning, had no desire to avoid a battle, and deployed for action, his front protected by great batteries of guns, many of them of heavy calibre, numbering some 200 in all.

During the night Augereau and the Guards had arrived, and Ney and Davout were expected on either flank in the forenoon. This time the emperor was determined his enemy should not escape him, and about 8 a.m. ordered Soult and Augereau on the left and right respectively to assault the enemy, Murat and the Guards remaining in the centre as reserve. Napoleon's own forces thus became the "general advanced guard" for Ney and Davout, who were to close in on either side and deliver the decisive stroke. But here too the weather and the state of the roads operated adversely, for Ney came up too late, while Davout, in the full tide of his victorious advance, was checked by the arrival of Lestocq, whose corps Ney had failed to intercept,
and the attack of Augereau's corps (VII), made in a blinding snowstorm, failed with the appalling loss of over 40% killed and wounded. Augereau himself was severely wounded, and the remnants of his corps were subsequently distributed amongst the other corps. Bennigsen, however, drew off on Ney's arrival, and the French were too much exhausted to pursue him. Again the emperor had to admit that his troops could do no more, and bowing to necessity, he distributed them into winter quarters, where, however, the enterprise of the Cossacks, who were no strangers to snow and to forests, left the outposts but little repose.

A protracted period of rest followed, during which the emperor exerted himself unremittingly to re-equip, reinforce and supply his troops. Hitherto he had been based on the entrenched camp of Warsaw, but he had already taken steps to organize a new line of supply and retreat via Thorn, and this was now completed. At the same time Lefebvre was ordered to press the siege of Danzig with all vigour, and on the 5th of May, after a most gallant resistance, Kalckreuth, who redeemed here his failure of Auerstädt, surrendered. English assistance came too late. By the beginning of June the French had more than made good their losses and 210,000 men were available for field service.

25. Heilsberg and Friedland.—Meanwhile Bennigsen had prepared for a fresh undertaking, and leaving Lestocq with 20,000 Prussians and Russians to contain Bernadotte, who lay between Braunsberg and Spandau on the Passarge, he moved southwards on the 2nd, and on the 3rd and 4th of June he fell upon Ney, driving him back towards Guttstadt, whilst with the bulk of his army he moved towards Heilsberg, where he threw up an entrenched position. It was not till the 9th that Napoleon received tidings of his advance, and for the moment these were so vague that he contented himself by warning the remainder of his forces to be prepared to move on the 6th. The next day, however, all doubts were set at rest, and as the Russians advanced south of Heilsberg, he decided to wheel his whole force to the right, pivoting on the III. corps, and cut Bennigsen off from Königsberg and the sea. On the 8th the VI., VIII., and Guard corps, together with a new cavalry reserve corps under Lannes, in all 147,000, stood ready for the operation, and with Murat and Soulé, as general, advanced guard, who moved forward to re-drive the Russian outposts before them. Bennigsen, who was to have attacked Lestocq, again failed to receive his orders and took no part in the following operations.

Murat attacked the Russians, who had halted in their entrenched position, on the 11th and drove in their outposts, but did not discover the entrenchments. Meanwhile Soulé had followed with his infantry in close support, and the emperor himself arriving, ordered him to attack at once. Now the Russians uncovered their entrenchments, and in the absence of artillery prepared to fall upon Soulé's leading troops received most severe punishment. Fresh troops arriving were sent in to his support, but these also proved insufficient, and darkness alone put an end to the struggle, which cost the French 12,000 killed and wounded.

Bennigsen, however, learning that his right was threatened by the III. corps, and not having as yet completed his concentration, retraced in the night to Bartenstein, and the following day turned sharp to right towards Schippenbell. The emperor now pressed on towards Friedland, where he would completely control the Russian communications with Königsberg, their immediate base of supply, but for once the Russians out-marched him and covered their movement so successfully that for the next three days he seems to have completely lost all knowledge of his enemy's whereabouts. Lestocq in the meantime had been forced northwards towards Königsberg, and Soulé with Murat was in hot pursuit. The III., VI., VIII. and Guard corps followed the main road towards Königsberg, and the former had reached Mühhausen, the remainder were about Preussisch-Eylau, when Latour Maubourg's dragoons sent in intelligence which pointed to the presence of Bennigsen about Friedland. For the first time Napoleon was indeed the case. The Russians, after passing Schippenbell, had suddenly turned northwards, and on the evening of the 13th were taking up a strong position on the river Alle with Friedland as a centre.

What followed presents perhaps the finest instance of the Napoleonic method. The enemy lay direct to his right, and Murat, the IV. and III. corps had well overshadowed the mark. Lannes's reserve corps (cavalry), to whom Latour Maubourg reported, lay at Domnau some 10 m. to the right. The latter at once assumed the rôle of advanced guard cavalry and was ordered on down the central road of Friedland, Ney following in close support. Davout was turned about and directed on the enemy's right, and the VIII. corps (Mortier), the Guards and the reserve cavalry followed as main body. On the 14th (the anniversary of Marengo) Lannes carried out his rôle of fighting advanced guard or screen, the emperor's main body gradually came up, and the battle of Friedland (q.v.), notable chiefly for the display of the new artillery tactics of the French, ended with a general attack about 5 p.m. and the retreat of the Russians, after severe losses, over the Alle. Lestocq was, meanwhile, Chief of Staff and Bernadotte, commanding the 4th infantry corps, was pulled by the French method of skirmishers and columns, but as yet they had hardly reached the increased density necessary to be given to a line of battle to enable it to endure the prolonged nervous strain the new system of tactics entailed. Where formerly 15,000 men to the mile of front had been considered ample for the occupation of a position or the execution of an attack, double that number now often proved insufficient, and their front was broken before reinforcements could arrive. Much had been done to create an efficient staff, but though the idea of the army corps command was now no new thing, the senior generals entrusted with these commands were far from having attained the independence and initiative of their French opponents. Hence the extraordinary slowness of their manoeuvres, not because the Austrian infantry were bad marchers, but because the preparation and circulation of orders was still far behind the French standard. The light cavalry had been much improved and the heavy cavalry on the whole proved a fair match for their opponents.

26. The Austrian Army in 1809.—Ever since Austerlitz the Austrian officers had been labouring to reconstitute and reform their army. The archduke Charles was the foremost amongst many workers who had realized that numbers were absolutely needed to confront the new French methods. With these numbers it was impossible to attain the high degree of individual efficiency required for the old line tactics, hence they were compelled to adopt the French methods of skirmishers and columns, but as yet they had hardly reached the increased density necessary to be given to a line of battle to enable it to endure the prolonged nervous strain the new system of tactics entailed. Where formerly 15,000 men to the mile of front had been considered ample for the occupation of a position or the execution of an attack, double that number now often proved insufficient, and their front was broken before reinforcements could arrive. Much had been done to create an efficient staff, but though the idea of the army corps command was now no new thing, the senior generals entrusted with these commands were far from having attained the independence and initiative of their French opponents. Hence the extraordinary slowness of their manoeuvres, not because the Austrian infantry were bad marchers, but because the preparation and circulation of orders was still far behind the French standard. The light cavalry had been much improved and the heavy cavalry on the whole proved a fair match for their opponents.

27. The French Army.—After the peace of Tilsit the Grand Army was gradually withdrawn behind the Rhine, leaving only three commands, totalling 63,000 men, under Davout in Prussia, and it was the orders of the old Grande Armée and for a brief period Napoleon directed operations in person; and the Austrians took advantage of the dissemination and weakness of the French forces in Germany to push forward their own preparations with renewed energy.

But they reckoned without the resourcefulness of Napoleon. The moment news of their activity reached him, whilst still in pursuit of Sir John Moore, he despatched letters to all the members of the Confederation warning them that their contingents might soon be required, and at the same time issued a series of decrees to General Clarke, his war minister, authorizing him to call up the contingent of 1810 in advance, and directing him in detail to proceed with the formation of 4th and 5th battalions for all the regiments across the Rhine. By these
means Davout's, Oudinot's and Lefebvre's commands were augmented, whilst in February and March new corps were formed and rapidly pushed towards the front.

On his return from Spain, seeing war imminent, he issued a series of march orders (which deserve the closest study in detail) by which on the 15th of April his whole army was to be concentrated for manoeuvres between Regensburg, Landshut, Augsburg and Donauworth, and sending on the Guard in wagons to Strassburg, he despatched Berthier to act as commander-in-chief until his own arrival.

28. Austrian Offensive.—The position of assembly was excellently chosen, but unfortunately the Austrians took the initiative. On the 9th of April their main body of six corps crossed the Inn between Braunau and Passau, and simultaneously two additional corps moved from Pilsen in Bohemia on Regensburg. At this moment Davout was entering Regensburg with his leading troops, the remainder still some marches in rear, and it was evident that the whole concentration could no longer be carried out before the Austrians would be in a position to intervene. Berthier received the news while still on his way to the front, and quite failed to grasp the situation. Reaching Donauworth at 8 a.m. on the 13th of April, he ordered Davout and Oudinot to remain at Regensburg, whilst Lefebvre and Wrede (Bavarians) who had fallen back before the Austrians were directed to reoccupy Landshut. This was in direct contradiction with the instructions Napoleon had given him on the 28th of March in view of this very emergency. Davout obeyed, but remonstrated. On the 16th Berthier went on to Augsburg, where he learnt that Lefebvre's advanced troops had been driven out of Landshut, thus opening a great gap seventy-six miles wide between the two wings of the French army. Meanwhile Napoleon, who had left Paris at 4 a.m. on the 13th of April, was hastening towards the front, but remained still in ignorance of Berthier's doings until on the 16th at Stuttgart he received a letter from the Marshal dated the 15th, which threw him into consternation. In reply he immediately wrote: "You do not inform me what has rendered necessary such an extraordinary measure which weakens and divides my troops — and — I cannot quite grasp the meaning of your letter yet, I should have preferred to see my army concentrated between Ingolstadt and Augsburg, the Bavarians in the first line, with the duke of Danzig in his old position, until we know what the enemy is going to do. Everything would be excellent if the duke of Auerstädt had been at Ingolstadt and the duke of Rivoli with the Württembergers and Oudinot's corps at Augsburg, . . . so that just the opposite of what should have been done has been done" (C. N. to Berthier, Ludwigsburg, 16th April).

29. Napoleon takes command.—Having despatched this severe reprimand he hastened on to Donauworth, where he arrived at 4 a.m. on the 17th, hoping to find Berthier, but the latter was at Augsburg. Nevertheless, at 10 a.m. he ordered Davout and Oudinot to withdraw at once to Ingolstadt; and Lefebvre and Wrede on the right to support the movement. About noon Berthier returned and after hearing his explanation Massena received orders to move from Augsburg towards Ingolstadt.

"To-morrow will be a day of preparation spent in drawing closer together, and I expect to be able by Wednesday to manoeuvre against the enemy's columns according to circumstances."

Meanwhile the Austrians had approached so near that by a single day's march it would have been possible to fall upon and crush by superior numbers either wing of the French army, but though the Austrian light cavalry successfully covered the operations of the following troops they had not yet risen to a conception of their reconnoitering mission, and the archduke, in view of his opportunity and possessed, moreover, with the preconceived idea of uniting at Regensburg with the two corps coming from Bohemia, moved the bulk of his forces in that direction, leaving only a covering body against Davout altogether insufficient to retain him. Davout, however, had left a garrison of 1800 men in Regensburg, who delayed the junction of the Austrian wings until the 20th inst. and on the same day the emperor, having now reunited his whole right wing and centre, overwhelmed the covering detachments facing him in a long series of disconnected engagements lasting forty-eight hours, and the archduke now found himself in danger of being forced back into the Danube. But with the Bohemian reinforcements he had still four corps in hand, and Napoleon, whose intelligence service in the difficult and intersected country had lamentably failed him, had weakened his army by detaching a portion of his force in pursuit of the beaten right wing, and against the archduke's communications.

30. Eckmühl.—When, therefore, the latter, on the 22nd, marched southward to reopen his communications by the defeat of the enemy's army, always the surest means of solving this difficulty, he actually reached the neighbourhood of Eckmühl with a sufficient numerical superiority had it been prompt enough to seize his opportunity. But the French had been beforehand with him. Napoleon, who had personally taken part in the fighting of the previous day, and followed the pursuit as far as Landshut, whence he had despatched Massena to follow the retreating Austrians along the Isar, seems to have realized about 3 a.m. in the morning that it was not the main body of the enemy he had had before him, but only its left wing, and that the main body itself must still be northward towards Regensburg. Issuing orders to Davout, Oudinot and his cavalry to concentrate with all speed towards Eckmühl, he himself rode back along the Regensburg road and reached the battle-field just as the engagement between the two leading troops had commenced. Here the Austrians possessed mobility equal to that of the French the latter should have been overwhelmed in detail, but whilst the French covered 17 and 19 m. the Austrians only marched 10, and, owing to the defect in their tactical training alluded to above, the troops actually on the ground could not hold out long enough for their reserves to arrive. The retreat of the front lines involved the following ones in confusion, and presently the whole mass was driven back in considerable disorder. It seemed as if nothing could save the Austrians from complete disaster, but at the last moment, as the preparations of his corps commanders, who represented the excessive fatigue of their troops, stopped the pursuit, and the archduke made the most of his opportunity to restore order amongst his demoralized men, and crossed to the north bank of the Danube during the night.

31. Austrian Retreat.—On the following morning the French reached Regensburg and at once proceeded to assault its medieval walls, but the Austrian garrison bravely defended it till the last of the stragglers was safely across on the north bank. It was here that for the only time in his career Napoleon was slightly wounded. Then, leaving Davout to observe the archduke's retreat, the emperor himself rode after Massena, who with the major portion of the French army was following the Austrian weaker wing under Hiller. The latter was not so shaken as Napoleon believed, and turning to bay inflicted a severe check on its pursuers, who at Ebelsberg lost 4000 men in three
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fruitless assaults. Thus covered by his rearguard Hiller gained space and time to pass his troops over to the north bank of the Danube and remove all boats on the river. This left the direct road to Vienna open, and Napoleon, hoping to find peace in the enemy's capital, pushed the whole of his army down the right bank, and with Murat's cavalry entered the city on the 12th of May, after somewhat severe resistance lasting three days. Meanwhile the archduke and Hiller, both now unmolested, effected their junction in the vicinity of Wagram, picking the whole line of the Danube with their outposts and collecting all the boats.

Aspern and Wagram.—The reconnaissance of the river was at once taken in hand by the French upon their arrival in Vienna, and a point opposite the island of Lobau selected for this purpose. They then required four days to collect the necessary material to span the main branch of the river, here some 2000 yards across, and though Napoleon personally spurred on all to activity nearly four days more were required for its construction. It was not till the night of the 19th of May that orders for the passage were finally issued, and during the night the troops commenced to occupy the island of Lobau. Surprise, of course, was out of the question, but the Austrians did not attempt to dispute the passage, their object being to allow as many French as they felt they could deal with to pass over and then to fall on them. Thus on the 21st of May the bridge having been finished, Napoleon crossed the river the night of the 22nd with the complete defeat of Napoleon, the first ever inflicted upon him. The French retreated into the island of Lobau. By nightfall upwards of 100,000 men, encumbered with at least 20,000 wounded, were crowded together on the little island scarcely a mile square, short of provisions and entirely destitute of course of all hospital accessories. The question then arose whether the retreat was to be continued across the main stream or not, and for the second time in his career Napoleon assembled his generals to take their opinion. They, however, counseled retreat, but having heard them all replied, in substance: "If we leave here at all we may as well retire to Strassburg, for unless the enemy is held by the threat of further operations he will be free to strike at our communications and has a shorter distance to go. We must remain here and renew operations as soon as possible."

Immediate orders were despatched to summon every available body of troops to concentrate for the decisive stroke. Practically the lines of communication along the Danube were denuded of combatants, even Bernadotte being called up from Passau, and the viceroy of Italy, who driving the archduke Johann before him (action of Rashau) had brought up more than 36,000 men through Tirol, was disposed towards Pressburg within easy call. The arsenal of Vienna was ransacked for guns, stores and appliances, and preparations in the island pushed on as fast as possible. By the end of June 200,000 troops were stationed within call, and on the 4th July the French began to cross over to the left bank of the Danube. The events which followed are described under Wagram. The great battle at this place, fought on the 5th and 6th of July, ended in the retirement of the Austrians. The only other event which occurred before peace was made was an unimportant action at Znaym on the 11th of July.

The Russian War of 1812.—Whilst the campaign of 1809 had seriously shaken the faith of the marshals and the higher ranks in the infallibility of the emperor's judgment, and the slaughter of the troops at Aspern and Wagram had still further accentuated the opposition of the French people to conscription, the result on the fighting discipline of the army had, on the whole, been for good. The panics of Wagram had taught men and officers alike a salutary lesson.

Aware of the growing feeling against war in France, Napoleon had determined to make no allies, but bear the expenses of the coming campaign, but find the men as well, and he was so far master of Europe that of the 363,000 who on the 24th of June crossed the Niemen no less than two-thirds were Germans, Austrians, Poles or Italians. But though the battlefield discipline of the men was better, the discipline in camp and on the march was worse, for the troops were no longer eager to reach the battlefield, and marched because they were compelled, not of their own goodwill. The result was apparent in a sudden diminution in mobility, and a general want of punctuality which in the event very seriously, and delayed the course of the campaign. On the other hand, the Russians, once their fatherland was invaded, became dominated by an ever-growing spirit of fanaticism, and they were by nature too obedient to their natural leaders, and too well trained to the hardships of campaigning, to lose their courage in a retreat.

The Strategic Deployment.—By the middle of June 1812 the emperor had assembled his army along the line of the Niemen. On the extreme right stood the Austrian contingent under Schwarzenberg (34,000 men). Next, centring about Warsaw, which he had declared his chief base, were the troops of Napoleon's brother Jerome. Then the main army under Napoleon in person (220,000 men; with 80,000 more under the viceroy of Italy on his right rear); and on the extreme left at Tilsit a flanking corps, comprising the Prussian auxiliary corps and other Germans (in all 40,000 strong). The whole army was particularly strong in cavalry; out of the 450,000, 80,000 belonged to that arm, and Napoleon, mindful of the lessons of 1807, had issued the most minute and detailed orders for the supply service in all its branches, and the forwarding of reinforcements, no less than 100,000 men being destined for that purpose in three days.

Information about the Russians was very indifferent; it was only known that Prince Bagration with about 33,000 men lay grouped about Wolkowysk; Barclay de Tolly with 40,000 about Vilna; and on the Austrian frontier lay a small corps under Tormassov in process of formation, while far away on the Turkish frontiers hostilities with the sultan retained Tschitschagov with 50,000 more. Of the enemy's plans Napoleon knew nothing, but, in accordance with his usual practice, the position he had selected met all immediate possible moves.

Opening of the Campaign.—On the 24th of June the passage of the Niemen began in torrid heat which lasted for a few days. The main army, with the emperor in person, covered by Murat and the cavalry, moved on Vilna, whilst Jerome on his right rear at once threatened Bagration and covered the emperor's outer flank. From the very first, however, the inherent weakness of the vast army, and the vicious choice of time for the beginning of the advance, began to make itself felt. The crops being still green, and nothing else available as forage for the horses, an epidemic of colic broke out amongst them, and in ten days the mounted arms had lost upwards of one-third of their strength; men died of sunstroke in numbers, and serious straggling began. Still everything pointed to the concentration of the Russians at Vilna, and Jerome, who on the 5th of July had reached Grodno, was ordered to push on. But Jerome proved quite inadequate to his position, listening to the complaints of his subordinates as to want of supplies and even of pay; he spent four whole days in absolute inertia, notwithstanding the emperor's reprimands. Meanwhile the Russians made good their retreat—Barclay towards the entrenched camp of Drissa on the Dvina, Bagration towards Mohilev.

The emperor's first great coup thus failed. Jerome was replaced by Davout, and the army resumed its march, this time in the hope of surrounding and overwhelming Barclay, whilst Davout dealt with Bagration. The want of mobility, particularly in the cavalry, now began to tell against the French. With horses only just recovering from an epidemic, they proved quite unequal to the task of catching the Cossacks, who swarmed round them in every direction, never accepting an engagement but compelling a constant watchfulness for which nothing in their previous experience had sufficiently prepared the French.

The French army steadily retired, Barclay from Vilna via Drissa to Vitebsk, Bagration from Wolkowysk to Mohilev. Again arrangements were made for a Napoleonic battle; behind Murat's cavalry came the "general advanced guard" to attack and hold the enemy, whilst the main body and Davout were held available to swing in on his rear. Napoleon, however, failed to allow for the psychology
of his opponents, who, utterly indifferent to the sacrifice of life, refused to be drawn into engagements to support an advance or to extiricate a rearguard, and steadily withdrew from every position when the French gained touch with them. Napoleon found himself in a far worse position, numerically and materially, than at the outset of the campaign. Then he had stood with 420,000 men on a front of 160 m., now he had only 220,000 men on a front of 135; he had missed three great opportunities of destroying his enemy in detail, and in five weeks, during which time he had only traversed 200 m., he had seen his troops reduced numerically at least one-third, and, worse still, his army was now far from being the fighting machine it had been at the outset.

36. Smolensk.—Meanwhile the Russians had not lost a single gun and the moral of their men had been improved by the result of the many minor encounters with the enemy; further, the junction of Bagration and Barclay was now assured in the vicinity of Smolensk. Towards this place the French advance was now resumed, and the Russian generals at the head of a united force of 130,000 men marched forward to meet them. Here, however, the inefficiency of the Russian staff actually saved them from the disaster which must certainly have overtaken them had they realized their intention of fighting the French. The Russians marched in two columns, which lost touch of one another, and as it was quite impossible for either to engage the French single-handed, they both retired again towards Smolensk, where with an advanced guard in the town itself—which possessed an old-fashioned brick enceinte not to be breached by field artillery alone—the two columns reunited and deployed for action behind the unfordable Dnieper.

Murat and Ney as “general advanced guard” attacked the town in the morning of the 16th of August, and whilst they fought the main body was swung round to attack the Russian left and rear. The whole of the 17th was required to complete the movement, and as soon as its purpose was sufficiently revealed to the Russians the latter determined to retreat under cover of night. Their manœuvre was carried out with complete success, and then began a series of rearguard actions and nocturnal retreats which completely accomplished their purpose of wearing down the French army. The Russian government, however, failed to see the matter in its true light, and Marshal Kutusov was sent to the front to assume the chief command. His intention was to occupy a strong position and fight one general action for the possession of Moscow, and to this end he selected the line of the Kalatscha where the stream intersects the great Moscow road.

37. Borodino.—Here he was overtaken by Murat and Ney, but the French columns had straggled so badly that four whole days elapsed before the emperor was able to concentrate his army for battle and then could only oppose 128,000 men to the Russians' 110,000. About 6 a.m. the battle began, but Napoleon was suffering from one of those attacks of illness and depression which hitherto became such an important factor in his fate. Till about midday he followed the course of the action with his usual alertness; then he appears to have been overcome by a kind of stupor and allowed his marshals to fight by themselves. There was no final decisive effort as at Wagram and the Guard was not even called on to move. Ultimately the sun went down on an undecided field on which 25,000 French and 38,000 Russians had fallen, but the moral reaction on the former was far greater than on the latter.

38. Moscow.—Kutusov continued his retreat, and Murat with his see the matter in its true light, and Marshal Kutusov had fallen, but the moral reaction on the former was far greater than on the latter.

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Towards nightfall Napoleon reached the scene, and the Russians being now clear the troops began to enter, but already fires were observed in the farther part of the city. Napoleon passed the night in a house in the western suburb and next morning rode to the Kremlin, the troops moving to the quarters assigned to them, but in the afternoon a great fire began and, continuing for two days, drove the French out into the country again.
The emperor was now in the direst perplexity. Kutuzov was hovering on the outskirts of the city, his main body at Kaluga, some marches to the S.W., where he was in full communication with the richest portion of the empire; and now news arrived that St. Cyr, who had relieved MacDonald on his extreme left, had only 17,000 men left under arms against upwards of 40,000 Russians under Wittgenstein; and to the south Tschitschagov's army, being no longer detained on the Turkish frontier, peace having been made, was marching to join Tormassov about Brest-Litewski with forces which would bring the total of the two well over 100,000 men. Meanwhile Schwarzenberg's force opposing these had dwindled to a bare 30,000.

The French army was thus disposed almost in an equilateral triangle with sides of about 570 m., with 95,000 men at the apex at Moscow opposed to 120,000-30,000 about Brest; opposite 100,000, and 17,000 about Drissa confronted by 40,000, whilst in the centre of the base at Smolensk lay Victor's corps, about 30,000. From Moscow to the Niemen was 550 m. In view of this situation Napoleon on the 4th of October sent General Lauriston to the Russian headquarters to treat. Whilst waiting his return Murat was enjoined to skirmish with Kutusov, and the emperor himself worked out a scheme to assume the offensive with his whole army towards St. Petersburg, calling in Victor and St. Cyr on the way. This project was persisted with, until on the 18th of October the 24th of July (versus Tschitschagov in the cordon of Tarutino or Vinkovo). On the morning of the 19th the whole army moved out to accept this challenge, and the French were thoroughly worsted on the 24th in the battle of Maloyaroslavetz.

39. The Retreat from Moscovy.—Then began the celebrated retreat. It has generally been forgotten that the utter want of march discipline in the French, and not the climatic conditions, was responsible for the appalling disasters which ensued. Actually the frost came later than usual that year, the 27th of October, and the weather was dry and bracing; not till the 8th of November did the cold at night become sharp. Even when the Battle of Tarutino was fought on the 26th, the cold was not severe; for the slow and sluggish stream was not frozen over, as is proved by the fact that Eblé's pioneers worked in the water all through that terrible day. But the French army was already completely out of hand, and the degree to which the panic of a crowd can master even the strongest instinct of the individual is shown by the conduct of the fugitives who crowded over the bridges, treading hundreds under foot, whilst all the time the river was easily fordable and mounted men rode backwards and forwards across it to return to the actual sequence of events. Kutuzov had been very slow in exploiting his success of the 24th and indeed had begun the pursuit in a false direction; but about the 2nd of November, headquarters of the French being at Vyszma, the Cossacks became so threatening that the emperor ordered the army to march (as in Egypt) in hollow square. This order, however, appears only to have been obeyed by the Guards, with whom henceforward the emperor marched.

Kutuzov had now overtaken the French, but fortunately for them he made no effort to close with them, but hung on their flank, molesting them with Cossacks and picking up stragglers. Thus the wreck of the Grande Armée, now not more than fifty thousand strong, reached Smolensk on the 9th and there rested till the 14th. The march was then resumed, the Guard leading and Ney commanding the rearguard. Near Krasnoi on the 16th the Russian advanced guard tried to head the column off. Napoleon halted a whole day to let the army close up; and then attacked with his old vigour and succeeded in clearing the road, but only at the cost of leaving Ney and the rearguard to its fate. By a night march of unexampled daring and difficulty Ney succeeded in breaking through the Russian cordon, but when he regained touch with the main body at Orcha only 800 of his 6000 men were still with him (21st).

40. The Beresina.—From here Napoleon despatched orders to Victor to join him at Borisov on the Beresina. The cold now gave way and thaw set in, leaving the country a morass, and Information came that Tschitschagov from the south had reached Borisov. He now selected Visselovo as the point of passage and at 1 a.m. on the 23rd sent orders to Oudinot to march thither and construct bridges. In the execution of these orders Oudinot encountered the Russian advanced guard near Borisov and drove the latter back in confusion, though not before the bridges had destroyed the existing bridge there. This sudden reassertion of the offensive threw Tschitschagov into confusion. Thus time was gained for Victor also to come up and for Oudinot to construct the bridges at Studienka near the above-mentioned place, but a spot in many respects better suited for the purpose. Thither therefore Napoleon sent his pontonniers under General Eblé, but on their arrival they found that no preparations had been made and much time was lost. Meanwhile Victor, in doubt as to the real point of passage, had left the road to Studienka open to Wittgenstein, who had followed hard on his heels.

By 4 p.m. on the 26th the bridges were finished and the passage began, but not without resistance by the Russians, who were gradually closing in. The crossing continued all night, though interrupted from time to time by failures of the bridges. All day during the 27th stragglers continued to cross, covered by such combatants as remained under sufficient discipline to be employed. At 8 a.m. on the 28th, however, Tschitschagov and Wittgenstein moved forward on both banks of the river to the attack, but were held off by the splendid self-sacrifice of the few envoicable troops on both Napoleon's right and Victor's until about 1 p.m. the last body of regular troops passed over the bridges, and only a few thousand stragglers remained beyond the river.

The number of troops engaged by the French that day cannot be given exactly. Oudinot's and Victor's men were relatively fresh and may have totalled 20,000, whilst Ney can hardly have had more than 6000 of all corps fighting under him. How many were killed can never be known, but three days later the total number of men reported fit for duty had fallen to 8000 only.

41. Final Operations.—Henceforward the retreat of the army became practically a headlong flight, and on the 5th of December, hearing that the Cossacks were spread between Tauroggen (December 30) which deprived the French of their last support upon their left. Königsberg thus became untenable, and Murat fell back to Posen, where on the 10th of January he handed over his command to Eugène Beauharnais and returned to Paris.

The Russian pursuit practically ceased at the line of the Niemen, for their troops also had suffered terrible hardships and a period of rest had become an absolute necessity.

42. The War of Liberation.—The Convention of Tauroggen became the starting-point of Prussia's regeneration. As the news of the destruction of the Grande Armée spread, and the appearance of countless stragglers convinced the Prussian people of the reality of the disaster, the spirit generated by years of French domination burst out. For the moment the king and his ministers were placed in a position of the greatest anxiety, for they knew the resources of France and the boundless versatility of their arch-enemy far too well to imagine that the end of their
sufferings was yet in sight. To disavow the acts and desires of the army and of the secret societies for defence with which all north Germany was honeycombed would be to imperil the very existence of the monarchy, whilst an attack on the wreck of the Grand Army meant the certainty of a terrible retribution from the new armies now rapidly forming on the Rhine.

But the Russians and the soldiers were resolved to continue the campaign. They had determined upon an all-out bloody war, and were determined to commit the Rhine and the Rhine-Ruhr defile to the enemy. Yet it was apparent to the grand army of France that the enemy could not be overthrown in their own country. Moreover, Napoleon's policy was to be upheld as long as his army endured. He could not afford to lose the advantage of his numerical superiority.

43. Napoleon's Preparations.—Meanwhile the emperor in Paris had been organizing a fresh army for the reconquest of Prussia. Thanks to his having compelled his allies to fight for his battle, he had not as yet drawn heavily on the fighting resources of France, the actual percentage of men taken by the conscriptions during the years since 1806 being actually lower than that in force in continental armies of to-day. He had also created in 1811-1812 a new National Guard, organized in cohorts, and distinguished it from the regular army and for home defence only, and these by a skilful appeal to their patriotism and judicious pressure applied through the prefects, became a useful reservoir of half-trained men for new battalions of the active army. Levies were also made with rigorous severity in the states of the Rhine Confederation, and even Italy was called on for fresh sacrifices. In this manner by the end of March upwards of 200,000 men were moving towards the Elbe, and in the first fortnight of April they were duly concentrated in the angle formed by the Elbe and Saale, threatening on the one hand Berlin, on the other Dresden and the east.

44. Second Campaign of 1813.—The allies were aware of the gradual strengthening of their enemy's forces but themselves as yet unable to put more than 200,000 in the field, had left a small corps of observation opposite Magdeburg and along the Elbe to give timely notice of an advance towards Berlin; and with the bulk of their forces had taken up a position about Dresden, whence they had determined to march down the course of the Elbe and roll up the French from right to left. Both armies were very indifferently supplied with information, as both were without any reliable regular cavalry capable of piercing the screen of outposts with which each endeavoured to conceal his disposition, and Napoleon, operating in a most unfriendly country, suffered more in this respect than his adversaries.

45. Battle of Lützen.—About 9 a.m. on May 2nd he began an attack on the French advance guard in Lützen, whilst the remainder of his army was directed against Napoleon's right and rear only. As the French were moving off the heads of the French main body suddenly appeared, and at 11 a.m. Napoleon, then standing near the Gustavus Adolphus monument on the field of Lützen, heard the roar of a heavy cannonade to his right rear. He realized the situation in a moment, galloped to the new scene of action, and at once grouped his forces for decisive action—the gift in which he was supreme. Leaving the leading troops to repulse as best they might the furious attack of both Russians and Prussians, and caring little whether they lost ground, he rapidly organized for his own control a battle-reserve. At length when both sides were exhausted by their efforts he turned and retired over the Elbe, after blowing up the stone bridge. Case-shot fire the enemy's line and marched his reserve right through the gap. Had he possessed an adequate cavalry force the victory would have been decisive. As it was, the allies made good their retreat and the French were too exhausted for infantry pursuit.

Perhaps no battle better exemplifies the inherent strength of the emperor's strategy, and in none was his grasp of the battlefield more brilliantly displayed, for, as he fully recognized, "These Prussians have at last learnt something—they are no longer the woolly milk of France or of Dresden the Great, and on the other hand, the relative inferiority of his own men as compared with his veterans of Austerlitz called for far more individual effort than on any previous day. He was everywhere, encouraging and compelling his men—it is a legend in the French army that the persuasion even of the imperial boot was used upon some of his reluctant conscripts, and in the result his system was fully justified, as it triumphed even against a great tactical surprise."

46. Bautzen.—As soon as possible the army pressed on in pursuit. Ney being sent across the Elbe to turn the position of the allies at Dresden. This threat forced the latter to evacuate the town and retire over the Elbe, after blowing up the stone bridge across the river. Napoleon entered the town hard on their heels, but the broken bridge caused a delay of four days, there being no pontoon trains with the army. Ultimately on the 18th of May the march was renewed, but the allies had continued their retreat in leisurely fashion, picking up reinforcements by the way. Arrived at the line of the Spree, they took up and fortified a very formidable position about Bautzen (52°). Here, on the 20th, they were attacked, and after a two days' battle dislodged by Napoleon; but the weakness of the French cavalry conditioned both the form of the attack, which was less effective than usual, and the results of the victory, which were extremely meagre.

The allies broke off the action at their own time and retired in such good order that the emperor failed to capture a single trophy as proof of his victory. The enemy's escape annoyed him greatly, the absence of captured guns and prisoners reminded him too much of his Russian experiences, and he redoubled his demands on his corps commanders for greater vigour in the pursuit. This led the latter to push on without due regard to tactical precautions, and Blücher took advantage of their carelessness when at Hayingau (May 26), with some twenty squadrons of Russian cavalry, he surprised, routed, and almost destroyed Maisonne's division. The material loss inflicted on the French was not very great, but its effect in raising the moral of the raw Prussian cavalry and increasing their confidence in their old commander was enormous.

Still the allies continued their retreat and the French were unable to bring them to action. In view of the doubtful attitude of Austria, Napoleon became alarmed at the gradual lengthening of his lines of communication and opened negotiations. The enemy, having everything to gain and nothing to lose thereby, agreed finally to a six weeks' suspension of arms. This was perhaps the gravest military error of Napoleon's whole career,
and his excuse for it, "want of adequate cavalry," is the strongest testimony as to the value of that arm.

47. The Autumn Campaign.—As soon as a suspension of arms (to 15th of August) had been agreed to, Napoleon hastened to withdraw his troops from the dangerous position they occupied with reference to the passes leading over the mountains from Bohemia, for he entertained no doubt now that Austria was also to be considered as an enemy. Finally he decided to group his corps round Gruhlitz and Bautzen whence they could either meet the enemy advancing from Breslau or fall on his flank over the mountains if they attempted to force their way into Saxony by the valley of the Elbe. This latter manoeuvre depended, however, on his maintenance of Dresden, and to this end he sent the I. Corps up the Elbe to Pirna and Königstein to cover the fortifications of Dresden itself. His instructions on this point deserve the closest study, for he foresaw the inevitable attraction which a complete entrenched camp would exercise even upon himself, and, therefore, limited his engineers to the construction of a strong bridge head on the right bank and a continuous enceinte, broken only by gaps for counter attack, around the town itself.

Then he turned his attention to the plan for the coming campaign. Seeing clearly that his want of an efficient cavalry precluded all ideas of a resolute offensive in his old style, he determined to limit himself to a defence of the line of the Elbe, making only dashes of a few days' duration at any target the enemy might present.

Reinforcements had been coming up without ceasing and at the beginning of August he calculated that he would have 300,000 men available about Bautzen and 100,000 along the Elbe from Hamburg via Magdeburg to Torgau. With the latter he determined to strike the first blow, by a concentric advance on Berlin (which he calculated he would reach on the 4th or 5th day), the movement being continued thence to extricate the French garrisons in Küstrin, Stettin and Danzig. The moral effect, he promised himself, would be prodigious, and there was neither room nor food for these 100,000 elsewhere.

Towards the close of the armistice he learned the general situation of the allies. The crown prince of Sweden (Bernadotte), with his Swedes and various Prussian levies, 135,000 in all, lay in and around Berlin and Stettin; and knowing his former marshal well, Napoleon considered Oudinot a match for him. Blücher with about 95,000 Russians and Prussians was about Breslau, and Schwarzenberg, with nearly 180,000 Austrians and Russians, lay in Bohemia. In his position at Bautzen he felt himself equal to all his enemy's combinations.

48. Dresden.—The advance towards Berlin began punctually with the expiration of the armistice, but with the main army he himself waited to see more clearly his adversaries' plans. At length becoming impatient he advanced a portion of his army towards Blücher, who fell back to draw him into a trap. Then the news reached him that Schwarzenberg was pressing down the valley of the Elbe, and, leaving Macdonald to observe Blücher, he hurried back to Bautzen to dispose his troops to cross the Bohemian mountains in the general direction of Königstein, a blow which must have had decisive results. But the news from Dresden was so alarming that at the last moment he changed his mind, and sending Vandamme alone over the mountains, he hurried with his whole army to the threatened point. This march remains one of the most extraordinary in history, for the bulk of his forces moved, mainly in mass and across country, 90 m. in 72 hours, entering Dresden on the morning of the 27th, only a few hours before the attack of the allies commenced. For the events which followed see DRESDEN (battle).

Dresden was the last great victory of the First Empire. By noon on the 27th August the Austrians and Russians were completely beaten and in full retreat, the French pressing hard behind them, but meanwhile Napoleon himself again succumbed.
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to one of his unaccountable attacks of apparent intellectual paralysis. He seemed unaware of the vital importance of the moment, crouched shivering over a bivouac fire, and finally rode back to Dresden, leaving no specific orders for the further pursuit.

49. French Defeats.—The allies, however, continued to retreat, but unfortunately Vandamme, with his single column, unsupported, issued out of the left, around Dresden, and threw himself across their line of retreat near Kulm, and was completely overwhelmed by sheer weight of numbers (20th). In spite of this misfortune, Napoleon could claim a brilliant success for himself, but almost at the same moment news reached him that Oudinot at Grossbeeren near Berlin, and Macdonald on the Katzbach opposed to Blücher, had both been severely defeated.

50. Napoleon's Movements.—During the next two days the emperor examined his situation and dictated a series of notes which have been a puzzle to every strategical thinker ever since. In these he seems suddenly to have cut adrift from every principle the truth of which he had himself so brilliantly demonstrated, and we find him discussing plans based on hypothesis, not knowledge, and on the importance of geographical points without reference to the enemy's field army. From these reveries he was at length awakened by news which indicated that the consequences of Macdonald's defeat had been far more serious to the moral of that command than he had imagined. He immediately rode over to establish order, and his manner and violence were so improper that Caulaincourt had the greatest difficulty in concealing his embarrassment. His emperor again returned to Dresden, where for the rest of the month he remained in an extraordinary state of vacillation. On the 4th of October he again drew up a review of the situation, in which he apparently contemplated giving up his communications with France and wintering in and around Dresden, though at the same time he is aware of the distress amongst his men for want of food.

51. Campaign of Leipzig.—In the meanwhile Blücher, Schwarzenberg and Bernadotte were working round his flanks. Ney, who had joined Oudinot after Grossbeeren, had been detached to cover the Schwarzenberg's left flank. Wellington, hoping to cross the Elbe, was on the move, but Napoleon, in his impetuous movement, had hastened the advance of his troops and in consequence the French made another attempt to throw him from the road, and this time saw the emperor decided to throw the bulk of his force on Blücher, and, with his usual sureness and celerity, but whilst the French moved on Wittenberg, Blücher was marching to his right, indifferent to his communications as all Prussia lay behind him.

This move on the 14th brought him into touch with Bernadotte, and now a single march forward of all three armies would have absolutely isolated Napoleon from France; but Bernadotte's nerve failed him, for on hearing of Napoleon's threat against Wittenberg he decided to retreat northward, and not all the persuasions of Blücher and Gneisenau could move him. Thus if the French movement momentarily ended in a blow in the air, it was indirectly the cause of their ultimate salvation.

52. The "Battle of the Nations."—On the 19th Napoleon concentrated his forces to the east of Leipzig, with only a weak detachment to the west, and in the evening the allies were prepared to attack him. Schwarzenberg, with 160,000 men available at once and 60,000 on the following day; Blücher had about 60,000, but Bernadotte now could not arrive before the 20th.

Napoleon prepared to throw the bulk of his force upon Schwarzenberg and massed his troops south-east of the town, whilst Schwarzenberg marched concentrically against him down the valley of the Elster and Pleisse, the mass of his troops on the right bank of the latter and a strong column under Gudlay on the left working round to join Blücher on the north. The fighting which followed was most obstinate, but the Austrians failed to make any impression on the French positions, and indeed Gudlay felt himself compelled to withdraw to his former line. On the other hand, Blücher carried the village of Möckern and came within a mile of the gates of the town. During the 19th there was only indecisive skirmishing, Schwarzenberg waiting for his reinforcements coming up by the Dresden road, Blücher for Bernadotte to come in on his left, and by some extraordinary oversight Gudlay was brought closer in to the Austrian centre, thus opening for the French their line of retreat towards Erfurt, and no information of this movement appears to have been conveyed to Blücher. The emperor when he became aware of the movement, sent the IVth Corps to Lindenau to keep the road open. Bernadotte came up and closed the gap to the N.E. of the town between Blücher and the Austrians. At 2 p.m. the Saxons, who had remained faithful to Napoleon longer than his other German allies, went over to the enemy. All hope of saving the battle had now to be given up, but the French covered their retreat obstinately and by daybreak next morning one-half of the army was already flying out along the road to Erfurt which had so fortunately been left for them.

53. Retreat of the French and Battle of Hanau.—It took Blücher time to extricate his men, who were well protected, and it had been his plan within which the battle had thrown them, and the garrison of Leipzig and the troops left on the right bank of the Elster still resisted obstinately—hence no direct pursuit could be initiated and the French, still upwards of 100,000 strong, moving rapidly, soon gained distance enough to be reformed. Blücher followed by parallel and inferior roads on their northern flank, but Schwarzenberg knowing that the Bavarians also had forsaken the emperor and were marching under Wrede, 50,000 strong, to intercept his retreat, followed in a most leisurely fashion. Blücher did not succeed in overtaking the French, but the latter, near Hanau, found their way barred by Wrede with 50,000 men and over 100 guns in a strong position.

To this fresh emergency Napoleon and his army responded in most brilliant fashion. As at Krasnoi in 1812, they went straight for their enemy and after one of the most brilliant series of artillery movements in history, directed by General Drouot, they marched right over their enemy, practically destroying his whole force. Henceforward their march was un molested, and they reached Mainz on the 5th of November.

54. The Defensive Campaign.—When the last of the French troops marched across the Rhine, divided counsels made their appearance at the headquarters of the allies. Every one was weary of the war, and many felt that it would be unwise to push Napoleon and the French nation to extremes.
Hence a prolonged halt arose, utilized by the troops in renewing their equipment and so forth, but ultimately the Young German party, led by Blücher and the principal fighting men of the army, triumphed, and on the 1st of January 1814 the Silesian army (50,000) began its passage of the Rhine at Kaub. They were to be supported by Schwarzenberg with 200,000 men, who was to advance by Basel and Neu Breisich to the south, and Bernadotte with the Northern army, about 120,000, was to move in support on the right flank through the Netherlands and Lauen; this force was not yet ready and did not, in fact, reach the latter place till March.

To meet these forces the emperor could not collect 200,000 men in all, of whom upwards of 100,000 were held by Wellington on the Spanish frontier, and 20,000 more were required to watch the debouches from the Alps. Hence less than 50,000 remained available for the east and north-eastern frontier. If, however, he was weak in numbers, he was now again operating in a friendly country, able to find food almost everywhere and practically indifferent as to his communications.

On the 25th of January, Blücher entered Nancy, and, moving rapidly up the valley of the Moselle, was in communication with the Austrian advanced guard near La Rothière on the afternoon of the 26th, but his headquarters were surprised and he himself nearly captured by a sudden rush of French troops, and he learnt at the same time that the emperor in person was at hand. He accordingly fell back a few miles next morning to a strong position covering the exits from the Bar-sur-Aube defile. There he was joined by the Austrian advance guard, and together they decided to accept battle—indeed they had no alternative, as the roads in rear were so choked with traffic that retreat was out of the question. About noon the 2nd of February Napoleon attacked them, but the weather was terrible, and the ground so heavy that his favourite artillery, the mainstay of his whole system of warfare, was useless and in the drifts of snow which at intervals swept across the field, the columns lost their direction and many were severely handled by the Cossacks. At nightfall the fighting ceased and the emperor retired to Lesmont, and thence to Troyes, Marmont being left to observe the enemy.

55. Montmirail.—Owing to the state of the roads, more perhaps to the extraordinary lethargy which always characterized Schwarzenberg's headquarters, no pursuit was attempted. But on the 4th of February Blücher, chafing at this inaction, obtained the permission of his own sovereign to transfer his line of operations to the valley of the Marne; Pahlen's corps of Cossacks were assigned to him to cover his left and maintain communication with the Austrians.

Believing himself secure behind this screen, he advanced from Vitry along the roads leading down the valley of the Marne, with his columns widely separated for convenience of subsistence and shelter—the latter being almost essential in the terrible weather prevailing. Blücher himself on the night of the 7th was at Sézanne, on the exposed flank so as to be nearer to his sources of intelligence, and the rest of his army were distributed in four widely scattered corps at or near Épernay, Montmirail and Étôges; reinforcements also were on their way to join him and were then about Vitry.

In the night his headquarters were again surprised, and he learnt that Napoleon himself with his main body was in full march to fall on his scattered detachments. At the same time he heard that Pahlen's Cossacks had been withdrawn forty-eight hours previously, thus completely exposing his flank. He himself retreated towards Étôges endeavouring to rally his scattered detachments, but Napoleon was too quick for him and in three successive days he defeated Sacken at Montmirail, York at Champ Aubert and Blücher and his main body at Étôges, pursuing the latter towards Vertus. These disasters compelled the retreat of the whole Silesian army, and Napoleon, leaving Mortier and Marmont to deal with them, hurried back to Troyes with his main body to strike the flank of Schwarzenberg's army, which had meanwhile begun its leisurely advance, and again at Mormant on the 17th of February, Montceau the 18th and Méry the 21st, he inflicted such heavy punishment upon his adversaries that they fell back precipitately to Bar-sur-Aube.

56. Lauen.—In the meantime Blücher had rallied his scattered forces and was driving Marmont and Mortier before him. Napoleon, as soon as he had disengaged himself of Schwarzenberg, counter-marched his main body and moving again by Sézanne, fell upon Blücher's left and drove him back upon Soissons. This place had been held by a French garrison, but had capitulated only twenty-four hours beforehand, a fact of which Napoleon was naturally unaware. The Silesian army was thus able to escape, and marching northwards combined with Bernadotte at Lauen—this reinforcement bringing the forces at Blücher's disposal up to over 100,000 men.

On the 7th of March Napoleon fell upon the advance guard of this force at Craonne and drove it back upon Lauen, where a battle took place on the 9th. Napoleon was here defeated, and with only 30,000 men at his back he was compelled to renounce all ideas of a further offensive, and he retired to rest his troops to Reims. Here he remained unmolested for a few days, for Blücher was struck down by sickness, and in his absence nothing was done. On the 14th of March, however, Schwarzenberg, becoming aware of Napoleon's withdrawal to Reims, again began his advance and had reached Arcis-sur-Aube when the news of Napoleon's approach again induced him to retreat to Brienne.

57. The Allies March on Paris.—Thus after six weeks' fighting the allies were hardly more advanced than at the beginning. Now, however, they began to realize the weakness of their opponent, and perhaps actuated by the fear that Wellington from Toulouse might, after all, reach Paris first, they determined
to march to Paris (then an open city), and let Napoleon do his worst to their communications. Actually this was exactly what he was preparing to do. He had determined to move eastward to St. Dizier, rally what garrisons he could find, and raise the whole country against the invaders, and had actually started on the execution of this plan when his instructions fell into the enemy's hands and his projects were exposed. Regardless of the threat, the allies marched straight for the capital. Marmont and Mortier with what troops they could rally took up a position on Montmartre heights to oppose them, but seeing further resistance to be hopeless they gave way on the 31st of March, just as Napoleon, with the wreck of the Guards and a mere handful of other detachments, was hurrying across the rear of the Austrians towards Fontainebleau to join them.

This was the end of the First Empire. The story of the Waterloo Campaign is told under its own heading.

The Military Character of Napoleon.

No military career has been examined more often and more freely than that of Napoleon. Yet even so the want of complete documentary evidence upon which to base conclusions has vitiated all but the most recent of the countless monographs and histories that have appeared on the subject. Fortunately the industry and ability of the military history section of the French General Staff have rendered available, by the publication of the arguments and particularly of several of his campaigns, a mass of information which, taken in conjunction with his own voluminous correspondence, renders it possible to trace the growth of his military genius with a reasonable approach to accuracy. Formerly we could only watch the evolution of his powers of organization and the purely psychic gifts of resolution and command. The actual working of his mind towards that strategic and tactical ascendency that rendered his presence on the battlefield, according to the testimony of his opponents, equal to a reinforcement of 49,000 men, was entirely indiscernible.

The history of his youth reveals no special predilection for the military service—the best of his mind was political far more than military, but unlike the politicians of his epoch he consistently applied scientific and mathematical methods to his theories, and desired above all things a knowledge of facts in their true relation to one another. His early military education was the best and most practical then attainable, primarily because he had the good fortune to come under the influence of men of exceptional ability—Baron du Kellé, Bois Roger and others. From them he derived a sound knowledge of artillery and fortification, and particularly of the art of maneuver, the latter was destined to prove of inestimable service to him in his first campaigns of 1794–95 and 1796. In these, as well as in his most dramatic success of Marengo in 1800, we can discern no trace of strategical innovation. He was simply a master of the methods of his time. Ceaseless industry, energy and conspicuous personal gallantry were the principal factors of his brilliant victories, and even in 1805 at Ulm and Austerlitz it was still the excellence of the tactical instrument, the army, which the Revolution had bequeathed to him that essentially procured the success.

Meanwhile the mathematical mind, with its craving for accurate data on which to found its plans (the most difficult of all to obtain under the conditions of warfare), had been searching for expedients which might serve him to better purpose, and in 1805 he had recourse to the cavalry screen in the hope of such results. This proved a palliation of his difficulty, but not a solution. Cavalry can only observe, it cannot hold. The facts as to the position of an opponent accurately observed and correctly reported at a given moment, afford no reliable guarantee of his position at the hour, when the orders based on this information enter upon execution. This can only be calculated on the ground of reasonable probability as to what it may be to the best interest of the adversary to attempt. But what may seem to a Napoleon the best course is not necessarily the one that suggests itself to a mediocre mind, and the greater the gulf which separates the two minds the greater the uncertainty which must prevail on the side of the abler commander.

It was in 1806 that an improved solution was first devised. The general advanced guard of all arms now followed immediately behind the cavalry screen and held the enemy in position, while the remainder of the army followed at a day's march in a "bataillon carré" ready to manoeuvre in any required direction. The full reach of this discovery seems as yet scarcely to have impressed itself upon the emperor with complete conviction, for in the succeeding campaign in Poland we find that he twice departed from this form—at Pultusk and Heilsberg—and each time his enemy succeeded in escaping him. At Friedland, however, his success was complete, and henceforth the method recurs on practically every battlefield. When it fails it is because its inventor himself hesitates to push his own conception to its full development (Eckmühl 1809, Borodino 1812). Yet it would seem that this invention of Napoleon's was intuitive rather than reasoned; he never communicated it in its entirety to his marshals, and seems to have been only capable of exercising it either when in full possession of his health or under the excitement of action. Thus we find him after the battle of Dresden— itself a splendid example of its efficacy—suddenly reverting to the terminology of the school in which he had been brought up, which he himself had destroyed, only to revive again in the most brilliant and handle his forces strategically with all his accustomed brilliancy.

In 1814 and in 1815 in the presence of the enemy he again rises supremely to each occasion, only to lapse in the intervals even below the level of his old opponents; and that this was not the consequence of temporary depression naturally resulting from the accumulated load of his misfortunes, is sufficiently shown by the downright puerility of the arguments by which he seeks to justify his own successes in the St. Helena memoirs, which one may search in vain for any indication that Napoleon was himself aware of the magnitude of his own discovery. One is not surprised at the chronicler's inability to understand the brain a dual capacity—one the normal and reasoning one, developing only the ideas and conceptions of his contemporaries, the other intuitive, and capable only of work under abnormal pressure. At such moments of crisis it almost excelled human comprehension; the mind seems to have gathered to itself and summed up the balance of all human passions arranged for and against him, and to have calculated with unerring exactitude the consequences of each decision.

A partial explanation of this phenomenon may perhaps be found in the economy of nervous energy his strategic method entailed to him. May 1806 was ready to fight whenever his enemy might stand or move to meet him, his mind was relieved from all the hesitations which necessarily arise in men less confident in the security of their designs. Hence, when on the battlefield the changing course of events left his antagonists mentally exhausted, he was able to face them with will power neither bound nor broken. But this only explains a portion of the mystery that surrounds him, and which will make the study of his career the most fascinating to the military student of all times.

Amongst all the great captains of history Cromwell alone can be compared to him. Both, in their powers of organization and the mastery of the tactical potentialities of the weapons of their day, were immeasurably ahead of their times, and both also understood to the full the strategic art of binding and restraining the independent willpower of their opponents, an art of which Marlborough and Frederick, Wellington, Lee and Moltke do not seem even to have glimpsed the fringe.

(F.N.M.)

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NAVAL OPERATIONS

The French navy came under the direct and exclusive control of Napoleon after the 18th Brumaire. At the close of 1799 (see French Revolutionary Wars) he had three purposes to serve by the help of his fleet: the relief of the French garrison besieged by the British forces in Malta; the reinforcement of the army he had left in Egypt; and the distraction of Great Britain by the threat of invasion of England across the Channel, or of Ireland. The deficiencies both in number and in quality of its naval resources doomed him to fail in all three. Though he had control of what remained of the navies of Holland and Spain, as well as of the French, he was outnumbered at every point, while the efficiency of the British fleet gave it a majority which doubled its material superiority. All Napoleon’s efforts to support his troops in Malta and Egypt were necessarily made under the hampering obligation to evade the British forces barring the road. The inevitable result was that only an occasional blockade-runner could succeed in escaping detection and attack. The relief thus brought to Malta and Egypt was not sufficient. In February 1800, the “Généraux” (“74), one of the few ships which escaped from the Nile, sailed from Toulon with three corvettes, under Rear-admiral Perrée, to relieve Malta. On the 18th she was sighted by the blockading squadron, surrounded and captured. The British were unable to carry the Nile, where were 87 ships, the “Guillaume Tell” (“80), and two frigates, the “Diane” and the “Justice.” On the 29th of July the “Guillaume Tell” endeavoured to slip out in the night. She was sighted, pursued and overpowered, after a singularly gallant resistance. The frigates made an attempt to get off on the 24th of August, but only the “Justice,” a solitary survivor of the squadron which fought at the Nile, reached Toulon. Malta, starved out by the British fleet, surrendered on the 4th of September 1800. Very similar was the fate of the efforts to reach and reinforce the army of Egypt. In the spring of 1800, Bonaparte stopped the relieving forces at their point of departure, or baffled, when they did not take them, at their landingfall. A squadron of seven sail of the line, under Admiral Ganteaume, succeeded in slipping out of Brest, when a gale had driven the British blockading force off the coast. Ganteaume met with some measure of success in capturing isolated British men-of-war, one of them being a 74, the “Swiftsure.” But he failed to give effectual help to the Egyptian army. He sailed on the 23rd of January 1801, entered the Mediterranean and, his squadron being in a bad condition, steered for home, and was round up by the British in the Ceuta Roads. On the 10th of March he sailed again for Egypt, but was again driven back by the same causes on the 5th of April. On the 25th he was ordered out once more. Three of his ships had to be sent back as unfit to keep the sea. With the other four he reached the coast of Egypt, on the 7th of May, only to sight a powerful British force, and to be compelled to escape to Toulon, which he did not reach till the 22nd of July. The French in Egypt were in fact beaten before he reached the coast. At the beginning of 1801, a British naval force, commanded by Lord Keith, had sailed from Gibraltar, establishing an army of 18,000 men under General Abercromby. It reached Malta, with Sir J. J. Keith, on the 31st of January, to arrange a co-operation with the Turks, and after some delay the army was transported and landed in Egypt, on the 7th and 8th of March. Before the end of September the French army was reduced to capitulation. In the interval another effort to carry help to it was made from Toulon. On the 13th of June 1801 Rear-admiral Linois left Toulon with three sail of the line, to join a Spanish squadron at Cadiz and go on to Egypt. In the straits he was sighted by the British squadron under Sir J. Saumarez, and driven to seek the protection of the Spanish batteries at Algeciras. On the 6th of July he beat off a British attack, capturing the “Hannibal,” 74. On the 9th a Spanish squadron came to his assistance, and the combined force steered for Cadiz. During the night of the 12th/13th of July they were attacked by Sir J. Saumarez. Two Spanish three-deckers blew up, and a 74-gun ship was taken. The others were blockaded in Cadiz. The invasion scheme was vigorously pushed after the 3rd of March 1801. Flat-bottomed boats were gradually collected at Boulogne. Two attempts to destroy them at anchor, though directed by Nelson himself, were repulsed on the 13th and 19th. But it required no more than a threat made for diplomatic purposes. On the 1st of October 1801 an armistice was signed in London, and the Peace of Amiens followed, on the 27th of March 1802. (For the operations in the Baltic in 1801, see Copenhagen, Battle of.)

The Peace of Amiens proved to be only an uneasy truce, and it was succeeded by open war, on the 18th of May 1803. From that date till about the middle of August 1805, a space of some two years and two months, the war took the form of a most determined attempt on the part of Napoleon to carry out an invasion of Great Britain, met by the counter-measures of the British government. The scheme of invasion was based on the Boulogne flotilla, a device inherited from the old French royal government, through the Republic. Its object was to throw a great army ashore on the coast between Dover and Hastings. The preparations were made on an unprecedented scale. The Republic had collected some two hundred and forty vessels. Under the direction of Napoleon ten times as many were equipped. They were divided into: prames, ship-rigged, of 35 metres long and 8 wide, carrying 13 guns; chaloupes cannonières, of 24 metres long and 5 wide, carrying 5 guns and 100 men; and bateau cannoniers, of 30 metres long by 1-56 wide, carrying 2 guns and more boats. All were built to be rowed, were flat-bottomed, and of shallow draft so as to be able to navigate close to the shore, and to take the ground without hurt. They were built in France and the Low Countries, in the coast towns and the rivers—even in Paris—and were collected gradually, shore batteries both fixed and mobile being largely employed to cover the passage. A vast sum of money and the labour of thousands of men were employed to clear harbours for them, at and near Boulogne. The Boulogne flotilla met the coast more impossible for the British line-of-battle ships, or even large frigates, to press the attack on them. Smaller vessels they were able to beat off and so, in spite of the activity of the British cruisers and of many sharp encounters, the concentration was effected at Boulogne, where an army of 130,000 was encamped and was incessantly practised in embarking and disembarking. Before the invasion was taken in hand as a serious policy, there had been at least a profession of a belief that the flotilla could push across the Channel during a calm. Experience soon showed that when the needful allowance was made for the tide, it was impossible to bring them out of harbour (two tides) and for the influence which the Channel currents must have upon their speed, it would be extremely rash to rely on a calm of sufficient length. Napoleon therefore came
early to the conclusion that he must bring about a concentration of his seagoing fleet in the Channel, which would give him a temporary command of its waters.

He had a squadron at Brest, ships at L'Orient and Rochefort, some of his vessels had taken refuge at Ferrol on their way back from San Domingo when war broke out, one was at Cadiz, and he had a squadron at Toulon. All these forces were watched by British blockading squadrons. The problem was to bring them together before the British fleet could be concentrated to meet them. Napoleon's solution grew, as time went on and circumstances changed, in scope and complexity. In July 1804, he ordered the new ships of the line of the Channel to lay in the estuaries of the river, in order to take advantage of the opportunity when Nelson, who was in command of the blockade, was driven off by a northerly gale, to put to sea, with 10 sail of the line, pick up the French ship in Cadiz, join Villeneuve who was in the Aix roads, and then effect a junction with Ganteaume and the 21 sail of the line at Brest. He hoped that if the British ships in the North Sea concentrated with the squadron in the Channel, he would be able to make use of Dutch vessels from the Texel. The death of Latouche Tréville, 20th of August 1804, supplied an excuse for delay. He was succeeded by Villeneuve, who had been selected as the most suitable person for the command of the fleet without Tréville, and began laying elaborate plans by which French vessels were to slip out and sail for distant seas, to draw the British fleet after them, and then return to concentrate in the Channel. A further modification was introduced by the end of 1804. Spain, which was bound by treaty to join Napoleon, was allowed to preserve a show of neutrality by paying a monthly subscription. The British government, treating this as a hostile action—as it was—seized the Spanish treasure ships on their way from America, near Cape Santa Maria, on the 5th of October 1804, and Spain declared war on the 12th of December. New plans were now made including the co-operation of the Spanish fleet. Amid all the variation in their details, and the apparent confusion introduced by Napoleon's habit of suggesting alternatives and discussing probabilities, and in spite of the preparations ostensibly made for an expedition to Ireland, which was to have sailed from Brest and to have carried 30,000 troops commanded by Augereau, the real purpose of Napoleon was neither altered nor concealed. He worked to produce doubt and confusion in the mind of the British government by threats and attacks on its distant possessions, which should lead it to scatter its forces. On the other hand, he unhesitatingly carried out, however, securing the co-operation, or effecting the purpose he had in view. On the 11th of January 1805 Admiral Missiessy left Rochefort with 5 sail of the line, undetected by the British forces on the coast. Missiessy carried out a successful voyage of commerce-destroying, and returned safely to Rochefort on the 20th of May, from the West Indies. But the force sent in pursuit of him was small, and the British government was not deceived into weakening its hold on the Channel. It was in fact well supplied with information by means of the spy service directed by an exiled French royalist, the count d'Antraigues, who was established at Dresden as a Russian diplomatic agent. Through his correspondents in Paris, some of whom had access to Napoleon's papers, the British government was able to learn the emperor's real intentions. The blockade of Brest was so strictly maintained that Ganteaume was allowed no opportunity to get to sea. Villeneuve, who was to have co-operated with Missiessy, did indeed leave Toulon, at a moment when Nelson, whose policy it was to encourage him to come out by not staying too near the port, was absent, on the 17th of January 1805. The British admiral, when informed that the French were at sea, justified Napoleon's estimate of his probable course in such a contingency, by making a useless cruise to Egypt. But Villeneuve's ill-appointed ships, manned by raw crews, suffered loss of spars in a gale, and he returned to Toulon on the 21st. His last start came when he sailed, unseen by Nelson, on the 30th of March. Aided by lucky changes of wind, he reached Cadiz, was joined by 1 French and 6 Spanish ships under Admiral Gravina, which, added to the 11 he had with him, gave him a force of 18 sail. He left Cadiz on the night of the 9th/10th of April, and reached Fort de France in Martinique on the 14th of May. Here he was to have remained till joined by Ganteaume from Brest. On the 1st of June he was joined by a frigate and two line-of-battle ships sent with orders from Rochefort, and was told to remain in the West Indies till the 5th of July, and if not joined by Ganteaume to steer for Ferrol, pick up the French and Spanish ships in the port, and come on to the Channel. Villeneuve learnt on the 8th of June that Nelson had reached Barbadoes in pursuit of him on the 4th. The British admiral, delayed by contrary winds, had not been able to start from the entrance to the Straits of Gibraltar till the 14th. An order of the emperor in the West Indies would have the emperor's plan of concentration, and Villeneuve decided to sail at once for Ferrol. Nelson, misled by false information, ranged the West Indies as far south as the Gulf of Paria, in search of his opponent whom he supposed to be engaged in attacks on British possessions. By the 13th of June he had learnt the truth, and sailed for Gibraltar under the erroneous impression that the French admiral would return to Toulon. He sent a brig home with despatches; on the 19th of June, in lat. 33° 12' N. and long. 58° W., the French were seen by this vessel heading for Ferrol. When the British ships of war hurled home, and the information he brought was at once acted on by Lord Barham, the First Lord of the Admiralty, who took measures to station a force to intercept Villeneuve outside Ferrol. On the 22nd of July, 35 leagues N.W. of Finisterre, Villeneuve was met by the British admiral sent to intercept him, Sir Robert Calder. A confused action in a fog ended in the capture of 2 Spanish line-of-battle ships. But Sir R. Calder, who had only 15 ships to his opponent's 20 and was nervous lest he should be overpowered, did not act with energy. He retreated to join the blockading fleet off Brest. Villeneuve was now able to join the vessels at Ferrol. Nelson, who reached Gibraltar on the very day the action off Ferrol was fought, was too far away to interfere with him. But Villeneuve, who was closely controlled by the inefficiency of the ships of his fleet and especially of the Spaniards, and who was convinced that an overwhelming British force would be united against him in the Channel, lost heart, and on the 15th of August sailed south to Cadiz. By this movement he ruined the emperor's elaborate scheme. Napoleon at once broke up the camp at Boulogne and marched to Germany. The further movements of Villeneuve's fleet are to be found under Trafalgar.
NAPOLEONITE—NARA

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NAQUET, ALFRED JOSEPH (1834— ), French chemist and politician, was born at Carpentras (Vaucluse), on the 6th of October 1834. He became professor in the faculty of medicine in Paris in 1863, and in the same year professor of chemistry at Palermo, where he delivered his lectures in Italian. He lost his professorship in 1867 with his civic rights, when he was condemned to fifteen months' imprisonment for his share in a secret society. On a new prosecution in 1869 for his book *Sagnostique* he was galley-slave for he took refuge in Spain. Returning to France under the government of Napoleon III, he took an active share in the revolution of the 4th of September 1870, and became secretary of the commission of national defence. In the National Assembly he sat on the extreme Left, consistently opposing the opportunist policy of successive governments. Re-elected to the Chamber of Deputies he began the agitation against the marriage laws with which his name is especially connected. His proposal for the re-establishment of divorce was discussed in May 1879, and again in 1881 and 1882, and became law in 1884. In the same year he became, at the request of the government, a professor at the École Politique.
works of scarcely inferior excellence may be seen among the relics, and at the shrine of Kasuga is performed a religious dance called Kagura, in which the costumes and gestures of the dancers are doubtless the same as those of twelve centuries back. Kasuga-

miiya was founded in 767, and its chapels with their rough red-
painted log-work afford fine examples of primitive Japanese architecture. In the temple-park are herds of tame deer; and little images of deer and tinkrlets from deer’s horn are the favourite charms purchased by the pilgrims. Within the enclosure stands a curious old trunk of seven plants entwined, including a camellia, cherry and wisteria. Of the great Buddhist temple Kōbuku-ji, founded in 710, and burnt for the third time in 1717, there remains little save two lofty pagodas. A railway now gives access to the town, but every effort is made to preserve all the ancient features of Nara. A museum has been formed, where many antique objects of great interest are displayed, as well as works from the hands of comparatively modern artists. Nara in the days of its prosperity is said to have had a population of a quarter of a million.

**NARAINGANJ,** or **NARAYANGANJ,** a town of India, in the Dacca district of eastern Bengal and Assam, situated near the junction of two rivers with the Meghna, 10 m. by rail S. of Decca city. Pop. (1901) 24,472. As the port of Dacca, having steamer communication with both Calcutta and Chittagong, it has become the chief entrepôt for the jute trade of eastern Bengal. There are 75 jute-presses, employing 6,000 hands, and the annual export of jute exceeds 500,000 tons. It also ranks as the model market of the district.

**NARBONNE,** a city of France, capital of an arrondissement in the department of Aude, situated in a vine-growing plain 5 m. from the Mediterranean, on the railway from Toulouse to Céte, 37 m. E. of Carcassonne. Pop. (1906) 23,280. The Robine canal, a branch of the Canal du Midi, divides Narbonne into two distinct portions, the bourg and the cité. The latter is one of the oldest and most interesting of French towns. The former cathedral (St Just), which consists only of a choir 350 ft. high and transept, was begun in 1272, and the transept was still unfinished at the end of the 15th century. The towers (104 ft. high) at each extremity of the transept were built about 1480. Some additions towards the west were made early in the 18th century. An unusual effect is produced by a double row of crenellation taking the place of halfstrades on the roof of the choir chapels and connecting the pillars of the flying buttresses. Among the sepulchral monuments, which are the chief feature of the interior, may be noticed the alabaster tomb of Cardinal Guillaume Briponnet, minister of state under Charles VIII. The chapter-

house, of the 13th century, has a vaulted roof supported on four free pillars. The treasury preserves many interesting relics. The spire of the cathedral is the tallest in France and the highest of the archiepiscopal palace, and the two buildings are still con-

nected by a mutilated cloister of the 14th and 15th centuries. On the front of the palace are three square towers of unequal height. Between the Tour des Télégraphes (1318), crenellated and turreted at the corners, and that of St Martial (1374), machi-

nolated and pierced by Gothic openings, a new façade was erected in the style of the 13th century after the plans of Viollet-le-Duc. This portion of the building now serves as hôtel de ville, and its upper stories are occupied by the Narbonne museum of art and archaeology, which includes a collection of Roman monuments, sarcophagi, jute. The palace garden also contains many fragments of Roman work once built into the now dismantled fortifications; and the Musée Lapidaire in the Lamouguier buildings (formerly the church of a Benedictine convent) has a collection of Roman remains derived from the same source. The church of St Paul, though partly Romanesque, is in the main striking, and for the south of France a rare example of a building of the first half of the 13th century in the Gothic style of the north. It possesses some ancient Christian sarcophagi and fine Renaissance wood carving. Narbonne has a sub-prefecture, tribunals of first instance and of commerce, a central post-office, a station for the mail coaches of commerce, a communal college for boys and a school of commerce and industry. It has a good trade in wine and

spirituous liquors, and is famous for its honey. The industries include cooperage, sulphur-refining, brandy-distilling and the manufacture of bricks and tiles and verdigris.

Long before the Roman invasion of Gaul Narbonne was a flourishing city, being called Tauras Taurinorum or Tauraudum. It was there that Julius Caesar founded his first colony, and to the name of the town is attributed the name of Narbo Martius; they constructed great works to protect the city from inundation and to improve its port, situated on the river Aude, which is now called the Canal du Midi. The Capitoline of Gallia Narbonensis, the seat of a proconsul and a station for the Roman fleet, Narbo Martius became the rival of Massilia. But in A.D. 150 it suffered greatly from a conflagration, and the city was again caught in the eyes of the Saracens, who occupied the town, and in 1156-1163 it was captured by the Visigoths, who occupied it again for a time. In 1180, for two years, it was captured by the Saracens, and by them its fortifications were restored and extended. Charles Martel, after the battle of Poitiers, and Pippin the Short, in 723, were both repulsed from its walls; but on a new attempt, after an investment of seven years, and by aid of a traitor, the Franks managed again to force their way into Narbonne. Charlemagne made the city the capital of the duchy of Gothia, and divided it into three lordships—one for the bishop, another for a Frankish lord, and the third for the Jews, who, occupying their own quarter, possessed schools, synagogues and a university famous in the middle ages. The viscounts who succeeded the bishops and the Frankish lords, who supported the Visigothic viscount of Narbonne, often occupied the town. In 1180, however, deprived him of this dignity, receiving from Philip Augustus the duchy of Narbonne along with the county of Toulouse. By his expulsion of the Jews Philip the Fair hastened the decline of the city, and in the 15th century the city was occupied by the English, who had formerly been diverted by the Romans, ceased to flow towards Narbonne and the harbour was silted up, to the further disadvantage of the place. In 1645 Henri Marquis de Cinq-Mars was arrested at Narbonne for conspiring against Richelieu. United to the French crown in 1507, Narbonne was enclosed by a new line of walls under Francis I., but having ceased to be a garrison town it had the last persecution of its ramparts abandoned and the fortifications, which had been founded about the middle of the 3rd century, its first holder being Serius Paulus; it was suppressed in 1790.

**NARBONNE-LARA, LOUIS MARIE JACQUES AMALRIC, COMTE DE** (1753-1833). French soldier and diplomatist, was born at Colorno, in the duchy of Parma, on the 24th of August 1753.

He was the son of one of the ladies-in-waiting of Elizabeth, duchess of Parma, and his father was either a Spanish nobleman or—as has been alleged—Louis XVII. himself. He was brought up at Versailles with the princesses of France, and was made colonel at the age of twenty-five. He became maréchal-de-
dépôt in 1791, and, through the influence of Madame de Stael, was appointed minister of war. But he showed incapacity in this post, gave in his resignation, and joined the Army of the North. Incurred suspicion as a Feuillant and also by his policy at the war office, he emigrated after the 10th of August 1792, visited England, Switzerland and Germany, and returned to France in 1801. In 1809 he re-entered the army as general of division, and was subsequently minister plenipotentiary at Munich and aide-de-camp to Napoleon. In 1813 he was appointed French ambassador at Vienna, where he was engaged in an unequal diplomatic duel with Metternich (q.v.) during the fateful months that witnessed the defection of Austria from the cause of Napoleon to that of the Allies. He died at Torgau, in Saxony, on the 17th of November 1813.

**NARBOROUGH, SIR JOHN** (d. 1688). English naval commander, was descended from an old Norfolk family. He received his commission in 1664, and in 1666 was promoted lieutenant for gallantry in the action with the Dutch fleet off the Downs in June of that year. After the peace he was chosen to conduct a voyage of exploration in the Southern Seas. He set sail from Deptford on the 26th of November 1669, and entered the Straits of Magellan in October of the following year, but returned home in June 1671 without accomplishing his original purpose. A narrative of the public services of the aforementioned two commanders, under the title An Account of several late Voyages and Discoveries to the South and North. During the second Dutch War Narbo-

rough was second captain of the lord high-admiral’s ship the
"Prince," and conducted himself with such conspicuous valour at the battle of Solebay (Southwold Bay) in May 1672 that he won special approbation, and shortly afterwards was made rear-admiral and knighted. In 1675 he was sent to suppress the Tripoline pirates, and by the bold expedient of despatching gun-boats into the harbour of Tripoli at midnight and burning the ships he induced the dey to agree to a treaty. Shortly after his return he undertook a similar expedition against the Algerines. In 1680 he was appointed commissioner of the navy, an office he held till his death in 1688. He was buried at Knowlton church, Kent, where a monument has been erected to his memory.

See Charnock, Biog. Nav. 1; Hist. MSS. Comm. 12th Rept.

NARCISSUS, in Greek mythology, son of the river god Cephissus and the nymph Leirioppe, distinguished for his beauty. The seer Teiresias told his mother that he would have a long life, provided he never looked upon his own features. His rejection of the love of the nymph Echo (p.103) drew upon him the vengeance of the gods. Having fallen in love with his own reflection in the waters of a spring, he pinned away (or killed himself) and the flower that bears his name sprang up on the spot where he died. According to Pausanias, Narcissus, to console himself for the death of a favourite twin-sister, his exact counterpart, sat gazing into the spring to recall her features by his own. Narcissus, representing the early spring-flower, which for a brief space beholds itself mirrored in the water and then fades, is one of the many youths whose premature death is recorded in Greek mythology (cf. Adonis, Linus, Hyacinthus); the flower itself was regarded as a symbol of such death. It was the last flower gathered by Persephone before she was carried off by Hades, and was sacred to Demeter and Core (the cult name of Persephone), the great goddesses of the underworld. From its associations Wieseler takes Narcissus himself to be a spirit of the underworld, of death and rest. It is possible that the story may have originated in the superstition (alluded to by Artemidorus, Onetorrecitice, li. 7) that it was an omen of death to dream of seeing one's reflection in water.

See Ovid, Metam. iii. 341-510; Pausanias ix. 31; Conon, Narraerum M. Worpini, II. 3-9; Greve in Roscher's Lexicon der Mythologie; J. G. Frazer, The Golden Bough (1900), i. 293.

NARCISSUS, a genus of bulbous plants belonging to the family Amaryllidaceae, natives of central Europe and the Mediterranean region; one species N. Tazetta, extends through Asia to Japan. From these, or rather from some of these, by cultivation and hybridization, have arisen the very numerous modern varieties. The plants have long narrow leaves springing from the bulb and a central scape bearing one or more generally large, white or yellow, drooping or inclined flowers, which are enveloped, before opening, in a membranous spathe. The flowers are regular, with a perianth arising from above the ovary, tubular below, with spreading segments and a central corona; the six stamens are inserted within the tube. The most interesting feature botanically is the "corona" or "cup," which springs from the

There are five well-marked sections.

1. The hoop-petticoat narcissi, sometimes separated as the genus Corbularia, are not more than from 3 to 6 in. in height, and have grassy foliage and yellow or white flowers. These have the corona in the centre of the flower very large in proportion to the other parts, and much expanded, like the old hooped petticoats. They are now all regarded as varieties or forms of the common hoop-petticoat, N. Bulbocodium, which has comparatively large bright yellow flowers; N. tenuifolius is smaller and somewhat paler and with slender erect leaves; N. citrinus is pale lemon yellow and larger; while N. monophyllus is white. The small bulbs should be taken up in summer and replanted in autumn and early winter, according to the state of the season. They bloom about March or April in the open air. The soil should be free and open, so that water may pass off readily.

2. A second group is that of the Pseudonarcissi, constituting the genus Ajax of some botanists, of which the daffodil, N. Pseudo-


![Fig. 1.—Flowers of Narcissus.](image1)

![Fig. 2.—Daffodil](image2)

Fig. 1.—Flowers of Narcissus. Base of the flower-segments, (N. Tazetta) bursting from This gives the special char-
acter to the flower, and the members of the genus are classed according to the length of this organ as compared with that of the segments. The most probable supposition is that the cup is simply an excess or "nation" from the mouth of the flower-tube, and is connected with the fertilization of the flowers by insect agency.

thickets in most parts of the north of Europe, but is rare in Scotland. Its leaves are five or six in number, are about 1 ft. in length and 1 in. in breadth, and have a blunt keel and flat edges. The stem is about 15 in. long and the spathe single-flowered. The flowers are large, yellow, scented and a little drooping, with a corolla deeply cleft into six lobes and a bell-shaped corona which is crisped at the margin; they appear in March or April. In this species the corona is also very large and prominent, but is more elongated and trumpet-shaped, while the other members are regarded as subspecies or varieties of this. Of this group the most striking one perhaps is N. bicolor, which has the perianth almost white and the corona deep yellow; it yields a number of varieties, some of the best known being Empress, Horsfieldi, Grandee, Ellen Willmott, Victoria, Weardale Perfection, &c. N. moschatus, a native of the Pyrenees and the Spanish peninsula, is a cream-coloured subspecies of great beauty with several forms. N. cyclamineus is a pretty dwarf subspecies, native of Portugal, with narrow linear leaves and drooping flowers with reflexed lemon-yellow segments and an orange-yellow corona. N. major is a robust form with leaves 1/2 in. broad and bright lemon-yellow flowers 2-3 in. long; maximus is a closely-related but still finer form; obnivallaris (the Tenby daffodil) is an early form with
uniformly yellow flowers. N. minor and minimus are miniature representatives of the daffodil. All these flowers are good in good sunshine, and blossom from March onwards, coming in very early in genial seasons.

3. Another group, the mock narcissi or star daffodils, with coronae of different colors, and flowers of the various species of N. incomparabilis, one of which, with large, double flowers, is known as butter-and-eggs; N. odorata, known as the campanelle jonquille, has two to four uniform bright yellow flowers, and is sometimes otherwise described as hyacinthine and N. Preludia. A form with sweet-scented double flowers is known as Queen Ann’s jonquille; N. juncifolius, a graceful little plant from Spain, Portugal and south France, has small bright yellow flowers on stems or cymes. The hardier forms of this set thrive in the open border, but the smaller sorts, like Queen Ann’s jonquille, are better taken up in autumn and replanted in February; they bloom freely about April or May, and have pretty flowers of a golden yellow, or with white flowers about 1 in. long; in several of its varieties the flowers are a pale or deeper yellow; they make attractive pot plants.

4. The polyanthus or bunch narciss, another well-marked group, whose peculiarity of producing many flowers on the stem is indicated by the name. In these the corona is small and shallow, as compared with the perianth. Some of the hardier sorts, as N. Tazetta itself, the type of the group, succeed in the open borders in light well-drained soil, but the bulbs should be deeply planted, not less than 6 or 8 in. below the surface, to escape risk of injury from frost. Many varieties of this form of narcissus, such as Grand Marquise, are marked with a white centre, and the flowers being forced into early bloom, like the hyacinth and tulip, they vary with a white, creamy or yellow perianth, and a yellow, lemon, primrose, or deep or coronet; and are very much in favour among florists. Many of these flowers are exported from the Scilly Isles to the London markets in spring. The "Chinese sacred lily" or "joss flower" is a form of N. Odorus, and many other types of south Europe and Algeria, of which there are single and double flowered varieties, is also grown in pots for early flowering, but does well outside in a warm border.

5. There remains another little group, the poet’s or pheasant’s-eye narcissi (N. poeticus), in which the perianth is large, spreading and conspicuous, and the corona very small and shallow. These plants are of easy culture, and among the most well-marked varieties, as radiiflorus, poetarum, recurvus, &c., blossom in succession during April and May, and all do well in the open borders as permanent hardy bulbs. N. biflorus, the primrose peerless, a two-flowered whirly-yellow-capped species, equally hardy and easy of culture, is a natural hybrid between N. poeticus and Tazetta. N. gracilis, a yellow-flowered species, has also been regarded as a hybrid between N. Tazetta and N. juncifolius, and blooms later.

Of late years some remarkably fine hybrids have been raised between the various distinct groups of narcissi, and the prices asked for the bulbs in many cases are exceedingly high. One of the most distinct-eyed narcissi, of which there is a good show in N. poeticus and Tazetta, is known under the name of "Postcard." The best forms of poeticus ornatus have been crossed with the bunch-flowered Tazettas, and have resulted in producing varieties with large trusses of exquisite flowers, having, in some cases, a colour from the purest white to yellow, the rim of the corona being in most cases conspicuously and charmingly coloured with red or crimson. This is an excellent group for cutting purposes, but it will take a little longer to reach the market than the others.

For an account of the history and culture of the narcissus see F. W. Burbidge, The Narcissus (1875); a more recent scientific treatment of the genus will be found in J. G. Baker’s Handbook of Amaryllidaceae (1888); see also Nicholson, Dictionary of Gardening (1886); and J. Weathers, Practical Guide to Garden Plants (1901).
NARDI—NARES

The Umbrian Nequinum was taken by the Romans after a long siege in 290 B.C., and a colony planted there against the Umbrians, taking its name from the river. It was among the twelve colonies that were established for refugees from Samnium in 273 B.C. It was considered a suitable spot to oppose a threatened march of Hasdrubal on Rome. It stood on the Via Flaminia, the great bridge of which over the river lies below the town. The original main road extending from Rome to Naples ran over that bridge, and it was joined at Forum Flaminii. According to some authors, the emperor Nerva was born at Narnia. The town is mentioned in the history of the Gothic wars. Procopius (B.G. i. 17) describes the site of the town, the river and the bridge—the latter as built by Augustus, and as having the highest arches that he knew. In the middle ages Narni was under the papal power. It was the birthplace of a Sieno-born known courtier Erasmo Cavallarola.

See G. Eroli, Miscellanea Storica Narinese (2 vols., Narni, 1858–1862), and other works by the same author.

NARRAGANSETT, a township of Washington county, Rhode Island, U.S.A. on the W. shore of Narragansett Bay, about 25 m. S. of Providence and about 8 m. W.S.W. of Newport. Pop. (1890) 1408; (1900) 1523; (1905) 1490; (1910) 1259. Area about 15 sq. m. It is connected at Kingston Station (about 9 m. N.W.) by the Narragansett Pier railway with the shore line of the New York, New Haven & Hartford railway; an electric line with a trolley. The southern part of the township is a peninsula, lying between the Narragansett Bay and an inlet separating this part of the township from South Kingstown. Narragansett Pier, within the township, has a fine bathing beach, which extends along the indented coast between the village and the mouth of the Pataquisset river; the force of the surf is somewhat broken by Point Judith, about 5 m. S. (also in the township), on which there is a lighthouse.

On a ridge overlooking the ocean and commanding a fine view is the Point Judith Country Club, with golf courses, tennis courts and a polo-field, on which is held a horse show at the close of each season. Many of the summer visitors at Narragansett Pier are from New England, New York and Philadelphia, but there is a sufficient number from Baltimore, Washington, Richmond, Louisville and other Southern cities to give to its society a noticeably Southern tone. Narragansett Pier was so-named from the piers that were built here late in the 18th century and early in the 19th to provide a port for the Narragansett Country, or southern Rhode Island, and it still has a coal wharf, and a yacht landing at the Casino. The development of the place as a summer resort was begun about the middle of the 19th century by the erection of a bathing-house and the conversion of some farm houses into boarding houses. The erection of large hotels and private residences soon followed, and the completion of the railway to the pier in 1876 increased its popularity. The District of Narragansett (in the town of South Kingstown) was organized in 1888 and in 1901 was incorporated as a separate township.

The town is named from the Narragansett Indians, a once-powerful Algonquian tribe, which occupied much of the shore of Narragansett Bay. Under their chief Canonicus (d. 1647) they were friendly to the early Rhode Island settlers, and under Miantonomo (g.r.) entered into a tripartite treaty with the Connecticut colonists and the Mohicans; but after the execution of Miantonomo the Narragansets under Miantonomo’s son, Canochet or Nanuntennoo, were less friendly. Their loyalty to the whites was suspected at the time of King Philip’s War, and on the 19th of December 1675, at the Great or Cedar Swamp (Narragansett Fort) in the present town of South Kingstown (immediately west of the town of Narragansett), they were decisively defeated by the whites, under Governor Josiah Winslow of the Plymouth Colony. The site of the engagement is marked by a granite monument erected in 1866 by the Rhode Island Historical Society. The monument and the surrounding grounds were made a national monument in April 1919. Fort Narragansett was captured near Stonington, Connecticut, and on the following day was executed. Most of the survivors of the tribe were later settled among the Niantic, to whom the name Narraganset has been transferred. There are now few survivors of pure Indian blood.

NARES, Narsee, Narseus, king of Persia, son of Shapur I. He rose as pretender to the throne against his grand-nephew Bahram III. in A.D. 292, and soon became sole king. He attacked...
the Romans, but after defeating the emperor Galerius near Callinicum on the Euphrates in 296 was completely defeated in 297, and forced to conclude a peace, by which western Mesopotamia and five provinces on the left bank of the upper Tigris were ceded to the Romans and their sovereignty over the kingdom of Armenia was acknowledged. This peace, concluded in 297, lasted for forty years. Narses died in 383 and was succeeded by his son Hormizd II. (Ed. M.)

**NARES** (c. 478–573) an important officer of Justinian, in the 6th century. He was a eunuch, but we are nowhere distinctly informed that he was of servile origin. A native of Persarmenia (that portion of Armenia which was allotted to Persia by the partition of 384), he may have been prepared and educated by his parents for service in an oriental court. If the statement that he died at the age of ninety-five be correct, he was born about 478. He was probably brought young to Constantinople, and attained a footing in the *officia* of the grand chamberlain. He rose to one of the three (spectables) "chartulari," a position implying some literary attainment, and involving the custody of the archives of the household. Hence, probably in middle life, he became "praepositus sacri cubiculi," an "illustrius," and entitled along with the praetorian prefects and the generals to the highest rank at the imperial court. In this capacity, in 530, he received into the emperor's obedience another Nares, a fellow-countryman, with his two brothers, Aratus and Isaac. These Persarmenian generals, having formerly fought under the standard of Persia, now in consequence of the successes of Belisarius transferred their alliance to the emperor Justinian, came to Constantinople, and received costly gifts from the great minister.

In 532 the insurrection known as the Nika broke out in Constantinople, when for some hours the throne of Justinian seemed doomed to overthrow. It was saved partly by the courage of his wife, Theodora, and partly by the timely prodigality of Nares, who stole out into the capital, and with large sums of money bribed the leaders of the "blu" faction, which was aforetime loyal to the emperor, to shout as of old "Justiniame Auguste tu vincas."

The African and Italian wars followed. In the fourth year of the latter war (538) the splendid successes of Belisarius had awakened both joy and fear in the heart of his master. Reinforcements were sent into Italy, and Nares was placed at their head. Belisarius understood that Nares came to serve under him like any other officer of distinguished but subordinate rank, and he received a letter from Justinian which seemed to support this conclusion. But the friends of Nares continually plied him with suggestions that he, a great officer of the household, in the secrets of the emperor, had been sent to Italy, not to retain a subaltern, but to hold independent command and win military glory for himself. The truth probably lay between the two. Justinian could not deprive his great general of the supreme command, yet he wished to have a very powerful emissary of the court constantly at his side. He would have him watched but not hampered.

The two generals met (A.D. 538) at Fermo on the Adriatic coast. The first interference of Nares with the plans of Belisarius was beneficial. John, one of the officers highest in rank under Belisarius, had pressed on to Rimini, contrary to the instructions of his chief, leaving in his rear the difficult fortress of Osimo (Auxilia). Nares, on reaching the coast, informed the emperor Justinian, came to Constantineople, and induced them to raise the siege of Rome; but he himself was now shut up in Rimini, and on the point of being forced by famine to surrender. Belisarius and his followers were prepared to let him pay the penalty of his rashness and disobedience. But his friend Nares so insisted on the blow to the reputation of the imperial arms which would be produced by the surrender of Rimini that he carried the council of war with him, and Belisarius had to plan a brilliant march across the mountains, in conjunction with a movement by the fleet, whereby Rimini was relieved while Osimo was still untaken. When Belisarius and John met, the latter ostentatiously thanked Nares alone for his preservation.

His next use of his authority was less fortunate. Milan, which was holding out for the Romans, was also hard pressed by famine. The two generals who were sent to relieve it lostered disgracefully over their march, and, when Belisarius wished to despatch further reinforcements, the commanders of these new troops refused to stir till Nares gave them orders. Belisarius wrote to the eunuch pointing out the necessity of unity of purpose in the imperial army. At length, grudgingly, Nares gave his consent, and issued the required orders, but it was too late. Milan had been compelled by extremity of famine to surrender, and with it the whole province of Liguria fell into the hands of the enemy. This event forced Justinian to recognize the dangers of even a partially divided command, and he recalled Nares to Constantinople.

Twelve years elapsed before Nares returned to Italy. Meanwhile there had been great vicissitudes of fortune both for the Romans and the Goths. Italy, which appeared to have been won by the sword of Belisarius, had been lost again by the exactions and misgovernment of Alexander. Totila had raised up a new army, had more than kept Belisarius at bay in five difficult campaigns (544–548) and now held nearly all the country. Belisarius, however, in this his second series of campaigns, had never been properly seconded by his master. In the spring of 552 Nares set sail from Salona on the Dalmatian coast with a large and well-appointed army. It was a Roman army only in name. Lombards, Heruli, Huns, Gepidae and even Persians followed the standard of Nares, men equal in physical strength and valour to the Goths, and inspired by the liberal pay which their emperor did not think it beneath him to confer.

The eunuch seems to have led his army round the head of the Adriatic Gulf. By skilfully co-operating with his fleet, he was able to cross the rivers of Venetia without fighting the Gothic general Teias, who intended to dispute their passage. Having mustered all his forces at Ravenna, he marched southward. He refused to be detained before Rimini, being determined to meet the Gothic king as soon as possible with his army undiminished. The occupation of the pass of Furio (Petra Fertusa) by the Goths prevented his marching by the Via Flaminia, but, taking a short circuit, he rejoined the great road near Cagli. A little farther on, upon the crest of the Apennines, he was met by Totila, who had advanced as far as Tadini, called by Procopius Tagina. Parleys, messages and harangues by each general followed. At length the line of battle was formed, and the Gothic army, probably greatly inferior in number to the Byzantine was hopelessly routed (July 552), the king receiving a mortal wound as he was hurrying from the battlefield.

With Totila the last hopes of the Gothic kingdom of Italy. Telas, who was proclaimed his successor, protracted for a few months a desperate resistance in the rocky peninsula of Castellamare, overlooking the bay of Naples. At last the emperor forced him into the plain, and there by the river Sarno, almost in sight of Pompeii, was fought (553) a battle which is generally named from the overrunning range of Mons Lactarius (Monte Lettere). The actual site of the battle, however, is about half a mile from the little town of Angri, and its memory is still vaguely preserved by the name *Pezzo dei Goti* (well of the Goths). In this battle Telas was killed. He was the last king of the Ostrogoths.

The task of Nares, however, was not yet ended. By the invitation of the Goths an army of 75,000 warlike Alamanni and Franks, the subjects of King Theudibald, crossed the Alps under the command of two Alamannic nobles, the brothers Lothair and Buccelin (553). The great strategic talents of Nares were shown even more conspicuously in this, than in his previous and more brilliant campaigns. Against the small but gallant bands of Totila and Teias he had adopted the policy of rapid marches and imperious challenges to battle. His strategy in dealing with the great host from Gaul was of the Fabian kind. He kept them as long as he could north of the Apennines, while he completed the reduction of the fortresses of the peninsula. At the approach of winter he gathered his troops into the chief cities and declined operations in the field, while the Alamannic brothers marched through Italy, killing and
plundering. When the spring of 554 appeared, Lothaire with his part of the army insisted on marching back to Gaul, there to deposit in safety the plunder which they had reaped. In an unimportant engagement near Pesaropo he was worsted by the Roman generals, and this hastened his northward march. At Ceneda in Venetia he died of a raging fever. Pestilence broke out in his army, which was so wasted as to be incapable of further operations in Italy. Meanwhile his brother Buccellin, who had left the pontifical service and wandered in the desert, was induced by free indulgence in the grapes of Campania, encamped at Casilinum, the site of modern Capua. Here, after a time, Narses accepted the offered battle (554). The barbarians, whose army was in the form of a wedge, pierced the Roman centre. But by a most skilful manœuvre Narses contrived to draw his lines into a curve, so that his mounted archers on each flank could aim their arrows at the backs of the troops who formed the other side of the Alamannic wedge. They thus fell in whole ranks by the hands of unseen antagonists. Soon the Roman cohorts, which had been belated in its march, arrived upon the field and completed the work of destruction. Buccellin and his whole army were destroyed, though we need not accept the statement of the Greek historian (Agathias ii. 9) that only five men out of the barbaric host of 30,000 escaped, and only eighty out of the Roman 18,000 perished.

The only other important military operation of Narses which is recorded—and that indistinctly—is his defeat of the Herulian king Sindbal, who had served under him at Capua, but who subsequently revolted, was defeated, taken captive and hanged by the eunuch's order (563). In the main the thirteen years after the battle of Ceneda (554) were devoted to the subjugation of the north, partly during them Narses ruled Italy from Ravenna with the title of prefect.1 He rebuilt Milan and other cities destroyed in the Gothic War; and two inscriptions on the Salarian bridge at Rome have preserved to modern times the record of repairs effected by him in the year 564.

His administration, however, was not popular. The effect of the imperial organization was to wring the last solidus out of the emaciated and fever-striken population of Italy, and the belief of his subjects was that no small portion of their contributions was necessarily lost by the eunuch's agents.2 Hence came the invasion of Alboin (568), which wrested the greater part of Italy from the empire, and changed the destinies of the peninsula.

Narses, who had retired to Naples, was persuaded by the pope (John III.) to return to Rome. He died there about 573, and his body, enclosed in a leaden coffin, was carried to Constantinople and buried there. Several years after death the secret of the hiding-place of his vast stores of wealth is said to have been revealed by an old man to the emperor Tiberius II., for whose charities to the poor and the captives they furnished an opportunity.

Narses was short in stature and lean in figure. His free-handedness and affability made him very popular with his soldiers. Eunarius tells us that he was very, religious, and paid especial reverence to the Virgin, never engaging in battle till he conferred that she had given him the signal. Our best authorities for his life are his contemporaries Procopius and Agathias. See Gibbon, Decline and Fall, vols. iv. and v., edited by J. B. Bury (1895).

**NARSINGHARH, a native state of Central India, in the Bhopal agency. Area, 741 sq. m.; pop. (1901) 92,903; estimated revenue, £33,000; tribute to Holkar, £4,000. The chief, whose title is raja, is a Rajput of the Omat clan. The state was that of mango groves. The population in 1901 was 315,518, showing a decrease of 14.5% in the decade, due to famine. The principal crops are wheat, millets, rice, pulses, oil-seeds and cotton. There are manufactures of cotton, silk, brass and iron-ware. At Mohpani are coal-mines. The Great Indian Peninsula railway runs through the district, with a branch to Mohpani. See **Narsinghpur District Gazetteer (Bombay, 1906).

**NARTHEX** (Gr. ναρθῇς, the name of the plant giant-fennel, in Lat. *ferula*), the name applied in architecture, probably from the Greek *narkhos*, a person who announced the beginning of the service or prayer. A narthex is represented as saying, "that she shall not find the end of it in her lifetime"; and forthwith he sent messengers to the Lombards in Pannonia, bearing some of the fruits of Italy, and inviting them to enter the land which bore such goodly produce. Hence came the invasion of Alboin (568), which wrested the greater part of Italy from the empire, and changed the destinies of the peninsula.

1 Gibbon's statement that Narses was "the first and most powerful of the exarchs" is more correct in substance than in form. The title of exarch does not appear to be given to Narses by any contemporary writer. He is always "Praefectus Italiae," "Patricius" or "Dux Italae," except when he bears the style of his former office in the imperial household, "Ex-Præpositus Cibucilii" or "Chaputarius." 2 This celebrated story seems to be unknown to strictly contemporary authors. We find no hint of it in Agathias (who wrote between 560 and 566), Procopius (532-590), or in Gregory of Tours (540-594). The possibly contemporary Liber Pontificalis and Isidore of Seville (560-636) hint at the invitation to the Lombards. Fredegarus (so-called), who probably wrote in the middle of the 7th century, and Paul the Deacon, towards the close of the 8th, supply the saga-like details, which become more minute the farther the narrators are from the action. The truth, the transaction, though it is too well vouched for to allow us to dismiss it as entirely fabulous, cannot take its place among the unoubted facts of history.

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**NARVA** (Rus. *Narva*), a sea-port and fortress of Russia, in the government of St Petersburg, 100 m. by rail W.S.W. of the city of St Petersburg. Pop. (1897) 16,577. It stands on the Narova river, which flows from Lake Peipus to Chudskoye, and enters the Gulf of Finland in Narva Bay, 5 m. below this town. The town was founded in 1225 by Danes, and changed hands between the Teutonic knights, Danes, Swedes and Russians until it was taken by Peter the Great in 1704, after the Russians had suffered a terrible defeat at the hands of Charles XII. of Sweden four years
before. Its fortress, built on the right bank of the river, and known as Ivangorod, has lost its importance, and was abandoned in 1864. The cathedral and the town hall (1683) contain interesting antiquities. There are here an arsenal, a small museum and a school of navigation. Several manufactories utilize the waterfalls of the Narova, e.g. cotton-mills, woollen cloth mills, flax and jute mills, saw-mills and steam flour mills. The total trade falls short of half a million sterling annually. A wintering-place of whalers is built up at Ust-Narova, or Hungerburg, at the mouth of the Narova.

NARVACAN, a town of the province of Ilocos Sur, Luzon, Philippine Islands, near the coast and on the main road 13 m. S.S.E. of Vigan, the capital. Pop. (1903) 19,575. It lies in a level valley surrounded by mountains, and has a cool and healthy climate. The soil, both in the valley and on the neighbouring mountain-sides, is very fertile, and produces rice, vegetables, Indian corn, indigo, cotton, tobacco, maguey and sugar-cane. Cotton fabrics are woven by the women and sold to the mountain tribes. The language of the town is Ilocano.

NARVAEZ, PÁNFILO DE (c. 1480–1528), Spanish adventurer, was an hidalgo of Castile, born at Valladolid about 1480. He was one of the subordinates of Velazquez in the reduction of Cuba, and, after having held various posts under his governorship, was put at the head of the force sent to the Aztec coast to compel Cortez to renounce his command; he was surprised and defeated, however, by his able and more active compatriot at Cempoallas, and made prisoner with the loss of an eye (1520). After his return to Spain he obtained from Charles V a grant of Florida as far as the River of Palms; sailing in 1527 with five ships and a force of about 600 men, he landed, probably near Pensacola Bay, in April 1528, and, striking inland with some 300 of his followers, reached "Apalache" on June 25. The prospects of fabulous wealth which had sustained them in their difficult and perilous journey having proved illusory a return to the coast was determined, and the Bahia de los Caballos, at or near St Mark's, was reached in the following month. Having built rude boats, the much-reduced company sailed hence for Mexico on September 22, but the vessel which carried Narvaez was driven to sea in a storm and perished. His lieutenant, Cabeza de Vaca, with the other adventurers who ultimately reached land, made his way across Texas to the Gulf of California. (See Florida.)

[See Prescott, Conquest of Mexico; H. H. Bancroft, Mexico (1882-1890); and the Naufragio of Alvaro Nuñez Cabeza de Vaca in the Biblioteca de Rivadeneyra, xxii.]

NARVAEZ, RAMON MARIA (1800–1868), Spanish soldier and statesman, was born at Loja, Granada, on the 4th of August 1800, entered the army at an early age, and saw active service under Mina in Catalonia in 1822. He was in his sympathies a Conservative, and could not go all lengths with the Radical opposition to Ferdinand VII., whom he served after his restoration. When the king died, Narvaez became one of the Conservative supporters of Isabel II. He achieved great popularity by his victory over Goméz, the Carlist general, near Arcos, in November 1836, and after clearing La Mancha of brigands by a vigorous policy of suppression in 1838 he was appointed captain-general of Old Castile, and commander-in-chief of the army of reserve.

In 1840, for the part he had taken at Seville in the insurrection against Espartero and the Progressists, he was compelled to take refuge in France, where, in conjunction with María Cristina, he planned the expedition of 1843 which led to the overthrow of his adversary. In 1844 he became prime minister, and was created field-marshal and duke of Valencia, but his policy was too reactionary to be tolerated long, and he was compelled to quit office in February 1846. He now held the post of ambassador at Paris, until again called to preside over the council of ministers in 1847; but misunderstandings with María Cristina led to his resignation in the following year. His ministry succeeded that of O'Donnell for a short time in 1856-1857, and he again returned to power for a few months in 1864-1865. He once more replaced O'Donnell in July 1866, and was still in office when he died at Madrid on the 23rd of April 1868.

Some very curious notices of Narvaez may be found in the letters of Prosper Merimée to Panizzi (1881). For his general political and military career see Gonzalez Baquedano, Geschichte Spaniens in Aufschreiben de französisch. Revol. bis auf unsere Tage (1866-1871); and the Historia Contemporanea of Antonio Pirala (1871-1879).

NARVIK or VICTORIAHAVN, a seaport on the Ofoten Fjord of the north-west coast of Norway, in Nordland amti (county), 68° 30' N. It is wholly modern, developed by the construction of the railway and canal (1903) of the Ofoten railway, the most northerly in the world. The station is 34 m. S.E. of Narvik, and on the branch, which runs on the iron ore from the rich districts traversed by the line. Narvik is 167 m. N.W. of Gellivara, and 82 m. W. of Stockholm by the railway. In summer express trains cover the whole distance in two days. Narvik is a convenient point from which to visit the beautiful Lofoten Islands.

NARWHAL, the Scandinavian name of a cetacean (Monodon monoceros), characterized by the presence in the male of a long horn-like tusk. In the adult of both sexes there are only two teeth, both in the upper jaw, which lie horizontally side by side, and in the male is of enormous size, and is hollowed out longitudinally and partly filled with a transparent mass, considered to be an organ of the reproductive system. Narwhals are found in the Arctic regions, and their tusks are eagerly sought after by dwellers in those parts for ornament of houses and furniture. The tusks, which are of an ivory-like material, are often more than 10 ft. long; they are white below, variously marbled and spotted with shades of grey.

The narwhal is an Arctic whale, frequenting the icy circumpolar seas, and rarely seen south of 65° N. lat. Four instances have, however, been recorded of its occurrence on the British coasts, one on the coast of Norfolk in 1388, one in the Firth of Forth in 1648, one near Boston in Lincolnshire in 1800, while a fourth entangled itself among rocks in the Sound of Weezeald, Shetland, in September 1808. Like most cetaceans it is gregarious and usually met with in "schools" or herds of fifteen or twenty individuals. Its food appears to be cuttlefishes, small fishes and crustaceans. The purpose served by the tusk—"horn"—is not known; and little is known of the habits of narwhals. Scoresby describes them as "extremely playful, frequently elevating their horns and crossing them with each other as in fencing." They have never been known to charge and pierce the bottom of ships with their weapons, as the swordfish does. The name "sea-unicorn" is sometimes applied to the narwhal. The ivory of which the tusk is composed is of very good quality, but owing to the central cavity, only fitted for the manufacture of objects of small size. The entire tusks are sometimes used for decorative purposes, and are of considerable, though fluctuating, value. (See CETACEA.)

[See Prescott, Conquest of Mexico; H. H. Bancroft, Mexico (1882-1890); and the Naufragio of Alvaro Nuñez Cabeza de Vaca in the Biblioteca de Rivadeneyra, xxii.]

NASCIMENTO, FRANCISCO MANOEL DE (1734–1819), Portuguese poet, better known by the literary name of Filinto Elsio, bestowed on him by the Marquesa de Alorna, was the reputed son of a Lisbon boat-owner. In his early years he acquired a love of national customs and traditions which his humanist education never obliterated, while, in addition, he learnt to know the whole range of popular literature (literatura de cordel)—songs, comedies, knightly stories and fairy tales, which were then printed in loose sheets (folhas volantes) and sold by the blind in the streets of the capital. These circumstances
explain the richness of his vocabulary, and joined to an ardent patriotism they fitted him to become the herald of the literary revival known as Romanticism, which was inaugurated by his distinguished follower Almeida Garrett. Nascimento began to write verses at the age of fourteen. He was ordained a priest in 1754, and shortly afterwards became treasurer of the Chagas church in Lisbon. He led a retired life, and devoted his time to the study of the Latin classics, especially Horace, and to the society of literary friends, among whom were numbered some cultivated foreign merchants. These men nourished the common ambition of the Portuguese, and half forgotten, to his rightful place as the king of the Portuguese Parnassus, and they proclaimed the cult of the Quinhentistas, regarding them as the best poetical models, while in philosophy they accepted the teaching of the French Encyclopaedists.

Nascimento's first publication was a version of one of Metastasio's operas, and his early work consisted mainly of translations. Though of small volume and merit, it suffered to arouse the jealousy of his brother bards. At this time the Arcadia was working to restore good taste and purify the language of July. He had received a man of this and sought to imitate the traditions of their own land in their desire to imitate the classics. Nascimento and other writers who did not belong to the Arcadia, formed themselves into a rival group, which met at the Ribeira das Ñ aos, and the two bodies attacked one another in rhyme without restraint, until the "war of the poets," as it was called, ended with the collapse of the Arcadia. Nascimento now conceived a strong but platonic affection for D. Maria de Almeida, afterwards Condesa de Ribeira, sister of the famous poetess the Marquesa de Alorna. This lady sang the chansonnette the wrote for her, and their poetical intercourse grew from him some lyrics of profound emotion. This was the happiest epoch of his life, but it did not last long. The accession of D. Maria I inaugurated an era of reaction against the spirit and reforms of Pombal, and religious succeeded to political intolerance. In June 1778 Nascimento was denounced to the Inquisition on the charge of having given vent to heterodox opinions and read "the works of modern philosophers who follow natural reason." The tribunal held a secret inquiry, and without giving him an opportunity of defence issued an order for his arrest, which was to take place early in the morning of the 14th of July. He had received a news of this and sought to escape to the house of a French merchant, Verdiere, where he lay hid for eleven days, at the end of which his friend the Marquesa de Marialva put him on board a French ship which carried him to Havre. Nascimento took up his residence in Paris, and in his first years there passed pleasantly enough. Soon, however, his circumstances changed for the worse. He received the news of the confiscation of his property by the Inquisition; and though he strove to support himself by teaching and writing he could hardly make both ends meet. In 1792 his admirer Antonio de Araujo, afterwards Conde de Barca, then Portuguese minister to Holland, offered the poet the hospitality of his house at the Hague, but neither the country, the people, nor the language were congenial, and when his host went to Paris on a diplomatic mission in 1797 Nascimento accompanied him, and spent the rest of his life in and near the French capital. He retained to the end an intense love of country, which made him wish to die in Portugal, and in 1796 a royal decree permitting his return there and ordering the restoration of his goods was issued, but delays occurred in its execution, and the flight of the court to the Brazils as a result of the French invasion finally dashed his hopes. In this the Conde de Barca had obtained him a commission from the Portuguese government to translate the De Rebus Emanueltis of Osorio; the assistance of some fellow-countrymen in Paris carried him through his last years, which were cheered by the friendship of his biographer and translator Alexandre Sané and of the Lusophil Ferdinand Dénis. Lamartine addressed an ode to him; he enjoyed the esteem of Chateaubriand; and his admirers at home, who imitated him extensively, were called after him Os Filíntistas. Exile and suffering had enlarged his ideas and given him a sense of reality, making his best poems those he wrote between the ages of seventy and eighty-five, and when he passed away, it was recognized that Portugal had lost her foremost contemporary poet.

Garrett declared that Nascimento was worth an academy in himself by his knowledge of the language, adding that no poet since Camoens had rendered it such valuable services; but his truest title to fame is that he brought literature once more into touch with the life of the nation. By his life, as by his works, Nascimento links the 18th and 19th centuries, the Neo-Classical period with Romanticism. The works of Chateaubriand's Martyrs opened a new world to him, and his contos or scenes of Portuguese life have a real romantic flavour; they are the most natural of his compositions, though his noble patriotic odes—those "To Neptune speaking to the Portuguese" and "To the liberty and independence of the United States"—are the most quoted and admired. On leaving Portugal, he abandoned the use of rhyme as cramping freedom of thought and expression; nevertheless his highly polished verses are generally robust to hardness and overdone with archaisms, and in part at least, but he retained a Faroese accent though harsh, and his renderings of Racine and the Fables of Lafontaine entirely lack the simplicity and grace of the originals. But Nascimento's blank verse translation of the Martyrs is in many ways superior to Chateaubriand's prose.

Bibliography.—The most useful edition of his collected works is that in 22 vols. Lisbon, 1836-1840. See Innocencio da Silva, in "Revista de Bibliografia," vol. II. Also see by the same author: also Filinto Elzio e a sua Época, by Pereira da Silva (Rio, 1891); Filinto Elzio, by Dr Theophilo Braga (Oporto, 1891).
the "Bluecoats," held out to the last, and was finally broken by a combined charge of Fairfax's regiment of foot, led by Cromwell, and the general's personal escort, led by Fairfax himself, who captured a colour with his own hand. The remnant of the king's army, re-formed by Rupert, stood inactive and irresolute while its infantry was being destroyed by Cromwell's "startling" cavalry and the king's private papers. But more important than trophies was the practical annihilation of the last field army of which the king disposed. Half the Royalists were captured, and about 1000 fell, in the battle and the pursuit which followed it. In addition all the artillery and the muskets (to the number of 8000) and ammunition with which the king could scarcely create a new army, fell into the hands of the victors.

NASH, RICHARD (1674–1762), English dandy, better known as "BEAU NASH," was born at Swansea on the 18th of October 1674. He was descended from an old family of good position, but his father from straitened means had become partner in a glass business. Young Nash was educated at Carmarthen grammar school and at Jesus College, Oxford. He obtained a commission in the army, which, however, he soon exchanged for the study of law at the Temple. Here among "wits and men of pleasure" he came to be accepted as an authority in regard to dress, manners and style. When the members of the Inns of Court entertained William III. after his accession, Nash was chosen to conduct the pageant at the Middle Temple. This duty he far exceeded in the satisfaction of the king that he was offered knighthood, but he declined the honour, unless accompanied by a pension. As the king did not take the hint, Nash found it necessary to turn gamerster. The pursuit of his calling led him in 1705 to Bath, where he had the good fortune almost immediately to succeed Captain Webster as master of the ceremonies. His qualifications for such a position were unique, and under his authority reforms were introduced which rapidly secured to Bath a leading position as a fashionable watering-place. He drew up a new code of rules for the regulation of balls and assemblies, abolished the habit of wearing swords in places of public amusement, and introduced gentlemen to adopt shoes and stockings in parades and assemblies instead of boots, reduced refractory chairmen to submission and civility, and introduced a tariff for lodgings. Through his exertions a handsome assembly-room was also erected, and the streets and public buildings were greatly improved. Nash adopted an outward state corresponding to his nominal dignity. He wore an immense white hat as a sign of office, and a dress adorned with rich embroidery, and drove in a chariot with six greyies, laced lackeys and French horns. When the king came to the city the satisfaction of the king that he was deprived of an easy though uncertain means of subsistence, but the corporation afterwards granted him a pension of six score guineas a year, which, with the sale of his snuff-boxes and other trinkets, enabled him to support a certain faded splendour till his death on the 3rd of February 1762. He was honoured with a public funeral at the expense of the town. Notwithstanding his vanity and impertinence, the tact, energy and superficial cleverness of Nash won him the patronage and notice of the great, while the success of his ceremonial duties, as shown in the increasing prosperity of the town, secured him the gratitude of the corporation and the people generally. He was a man of strong personality, and considerably more able than Beau Brummell, whose prototype he was.


NASH, THOMAS (1567–1601), English poet, playwright and pamphleteer, was born at Lowestoft in 1567. His father, a clergyman, moved to an old Herefordshire family, and is vaguely described as a minister. Nash spent nearly seven years, 1582 to 1589, at St John's College, Cambridge, taking his B.A. degree in 1585–1586. On leaving the university he tried, like Greene and Marlowe, to make his living in London by literature. It is probable that his first effort was The Anatomy of Absurditie (1589) which was perhaps written at Cambridge, although he refers to it as a forthcoming publication in his preface to Greene's Menaphon (1586). In this preface, addressed to the gentlemen students of both universities, he makes bitter ridicule of the Master of Arts, Thomas Kyd and the English hexametrist of Richard Stanburl, but there he forgets he is the author of many good books. Nash was really a journalist born out of due time; he boasts of writing "as fast as his hand could trot"; he had a brilliant and picturesque style which, he was careful to explain, was entirely original; and in addition to his keen sense of the ridiculous he had an abundance of miscellaneous learning. As there was no market for his gifts he fared no better than the other university wits who were trying to live by letters. But he found an opening for his ready wit and keen sarcasm in the Martin Marprelate controversy. His share in this war of pamphlets cannot now be accurately determined, but he has, with more or less probability, been credited with the following: A Counterfuce given to Martin Junior (1586), Martinis Mensch Minde (1586), The Returne of the renowned Cavallerio Pasquall and his Meeting with Marforius (1587), The First Parte of Pasquils Apologie (1590), and An Almond for a Parrat (1590). He edited an unauthorised edition of Sidney's poems with an enthusiastic preface in 1591, and A Wonderfull Astrologickal Prognostication, in ridicule of the almanac-makers, by "Adam Fouleweather," which appeared in the same year, has been attributed to him. Pierce Penniless, His Supplication to the Devil, published in 1592, shows us his power as a humorous critic of national manners, and tells incidentally how hard he found it to live by the pen. It seems to Pierce a monstrous thing that brainless drudges wax fat while the seven liberal sciences and a good leg will scarce get a scholar bread and cheese. In this pamphlet, too, Nash began his attacks upon the Harveys by assailing Richard, who had written contemptuously of his preface to Greene's Menaphon. Greene died in September 1592, and Richard's brother, Gabriel Harvey, at once attacked his memory in his Foure Letters, at the same time adversely criticizing Pierre Penniless. Nash retaliated, both for Greene and himself, in Strange News of the intercepting certaine Letters, better known, from the running title, as Foure Letters Confuted (1592), in which all the Harveys are violently attacked. The autumn of 1592 Nash seems to have spent at or near Croydon, where he wrote his satirical masque of Summers Last Will and Testament at a safe distance from London and the plague. He afterwards lived for some months in the Isle of Wight under the patronage of Sir George Carey, the governor. In 1593 he wrote Christis Tears over Jerusalem, in the first edition of which he made remarkable conjectures about Shakespeare. This was published in a second edition, published in the following year, replaced by a new attack, and two years later appeared the most violent of his tracts against Harvey, Have with you to Saffron-walden, or, Gabriell Harveyes Hunt is up (1596). In 1599 the controversy was suppressed by the archbishop of Canterbury. After Marlowe's death Nash prepared his friend's unfinished tragedy of Dido (1596) for the stage. In the next year he was in trouble for a play, now lost, called The Isle of Dogs, for only part of which, however, he seems to have been responsible. The excision and slandering matter contained in this play induced the authorities to close the theatre and, when it had been performed, and the dramatist was put in the Fleet prison. Besides his pamphlets and his play-writing, Nash turned his energies to novel-writing. He may be regarded as the pioneer in the English novel of adventure. He published in 1594 The Unfortunate Traveller, Or the Life of Jack Wilton, the history of an ingenious page who was present at the siege of Térouenne, and afterwards travelled in Italy with the earl of Surrey. It tells the story of the earl and Fair Geraldine, describes a tournament held by Surrey at Florence, and relates the adventures of Wilton and his mistress Diamante at Rome after the earl's return to England. The detailed, realistic manner in which Nash relates his improbable fiction resembles that of Defoe. His last work is entitled Lenten Stuffs (1599)
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and is nominally "in praise of the red herring," but really a
description of Yarmouth, to which place he had retired after his
imprisonment, written in the best style of a "special corre-
spondent." Nash's death is referred to in Thomas Dekker's
Knight's Conjurings (1667), a kind of sequel to Pierce Penniless.
He is there represented as joining his boon companions in the
Elysian fields "still haunted with the sharp and satirical spirit
that followed him here upon earth." Had his patrons under-
stood their duty, he would, he said, have shortened his days
by keeping company with pickled herrings. It may therefore
be reasonably supposed that he died eating bad and in-
sufficient food. The date of his death is fixed by an elegy on
him prefaced to Fitzgerald's Astarthe (1690).
The works of Thomas Nash were edited by Dr A. B. Grosart in
1888-1889, and more recently by Ronald B. McKerrow (1904).
An account of his work as a novelist may be found in the English
Novel in the Time of Shakespeare, by J. J. Jusserand (Eng. trans.,
1890). The Unfortunate Traveller was edited with an introduction
by Edmund Gosse in 1892. See also "Nash's Unfortunate Traveller
and Head's English Rogue, die beiden Hauptvertreter des englischen
Schelmenromans," by W. Kolmann in Anglia (Halle, vol. xlvii., 1890,
pp. 81-140).

NASHUA, a city and one of the county seats of Hillsboro
county, New Hampshire, U.S.A., at the confluence of the Nashua
and Merrimack rivers, 33 m. S.S.E. of Concord and 40 m. N.W.
by rail. Pop. (1890) 19,311; (1900) 23,898, of whom 889 were
foreign-born. The first settlement was made in 1720. In 1790
the town was incorporated by the name Nashua, and was
served by the Boston & Maine railroad, whose several divisions
centring here give the city commercial importance, and by
electric lines to Hudson, Litchfield, Pelham, Dracut and
Tyngsboro. The area of the city in 1866 was 30-71 sq. m. To
the N., W. and S.W. of the city there are beautiful hills and
mountains. The church of Saint Francis Xavier and the First
Congregational church are architecturally noteworthy. The city has
a soldiers' monument, a public library, a court house and two
hospitals. There is a United States fish hatchery here, and until
after the close of the 19th century fishing was the principal
industry of the place. Manufacturing now is the principal
goods, shoes, boots, shoes, and foundry and machine-shop products.
The value of the city's factory products increased from $16,066,664
in 1900 to $12,858,382 in 1905, and 27½%, and in 1905 Nashua
ranked second among the manufacturing cities of the state.
Nashua is one of the oldest interior settlements of the state.
The first settlement here was established about 1665; and in 1673
the township of Dunstable was incorporated by the General Court
of Massachusetts-born; in 1741, when the boundary between Massa-
chusetts and New Hampshire was settled, the jurisdiction of this
portion of Dunstable was transferred to New Hampshire; five
years later it was incorporated under the laws of that state; and
in 1803 the settlement, originally known as Indian Head, was
incorporated as a village under the name of Nashua, and in 1836
the township of Dunstable also received the name Nashua.
The town of Nashua was set apart from the town of Nashua in 1842,
but the two towns were united under a city charter obtained in
1853. In 1795 the first stage coach was run through here from
Boston to Amherst, and at about the same time a canal was
built around Pawtucket Falls on the Merrimack at Lowell. In
1822 a manufacturing company was formed, which at once began
to develop the water-power and in 1825 erected the first cotton
mill. Thirty years later the Nashua & Lowell railroad (now
leased to the Boston & Maine) first reached Nashua.
See The History of the City of Nashua, edited by E. E. Parker
(Nashua, 1880).

NASHVILLE, the capital of Tennessee, U.S.A., and the
county-seat of Davidson county, on the Cumberland river, 186 m.
S.S.W. of Louisville, Kentucky. Pop. (1890) 76,168; (1900)
80,865, of whom 30,337 were foreign-born and 30,444 were negroes;
(1910 census) 110,624. Nashville is served by the Tennessee
Central, the Nashville & Louisville, and the Nashville, Chat-
anooga & St Louis railways, and by several steamboat lines.
The Cumberland river is crossed here by four foot-bridges.
Nashville is situated on and between hills and bluffs in an un-
dulating valley; its streets are paved with brick or granite
blocks in the business section and macadamized or paved with
asphalt in the residential sections. The city has fine public
buildings, many handsome residences, and several beautiful
parks. The principal building is the State House, a fine example
of pure Greek architecture, on the most prominent hill-top, with
a tower 205 ft. in height. On the grounds about it are a bronze
equestrian statue of Andrew Jackson, by Clark Mills (1815-1883),
and the tomb of President James K. Polk, who lived in Nashville.
Other prominent buildings and institutions are the United
States Government Building, the County Court House, the City
Hall, the Tennessee State University, the Belle Meade Church,
the State Normal School, the State Library, the Library of the State
Historical Society housed in Watkins Institute, a Carnegie library,
park buildings, the State Penitentiary, Vendôme Theatre, the Board
of Trade Building, the City Hospital, the St Thomas Hospital
(Roman Catholic), and, near the city, a Confederate Soldiers' Home
and a State Hospital for the Insane. Eleven miles east of
the city is the "Hermitage," which was the residence of President
Andrew Jackson.

The grounds of the Tennessee Centennial Exposition of 1897
(commemorating the admission of Tennessee into the Union
on the 15th day of June, 1796), now constitute Centennial Park,
in which still stand the reproduced Parthenon of Athens, the
History Building, which in general outline is a reproduction of
the Erectheum and contains a museum and an art gallery, and
a monument to the memory of James Robertson (1742-1814),
the founder of the city. Besides this there are four other parks:
Glenendale Park in the south section, a place of much natural beauty;Shelby Park, in the eastern part of the city, fronting the river;
Watkins Park, on the north; and Cumberland Driving Park.
In Mount Olivet Cemetery is a beautiful Confederate Soldiers' monument surrounded by the Bickel Coliseum, and a little to
the north of the city is a National Cemetery in which 16,643
Federal soldiers are buried, the names of 4711 of them being
unknown.

Nashville is one of the foremost educational centres in
the Southern states. In the western part of the city is Vanderbilt
University. This institution, opened in 1875, is under the
patronage of the Methodist Episcopal Church, South, and was
named in honour of Cornelius Vanderbilt, who contributed
$1,000,000 to its funds, and whose son, W. H. Vanderbilt, and
grandsons, W. K. Vanderbilt and Cornelius Vanderbilt II, to
the university about $850,000. It is coeducational and embraces
an academic department, a biblical department, and departments
of engineering, law, medicine, pharmacy and dentistry; in 1909
it had 125 instructors and 959 students. The University of
Vanderbilt is a non-sectarian institution embracing a college
department, a medical department, a preparatory department,
and the George Peabody College for Teachers; it was incorporated
under the laws of North Carolina as Davidson Academy in 1785
and under the laws of Tennessee as Cumberland College in 1806,
and the present name was adopted in 1856. The George Peabody
College for Teachers, an important part of the institution, was
opened as a normal school in 1873; in 1907-1908 it had an
enrolment (including the summer session) of 647 students.
In 1909 it received $1,000,000 from the Peabody Fund, later supple-
mented by $250,000 from the state, $200,000 from the city and
$100,000 from Davidson county. The University of Tennessee,
located mainly at Knoxville, has at Nashville its medical and
dental departments. Ward Seminary, opened in 1865, Boscosel
College, opened in 1880, and Buford, Belmont and Radnor colleges
are all non-sectarian institutions of Nashville for the higher edu-
cation of women. For the education of negroes the city has the
Fisk University (opened in 1866, incorporated in 1867), under the
auspices of the American Missionary Association and the Western
 Freedman's Aid Commission of the Congregational Church (noted
since 1871 for its Jubilee Singers, who raised money for Jubilee Hall,
finished in 1876); it embraces a college department, a preparatory
department, a normal department and departments of theology,
music and physical training; and Walden University, founded as
Central Tennessee College in 1866, under the auspices of the
Methodist Episcopal Church, and embracing a college department, a normal department, an industrial department, and departments of English, commerce, law, medicine, dentistry, pharmacy, music, Bible training, nurse training and domestic science. The Baptist, the Methodist Episcopal (South), the Cumberland Presbyterian, and the African Baptist and the African Methodist Episcopal churches have publishing houses in Nashville.

The leading manufactures of the city are flour and grist mill products (valued at $4,242,480 in 1905), lumber and timber products—Nashville is one of the greatest hard wood markets in the United States, and in 1905 the value of lumber and timber products was $1,119,162 and of planing-mill products, $1,299,069 —construction and repair of steam railway cars ($1,734,000 in 1905), tobacco ($1,311,019 in 1905), fertilizers ($84,571 in 1905), men's clothing ($720,227 in 1905), saddlery, harness, soap and candles. The total value of the products of the factories increased from $1,5,301,056 in 1900 to $2,169,661 (16.6% of the entire factory product of the state) in 1905, amounts greater than those of any other city in the state. Nashville has a large trade in grain, cotton, groceries, dry goods, drugs, and boots and shoes. The water-works and the electric lighting plant are owned and operated by the municipality.

Nashville was founded in 1780 as "the advance guard of western civilization" by a company of two hundred or more pioneers under the leadership of James Robertson, the nearest settlement being at the time about three hundred miles distant. While the first settlement was in South Carolina and in Abner Nash (1776-1780), who was at the time governor of North Carolina, or more probably in honour of the Revolutionary general, Francis Nash (1720-1777), a brother of Abner, killed at Germantown; but when, in 1784, it was incorporated as a town by the North Carolina legislature the present name was substituted. In 1806 Nashville was chartered as a city. Although it was not the capital of the state until 1843, the legislature met here from 1812 with the exception of the period from 1813 to 1826. Many of the pioneers of Nashville were slain by the Creek and Cherokee Indians, and at times the settlement was saved from destruction only by the heroism of Robertson, but in 1794 the savages were dealt a crushing blow at Nickajack on the lower Tennessee and much more peaceful relations were established.

On the 3rd of June 1830 a convention, known as the Southern or Nashville Convention, whose action was generally considered a threat of disunion, met here to consider the questions at issue between the North and the South. Since such a meeting had first been proposed by a state convention of Mississippi, the famous Compromise Measures of 1850 had been introduced in Congress and the support of the movement had been greatly weakened. The convention met here in honour of the statesman, whose influence would have been greater had he lived. Nine states, however, were represented by about 100 delegates, mostly Democrats, and the convention denounced the Wilmot Proviso, and, as "an extreme concession on the part of the South," promised to agree that, W. of Missouri, there should be slavery only in the territory S. of 36° 30' N. lat. At an adjourned meeting in November it expressed its dissatisfaction with the Compromise Measures of Congress, and asserted the right of the South to secede.

During the Civil War Nashville was at first held by the Confederates and mostly in 1862 it was occupied by the Federals, who retained possession of it to the end. The battle of Nashville was fought on the 15th and 16th of December 1864 between the Union army under Major-General G. H. Thomas and the Confederates under General J. B. Hood. The Union defences extended in a semicircle round Nashville, the flanks on the river above and below. Hood's army was to the south-east, lightly entrenched, with its flanks on two creeks which emptied into the Cumberland above and below Nashville. This position he desired to maintain as long as possible so as to gather recruits and supplies in safety. If Thomas, whose army was of motley composition, could be brought to a line west of him and between the two streams, he would have won his point. As it was, he was forced to retreat from Nashville on his heels. Thomas, however, would not strike until he had his army organized. Then, on the 15th, he emerged from the entrenchedments and by a vigorous attack on the Confederate left forced back Hood's line to a second position 1½ m. to the south. Hood, having detached a part of his army, desired to gain time to bring in his detachments by holding this line for another day. Thomas, however, gave him no respite. On the 16th the Union army deployed in front of him, again over-lapping his left flank, and although a frontal attack was repulsed, the extension of the Federal right wing compelled Hood to extend his own lines more and more. Then the Confederates broke the attenuated line of defence at its left centre, and Hood's army drifted away in disorder. The pursuit was vigorous, and only a remnant of the Confederate forces reassembled at Columbia, 40 m. to the south, whence they fell back without delay behind the Tennessee.

Nasi, Joseph (16th century), Jewish statesman and financier, was born in Portugal of a Jewish (Marano) family. Emigrating from his native land, he founded a banking house in Antwerp. Despite his financial and social prosperity there, he felt it impossible to be compelled to wear the gage of Catholicism, and determined to settle in a Mahomedan land. After two troubled years in Venice, Nasi betook himself to Constantinople. Here he proclaimed his Judaism, and married his beautiful cousin Reyna. He rapidly rose to favour, the sultana Suleiman promoting him to high office. He founded a Jewish colony at Tiberias which was to be an asylum for the Jews of the Roman Campagna. In 1566 when Selim ascended the throne, Nasi was made Duke of Nasi. He had deserved well of Turkey, for he had conquered Cyprus for the sultan. Nasi's influence was so great that foreign powers often negotiated through him for concessions which they sought from the sultan. Thus the emperor of Germany, Maximilian II., entered into direct correspondence with Nasi; William of Orange, Sigismund August II., king of Poland, also conferred with him on political questions of moment. On the death of Selim in 1574, Nasi recoiled from his political position, but retained his wealth and offices, and passed the five years of life remaining to him in honoured tranquillity at Belvedere (Constantinople). He died in 1579. His care was not productive of great moral importance. It was one of the tokens of the new era that was to dawn for the Jews as trusted public officials and as members of the state.


Nasi, a town and district of British India, in the central division of Bombay. The town is on the Godavari river, connected by a tramway (5 m.) with Nasik Road railway station, 107 m. N.E. of Bombay. Pop. (1901) 21,400. It is a very holy place of Hindu pilgrimage, being 30 m. from the source of the Godavari. Shrines and temples line the river banks, and some stand even in the river. In the vicinity there are a number of sacred caves, among which those of Pandu Lena are the most noteworthy. They are ancient Buddhist caves dating from the 3rd century before Christ to the 6th century after. There are numerous inscriptions of the highest historical value. Nasik has manufactures of cotton goods, brass-ware and mineral waters.

The District of Nasik has an area of 5550 sq. m. With the exception of a few villages in the west, the whole district is intersected by a table-land of 3000 ft. above sea-level. The western portion is hilly, and intersected by ravines, and only the simplest kind of cultivation is possible. The eastern tract is open, fertile and well cultivated. The Sahyadri range stretches from north to south; the watershed is formed by the Chander range, which runs east and west. All the streams to the south of that range are tributaries of the Godavari. To the north of the watershed, the Grina and its tributary the Mosam flow through fertile valleys into the Tapti. The district generally is destitute of trees, and the forests which formerly clothed the Sahyadri hills have nearly disappeared; efforts are now being made to reforest them. The Mahratta wars caused great destruction, and to replete some of the slopes. The district contains several old hill forts, the scenes of many engagements during the Mahratta wars. Nasik district
became British territory in 1818 on the overthrow of the peshwa. The population in 1901 was 816,504, showing a decrease of 3% in the decade. The principal crops are millet, wheat, pulse, oil-seeds, cotton and sugar cane. There are also some vineyards of old date, and much garden cultivation. Yeola is an important centre of weaving silks both of Indian and Chinese origin. There are railroads at Malegaon, railway workshops at Igatpuri, and cantonments at Deolali and Malegaon. At Sharanpur is a Christian village, with an orphanage of the C.M.S., founded in 1854. The district is crossed by the main line and also by the chord line of the Great Indian Peninsula railway.

NASIR KHOSRAU (Nasiri Khusru), Abū Mu‘in-ed-dīn Nasīr b. Khosrau (1004–1088), whose nom de plume was Hujjat, the first great didactic poet of Persia, was born, according to his own statement, A.H. 394 (A.D. 1004), at Kubdāyān, near Balkh in Khurāsān and was, according to the ordinary opinion of the life of the poet, in the east; we learn from incidental remarks of his that he was a Sunnite, probably according to the Ḥanifite rite, well versed in all the branches of natural science, in medicine, mathematics, astronomy and astrology, in Greek philosophy, and the interpretation of the Koran; that he was much addicted to worldly pleasures, especially to excessive wine drinking. He had studied Arabic, Turkish, Greek, the vernacular languages of India and Sind, and perhaps even Hebrew; he had visited Multān and Lahore, and the splendid Chaznavīde court under Sultan Mahmūd, Firdousī's patron. Later on he chose Merv for his residence, and is the owner of a building called the Unch (now a street) in that place. In A.H. 437 (A.D. 1045) he appears as financial secretary and revenue collector of the Seljuk sultan Toghru Beg, or rather of his brother Jāhār Beg, the emir of Khorāsān, who had conquered Merv in 1037. About this time, inspired by a heavenly voice (which he pretends to have heard in a dream), he abjured all the luxuries of life, and resolved upon a pilgrimage to the holy shrines of Mecca and Medina, hoping to find there the solution of all his religious doubts. The graphic description of this journey is contained in the Safarnāma, which possesses a special value among books of travel, since it contains the most minute account of the state of the Mussulman world in the middle of the 11th century. The minute sketches of Jerusalem and its environs are even now of practical value. During the seven years of his journey (A.D. 1045–1052) Nasir visited Mecca four times, and performed all the rites and observances of a zealous pilgrim; but he was far more attracted by Cairo, the capital of Egypt, and the residence of the Fatimite sultan Mostānsir bil-lāh, the great champion of the Shi‘a, and the spiritual as well as political head of the house of ‘Ali, which was just then waging a deadly war against the ‘Abbāsid caliph of Bagdad, and whose greatest supporter was the Great Seljuk Khalif at Sihjūk. At the very time of Nasir’s visit to Cairo, the power of the Egyptian Fatimites was in its zenith; Syria, the Hejaz, Africa, and Sicily obeyed Mostanṣir’s sway, and the utmost order, security and prosperity reigned in Egypt. At Cairo he became thoroughly imbued with Shi‘a doctrines, and their introduction into his native country was henceforth the sole object of his life. The hostility he encountered in the propagation of these new religious ideas after his return to Khorāsān in 1052 and Sunnite fanaticism compelled him at last to flee, and after many wandering journeys, first of all the house of a house and garden there. At Badakshān, where he spent as a hermit the last decades of his life, and gathered round him a considerable number of devoted adherents, who have handed down his doctrines to succeeding generations.

Most of Nasir’s lyrical poems were composed in his retirement, and their chief topics are—an enthusiastic praise of ‘Ali, his descendent, and Mostanṣir in particular; passionate outcries against Khorāsān and its rulers, who had driven him from house and home; the highest satisfaction with the quiet solitude of Yumgān; and utter despondency again in seeing himself despised by his former associates and forever excluded from participation in the glorious contest of life. But scattered through all these alternate outbursts of hope and despair we find precious lessons of purest morality, and solemn warnings against the tricks and perfidy of the world, the vanity of all earthly splendour and greatness, of all the hypocrisies, frivolity and viciousness of fashionable society and princely courts in particular. It is the same strain which runs, although in a somewhat lower key, through his two most important works of historical poetry, the Rashidunāma, or "book of enlightenment," and the Sa‘dādatnāma, or "book of felicity." The former is divided into two sections: the first, of a metaphysical character, reproduced in Persian verse, is based on Avicenna’s theories, but frequently intermixed both with the freer speculations of the well-known philosophical brotherhood of Basra, the Ḥikwān-es-safā’ī, and purely Shi‘ite or Isma’īlite maxims and ingenious thoughts on man’s good and bad qualities, on the necessity of shunning the company of fools and double-faced friends, and the deceptive allurements of the world and the secret shares of ambitious and corrupt men. The second section is composed with an imaginary vision of a beautiful world of spirits who have stripped off the fetters of earthly cares and sorrows and revel in the pure perfume of the wireless and ethereal. If we substitute for the alleged allegory in Nasir’s diwan, which culminates in the praise of Mostanṣir, we are fairly entitled to look upon it as a covert allusion to the eminent men who revealed to the poet in Cairo the secrets of the Isma’īlī faith, and showed him what he considered the "heavenly ladder" to superior knowledge and spiritual bliss. The passage, thus interpreted, lends additional weight to the correctness of Dr Ethè’s theory of Nasir’s conversion at the court of the Seljuk Sultan in 1052.

A similar series of excellent teachings on practical wisdom and the moral laws of a vanishing life, only of slight and occasional interest, is contained in the Sa‘dādatnāma; and, judging from the extreme bitterness of tone manifested in the "reproofs" of its emirs and the "memories" of the transtended sultan, who was still furious against the vile aspersions poured out upon Nāsir’s moral and religious attitude during those persecutions which drove him at last to Yumgān. Of all the other works of our author mentioned by Oriental writers there has as yet been found only one, the Zidd elmas‘ūdīn or "travelling provisions of pilgrims" (in the private possession of M. Schefler, Paris), a theoretical description of his religious and philosophical principles; and we can very well dismiss the rest as being probably just as apocryphal as Nāsir’s famous autobiography (found in several Persian tadkhīlas or biographies of poets), a mere forgery of the most extravagant description, which is mainly responsible for the confusion in names and dates in older accounts of our author.


NASIRABAD, or MYMENNSHG, a town of British India, headquarters of Mymensingh district in Eastern Bengal and Assam, situated on the left bank of the old channel of the Brahmaputra, which is only navigable during the rainy season. Pop. (1901) 14,668. It has a station on the branch of the Eastern Bengal railway from Dakca to Jagannathganj, on the Jamuna or main stream of the Brahmaputra. The earthquake of the 12th of June 1897 destroyed the church and the high school, and seriously damaged other public buildings.

NASIRABAD is also the name of a town and cantonment in the district of Patna, North Bengal, the headquarters of a brigade in the 5th division of the Southern army.

NASMUTH, ALEXANDER (1758–1840), Scottish portrait and landscape painter, was born in Edinburgh on the 6th of September 1758. He studied at the Trustees’ Academy under Runciman, and, having been apprenticed as an heraldic painter to a coachbuilder, he, at the age of sixteen, attracted the attention of Allan Ramsay, who took the youth with him to London, and employed him upon the subordinate portions of his works. Nasmuth returned to Edinburgh in 1788, and was soon largely patronized by one portrait painter. He also assisted Mr Miller of Delft as draughtsman, in his mechanical researches and experiments; and, this gentleman having generously offered the painter a loan to enable him to pursue his studies abroad, he left in 1792 for Italy, where he remained two years. On his return he painted...
the excellent portrait of Burns, now in the Scottish National Gallery, well known through Walker’s engraving. Political feeling at that time ran high in Edinburgh, and Nasmyth’s pronounced Liberal opinions, which he was too outspoken and sincere to disguise, gave offence to many of his aristocratic patrons, and led to the diminution of his practice as a portraitist. In his later years, accordingly, he devoted himself mainly to landscape work, and did not disdain on occasion to set his hand to scene-painting for the theatres. He has been styled, not unjustly, the "father of Scottish landscape art." His subjects are carefully finished and coloured, but are sagging in bosoms and sometimes are partially destroyed by the amateurish disposition of their estates, in which his fine taste rendered him especially skillful; and he was known as an architect, having designed the Dean Bridge, Edinburgh, and the graceful circular temple covering St. Bernard’s Well. Nasmyth died in his native city on the 20th of April 1840. His youngest son, James, was the well-known inventor of the steam-hammer. His six daughters all attained a certain local reputation as artists, but it was in his eldest son, Patrick (1875-1931), that the artistic skill of his family was most powerfully developed. He studied under his father, Patrick went to London at the age of twenty, and soon attracted attention as a clever landscapist. He was a diligent student of the works of Claude and Richard Wilson, and of Ruysdael and Hobbema, upon whom his own practice was mainly founded. His most characteristic paintings are of English domestic scenery, full of quiet tone and colour, and detailed and minute expression of foliage, and with considerable brilliancy of sky effect. They were executed with his left hand, his right having in early life been injured by an accident.

For an account of the Nasmyth family see James Nasmyth’s Autobiography (1883).

NASMYTH, JAMES (1808-1890), Scottish engineer, was born in Edinburgh on the 19th of August 1808, and was the youngest son of Alexander Nasmyth, the "father of Scottish landscape art." He was sent to school in his native city, and then attended classes in chemistry, mathematics and natural philosophy at the university. From an early age he showed great fondness for mechanical pursuits, and the skill he attained in the practical use of tools enabled him to make models of engines, &c., which found a ready sale. In 1829 he obtained a position in Henry Macleod’s works in London, where he stayed two years, and then, in 1834, started business on his own account in Manchester. The beginnings were small, but they quickly developed, and in a few years he was at the head of the prosperous Bridgewater foundry at Patricroft, from which he was able to retire in 1856 with a fortune. The invention of the steam-hammer, with which his name is associated, was actually made in 1839, a drawing of the device appearing in his note-book, or "scheme-book," as he called it, with the date 24th November of that year. It was designed to meet the difficulty experienced by the builders of the Great Britain steamship in finding a firm that would undertake to forge the large paddle-wheel shaft required for that vessel, but no machine of the kind was constructed till 1842.

In that year Nasmyth discovered one in Schneiders’ Creuzot works, and he found that the design was his own and had been copied from his "scheme-book." His title, therefore, to be called the inventor of the steam-hammer holds good against the claims sometimes advanced in favour of the Schneiders, though apparently he was anticipated in the idea by James Watt. Nasmyth did much for the improvement of machine-tools, and his inventive genius devised many new appliances—a planeing-machine ("Nasmyth steam-arch"), a nut-shaping machine, steam pile-driver, hydraulic machinery for various purposes, &c., &c.

In his retirement he lived at Penshurst in Kent, and amused himself with the study of astronomy, and especially of the moon, on which he published a work, The Moon considered as a Planet, a World and a Satellite, in conjunction with James Carpenter in 1874. He died in London on the 7th of May 1890.

His Autobiography, edited by Dr Samuel Smiles, was published in 1883.
supported them against rebels. The end came when the weakness of Mahomm edan rulers in Morocco coincided with the rule of strong sovereigns in Castile. Frontier wars between Mahom medan and Christian borderers were incessant, and at long intervals the kings of Castile made invasions on a considerable scale, without, however, following up any successes they might gain. The comparative prosperity of Granada was due to the concentration of a large population driven from other parts of Spain, and the consequent necessity for the intensive cultivation of the rich valleys lying among the ranges of mountains which encircle the kingdom, and the extensive "Vega" or plain of Granada. The reputation for civilization which the agitated Mahomm edean state enjoys in history is based on the surviving parts of the highly decorated fortress palace of the Alhambra, which was mainly the work of three of the sultans, the founder, Mahomed el Ghallib, and his two successors.

See S. Lane-Poole, The Mahomm edean Dynasties (London, 1894); and Historia de Granada, by Don M. Lafuente Alcántara (Granada, 1884).

**NASSARAWA**

NASSARAWA, a province of the British protectorate of northern Nigeria, lying approximately between 6° 40' and 9° E. and between 7° 40' and 12° 40' N. It is situated on the northern bank of the river Benue, which in its windings forms the southern frontier of the province. Nassarawa is bounded E. by the province of Muri, N.E. by Bauchi, N. by Zaria and W. by Nupe and the trans-Nigerian portion of the province of Kabba. It has an area of 18,000 sq. m. and an estimated population of 1,500,000. The province, like that of Bauchi, is traversed by modern and native courts. It consists of a hilly plateau, interspersed with many fertile river valleys. Native products include rubber, palm kernels and beni seed. Cotton is grown extensively. Until the middle of the 18th century Nassarawa appears to have been peopled by many native tribes of a primitive type. About 1750 an important pagan tribe, the Igbara, came from the south-west across the Niger and established two rival kingdoms in the western portion of the province. Later the native inhabitants of Zaria, driven before the Fula, came from the north and occupied the central portion of Nassarawa. Later still (about 1840) certain Fula of Zaria themselves conquered portions of the province, founded Keffi, spread as far as the Benue in the south-west corner and occupied the town and district of Abuja in the west. Fula also made a settlement at the town of Nassarawa and at Darroro in the N.E. A colony from Bornu entered the province and founded the important town of Lafia Berefere in the eastern district. As a result of these movements the aboriginal tribes were driven into the hilly regions of the S.E. and N.E. The Musha, a truculent and hardy people, hold a portion of the northern bank of the Benue, and the Kagoro and Attakar tribes hold the hilly country to the N.E., through which the roads pass from Keffi and through the Bauchi high- lands. Before the British occupation the state of Nassarawa had become a partially subdued Fula emirate, exercising doubtful sway over the native pagans and paying a scarcely less doubtful allegiance on its own part to the Fula ruler of Zaria. The riverain tribes of Nassarawa were among the first to break into open aggression against the British administration established at Lokoja. In January 1900 they attacked a telegraph construction party in the Mushu country on the banks of the Benue. The result was the occupation of Keffi by British troops and the gradual subjugation of the province. In 1902 the first British resident, Captain Moloney, was murdered at Keffi by an official of the emir's court. The emir repudiated all responsibility for the crime, and the murderer fled to Kano, where his reception on friendly terms was among the incidents which determined the Sokoto-Kano campaign of 1903. The British were now recognized as the rulers of Nigeria, and the emir of Nassarawa threw in his lot with the British government. Slave raiding was abolished and the slave trade made illegal. A British court of justice was established at the provincial head- quarters and native courts in every district. Roads have been opened and trade is steadily increasing. In 1905 an expedition was required against the Kagoro people, who occupy a vast open plateau having an elevation of about 1800 ft. through which a short road to the Bauchi tin mines passes from the Benue. These people had been raiding the Fula for cattle and murdering traders upon the road. A splendid grazing country, healthy and also rich in rubber, was opened. The road to the tin mines was rendered safe and is now the Bauchi mail route. There is a cart road from Loko to the Benue to Keffi.

NASSAU, a territory of Germany, now forming the bulk of the government district of Wiesbaden, in the Prussian province of Hesse-Nassau, but until 1866 an independent and sovereign duchy of Germany. It consists of a compact mass of territory, 1830 sq. m. in area, bounded on the S. and W. by the Main and Rhine, on the N. by Westphalia and on the E. by Hesse. This territory is divided into two nearly equal parts by the river Lahn, which flows from east to west into the Rhine. The southern half is almost entirely occupied by the Taunus Mountains, which attain a height of 2000 ft. In the Great Feldberg, while to the north of the Lahn is the barren Westerwald, culminating in a hill 3000 ft.). The valleys and low-lying districts, especially the Rheingau, are very fertile, producing abundance of grain, flax, hemp and fruit; but by far the most valuable product of the soil is its wine, which includes several of the choicest Rheinisch varieties, such as Johannisberger, Marzobrunner and Assmannshütser. Nassau is one of the most thickly wooded regions in Germany, about 42% of its surface being occupied by forests, which yield good timber and harbour large quantities of game. The rivers abound in fish, the salmon fisheries on the Rhine being especially important. There are numerous salt springs of which formerly belonged to the duke, and afforded him a considerable part of his revenue. The best known are those of Wiesbaden, Ems, Soden, Schwalm, Schlangenbad, Gelna and Fachingen. The other mineral wealth of Nassau includes iron, lead, copper, building stone, coals, slate, a little silver and a bed of malachite. Its manufactures, including cotton and woollen goods, are unimportant, but a brisk trade is carried on by rail and river in wine, timber, grain and fruit. There are few places of importance besides the above-named spas; Höchst is the only manufacturing town. Wiesbaden, with 100,000 inhabitants, is the capital of the government district as it was of the duchy. In 1864 the duchy contained 466,117 inhabitants, of whom 242,000 were Protestants, 275,000 Roman Catholics and 7000 Jews. The ecclesiastical jurisdiction was in the hands of the Protestant bishop of Wiesbaden and the Roman Catholic bishop of Limburg. Education was amply provided for in numerous higher and lower schools. The annual revenue of the dukedom was about £400,000 and it furnished a contingent of 6000 men to the army of the German Confederation.

**History.**—During the Roman period the district enclosed by the Rhine, the Main and the Lahn was occupied by the Marcomanni and later by the Alamanni. The latter were subdued by the Franks under Clovis at the end of the 5th century, and at the partition of Verdun in 843 the country became part of the East Frankish or German kingdom. Christianity seems to have been introduced in the 4th century. The founder of the house of Nassau is usually regarded as a certain Druwin (d. 706), who, with his brother Dudo, count of Luxembourg, built a castle on a hill overlooking the Lahn, near the present town of Nassau. Druwin's descendant Walram (d. 1108) took the title of count of Nassau, and placed his hands under the immediate suzerainty of the German king, and the house had been a vassal of the archbishop of Trier. Then in 1255 Walram's grandsons, Walram and Otto, divided between them their paternal inheritance, which had been steadily increasing in size. Walram took the part of Nassau lying on the left bank of the Lahn and made Wiesbaden his residence; Otto took the part on the right bank of the river and his capital was Siegen. The brothers thus founded the two branches of the house of Nassau, which have flourished to the present time.

The emirs of the Ottonian, or younger, line belong mainly to the history of the Netherlands. The family was soon divided into several branches, and in the 15th century one of its members,
Count Engelbert I. (d. 1442), obtained through marriage lands in Holland. Of his two sons one took the Dutch, and the other the German possessions of the house, but these were united again in 1504 under the sway of John, count of Nassau-Dillenburg, the head of a branch of the family which, in consequence of a series of deaths, the last of which took place in 1561, was a few years later the sole representative of the descendants of Count Otto. John's son was Count William the Rich (d. 1559), and his grandson was the hero, William the Silent, who inherited the principality of Orange in 1544 and surrendered his prospective inheritance, in Nassau to his brother John (d. 1606). William and his descendants were called princes of Orange-Nassau, and the line became extinct when the English king William III. died in 1702. Meanwhile the descendants of Count John, the rulers of Nassau, were flourishing. They were divided into several branches, and in 1702 the head of one of these, John William Friso of Nassau-Dietz (d. 1711), whose ancestor had been made a prince of the Empire in 1654, inherited the title of prince of Orange and the lands of the English king in the Netherlands.

A few years later in 1743 a number of deaths left John William's son, William, the sole representative of his family, and as such he ruled over the ancestral lands both in Nassau and in the Netherlands. In 1866, however, these were taken from a succeeding prince, William VI., because he refused to join the Confederation of the Rhine. Some of them were given in 1815 to the other main line of the family, the one descended from Count Walram (see below). In 1815 William VI. became king of the Netherlands as William I., and was compensated for this loss in 1840 by the gift of parts of Luxembourg. William's eldest son, Otto, was again united in 1866 under Louis II. of Nassau-Weilburg (d. 1862). Soon, however, the family was again divided; three branches were formed, those of Saarbrücken, Idstein and Weilburg, the heads of the first two becoming princes of the Empire in 1868. Other partitions followed, but at the opening of the 19th century only two lines were flourishing, those of Nassau-Usingen and Nassau-Weilburg. In 1801 Charles William, prince of Nassau-Usingen, was deprived of France by his lands on the left bank of the Rhine, but both he and Frederick William of Nassau-Weilburg, who suffered a similar loss, received ample compensation. In 1815 both Nassau-Usingen and Frederick Augustus, the brother and successor of Charles William, joined the Confederation of the Rhine and received from Napoleon the title of duke, but after the battle of Leipzig they threw in their lot with the allies, and in 1815 joined the German Confederation. As a result of the changes of 1815 Frederick Augustus of Nassau-Usingen ceded some of his newly-acquired lands to Prussia, receiving in return the greater part of the German possessions of the Ottonian branch of the house of Nassau (see above). In March 1876 he died without sons and the whole of Nassau was united under the rule of Frederick William of Nassau-Weilburg as duke of Nassau. Already in 1814 Frederick William had granted a constitution to his subjects, which provided for two representative chambers, and under his son William, who succeeded in 1816, the first landtag met in 1818. At once, however, it came into collision with the duke about the ducal domains, and these dissensions were not settled until 1836.

In this year the duchy took an important step in the development of its material prosperity by joining the German Zollverein. In 1838 Duke Adolph, the son and successor of Duke William, was compelled to yield to the temper of the times and to grant a more liberal constitution to Nassau, but in the following years a series of reactionary measures reduced matters to their former unsatisfactory condition. The duke adhered steadfastly to his conservative principles, while his people showed their sympathies by electing one liberal landtag after another. In 1866 Adolph espoused the cause of Austria, sent his troops into the field and asked the landtag for money. This was refused, Adolph was soon a fugitive before the Prussian troops, and on the 3rd of October 1866 Nassau was formally incorporated with the kingdom of Prussia. The deposed duke entered in 1867 into a convention with Prussia by which he retained a few castles and received an indemnity of about £5,500,000 for renouncing his claim to Nassau. In 1869, on the extinction of the collateral line of his house, he became grand-duke of Luxembourg, and he died on the 17th of November 1905.

The town of Nassau (Lat. *Nasonga*) on the right bank of the Lahn, 15 m. above Coblenz, is interesting as the birthplace of the Prussian statesman, Freiherr von Stein. Pop. (1905) 2238. It has a Roman Catholic and an Evangelical church, while its main industries are brewing and mining. Near the town are the ruins of the castle of Stein, first mentioned in 1138, with a marble statue of Stein, while the ruins of the ancestral castle of the house of Nassau may also be seen.


**NAST, THOMAS** (1840–1902), American caricaturist, was born on the 27th of September 1840, in the military barracks of the city of Ansbach, in the electorate of Würtemberg, the son of a musician in the Ninth regiment of the Bavarian band. His mother took him to New York in 1846. He studied art there for about a year with Theodor Kaufmann and then at the school of the National Academy of Design. At the age of fifteen he became a draughtsman for Frank Leslie's *Illustrated Newspaper*; three years afterwards for *Harper's Weekly*. In 1860 he went to England for the *New York Illustrated News* to depict the prize-fight between Heenan and Sayers, and then joined Garibaldi in Italy as artist for *The Illustrated London News*. His first serious work in caricature was the cartoon "Peace," in 1862, directed against those in the North who opposed the prosecution of the Civil War. This and his other cartoons during the Civil War and Reconstruction days were published in *Harper's Weekly*; they attracted great attention, and Nast was called by President Lincoln "our best recruiting sergeant." Even more able were Nast's cartoons against the Tweed Ring conspiracy in New York city; his caricature of Tweed being the means of the latter's identification and arrest at Vigo. In 1873, 1885 and 1887 Nast toured the United States as lecturer and sketch-artist, but with the advent of new methods and younger blood his vogue decreased. He had been an ardent Republican in his earlier years; had bitterly attacked President Johnson and his Reconstruction policy; had ridiculed Greeley's candidature, and had opposed inflation of the currency, notably with his famous "rag-baby" cartoons, but his advocacy of civil service reform and his distrust of Blaine forced him to become a Mugwump and in 1884 an open supporter of the Democratic party, from which in 1892 he returned to the Republican party and the support of Harrison. He had lost practically all of his earnings by the failure of Grant and Ward, and in May 1902 was appointed by President Roosevelt commissary-general at Guaynabo, where he died on the 7th of December that year. He did some painting in oil and some book illustrations, but these were comparatively unimportant, and his fame rests on his caricatures and political cartoons. Nast introduced the donkey to typify the Democratic party, the elephant to typify the Republican party, and the tiger to typify Tammany Hall, and introduced into American cartoons the practice of modernizing scenes from Shakespeare for a political purpose.

NASTURTIUM—NATAL

NASTURTIUM, or Indian cress, Tropaeolum majus, a perennial climber, native of Peru, but in cultivation treated as a hardy annual. It climbs by means of the long stalk of the peltate leaf which is sensitive to contact like a tendril. The irregular flowers have five sepals united at the base, the corolla with its spurred development of the axis; of the five petals the two upper are slightly different and stand rather apart from the lower three; the eight stamens are unequal and the pistil consists of three carpels which form a fleshy fruit separating into three one-seeded portions. The flowers are sometimes eaten in salads, and the leaves and young green fruits are pickled in vinegar as a substitute for capers. The pungency of the nasturtium officinale, the water-cress, gave it its name nasi-tortium, that which twists the nose. The plant should have a warm situation, and the soil should be light and well eniriched; it may be sown in April, either near a fence or wall, or in an open spot, where it will require stakes 6 to 8 ft. high.

The dwarf form known as Tom Thumb (T. m. nanum), is an excellent bedding or border flower, growing about a foot high. Sow in April in the beds or borders; and again in May for a succession. Other fine annual Tropaeolums are T. Lobbianum with long spurred orange flowers and numerous varieties; and T. minus, a kind of miniature T. majus with yellow, scarlet and crimson varieties.

The genus Tropaeolum, native of South America and Mexico, includes about 35 species of generally climbing annual and perennial herbs, with either one or numerous petals; the irregular flowers, T. peregrinum is the well-known canary creeper. The flame nasturtium with brilliant scarlet blossoms is T. speciosum from Chile; it has tuberous roots, as have also such well-known perennials as T. polyphyllum, T. pentaphyllum. Of these T. speciosum should be grown in England in positions facing north; it flourishes in Scotland.

NATAL, a maritime province of the Union of South Africa, situated between 27° and 31° S., 29° and 33° E. It is bounded S. by the Indian Ocean, S.W. by the Cape province and Basutoland, N.W. by the Orange Free State province, N. and N.E. by the Transvaal and Portuguese East Africa. It has a coast line of 376 m.; its greatest length N. to S. in a direct line is 247 m.; its greatest breadth E. to W., also in a direct line, 200 m. Natal has an area of 35,371 sq. m., being nearly three-quarters the size of England. (For map see SOUTH AFRICA.)

The province consists of two great divisions, namely Natal proper and Zuulund (q.v.). Natal proper has a seaboard of 106 m. and an area of 24,010 sq. m., Zuulund, in which is included Amatongeland, a seaboard of 210 m. and an area of 10,461 sq. m. It lies north-east of Natal. In this article the description of the physical features, crops and industries of Natal proper only is considered.

Physical Features.—The terrace formation of the land characteristic of other coast regions of South Africa prevails in Natal. The country may be likened to a steep and gigantic staircase leading to a broad and level land lying beyond its borders. The rocky barrier which shuts off this land is part of the Drakensberg range. From the mountain sides flow many rivers which dash in magnificent waterfalls and through deep gorges to the sea. Falling 500 or more feet in little over 200 m., these streams are un navigable. The south-eastern sides of the mountains are in places overhung with heavy timber, while the semi-tropical luxuriance of the coast belt has earned for Natal the title of "the garden colony."

The coast trends in an almost unbroken line, from S.W. to N.E. It extends from the mouth of the Umntumvuna river (3º 4' S., 30º 12' E.), which separates Natal from the Cape, to the mouth of the Tugela (29º 15' S., 31º 30' E.), which marks the frontier between Natal and Zululand. The only considerable indentation is at Durban, about two-thirds of the distance from the Umntumvuna to the Tugela, where there is a wide and shallow bay, covering with its islands nearly 6 sq. m. The coast, though low and sandy in places, is for the most part rocky and dangerous. The warm Mozambique current sweeps down from the N.E. setting up a back drift close in shore. The southern entrance to Durban harbour is marked by a bold bluff, the Bluff of Natal, which is 250 ft. high and forested to the water's edge. Opposite the Bluff a low sandy spit called the Point forms the northern entrance to the harbour. North of Durban the coast belt, hitherto very narrow, widens out and becomes more flat. But the mountain belt on this side of the coast is less developed than in the Drakensberg, the ridge of 15 m., is broken and rugged. Ranges of hills lead to the first plateau, which has an average elevation of 2000 ft. and is of ill-defined extent. Here the land loses its semi-tropical character and resembles more the plains of the Orange Free State and the Transvaal. The second plateau, reached by a steep ascent, has an elevation of from nearly 4000 to fully 5000 ft. It is an undulating plain, grass-covered, but for the most part without trees or bush. It continues to the foot of the Drakensberg range, the mountains rising towards the S.W., with almost perpendicular sides, 6000 to 7000 ft. above the country at their base. North-west of the Drakensberg, the mountains are of lower elevation and the more rounded contours.

Mountains.—Although the division of the country into terraces separated by ranges of hills is clearly marked in various districts, as for instance between Durban and Colenso, the province is traversed by many secondary chains, as well as by spurs of the Drakensberg. As the highest points of that range, and the highest land in Africa south of the Equator, it is the escarpment of the Drakensberg, which runs from Majuba Hill on the N.W. to Bushman's Nek in the S.W., forming the front of the province, the crest of the range being generally near the coast. This is the case in the Montagu Mountains, the ridge of which is 11,170 ft. and Cathkin Peak or Champagne Castle (10,357 ft.); the top of the third great height, Giant's Castle (9657 ft.), is in Basutoland, but its seaward slopes are in Natal. From Giant's Castle to Mont-aux-Sources, in which, forsaking their general direction of direction, the Drakensberg run S.E. to N.W., the mountains attain an elevation of 10,000 to 11,000 ft., with few breaks in their face. North of Mont-aux-Sources the mountain range sinks to 8000 and 9000 ft., and here are several passes leading into the Orange Free State. Laing's Nek is a pass into the Transvaal. The chief heights in Natal between Mont-aux-Sources and Laing's are the Tintwa (7900 ft.), Inkwelo (6608 ft.) and the Niger Valley which the Drakensberg at right angles to the main range, cross the plateaus. The most northern, which runs E. from Majuba to the Lebombo Mountains, coincides roughly with the northern frontier of Natal. It is one of the chief drainage divisions for the Drakensberg range. The higher plateaux and the wider valleys, which it controls, is drained by the Umzimkulu river and its tributaries, and the wide valleys, though usually not navigable, are crossed by numerous passes which are marked by the names of the rivers. In a distance of 100 m., the Umzimkulu river is navigable and reaches the Indian Ocean between Illovo and Ballito. The Drakensberg range forms the main divide of the southern Drakensberg, and the eastern ranges are drained by the Kei and Tugela, and the western ranges by the Umzimkulu and Tugela. The latter river, rising in the Drakensberg south of the Umzimkulu, which it joins after a course of some 50 m. Below the junction the Umzimkulu forms for some distance the frontier between Natal and the Griqualand West, joined by the Tugela, which drains nearly 100 m. of rich volcanic soil, and which are almost entirely bounded by the escarpment of the Montagu Mountains. The coast of the Natal rivers is highly indented, and the coast is broken by the rivers, the coasts of the Tugela (120 m. long) is striking, in turns rugged and desolate, verdant and smiling, with patches of dense forest and heights wooded to western. The Transvaal is situated at the mouth of the river, which, like that of all others in Natal, is obstructed by a bar. As a
result of harbour works, however, a channel has been cleared and steamers can ascend the river for 6 m.

The Pongola rises in the Transvaal in high ground N.E. of Wakkerstroom and flows E., forming, for the greater part of its course, the eastern boundary of the province. After piercing the Lebombo Mountains, it turns N. and joins the Maputa, a river emptying into Delagoa Bay. The Umgeni, which rises in the Spion Kop hills some 30 m. E. of Giant’s Castle, flows through the central part of Natal and reaches the sea 4 m. N. of Durban. It flows alternately through magnificent pastoral and mountainous country, and is known for two magnificent waterfalls, both within 12 m. of Pietermaritzburg. The upper falls is clearly visible from a hill on the Umgeni leaps in a single sheet of water down a precipice over 350 ft. high, more than double the height of Niagara, forming, when the river is swollen by rains, a spectacle of rare magnificence.

Karkloof or Lower Falls, where in series of beautiful cascades the water descends to the plain. Other rivers of Natal which rise in the spurs of the Drakensberg or in the higher terraces are the Umvuma, which is nowhere navigable, the Tugela, which has cleared a path for steamers, and the Drakens River. The Drakens River flows between the Karroo spurs and the Drakensberg range of mountains, in the northern county division, the Umflaas (which gives Durban its main water supply), the Illovo, which traverse the country between the Umgeni and Umkomaas, and the Umtamatungu, noteworthy as forming the boundary between Natal and Pondoland. There are also seventeen distinct coast streams in the colony.

[Geology.]—The general geological structure of Natal and Zululand is one of a series of a series of plateaux formed on sedimentary rocks which mainly belong to three formations of widely separated ages, and which rest on a platform of granitic and metamorphic rocks.

The geological formations represented include:

- Post-Cretaceous
- Recent Cretaceous
- Pre-Cretaceous

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<th>U. Karroo</th>
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<td>Granites, Gneisses, Schists, Marbles, Granites (Swaziland Series).</td>
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Pre-Cape Rocks.

The granites and schists occur in close association. The series covers considerable areas in the lowest parts of the valleys and near the coast. The widest areas are in Zululand. In the Umzimkulu river and in the Tugela river below its junction with the Buffalo, metamorphic limestones are associated with schists, gneisses and granites. With increasing distance from the coast, the sequence of the formations changes. The Ecca Series, which is true and is auriferous, but the gold has not been met with in payable quantities.

Table Mountain Sandstone Series.

This rests unconformably on the pre-Cape rocks. Traced northwards, the series becomes thinner and finally dies out. As a rule denudation, which has acted on a magnificant scale, has removed all but a few hundreds feet of the basement beds. The maximum thickness of 2000 ft. occurs near Melmoth. The beds are usually thin false-bedded sandstones with an almost complete absence of shales. A conglomerate at the base contains traces of gneiss. Griesbach mentions the occurrence of some small bivalves in the shales of Greytown, but Anderson failed to find any fossils.

Ecca Glacial Series.—A great unconformity separates the Table Mountain and the Ecca Series. The thickness of the gap is represented by the Witteberg and Bokkeveld series. The Dwyka conglomerate rarely attains any great thickness though forming wide outcrops. It is usually a hard compact rock containing striated stones. The Umflaas series, where the rock is used for road-metal, furnishes the best exposures.

Ecca Series.—With the Beaufort series this occupies over two-thirds of the western portion of the province and has wide outcrops in Zululand and in the Vryheid districts. The Ecca shales contain some of the best coal of South Africa, but the seams contain much marketable coal. Around Dundee and Newcastle the coals are being mined in large quantities and are exported. There include several species of Glossopteris among them: Glossopteris browniana var. indica; Bubh. Phyllotheca Zeilleri eth. fl.; Estharia Greysi, Jones, indicating a Perm-Carboniferous age.

Beaufort Series.—The Ecca series grades upwards into the highly coloured sandstones and shales of the Beaufort series. Fossil remains are rare, but the sandstones in the vicinity of the Tugela river, near Port Alfred, contain the remains of the insect Pterophyllum.—A Nautilus series. This consists of sandstones and shales with thin seams of coal. The chief outliers occur around Biggarsberg and Vryheid. The highest formation is the Zululand sandstone. The basin is—Strati- 
 fielda odoniporioides, Morr. and a Pterophyllum—indicate a Rhetaeic age. No reptilian remains have been found.

Upper Karroo.—The Red beds and Cave sandstones occur along the shelf banks of the Gulf of Zululand.

Cretaceous.—Deposits of this age are confined to the littoral. They are exceedingly prolific in fossils which prove them to be of Cretaceous age. The bones of fossil has been obtained from Umkfilede Hill, Zululand. W. G. C.

Climate.—With a rise in level (not reckoning the mountain tops) of 3500 ft. in a distance of 170 m., Natal possesses several varieties of climate, and the temperature within the province varies from 70° F. at the coast in January to 74° at Durban at the coast in January. At Pietermaritzburg, 41 m. inland and 2200 ft. above the sea, the temperature is about 64°. In the uplands the heat of summer is often greater than on the coast, but the air is less humid and the climate is generally cooler. The temperatures of the months are increased by the great mass of water, the Mozambique current flowing south from the equatorial regions. At Durban the annual rainfall is 40 in. and at Pietermaritzburg 550 in. The average between the years 1893 and 1905 is 64 in. 1893 is the rainy season, and May, June and July the driest months of the year. The mean temperature at Durban, records taken at 260 ft. above the sea, is 70° F., varying from 42° in winter to 98° in the summer averaged over a hundred years. The winter season, from May to August, is the rainy season, and May, June and July the driest months of the year. The year is divided into two seasons, summer, which begins in October and ends in January; and winter, which begins in February and ends in May. The weather is settled during the summer season, and it is then that the It is a coastal region, characterized by a wide variety of vegetation including savannas, forests, and mangroves. The coastline is rugged, with numerous islands and rocky formations.

The landscape is characterized by a diversity of vegetation types and topography. The region is home to a rich array of plant species, including various types of grasses, shrubs, trees, and other vegetation. The climate is typically warm and humid, with temperatures ranging from mild to hot throughout the year. The region is known for its scenic beauty and biodiversity, attracting visitors and researchers alike.

In the context of the text provided, there is a mention of the "littoral" area, which is the coastline and its immediate surroundings. The coastline of Natal includes the Illovo, which traverses the country between the Umgeni and Umkomaas, and the Umtamatungu, noted for its role as the boundary between Natal and Pondoland. The coastline is marked by several distinct coast streams, with the Umzimkulu river and the Tugela river being particularly significant.

The geological structure of the region is rich, with the presence of various geological formations such as the Table Mountain Sandstone Series and the Ecca Glacial Series. These formations are significant in understanding the geological history of the area, providing insights into the past sedimentary processes and depositional environments.

The climate of the region is diverse, with a range of seasonal variations. The coastal regions experience milder temperatures, while inland areas may have more significant variations. The text highlights the importance of the Mozambique current in influencing the climate, with summer seasons bringing higher temperatures and increased precipitation.

In summary, the coastal region of Natal is characterized by its diverse vegetation, rugged coastline, and varied climatic conditions, making it a region of significant ecological and geological importance.
principally the yellow wood (Podocarpaceae), sneezeweed (Platystemon), wild olive (Olea europaea), blackwood (Olea lanceolata), white ironwood (Viburnum coccineum), and sandalwood (Eucalyptus africanus); all are very useful woods, and the yellow wood, sneezeweed, wild olive and ironwood when polished have a good, greyish bloom. The "rooibos" tree, a red pear and milkwood trees are used for boatbuilding. The Australian Eucalyptus and Casuarina in great variety, and many other imported tropical species are grown. Of the reeds, the common pink and white ribbon reeds are the most useful. These are used for the making of the large wicker baskets and vases. Sometimes, the reeds are planted near the coast and oak all thrive when properly planted and protected from grass fires. The black wattle has been extensively planted and flourishes at elevations of from 1000 to 3000 ft. It also forms a valuable timber in the interior.

Flowers which bloom in the early spring are abundant, especially on the edges of forests. Among these found throughout the country are many species of daisies and everlasting. The most common and beautiful flowers are the Naivasha lilies, red, pink and white ribbed bells, the fire-lily, with flame-coloured blooms, ixias, gladiolus, the Iaffa lily, with fuchsia-like clusters, and the arum lily. A conspicuous veld plant is the orange and crimson Jacobinia. Geraniums grow extensively throughout the district. Of the "skein," as it is called locally, the feather flower life is abundant; 125 species are indigenous, two being tree-ferns. One of these, Cytosia dregert, found in moist places and open land, has a stem 20 ft. high; and the Hemitheca, the redbush, is found in the hills. The fynbos are most common in the midland zone and in the heavy timber forests. Sixty different species have been identified in one valley not more than 1 m. long and about 100 m. in breadth. Among fruit trees, besides the wild fruits already mentioned, are the pineapple, mango, papaw, guava, grenadilla, rose apple, custard apple, soursop, loquat, naartjie, shaddock and citrus fruits.

The larger animals which abounded in Natal in the first half of the 19th century have been exterminated or driven out of the country. This fate has overtaken the elephant, giraffe, the buffalo, quagga and antelopes. The only large mammals which can now be excluded, the lion and rhinoceros may be added to this list; and the Vryheid district belongs geographically to Zululand. Hippopotami are still found in the Umgeni river and crocodiles in several of the coast streams. Leopards and panthers are found in thickly wooded kloofs. Hyenas, jackals, wild pig, polecat and wild dogs (Canis pictus) of different species are still found in or about bush jungles and forest dumps; clowns (Antilope aethiops) are preserved on game farms, but there are now some species of impala and elands. The most common of these species are now preserved. Ant-eaters (Orycteros capensis), porcupines, weasels, squirrels, rock rabbits, hares and cane rats are common in different localities. Baboons (Cynopithecus podicipus) and vervet monkeys are common throughout the interior. Antelopes are found in kloofs and bush and timber lands. The birds of Natal! are of many species; some have beautiful plumage, but none of them, with the exception of the cranes, are to be considered as game. Among the larger birds are cranes, herons, the ibis, storks, eagles, vultures, falcons, hawks, kites, owls, the secretary bird, pelicans, flamingoes, wild duck and geese, gulls, and of game birds, the pawaq, kori, phasian, partridge, guinea fowl and quail. The other game include parrots, toucans, gaudily coloured cuckoos, lories, swallows, shrines, sun-birds, kingfishers, weavers, finches, wild pigeons and cranes. The otter is found in some of the rivers, which are also frequented by the elephant. The crocodile and hippopotamus in the coast lagoons and sometimes are of great size. Iguanas, 4 and 5 ft. long, are found on the wooded banks of the rivers; small lizards and chameleons are common, and there are several varieties of tortoise.

Of snakes there are about forty distinct species or varieties. The most dreaded by the natives are called "imamba," of which there are at least eight different kinds; these snakes elevate and throw themselves forward, and have been known to pursue a horseman. One sort of imamba, named by the natives "indhloniho," is of the size of a dog, and is all of a bright flame colour. The sluggish puff-adder (Clotho aruatis) is very common and very dangerous. A hooded snake (Naja haemachetes), the imfazi of the natives, is dangerous, and spits or ejects its poison; besides this there are a few venomous species. About 50 different species of peabirds, or honey guides, are found in Natal; to the knowledge of the natives, however, is the python (Hortalis natalensis), called inhluvuti by the natives; its usual haunts are by streams amongst rocky boulders and in jungles, and instances are recorded of its strangling and crushing adult natives. It is common in the coast districts, and occasionally attacks man in gorges. They are the most troublesome and destructive being the tick (Ixodes natalensis), which infests the pasturage, and the white ant (Termes mandibulatus). Occasionally great armies of locusts, caterpillars advance over large tracts of country, devouring all vegetation. They are the "seed" of march. The fish moth, a steel-grey slimy fish-shaped insect, is found in every house and is very destructive. Fish of the sea, rivers, and streams abound in Natal, and are numerous. They include shad, rock cod, mackerel, mullet, bream and sole; sharks, stingrays, cuttlefish and the octopus are also common in the waters off the coast of Natal. Prawns, crayfish and oysters are also obtainable, and turtle (Cochleita mydas) are frequently captured. Freshwater scale-fish are mostly full of bones, but fine eels and barbel are plentiful in the rivers. Trout have been introduced into some of the higher reaches of the rivers.

Inhabitants.—At the census of 1901 the population of the province increased slightly to 1,088,734. Of this total 8.5%, or 97,109, were Europeans, 9%, or 101,288, Asians and the rest natives of South Africa, mainly of Zulu-Kaffir stock. Of the 824,063 natives, 203,373 lived in Zululand. The white and Asiatic population nearly doubled in the thirteen years since the previous census, allowance being made for the Utrecht and Vryheid districts, which in 1891 formed part of the Transvaal. Of the total population 985,167 live in rural areas, the average density for the whole country being 31.34 per sq. m. The white population is divided into 36,738 males and 40,351 females. Of the white inhabitants the great majority are British. Some 46,137 of Dutch extraction live in the districts of Utrecht and Vryheid. There are also about 4,900 Natalians of German extraction, settled mainly in the New Hanover and Umzimkulu districts. The Asiatics at the 1901 census were divided into 63,497 males and 37,421 females. They include a few high caste Indians, Arabs and Chinese, but the great majority are Indian coolies. The Asiatics are mainly congregated in the coast districts between the Umzimkulu and Tugela rivers. In this region (which includes Durban) the Asiatic population was 61,684. In none of the inland districts did the Asiatic population exceed 500. In the coast districts the number of Asiatic coolies employed chiefly on the sugar, coffee, cotton and other plantations, a small proportion being employed in the coal-mines.

The native inhabitants of Natal proper were almost exterminated by the Zulus in the early years of the 19th century. Before that period the natives of what is now Natal proper were estimated to number about 100,000. In 1835 when the Zulu power was first checked the natives had been reduced to about 19,000. The stoppage of intertribal wars by the British, aided by a great influx of refugees from Zululand, led to a rapid increase of the population. With the exception of a few Bushmen, who live in the steep slopes of the Drakensberg, all the natives are of mixed African and European stock. Before the Zulu devastations the natives belonged to the Ama-Xosa branch of the Kaffirs and are said to have been divided into ninety-four different tribes; to-day all the tribes have a large admixture of Zulu blood (see KAFFIRS, ZULULAND AND BANTU LANGUAGES).

The Natal natives have preserved their tribal occupation to a considerable extent. Nearly 30% live in special reserves or locations, the area set apart for native occupation being about 4000 sq. m. exclusive of Zululand. Most of the remainder are employed on or five upon farms owned by the British. The remainder are employed in the coast towns and the sugar and cotton plantations. The number of males was, however, in 1904, 69,746 male natives and 10,232 female natives in domestic service. Of the tribes who were in Natal before the Zulu invasion about 1812, the two largest are the Aphetamine (who are in five main divisions and number about 30,000) and the Amakwabe (seven divisions and about 20,000 people). Other large tribes are the Amanuseswa (ten divisions—35,000 people), the Amakuni (three divisions—26,000 people), and the Amabomvu (five divisions—25,000 people). The three last tribes are among those which sought refuge in Natal from Zulu persecution, before the establishment of British rule in 1843. The number of half-castes is remarkably small, at the census of 1904 the number of "mixed and others," which

1 See R. B. and J. D. Woodward, "Natal Birds" (Maritzburg, 1899).
includes Griquas and Hottentots and non-aboriginal negroes, was only 6856.

Natal.—The seat of the provincial government is Pietermaritzburg (q.v.), commonly called Maritzburg (or P.M.B.), with a population (1904) of 31,199. It is 71 m. by rail N.W. of Durban (q.v.), the seaport and only large city in Natal, pop. 67,582. LadySmith, N.W. of Pietermaritzburg (4800 ft. above sea-level), is the capital of a district of the same name, is famous for its investment by the Boers in 1899 and is an important railway junction. North-east of LadySmith are Dundee (29 m. by rail from Durban) and the Transvaal district. Dundee is also a mining town, and depends chiefly on its large trade in wool. It is named after the duke of Westminster, who was secretary for the colonies in 1858 and 1859. Its altitude is 1873; the climate is mild, grades from 29 to 75 degrees, and the altitude is 5152 ft., but on reaching Ladysmith, 191 m. by rail, the climate is colder and more humid, and the altitude is 3284 ft. The Orange Free State line, after leaving Ladysmith, ascends by steep gradients the whole of its own course in Natal territory, and when it gains the summit at Van Reenen's Pass it is 5500 ft. above sea-level. The descent from this point to Pietermaritzburg, 3284 ft. below, is the most precipitous in the world. Its average gradient is 1 in 40, and it is 450 m. long. The traffic on the line, to the year ending in 1903, exceeded 336,000,000. The total amount of freight and passenger traffic on the line was 1,173,000,000. The Oranje-Vrijheid line, following the Orange River, also of great importance, is 1143 m. long, from Pietermaritzburg to the river; the average daily traffic on it is about 10,000 passengers and 300,000 tons of freight.

There are about 5000 m. of high roads kept in repair by the government.

There is a well-organized postal and telegraphic service. Land lines and cable are used to connect with European telegraphic stations, and there are submarine cables from Durban to Zanzibar and Aden, whence there is communication with every quarter of the globe. The first telegraph line in Natal was opened in 1873; in 1878 communication was established with Cape Town and in the following year with Delagoa Bay.

Agriculture and Allied Industries.—The diversity of soil and climate leads to great diversification in agricultural pursuits. The chief drawback to farming in the midland and upper districts is the considerable proportion of stony ground, and, in some cases, the lack of running water. The area of land under tillage is less than a million acres. The chief crops are maize, sorghum, tobacco, barley, and potatoes. The maize crop in the lower districts is grown chiefly in the valley of the Tugela. In the midland and upper districts it is grown in the valleys of the Umzimkulu and the Mkuzi. The yield per acre of maize is over 1000 bushels, and the average yield in this province is over 730 bushels. The yield of sorghum is about 300 bushels per acre. The area planted to tobacco is about 110,000 acres, and the yield per acre is about 532 lbs. The area planted to potatoes is about 200 acres, and the yield per acre is 1000 bushels. The area planted to sugar-cane is about 10,000 acres, and the yield per acre is 1000 bushels. The area planted to tea is about 5000 acres, and the yield per acre is 6000 bushels.

The area under maize is about 10,000,000 acres, and the yield per acre is about 1000 bushels. The area under sorghum is about 5,000,000 acres, and the yield per acre is about 300 bushels. The area under tobacco is about 110,000 acres, and the yield per acre is about 5000 bushels. The area under barley is about 1000 acres, and the yield per acre is about 50 bushels. The area under potatoes is about 200 acres, and the yield per acre is about 1000 bushels. The area under sugar-cane is about 10,000 acres, and the yield per acre is about 1000 bushels. The area under tea is about 5000 acres, and the yield per acre is about 6000 bushels.

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Valuable timber is obtained from the forests. Stinkwood is largely employed in the making of oars, billhooks, etc., and is also used for furniture. Pine is also used in building wagons, while snaeewood is largely utilized for supports for piers and other marine structures, being impervious to the attacks of the Teredo navalis. Nottia, the name of the black locust tree (Acacia nollissima), which began in 1886, the bark being exported for tanning purposes, the wood also commanding a ready sale. This wattle thrives well in most localities, but especially in the highlands of Natal. By 1886 the production of wattle bark was 1,326,000 tons, and the area planted with the tree over 60,000 acres. Aloes and rameia are cultivated to some extent for their fibre.

The government has maintained vast farms and forestry plantations and a veterinary department to cope with lung sickness, rinderpest, East Coast fever and such like diseases. It also conducts campaigns against locusts and other pests and helps irrigation schemes. By means of an Agricultural Bank it affords assistance to farmers.

Mining.—There are several highly mineralized areas in the country. The existence of coal in the north-east districts on or near the surface of the ground was reported as early as 1839, but it was not until 1880 that steps were taken to examine the coalfields. This was done by F. W. North, who reported in 1881 that in the KwaZulu (Durban) district there was an area of 1,350 sq. m., that might be depended upon for the supply of coal, which is of all characters from lignite to anthracite. In 1889 the extension of the railway from Ladysmith through the coal area first made mining practicable. At the end of 1891 the production of coal was 165,056 tons (valued at £108,853 at the pit's mouth), in 1908 it had increased to 1,660,774 tons (valued at the pit's mouth at £73,156). There is a considerable export of coal and mineral water for medicinal purposes. In 1908 the coal landed at Durban, Middelburg and Ladysmith was 2,065,915 tons, valued at £118,740, in 1909 to 710,777 in 1908. In the last named year 446,915 tons of coal were exported. Besides the mines in the Newcastle and Dundee district there are extensive coal-fields in the district of Mount Low and north of the land (Lebombo). Iron ore is widely distributed and is found in the neighbourhood of all the coal-fields. There are extensive copper and gold-yielding areas, and in some districts these metals are mined near Umzimkulu, near Port Shepstone, marble is found in great quantities.

Commerce.—The chief exports, not all products of the province, are coal, wool, woollen and worsted goods, tobacco, tea, sugar, fruits and jams. The import trade is of a most varied character, and a large proportion of the goods brought into the country are in transit to the Transvaal and Orange Free State, Natal affording, next to Delagoa Bay, the shortest route to the Rand. Textiles, largely cotton goods, hardware, mining and agricultural machinery, tobacco and foodstuffs form the bulk of the imports. In 1896 the value of exports was £1,795,000; in 1908 the value was £6,622,000. In 1908 the imports were valued at £5,437,000, in 1908 at £8,330,000 (a decrease of £2,900,000 compared with 1905). The bulk of these exports are to the Transvaal and neighbouring countries, and general trade is carried on with the United States, the Mediterranean countries, and the British Empire. The foreign trade of the province is not large, and the bulk of the imports are first imported from the Transvaal. Over three-fifths of the imports are from Great Britain, and about one-seventh of the exports go to Great Britain. The shipping, which in 1874 was 126,883 tons and 187,826 tons in 1881, was in 1906, 1,426,535 tons, in 1908, 2,493,000; and in 1908, 5,028,000. Over six-sevenths of the shipping is British.

Government and Constitution.—Natal was from 1883 to 1910 a self-governing colony. It is now represented in the Union Parliament by eight senators and seventeen members of the House of Assembly. The qualifications for electors and members of the Assembly are the same, namely men of full age owning houses or land worth £50, or who rent such property of the yearly value of £10; or who, having lived three years in the province, have incomes of not less than £60 a year.

Coloured persons are not, by name, excluded from the franchise, but no persons "subject to special laws and tribunals," in which category all natives are included, are entitled to vote. Another law, directed against Indians, excludes from the franchise, natives, or descendants of natives in the male line, of countries not possessing elective representative institutions. Exemption from the scope of these provisions may be granted by the governor-general and under such exemption a few Kaffirs are on the roll of electors.

At the head of the provincial government is an administrator, appointed by the Union Ministry, who holds office for five years. He is assisted by an executive committee of four members elected by the provincial council. This council to which is entrusted the management of affairs purely provincial consists of 25 members, elected by the parliamentary voters and each representing a separate constituency. The council sits for a statutory period of three years. For local government purposes the cities of Durban and Pietermaritzburg are under separate charters; Zululand being under special jurisdiction. The chief towns of Durban, Maritzburg, Ladysmith, Newcastle and Dundee—are governed by municipal corporations and minor towns by local boards.

Revenue and Expenditure.—Revenue is derived chiefly from customs and excise, railways, land sales, posts and telegraphs and a capitation tax. The expenditure is largely on reproductive works (canals, roads, harbours), charitable purposes, education and military defence. The major services are, since 1910, managed by the Union Government, but the provincial council has power to levy direct taxation, and (with the consent of the Government) to incur debt for purely provincial purposes. Its revenues and powers are those pertaining to local government. Some particulars follow as to the financial position of Natal previous to 1910.

In 1846, the first year of Natal's separate existence, the revenue was £3,073 and the expenditure £6,905. In 1852 the revenue was £27,158 and the expenditure £24,296, and in 1862 the corresponding figures were £68,198 and £74,172. In 1893-94, expenditure was £180,499 and expenditure to £132,978. Ten years later the figures were, revenue £657,735, expenditure £659,351. The rise of Johannesburg and the opening up of the Dundee coal-fields, as well as the development of East London, caused the expenditure to rise to two sides of the account. In 1888 the revenue for the first time exceeded a million, the figures for that year being, revenue £1,130,614, expenditure £1,201,500. In 1909-10, the last year of Natal's existence as a colony, the revenue was £4,035,000, again exceeded the expenditure. The public debt, £2,101,500 in 1882, had risen at the close of the Boer War in 1902 to £14,000,000, and in 1908 was £16,000,000.

Defence.—A small garrison of imperial troops is quartered at Pietermaritzburg. The provincial force consists of a militia, fully equipped and armed with modern weapons. It is divided into mounted rifle-men, about 1,900 strong, four field battalions of 340 men and two infantry battalions, each of over 800 men. There is also an armed and mounted police force of 870 Europeans. Military training is compulsory on all lads over ten attending government schools. The boys are organized in cadet corps. A senior cadet corps is formed of youths between sixteen and twenty. There are also many rifle associations, the members of which are liable to be called out in time of emergency. The troops are furnished with modern guns. The batteries are manned by the naval corps (150 strong) of the Natal militia. Natal makes an annual contribution of £3,000 towards the upkeep of the British forces in South Africa.
In 1886 a new Dutch paper, De Afrikaner, was started at Maritzburg. The Kafris have their own organ, Lipa lo Hluga (the paper of grievances), issued at Maritzburg, and the Asiatics, Indian Opinion, a weekly paper started in 1903 and printed in English, Gujarati, Hindi and Tamil. Local papers are published weekly at Ladysmith, Durban, Greytown, Pietermaritzburg, and a Horizonal Journal, a government publication issued fortnightly, is of great service in the promotion of agricultural knowledge.

History.

Vasco da Gama on his voyage to India sighted the bluff at the entrance to the bay now forming the harbour of Durban on Christmas Day 1497 and named the country Terra Natalis. Da Gama made no landing here and, like the other Portuguese, was chiefly interested in the coast of South Africa, Natal was neglected by the Portuguese, whose nearest settlement was at the bay of Natal Bay. In 1575 Manuel de Mesquita Perestrello, commanded by King Sebastian to explore the coast of South Africa and report on suitable harbours, made a rough chart, even then of little use to navigators, which is of value as exhibiting the most that was known of the country by its discoverers before the advent of their Dutch rivals, who established themselves at Cape Town in 1652.

Perestrello states that Natal has no ports but otherwise he gives a fairly accurate description of the country—noting particularly the abundance of animals and the density of the population. The first detailed accounts of the country were received from shipwrecked mariners. In 1683 the English ship "Good Hope" went ashore near Delagoa Bay and the crew made a remarkable journey overland to Cape Town, passing through Natal, where they were kindly received by the natives. About the same time (in 1684) an English ship put into Port Natal (as the bay came to be known) and purchased ivory from the natives, who, however, refused to deal in slaves. In May 1685 another English ship the "Good Hope" was wrecked in crossing the bar at Port Natal and in February 1686 the "Stavenisse," a Dutch East Indianman, was wrecked a little farther south. Survivors of both vessels lived for a year at Port Natal and there lived a boat in which they made the voyage to Cape Town in twelve days. They brought with them 3 tons of ivory. This fact and their reports of the immense herds of elephants which roamed the bush led Simon van der Stell, then governor at Cape Town, to despatch (1686) the ship "Noord" to Port Natal, with instructions to her commander to open up a trade in ivory and to acquire possession of the bay. From the chief of the Amatuli tribe, who inhabited the adjacent district, the bay was " purchased " for £50 worth of goods. No settlement was then made and in 1705 the son of the chief repudiated the bargain. In 1717 the Cape government directed settlement in the bay, but it was soon afterwards abandoned. Thereafter for nearly a hundred years Natal was again neglected by white men. A ship now and again put into the bay, but the dangerous bar at its entrance militated against its frequent use. When in 1824 the next attempt was made by Europeans to form a settlement at the bay, Cape Colony had passed from the Dutch into the possession of Great Britain, while in Natal great changes had come over the land as a result of wars between the natives.

From the records of the 17th and 18th centuries it is apparent that the people then inhabiting Natal were Bantu-negroes of the Kafr (Ama Xosa) branch. There is no mention of Hottentots, and the few Bushmen who dwelt in the upper regions by the Drakensberg did not come into contact with Europeans. The sailors of the "Stavenisse" reported the most numerous and most powerful tribe to be the Zulus, while that which came in contact with the whites was the Amatuli, as it occupied a considerable part of the coast-land. These Kafris appear to have been more given to agriculture and more peaceful than their neighbours in Kaffraria and Cape Colony. But the quiet of the country was destroyed by the inroads of Chaka, the chief of the Zulus (see ZULULAND). Chaka between 1818 and 1820 ravaged the whole of what is now known as Natal, and after beating his foes in battle, butchered the women, children and old men, incorporating the young men in his impis. The population was greatly reduced and large areas left without a single
inhabitant. By right of conquest Chaka became undisputed master of the country.

Such was the situation when the first British settlement was made in Natal. In 1823 Francis George Farewell, formerly a lieutenant in the British navy, with other merchants of Cape Town, formed a company to trade with the natives of the south-east coast. In the brig "Salisbury," commanded by James S. King, who had been a midshipman in the navy, Farewell visited Port Natal, St Lucia and Delagou Bays. The voyage was not successful as a trading venture, but Farewell was so impressed with the possibilities of Natal both for trade and colonization that he decided to try his hand as a pioneer himself, vowing to take out ten companions, among them Henry Francis Fynn. All the rest save Farewell and Fynn speedily repented of their adventure and returned to the Cape, but the two who remained were joined by three sailors, John Cane, Henry Ogle and Thomas Holstead, a lad. Farewell, Fynn and the others went to the royal kraal of Chaka, and, having cured him of a wound and made him various presents, obtained a document, dated the 7th of August 1824, ceding to "F. G. Farewell & Company entire and full possession in perpetuity of a tract of land including the port or harbour of Natal." On the 26th of the same month Farewell and his party, under the name "Elizabeth and Susan," a small schooner built by the settlers, to Port Elizabeth. He appears to have been coldly received by the authorities, who were even unable to ascertain the nature of Chaka's embassy. Soon after his return to Natal King died, and in the same month (September 1828) Chaka was murdered by his brother Dingaan. In the December following Farewell went in the "Elizabeth and Susan" to Port Elizabeth. On this occasion the authorities were more hostile than before to the Natal pioneers, for they confiscated the schooner on the ground that it was unregistered, and drove the foreign-born Farewell and his crew away. The British governor, Lieutenant-Colonel Philip, capitulated the Cape in 1819, and the following year retired to England, leaving the place in charge of Lieutenant-Commander James Hope, who was succeeded by Captain John Linton in 1823, and by Captain John T. Despard in 1827. The British government determined to establish a settlement on the Natal coast.

The first British settlement.

The British Government saw in the Cape Colony the only real hope of securing the independence of the Transvaal and the Orange Free State. The establishment of settlements in Natal started with the hope that the coastal regions might be brought under British control.

In 1824, the year of Farewell's departure, the British government decided to establish a settlement in Natal. The first British settlement was founded by Captain Francis Gardiner, a naval officer, whose chief object was the evangelization of the natives. With the support of the traders he founded a mission station on the hill overlooking the bay. In 1837 Gardiner was given authority by the British government to exercise jurisdiction over the traders. They, however, refused to acknowledge Gardiner's authority, and from the Cape government he received no support. It was not until their hand was forced by the occupation of the interior by Dutch farmers that the Cape authorities at length intervened.

The British settlers had, characteristically, reached Natal mainly by way of the sea; the new tide of immigration was by land. In 1836, a party of Boers under Dr Fyn, under the leadership of a Dutch Voortrekkers, accompanied by Dr Fyn, led by his son, rode from the Drakensberg, bringing with them their wives and children and vast herds of cattle. The reasons which caused the exodus from the Cape are discussed elsewhere (see SOUTH AFRICA AND CAPE COLONY), here it is only necessary to point out that those emigrants who entered Natal shared with those who settled elsewhere an intense desire to be free from British control. The first emigrant Boers to enter the country were led by Pieter Retief (c. 1780-1838), a man of Huguenot descent and of marked ability, who had formerly lived in the Cape Colony and had suffered severely in the Kaffir wars. Passing through the interior, they entered the regions Retief arrived at the bay in October 1837. He went thence to Dingaan's kraal with the object of securing a formal cession of territory to the Dutch farmers. Dingaan consented on condition that the Boers recovered for him certain cattle stolen by another chief; this task Retief accomplished, and with the help of the Rev. F. Owen, a missionary then living at Dingaan's kraal, a deed of cession was drawn up in English and signed by Dingaan and Retief on the 4th of February 1838. Two days after the signature of the deed Retief and all of his party, 60 whites, besides Hottentot servants, were treacherously murdered by Dingaan's orders. The Zulu king then commanded his impis to kill all the Boers who had entered Natal. The Zulu forces crossed the Tugela the same day, and the most advanced parties of the Boers were massacred, many at a spot near where the town of Weenen now stands, its name (meaning wailing or weeping) commemorating the event. Other of the farmers hastily laagered and were able to repulse the Zulu attacks; the assailants suffering serious loss at a fight near the Bushman's river. Nevertheless in one week after the murder of Retief 100 Boers were killed on the Zululand border. On Sunday the 10th of December, while laagered near the Umzimkulu river, they were attacked by over 10,000 Zulus. The Boers had firearms, the Zulus their assegais only, and after a three hours' fight the Zulus were totally defeated, losing thousands killed, while the farmers' casualties were under
a dozen. (This memorable victory is annually commemorated by the Boers as Dingaan's Day, while the Umsatats, which ran red with the blood of the slain, was renamed Blood river.) Dingaan fled, the victorious Boers entered the royal kraal, gave decent burial to the skeletons of Retief and his party, and regarded themselves as now undisputed masters of Natal. They had recovered from a leather pouch which Retief carried the deed by which Dingaan ceded "to Retief and his countrymen the place called Port Natal together with all the lands annexed... as far as the land may be useful and in my possession." This was the 5th or 6th cession made by Chaka or Dingaan of the same territory to different individuals. In every case the overlordship of the British was recognised.

Returning south, Pretorius and his commando were surprised to learn that Port Natal had been occupied on the 4th of December by a detachment of the 72nd Highlanders sent thither from the Cape. The emigrant farmers had, with the assent of the few remaining Englishmen at Port Natal, in May 1838 issued a proclamation taking possession of the Port. This had been followed by an intimation from the governor of the Cape (Major-General Sir George Napier) inviting the emigrants to return to the colony, and stating that whenever he thought it desirable he should of December 1838, on a tribe of Kaffirs on the southern, of the occupation of the port the British government of the day had no intention of making Natal a British colony, but wished to prevent the Boers establishing an independent republic upon the coast with a harbour through which access to the interior could be gained. After remaining at the port just over a year the Highlanders were withdrawn, on Christmas Eve 1839. Meanwhile the Boers had founded Pietermaritzburg and made it the seat of their volksraad. They rendered their power in Natal absolute, for the time, in the following month, when they joined with Panda, Dingaan's brother, in another attack on the Zulu king. Dingaan was utterly defeated and soon afterwards perished, Panda becoming king in his stead by favour of the Boers.

At this time, the affairs of the Boer community been managed with prudence and sagacity they might have established an enduring state. But their impatience of control, reflected in the form of government adopted, led to disastrous consequences. Legislative power was vested, nominally, in the volksraad (consisting of twenty-four members), while the president and executive were changed every three months. But whenever any measure of importance was to be decided a meeting was called of "the people," that is, of all who chose to attend, to sanction or reject it. "The result," says Theal, "was utter anarchy. Decisions of one day were frequently reversed the next, and every one held himself free to disobey any law that he did not approve of. ... Public opinion of the hour in each section of the community was the only force in the land" (History of South Africa 1834-1843, chap. xlvii). While such was the domestic state of affairs during the period of self-government, the settlers cherished large territorial views. They were in loose alliance with and in quasi-supremacy over the Boer communities which had left the Cape and settled at Winburg and at Potchefstroom. They had declared themselves a free and independent state under the title of "The Republic of Port Natal and adjacent countries," and sought (September 1840) from Sir George Napier at the Cape an acknowledgment of their independence by Great Britain. Sir George, being without definite instructions from England, could give no decisive answer, but he was friendly disposed to the Natal farmers. This feeling was, however, changed by what Sir George (and many of the Dutch in Natal also) thought a wilful and unjustifiable attack (December 1840) on a tribe of Kaffirs on the southern, or Cape Colony, frontier by a commando under Andries Pretorius, which set out, nominally, to recover stolen cattle. Having at length received an intimation from London that the queen "could not acknowledge the independence of her own subjects, but that the trade of the emigrant farmers would be placed on the same footing as that of any other British settlement, upon their receiving a military force to exclude the interference with or possession of the country by any other European power," Sir George communicated this decision to the volksraad in September 1841. Under the arrangement proposed the Boers might easily have secured the benefits of self-government, subject to an acknowledgment of British supremacy, together with the advantage of military protection, for the British government was then extremely reluctant to extend its colonial responsibilities. The Boers, however, strongly resented the contention of the British that they could not shake off British nationality though beyond the bounds of any recognized British possession, nor were they prepared to see their only port garrisoned by British troops, and they rejected Napier's overtures. Napier, in the meantime, was on his way to Natal, and on his arrival towards the end of May 1842, he published a proclamation in which he stated that in consequence of the emigrant farmers refusing to be treated as British subjects and of their attitude towards the Kaffir tribes he intended resuming military occupation of Port Natal. This proclamation was answered in a lengthy minute, dated the 21st of February 1842, drawn up by J. N. Bosshof (afterwards president of the Orange Free State), by far the ablest of the Dutch who had settled in Natal. In this minute the farmers ascribed all their troubles to one cause, namely, the absence of a representative government, which was established for them by the British, and was still living in Cape Colony and as often denied or delayed, and concluded by a protest against the occupation of any part of their territory by British troops. An incident which happened immediately after these events greatly encouraged the Boers to persevere in their opposition to Great Britain. In March 1842 a Dutch vessel sent out by G. G. Ohrig, an Amsterdam merchant who sympathized warmly with the cause of the emigrant farmers, reached port Natal, and its supercargo, J. A. Smelkamp (a man who subsequently played a part in the early history of the Transvaal and Orange Free States), concluded a treaty with the volksraad assuring the protection of Holland. The Natal Boers believed the Netherlands to be one of the great powers of Europe, and were firmly persuaded that its government would aid them in resisting England.

On the 1st of April Captain T. C. Smith with a force of 263 men left his camp at the Umgazi, on the eastern frontier of Cape Colony, and marching overland reached Durban without opposition, and encamped, on the 4th of May, at the base of the Berea hills. The Boers, cut off from their port, called out a commando of 300 to 400 men under Andries Pretorius and gathered at Congella at the head of the bay. On the night of the 12th of May the Boers made an unsuccessful attack on the British camp, losing his guns and fifty men killed and wounded. On the 26th the Boers captured the harbour and settlement, and on the 31st blockaded the British camp, the women and children being removed, on the suggestion of Pretorius, to a ship in the harbour of which the Boers had taken possession. Meantime, an old Durban resident, Richard (commonly called Dick) King, had undertaken to convey tidings of the perilous position of the British force to the commandant at Graham's Town. He started on the night of the 24th, and escaping the Boer outposts rode through the dense bush and across the bridgeless rivers of Kaffirria at peril of his life from hostile natives and wild beasts, and in nine days reached his destination—a distance of 360 m. in a direct line, and nearly 600 by the route to be followed. This remarkable ride was accomplished with one change of mount, obtained from a missionary in Pondoland. A comparatively strong force under Colonel A. J. Cloete was at once sent by sea to Port Natal, and on the 26th of June Captain Smith was relieved. The besieged had suffered greatly from lack of food. Within a fortnight Colonel Cloete had received the submission of the volksraad at Pietermaritzburg. The burgheers represented that they were under the protection of Holland, but this plea was peremptorily rejected by the commander of the British forces.

The British government was still undecided as to its policy towards Natal. In April 1842 Lord Stanley (afterwards 14th earl of Derby), then secretary for the colonies in the second Peel Administration, wrote to Sir George Napier that the establishment of a colony in Natal would be attended with little prospect of
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advantage, but at the same time stated that the pretensions of the emigrants to be regarded as an independent community could not be admitted. Various measures were proposed which would but have aggravated the situation. Finally, in deference to the strongly urged views of Sir George Napier, Lord Stanley, in a despatch of the 15th of December, received in Cape Town on the 23rd of April 1843, consented to Natal becoming a British colony. The institutions adopted were to be as far as possible in accordance with the wishes of the people, but it was a fundamental condition "that there should not be in the eye of the law any distinction or disqualification whatever, founded on mere difference of colour, origin, language or creed." Sir George then appointed Mr Henry Cloete (a brother of Colonel Cloete) a special commissioner to explain to the Natal volksraad the decision of the government. There was a considerable party of Natal Boers still strongly opposed to the British, and they were reinforced by numerous bands of Boers who came over the Drakensberg from Winburg and Potchefstroom. Commandant Jan Mocke of Winburg (who had helped to besiege Captain Smith at Durban) and others of the "war party" attempted to induce the volksraad not to submit, and a plan was formed to murder Pretorius, Boshof and other leaders, who were now convinced that the only chance of ending the state of complete anarchy into which the country had fallen was by accepting British sovereignty. In these circumstances the task of Mr Henry Cloete was one of great difficulty and delicacy. He behaved with the utmost tact and got rid of the Winburg and Potchefstroomburgers by declaring that he should recommend the Drakensberg as the northern limit of Natal. On the 18th of August they agreed to the volksraad unanimously agreed to the terms proposed by Lord Stanley. Many of the Boers who would not acknowledge British rule trekked once more over the mountains into what are now the Orange Free State and Transvaal provinces. At the end of 1843 there were not more than 500 Dutch families left in Natal. Cloete, before returning to the Cape, visited Pinda and obtained from him a valuable concession. Hitherto the Tugela from source to mouth had been the recognized frontier between Natal and Zululand. Pinda gave up to Natal all the territory between the Buffalo and Tugela rivers, now forming Klip River county.

Although proclaimed a British colony in 1843, and in 1844 declared a part of Cape Colony, it was not until the end of 1845 that an effective administration was installed with Mr Martin West as lieutenant-governor, and the power of the volksraad finally came to an end. In that year the external trade of Natal, almost entirely with Cape Colony, was of the total value of £42,000—of which £32,000 represented imported goods.

The new administration found it hard to please the Dutch farmers, who among other grievances resented what they considered the undue favour shown to the Kaffirs, whose numbers had been greatly augmented by the flight of refugees from Pinda. In 1843, for instance, no fewer than 50,000 Zulus crossed the Tugela seeking the protection of the white man. The natives were settled in 1846 in specially selected locations and placed under the general supervision of Sir (then Mr) Theophilus Shepstone (q.v.). Sir Harry Smith, newly appointed governor of the Cape, met, on the banks of the upper Tugela, a body of farmers preparing to recross the Drakensberg, and by remedying their grievances induced many of them to remain in Natal. Andries Pretorius and others, however, declined to remain, and from that time Pretorius (q.v.) ceased his connexion with Natal. Although by this migration the white population was again considerably reduced, those who remained were contented and loyal, and through the arrival of 4,500 emigrants from England in the years 1848-1851 and by subsequent immigration from overseas the colony became overwhelmingly British in character. From the time of the coming of the first considerable body of British settlers dates the development of trade and agriculture in the colony, followed somewhat later by the exploitation of the mineral resources of the country. At the same time education was established and various churches began or increased their work in the colony. Dr Colenso, appointed bishop of Natal, arrived in 1854. In 1856 the dependence of the country on Cape Colony was put to an end and Natal constituted a distinct colony with a legislative council of sixteen members, twelve elected by the inhabitants and four nominated by the crown. At the time the white population exceeded 8000. While dependent on the Cape, ordinances had been passed establishing Roman-Dutch law as the law of Natal, and save where modified by legislation it remained in force.

The British settlers soon realized that the coast lands were suited to the cultivation of tropical or semi-tropical products, and from 1852 onward sugar, coffee, cotton and arrow-root were introduced, ten being afterwards substituted for coffee. The sugar industry soon became of importance, and the planters were compelled to seek for large numbers of labourers. The natives, at ease in their locations, did not volunteer in sufficient numbers, and recourse was had to coolie labour from India. The first coolies reached Natal in 1860. They came under indentures, but at the expiration of their contract were allowed to settle in the colony.1 This proved one of the most momentous steps taken in the history of South Africa, for the Indian population rapidly increased, the "free" Indians becoming market gardeners, farmers, hawkers, traders, and in time serious competitors with the whites. But in 1860 and for many years afterwards these consequences were not foreseen, and alone among the South Africa states Natal offered a welcome to Asians.

In 1866 the borders of the colony were extended on the southwest by the annexation of part of Kaffraria that had formerly been under the sway of the Fondo chief Faku, who had himself unable to maintain himself in a region occupied by many diverse tribes. The newly acquired territory was named Alfred county in memory of a visit paid to Natal by Prince Alfred (afterwards duke of Saxe-Coburg-Gotha). In 1867 R. W. Keate (1814-1873) became lieutenant-governor, a post which he filled until 1872. His administration is notable, not so much for internal affairs but from the fact that he twice acted as arbitrator in disputes in which the Boer states were involved. In a dispute between the Transvaal and the Orange Free State he decided (February 1870) that the Vaal river and not the upper Vaal was the frontier stream. A more famous decision, that known as the Keate Award, was given in October 1871. It concerned the southwestern frontiers of the Transvaal, and the award, which was against the Transvaal pretensions, had important effects on the history of South Africa (see TRANSVAAL and SOUTH AFRICA).

During all this time little was done to alter the condition of the natives. There was scarcely an attempt to copy the policy, deliberately adopted in Cape Colony, of educating and civilizing the black man. Neither was Natal faced with the Cape problem of a large half-caste population. The Natal natives were left very much in the state in which they were before the advent of the white men. While this opportunity of educating and training a docile people was in the main neglected, savage abuse of power by their chiefs was prevented. Under the superintendence of Shepstone the original refugees were quiet and contented, enjoying security from injustice and considerable freedom. This ideal lot, from the native point of view, drew such numbers of immigrants from disturbed districts that with the natural increase of population in thirty years the native inhabitants increased from about 100,000 to fully 350,000. New generations, as ignorant as any former fathers, did not wish the same sense of dependence upon the white men. In this way was sown the seed of future trouble between the two races. The first serious collision between the natives and the government occurred in 1873. The Amalubi, one of the highest in rank of the Bantu tribes of South Africa, fleeing from the cruelties of

1 Between 1860 and 1866 some 5000 Indians entered the colony. Immigration then ceased, and was not resumed until 1874. By that year the natives from Portuguese territory and elsewhere who had found employment in Natal had been attracted to the Kimberley diamond mines, and the Natal natives not coming forward (save under compulsion), the importation of Indian coolies was again permitted (see the Natal Blue Book, Report of the Indian Immigration Commission, 1869).
Panda, had been located by the Natal government under their chief Langalibalele (i.e. the great sun which shines and burns) in 1848 at the foot of the Drakensberg with the object of preventing the Bushmen who dwelt in the mountains plundering the upland farmers. Here the Amahlubi prospered, and after the diamond fields had been discovered by many of the young men who had been to Kimberley brought back firearms. These Langalibalele refused to register, and entered into negotiations with several tribes with the object of organizing a general revolt. Prompt action by Sir Benjamin Pine, then lieutenant-governor of the colony, together with help from the Cape and Bantuoland, prevented the success of Langalibalele's plan, and his own tribe, numbering some 10,000 persons, was the only one which rebelled. The chief was captured, and exiled to Cape Colony (August 1874). Permitted to return to Natal in 1886, he died in 1889.

This rebellion drew the attention of the home government to the native question in Natal. The colonists, if mistaken in their general policy of leaving the natives in a condition of mitigated barbarism, had behaved towards them with uniform kindness and justice. They showed indeed in their dealings both with them and the Umlungu, their rulers, and with the Zulus beyond the Tugela a disposition to favour the natives at the expense of their white neighbours in the Transvaal and Orange Free State, and their action against Langalibalele was fully justified and the danger of a widespread native revolt real. But there were, including Bishop Colenso, who thought the treatment of the Amahlubi wrong, and their agitation induced the British government to recall Sir Benjamin Pine, Sir Garnet Wolseley being sent out as temporary governor. Sir Garnet reported the natives as "happy and prosperous—weell off in every sense."

As a result of consultations with Shepstone certain modifications were made in native policy, chiefly in the direction of more European civilization. Meanwhile the colony had weathered a severe commercial crisis brought on in 1865 through over-speculation and the neglect of agriculture, save along the coast belt. But the trade over berg largely developed on the discovery of the Kimberley diamond mines, and the progress of the country was greatly promoted by the substitution of the railway for the ox wagon as a means of transport. There already existed a short line from the Point of Disembarkation to the Umgeni, and on the 1st of January 1876 Sir Henry Bulwer, who had succeeded Wolseley as governor, turned the first sod of a new state-owned railway which was completed as far as Maritzburg in 1880. At this date the white inhabitants numbered about 20,000. But besides a commercial crisis the colony had been the scene of an ecclesiastical dispute which attracted widespread attention. Bishop Colenso (q.v.), condemned in 1863 on a charge of heresy, ignored the authority of the court of South African bishops and was maintained in his position by decision of the Privy Council in England. This led to a division among the Anglican community in the colony and the consecration in 1869 of a rival bishop, who took the title of bishop of Maritzburg. Colenso's bold advocacy of the cause of the natives—which he maintained with vigour until his death (in 1883)—attracted almost equal attention. His native name was Usobantu (father of the people).

For some years Natal, in common with the other countries of South Africa, had suffered from the absence of anything resembling a strong government among the Boers of the Transvaal, neighbours of Natal on the north. The annexation of the Transvaal to Great Britain, effected by Sir Theophilus Shepstone in April 1877, would, it was hoped, put an end to the disorders in that country. But the new administration at Pretoria inherited many disputes with the Zulus, disputes which were in large measure the cause of the war of 1879. For years the Zulus had lived at amity with the Natalians, from whom they received substantial favours, and in 1872 Cetywayo (q.v.), on succeeding his father Panda, had given assurances of good behaviour. These promises were not kept for long, and by 1878 his attitude had become so hostile towards both the Natal and Transvaal governments that Sir Bartle Frere, then High Commissioner for South Africa, determined on his reduction. During the war (see ZULULAND) Natal was used as the British base, and the Natal volunteers rendered valuable service in the campaign, which, after opening with disasters to the British forces, ended in the breaking of the Zulu power. (F. R. C.)

Scarcely had the colony recovered from the shock of the Zulu War than it was involved in the revolt of the Transvaal Boers (1880–1881), an event which overshadowed all domestic concerns. The Natalians were intensely British in sentiment, and the attack dealt by the policy of retrocession adopted by the Gladstone administration on Zululand, Zogo, Majuba, and Laing's Nek, all of them situated within the colony, British forces had been defeated by the Boers. And the treaty of retrocession was never regarded in Natal as anything but a surrender. It was clearly understood that the Boers would aim to establish a republican government over the whole of South Africa, and that the terms of peace simply meant greater bloodshed at no distant date. The protest made by the Natalians against the settlement was in vain. The Transvaal Republic was established, but the prediction of the colonists, ignored at the time, was afterwards fulfilled to the letter. Justice, however, to the colonists of Natal it must be recorded that, finding their protest with regard to the Transvaal settlement useless, they made up their minds to shape their policy in conformity with that settlement. But it was not long before their worst fears with regard to the Boers began to be realized, and their patience was once more severely taxed. The Zulu power, as has been recorded, was broken in 1879. After the war quarrels arose among the petty chiefs set up by Sir Garnet Wolseley, and in 1883 some Transvaal Boers intervened, and subsequently, as a reward for the assistance they had rendered to one of the combatants, demanded and annexed 8000 sq. m. of country, which they styled the "New Republic." As the London Convention had stipulated that there should be no trespassing on the part of the Boers over their specified boundaries, and as Natal had been the basis for those operations against the Zulus on the part of the British in 1879, which alone made such an annexation of territory possible, a strong feeling was once more aroused in Natal. The "New Republic," reduced in area, however, to less than 2000 sq. m., was nevertheless recognized by the British government in 1886, and in 1888 its consent was given to the territory (the Vryheid district) being incorporated with the Transvaal. Meanwhile, in 1887, the remnant of Zululand had been annexed to Great Britain (see ZULULAND).

In 1884 the discovery of gold in De Kaap Valley, and on Mr Moodie's farm in the Transvaal, caused a considerable rush of colonists from Natal to that country. Railways were still far from the Transvaal border, and Natal not only sent her own colonists to the new fields, but also offered the nearest route for prospectors from Cape Colony or from Europe. Durban was soon thronged; and Pietermaritzburg, which was then practically the terminus of the Natal railway, was the base from which nearly all the expeditions to the goldfields were fitted out. The journey to De Kaap by bullock-waggon occupied about six weeks. "Kurveying" (the conducting of transport by bullock-waggon) in itself constituted a great industry. Two years later, in 1886, the Rand goldfields were proclaimed, and the tide of trade which had already set in with the Transvaal steadily increased. Natal colonists were not merely the first in the field with the transport traffic to the new goldfields; they became some of the earliest proprietors of mines, and for several years many of the largest mining companies had their chief offices at Benoni, Pretoria, or Durban. In this year (1886) the railway reached Ladysmith, and in 1891 it was completed to the Transvaal frontier at Charlestown, the section from Ladysmith northward opening up the Dundee and Newcastle coalfields. Thus a new industry was added to the resources of the colony.

The demand which the growing trade made upon the one port of Natal, Durban, encouraged the colonists to redound their efforts to improve their harbour. The question of a fairway

The Colenso Affair.
from ocean to harbour has been a difficult one at nearly every port on the African coast. A heavy sea from the Indian Ocean is always breaking on the shore, even in the finest weather, and at the mouth of every natural harbour a bar occurs. To deepen the channel over the bar at Durban so that steamers might enter the harbour was the cause of labour and expenditure for many years. Harbour works were begun in 1857, piers and jetties were constructed, dredgers imported, and controversy raged over the various schemes for harbour improvement. In 1881 a harbour board was formed under the chairmanship of Mr Harry Escombe. It controlled the operations for improving the sea entrance until 1893, when on the establishment of responsible government it was abolished. The work of improving the harbour was however continued with vigour, and finally, in 1896, youth success was achieved that vessels of the largest class were enabled to enter port (see DURBAN). At the same time the railway system was continually developing.

Self-government granted.

For many years there had been an agitation among the colonists for self-government. In 1882 the colony was offered self-government coupled with the obligations of self-defence. The offer was declined, but in 1883 the legislative council was remodelled so as to consist of 23 elected and 7 nominated members. In 1890 the elections to the council led to the return of a majority in favour of accepting self-government, and in 1893 a bill in favour of the proposition was passed by parliament and assented to by the Imperial government. At the time the white inhabitants numbered about 50,000. The electoral law was framed to prevent more than a very few natives obtaining the franchise. Restrictions in this direction dated as far back as 1865, while in 1896 an act was passed aimed at the exclusion of Indians from the suffrage. The leader of the party which sought responsible government was Sir John Robinson (1839–1903) who had gone to Natal in 1850, was a leading journalist in the colony, had been a member of the legislative council since 1853, and had filled various official positions. He became the first premier and colonial secretary with Sir Harry Escombe (q.v.) as attorney-general and Mr F. R. Moor as secretary for Native Affairs. The year that witnessed this change in the constitution was also notable for the death of Sir Theophilus Shepstone, Natal's most prominent citizen. In the same year Sir Walter Hely-Hutchinson became governor. His immediate predecessors had been Sir Charles Mitchell (1839–1893) and Sir Arthur Havelock (1836–1889). Sir John Robinson remained premier until 1897, a year marked by the annexation of Zululand to Natal. In the following year Natal entered the Customs Union already existing between Cape Colony and the Orange Free State. Sir John Robinson had been succeeded as premier by Mr Harry Escombe (February-October 1897) and Escombe by Sir Henry Binns, on whose death in June 1899 Lieut.-Colonel (afterwards Sir) Albert Hime formed a ministry which remained in office until after the conclusion of the Anglo-Boer War. Meanwhile (in 1901) Sir Henry McCallum had succeeded Sir Walter Hely-Hutchinson as governor.

For some years Natal had watched with anxiety the attitude of increasing hostility towards the British adopted by the Boers as a result of the events of 1881, gauged with accuracy the intentions of the Boers. So suspicious had the ministry become of the nature of the military preparations that were being made by the Boers, that in May 1899 they communicated their apprehensions to the High Commissioner, Sir Alfred Milner, who telegraphed on the 25th of May to Mr Chamberlain, informing him that Natal was uneasy. The governor expressed his views to the prime minister that the Natal government ought to give the British government every support, and Colonel Hime replied that their support would be given, but at the same time he feared the consequences to Natal if, after all, the British government should draw back. In July the Natal ministry learnt that it was not the intention of the Imperial government to endeavour to hold the frontier in case hostilities arose, but that a line of defence considerably south of the frontier would be taken up. This led to a request on their part that if the Imperial government had any reason to anticipate the breakdown of negotiations, such steps may be at once taken as may be necessary for the effectual defence of the whole colony." Sir William Penn Symons, the general commanding the British forces in Natal in September, decided to hold Glencoe. On the arrival of Lieut.-General Sir George White from India, he informed the governor that he considered it dangerous to attempt to hold Glencoe, and urged the advisability of withdrawing the troops to Ladysmith. The governor was strongly opposed to this step, as he was anxious to protect the coal supply, and also feared the moral effect of a withdrawal. Eventually Sir Archibald Hunter, then chief of staff to Sir Redvers Buller, was consulted, and stated that in his opinion, Glencoe being already occupied, "it was a case of balancing the drawbacks and advised that, under the circumstances, the troops be retained at Glencoe." This course was then adopted.

On the 11th of October 1899 war broke out. The first act was the seizure by the Boers of a Natal train on the Free State border. On the 12th Laiing's Nek was occupied by the Boer forces, who were moved in considerable force over the Natal border. Newcastle was next occupied by the Boers unopposed, and on the 29th of October occurred the battle of Talana Hill outside Dundee. In this engagement the advanced body of British troops, 3,000 strong, under Symons, received a heavy cavalry charge which, by being driven back towards Dundee by the Boers, prolonged the occupation. General Symons hoped to be able to hold the northern portion of Natal. There is no doubt that this policy strongly commended itself to the governor and ministers of Natal, and that they exercised considerable pressure to have it adopted. But from a military point of view it was not at all cordially approved by Sir George White, and it was afterwards condemned by Lord Roberts. Fortunately Symons was able to win a complete victory over one of the Boer columns at Talana Hill. He himself received a mortal wound in the action. Brigadier-General Yule then took command, and an overwhelming force of Boers rendering the further occupation of Dundee dangerous, he decided to retire his force to Ladysmith. On the 21st of October General Sir George White and General (Sir John) French defeated at Elandslaagte a strong force of Boers, who threatened to cut off General Yule's retreat. He again attacked the Boer forces at Rietfontein on the 24th of October, and on the 26th General Yule reached Ladysmith in safety. Ladysmith now became for a time the centre of military interest. The Boers gradually surrounded the town and cut off the communications from the south. Various engagements were fought in the attempt to prevent this movement, including the actions of Farquhar's Farm and Nicholson's Nek on the 30th (see TRANSVAAL). The investment of Ladysmith continued till the 28th of February 1900, when, after various attempts to relieve the beleaguered garrison, Sir Redvers Buller's forces at last entered the town. During the six weeks previous to the relief, 200 deaths had occurred from disease alone, and altogether as many as 8,242 were reported to have passed through the hospitals. The relief of Ladysmith soon led to the evacuation of Natal by the Boer forces, who retreated northwards.

The war of 1899-1902.

The war that was to be short and decisive became a long one. The Imperial government and the loyal colonists, constituting the great majority of the inhabitants of the colony, rendered the Imperial forces every assistance. A comparatively small number of the Dutch colonists joined the enemy, but there was no general rebellion among them. As the war progressed the Natal volunteers and other Natal forces took a prominent part. The Imperial Light Horse and other irregular corps were recruited in Natal, although the bulk of the men in the forces were Uitlanders from Johannesburg. As the nearest colony to the Transvaal, Natal was resorted to by a large number of men, women and children, who were compelled to leave the Transvaal on the outbreak of the war. Refugee and Uitlander committees were formed both at Durban and Maritzburg, and, in conjunction with the colonists, they did all in their power to assist in recruiting irregular corps, and also in furnishing relief to the sick and needy.
As one result of the war, an addition was made to the territory comprised in Natal, consisting of a portion of what had previously been included in the Transvaal. The Natal government originally made two proposals for annexing new territory. One was that the following districts should be transferred to Natal, viz. the district of Vryheid, the district of Utrecht and such portion of the district of Wakkerstroom as was comprised by the line drawn from the centre of Natal to the village of Volksrust in a northerly direction to the summit of the Drakensberg Range, along that range, passing just north of the town of Wakkerstroom, to the head waters of the Pongola river, and thence following the Pongola river to the border of the Utrecht district. In consideration of the advantage to Natal from this addition of territory, Natal should take over £700,000 of the Transvaal debt.

The Imperial government decided to sanction only the first of these two proposals. For this course there were many reasons, the Transvaal territory annexed, or the greater part of it (the Vryheid district), having been only separated from the rest of Zululand in 1853 by a raid of armed Boers. In handing over this district to the administration which controlled the rest of Zululand, His Majesty's government had decided to confine the territory to be transferred to the districts in the Transvaal.

The districts added to Natal contained about 6000 white inhabitants (mostly Dutch), and some 92,000 natives, and had an area of nearly 7000 sq. m., so that this annexation meant an addition to the white population of Natal of about one-tenth, to her native population of about one-tenth also, and to her territory of about one-fourth. An act authorizing the annexation was passed during 1902 and the territories were formally transferred to Natal in January 1903.

The punitive war in Zululand was succeeded by a commercial depression, though in Natal it was not so severely felt as in other parts of South Africa. The government met the crisis by renewed energy in harbour works, railway constructions and the development of the natural resources of the country. A railway to the Zululand coalfields was completed in 1903, and in the same year a line was opened to Vryheid in the newly annexed territories. Natal further built several railway lines in the eastern half of the Orange River Colony, thus opening up new markets for her produce and facilitating her trade to Natal. Mr Chamberlain, in his visit to South Africa early in 1903, came to Natal, where he landed in the last days of 1902, and conferred with the leading colonists. In August 1903 the Hime ministry resigned and was succeeded by a cabinet under the premiership of Mr (afterwards Sir) George Sutton, the founder of the wattle industry in Natal and one of the pioneers in the coal-mining industry. In May 1905 Sir George Sutton was replaced by a coalition ministry under Mr C. J. Smythe, who had been colonial secretary under Sir Albert Hime. These somewhat frequent changes of ministry, characteristic of a country new to responsible government, reflected chiefly the difficulty of adjusting questions of policy and the policy to be adopted towards the natives. Towards those Dutch colonists who had joined the enemy during the war lenity was shown, all rebels being pardoned.

The attitude of the natives both in Natal proper and in Zululand caused much disquiet. As early as July 1903 rumours were current that Dinizulu (a son of Cetywayo) was disaffected and the power he exercised as representative of the former royal house rendered his attitude a matter of great moment. Dinizulu, however, remained at the time quiescent, though the Zulus were in a state of excitement over incidents connected with the war, when they had been subject to raids by Boer commandoes, and on one occasion at least had retaliated in characteristic Zulu fashion. Unrest was also manifested among the natives west of the Tugela, but it was not at first cause for alarm. The chief concern of the Natal government was to remodel their native policy where it proved inadequate, especially in view of the growth of the movement for the federation of the South African Colonies. During 1903-1904 a Native Affairs' Commission, representative of all the states, obtained much evidence on the status and conditions of the natives. Its investigations pointed to the loosening of tribal ties and to the corresponding growth of a spirit of individual independence. Among its recommendations was the direct political representation of natives in the colonial legislatures on the New Zealand model, and the imposition of direct taxation upon natives, which should not be less than £1 a year payable by every adult male. The commission also called attention to the numerical insufficiency of magistrate and native commissioners in certain parts of Natal. With some of the recommendations the Natal commission disagreed; in 1905, however, an act was passed by the Natal legislature imposing a poll-tax of £1 on all males over 18 in the colony, except indented Indians and natives paying hut-tax (which was 14s. a year). Every European was bound to pay the tax. In 1906 a serious rebellion broke out in the colony, attributable ostensibly to the poll-tax, and spread to Zululand. It was suppressed by the colonial forces under Colonel (afterwards Sir) Duncan McKenzie, aided by a detachment of Transvaal volunteers. An incident which marked the beginning of this rebellion brought the Natal ministry into sharp conflict with the Imperial government (the Campbell-Bancroft crisis), subsequently repealed, and the home government to postpone the execution of the sentence. Early in the year a farmer who had insisted that the Kafrir on his farm should pay the poll-tax was murdered, and on the 8th of February some forty natives in the Richmond district forcibly resisted the collection of the tax and killed a sub-inspector of police and a trooper at Byrnetown. Two of the natives implicated were court-martialled and shot (February 15); others were subsequently arrested and tried by court martial. Nineteen were sentenced to death, but in the case of seven of the prisoners the sentence was commuted. On the day before that fixed for the execution Lord Elgin, then Secretary of State for the Colonies, intervened and directed the home governor to postpone the execution of the sentence. Thereupon the Natal ministry resigned, giving as their reason the importance of maintaining the authority of the colonial administration at a critical period, and the constitutional question involved in the interference by the imperial authorities in the domestic affairs of a self-governing colony. The action of the British cabinet caused both astonishment and indignation throughout South Africa and in the other self-governing states of the empire. After a day's delay, during which Sir George McCallum, the Home Secretary, had already made his well-known speech in London, in the justice of the sentence passed on the natives, Lord Elgin gave way (March 30). The Natal ministry thereupon remained in office. The guilty natives were shot on the end of April. It was at this time that Bambata, a chief in the Greytown district who had been deposed for misconduct, kidnapped the regent appointed in his stead. He was pursued and escaped to Zululand, where he received considerable help. He was killed in battle in June, and by the close of July the rebellion was at an end. As has been stated, it was ostensibly attributable to the poll-tax, but the causes were more deep-seated. Though somewhat obscure they may be found in the
growingsense of power and solidarity among all the Kafir tribes of South Africa—a sense which gave force to the "Ethiopian movement," which, ecclesiastical in origin, was political in its development. There were moreover special local causes such as undoubted defects in the Natal administration. Those Africans whose "nationalism" was greatest looked to Dinizulu as their leader, and he was accused by many colonists of having incited the rebellion. Dinizulu protested his loyalty to the British, nor was it likely that he viewed with approval the action of the republican chiefs of Zululand against the traditional chief. As time went on, however, the Natal government, alarmed at a series of murders of whites in Zululand and at the evidences of continued unrest among the natives, became convinced that Dinizulu was implicated in the rebellious movement. When a young man, in 1839, he had been convicted of high treason and had been exiled, but afterwards (in 1897) allowed to return. Now a force under Sir Duncan McKenzie entered Zululand. Thereupon Dinizulu surrendered (December 1907) without opposition, and was removed to Maritzburg. His trial was delayed until November 1908, and it was not until March 1909 that he was brought to court. He was acquitted on the minor charge of harbouring rebels. Meanwhile, in February, 1908, the governor—Sir Matthew Nathan, who had succeeded Sir Henry McCallum in August 1907—had made a tour in Zululand, on which occasion some 1,500 of the prisoners taken in the rebellion of 1906 were released.

The intercolonial commission had dealt with the native question as it affected South Africa as a whole; it was felt that a more local investigation was needed, and in August 1906 a strong commission was appointed to inquire into the condition of the Natal natives. The general election which was held in the following month turned on native policy and on the measures necessary to meet the commercial depression. The election, which witnessed the return of four Labour members, resulted in a ministerial majority of a somewhat heterogeneous character, and in November 1906 Mr Smythe resigned, being succeeded by Mr F. R. Moor, who in his election campaign had criticized the Smythe ministry for their financial proposals and for the "theatrical" manner in which they had conducted their conflict with the home government. Mr Moor remained premier until the following year, and during his administration a number of changes were made in the establishment of the Union of South Africa. In August 1907 the report of the Native Affairs' Commission was published. The commission declared that the chasm between the native and white races had been broadening for years and that the efforts of the administration—especially since the grant of responsible government—to reconcile the Kafirs to the changed conditions of rule and policy and to convert them into an element of strength had been ineffective. It was not sufficient to secure them, as the government had done, peace and ample means of livelihood. The commission among other proposals for a more liberal and sympathetic native policy urged the creation of a native advisory Board entrusted with very wide powers. "Personal rule," they declared, "supplies the keynote of successful native control"—a statement amply borne out by the influence over the natives exercised by Sir T. Shepstone. The unrest in Zululand delayed action being taken on the commission's report. But in 1909 an act was passed which placed native affairs in the hands of four district commissioners, gave to the minster for native affairs direct executive authority and created a council for native affairs on which non-official members had seats. While the district commissioners were intended to keep in close touch with the natives, the council was to act as a "deliberative, consultative and advisory body."

Concurrently with the efforts made to reorganize their native policy the colony also endeavoured to deal with the Asiatic question. The rapid growth of the Indian population from about 1890 caused much disquiet among the majority of the white inhabitants, who viewed with especial anxiety the activities of the "free," i.e. undunted Indians. An act of 1895, which did not become effective until 1901, imposed an annual tax of £3 on time-expired Indians who remained in the colony and did not reinstate. In 1897 an Indian Immigration Restriction Act was passed with the object of protecting European traders; in 1903 another Immigration Restriction Act among other things, permitted the exclusion of all would-be immigrants unable to write in the characters of some European language. Under this act nothing further was done in Natal until the establishment of the Union of South Africa, when all questions specially or differentially affecting Asians were withdrawn from the competence of the provincial authorities.

Not long after the conclusion of the war of 1899–1902 the close commercial relations between the Transvaal and Natal led to suggestions for a union of the two colonies, but these suggestions were not seriously entertained. The divergent interests of the various colonies threatened indeed a tariff and railway war when the Customs Convention (provisionally renewed in March 1906) should expire in 1908. But at the close of 1906 the Cape ministry formally reopened the question of federation, and at a railway conference held in Pretoria in May 1908 the Natal delegates agreed to a motion affirming the desirability of the early union of the self-governing colonies. The movement for union rapidly gained strength, and a National Convention to consider the matter met in Durban in October 1908. In Natal, especially among the older colonists, who feared that in a united South Africa Natal interests would be overborne, the proposals for union were met with suspicion and opposition, and the Natal ministry felt bound to submit the question to the people. A referendum act was passed in April 1909, and in June following the electors by 11,121 votes to 3701 decided to join the Union. (See SOUTH AFRICA.)

Natal was concerned not only with the political aspects of union, and with its natives and Indian problems, but had to safeguard its commercial interests and to deal with a revenue insufficient for its needs. In 1908 an Income Tax and a Land Tax Act was passed; the land tax being a halfpenny in the £ on the aggregate unimproved value. It brought in £3,000,000 in 1908–1909. Meanwhile it was agreed by the Cape, Transvaal and Natal governments that, subject to Natal entering the Union, its share of the Rand import trade should be 25% before and 30% after the establishment of the Union. Previously Natal had only 22½% of the traffic, and this agreement led to a revival in trade. Moreover, the development of its coal-mines and agriculture was vigorously prosecuted, and in 1910 it was found possible to abolish both the Income Tax and Land Tax and yet have a surplus in revenue. The closing months of Natal's existence as a separate colony thus found her peaceful and prosperous. The governor, Sir Matthew Nathan, had

1 The causes, both local and general, are set forth in a despatch by the governor of the 21st of June 1906 and printed in the Blue Book, Cd. 3247.
were negroes, (1910 census) 11,701. It is served by the Yazoo & Mississippi Valley, the St. Louis, Iron Mountain & Southern, the New Orleans & North-Western and the Mississippi Central railways, and by steamboats on the Mississippi river. The city, which has an area of 2-19 sq. m., is mostly on a bluff that rises 200 ft. above the river, the wharfs and landings, and a few old buildings being the only reminders of what was before the Civil War the principal business section. Among the city institutions are the Fisk Public Library, a charity hospital, two sanatoriums, three orphan asylums, Stanton College for girls (non-sectarian; opened in 1894 and lodged in the old Fisk mansion), St. Joseph's College for girls, the Jefferson Military College (1802), 6 m. from the city, and Natchez College for negroes. The city has four public parks, three on the river front, and one, Memorial Park, in honour of Confederate dead, in the heart of the city. On a neighbouring bluff is a national cemetery. Just outside the city limits, at Gloster, the former state of Winthrop Sargent, first governor of the Territory of Mississippi, are the graves of Sargent and S.S. Prentiss, who lived in Natchez for some years. In and near the city are many handsome old residences typical of ante-bellum Natchez, among them being: Mommon, General Quitman's estate; Somerset and Oakland, long in the Chotard family; and The Briars, the home during girlhood of Varina Howell, the wife of Jefferson Davis. A Roman Catholic cathedral (1847), Trinity Protestant Episcopal Church (1855) and a Presbyterian church (1829) are the principal church buildings. The Prentiss and the Elk and Savage and other clubs are among the city's most noted. The leading industries are the shipment of cotton (70,000 to 90,000 bales are handled annually) and the manufacture of cottonseed oil and cake—the first cottonseed-oil mill in the country was built here in 1834—cotton goods, rope and yarns, lumber, brick, drugs and ice. Natchez was the first city in the state to own municipal water-works and sewage system. The city was named from the Natchez Indians who lived on its site when the country was first settled. In 1716 on the bluff Le Moyne de Bienville built Fort Rosalie for the protection of some French warehouses, and later the French demanded a neighbouring hill for another settlement. This offended the Natchez, and on the 28th of November 1729 they massacred the French and destroyed the fort, which was immediately rebuilt, and in 1764 was handed over to the English in accordance with the treaty of Paris, and became Fort Pampern; in 1779 it was turned over to the Spanish, who held it until 1798, when they withdrew and United States troops occupied the place. Under Spanish rule Natchez was the seat of government of a large district, and from 1798 to 1802 and from 1817 to 1821 it was the capital of Mississippi. It was chartered as a city in 1802. On the 7th of November, 1817, a large part of the city was destroyed by a fire, but it was soon rebuilt, and at the outbreak of the Civil War was a place of considerable wealth and culture. For several years it was the home of General John Anthony Quitman (1799–1858). Natchez surrendered to Union forces during the Vicksburg campaigns, first on the 12th of May 1862, and again on the 13th of July 1863. On the 2nd of September 1862 the Union iron-clad "Essex," commanded by William David Porter, bombarded the city and put an end to the commercial importance of the river front section.

NATHANIEL, a character in the New Testament, who appears in John 1, 40-42, as one of the first disciples of Jesus. In John xxii. 2 he is described as belonging to Cana of Galilee. The account of his call reveals to us a man of a deeply spiritual and sincere nature. Otherwise we know nothing beyond the mention of his name as one of the seven to whom, after the Resurrection, Christ revealed himself at the sea of Tiberias (John xxii. 2). But the interest he has evoked is shown by the attempts to identify him with other New Testament characters. Of these the one which has found most favour seems to be the apostle Bartholomew (q.v.). The actual identification must remain a matter of opinion. There is no doubt that he be said for the attempts to find in Nathanael another name for the apostle Matthew, or for Matthias, or for Paul "the
apostle of visions," or even for the writer of the Fourth Gospel himself.

**BIBLIOGRAPHY**—For the story of Nathanael's call see Archbishop Trench, Sketches in the Gospels, No. 2, and on his character, J. J. Newman's Sermons for the Festivals of the Church, No. 27.

**NATHUBHOY, SIR MANGALDAS** (1832–1850), Seth or head of the Kapol Bania caste, well known for their thrift and keen commercial instincts. He was born on the 15th of October 1832, of a family whose ancestors emigrated from Diu to Bombay soon after Bombay came into British possession. His grand-uncle, Mangaldas, had accumulated a considerable fortune, which, owing to the premature death of his father, came into the sole possession of Mangaldas at the age of eleven. He had to take charge of the business in early life, though he gave some time to English studies. On the death of his wife he established a dispensary at Kalyan in her memory and also a special female ward in connexion with the David Sassoon hospital in Poona. As a merchant Mangaldas was upright and successful. In social matters he stood forth as a reformer, and to him the change to election from hereditary succession to the headship of the caste is due. In 1862 he founded a fellowship in Bombay university to allow graduates to spend some years in Europe. A bequest in his will enabled the university to establish seven similar scholarships. He took keen interest in learning, and in such institutions as the Asiatic and geographical societies. In 1866 he was nominated to the legislative council and sat till 1874. He was made C.S.I., and in 1875 the dignity of Knight Bachelor was conferred on him. Besides a large donation to the Indian Famine Fund, Sir Mangaldas is known to have embezzled £5,000 on charities. He died at Bombay on the 9th of March 1880.

**NATICK,** a township of S.E. Middlesex county, Massachusetts, U.S.A., on the S.E. end of Cochituate Lake. Pop. (1890) 9118; (1900) 9488, of whom 1788 were foreign-born; (1910 census) 9666. The area of the township is 12.375 sq. m. The township's largest village, also named Natick, lying 18 m. W.S.W. of Boston, is served by the Boston & Albany railroad; it has the Walnut Hill preparatory school, the Leonard Morse hospital, and a public library, the Morse institute, which was given by Mary Ann Morse (1821-1839) to the township in 1878. In the village of South Natick is the Bacon Free Library (1880), in which is housed the Historical, Natural History and Library Society. In 1905 the factory product was valued at $3,453,004; the boots and shoes manufactured in 1905 were valued at $2,896,110 or 83.6% of the town's total, the output of brogans being especially important. Other distinctive manufactures are shirts and base-balls. Natick is the Indian name, signifying "our land," or "hilly land," of the site (originally part of Dedham) granted in 1650 to John Eliot, for the "praying" Indians. There was an Indian church in Natick, at which is now called South Natick or "Oldtown," from 1660 to 1716; and for some years the community was governed, in accordance with the eighteenth chapter of Exodus, by "rulers of tens," "rulers of fifties," and "rulers of hundreds." Until 1710 the Indians held the land in common. In 1735 the few Indians remaining were put under guardianship. The township owns a copy of Eliot's Indian Bible. An Eliot monument was erected in 1847 on the Indian burying-ground near the site of the Indian church, now occupied by a Unitarian church. Of the Eliot oak, made famous by Longfellow's sonnet, one was cut down in recent years; there are said to be 6,000 other trees about the place. In the village of North Natick, or "Smitty," the house of Paul Revere, who was born there in 1735, there is an elm tree, which is said to be 400 years old. Nearby, in the presidential campaign in 1840 gained the sobriquet of the "Natick cobbler." By the colonial authorities Natick was considered a "plantation" until the establishment of the church; in 1762 the parish (erected in 1745) became a district, and in 1781 this was incorporated as a town.

See "Natick," by S. D. Hosmer, Daniel Wright and Austin Bacon, in vol. 2 of A. Drake's History of Middlesex County (Boston, 1886); and Oliver N. Bacon, History of the Town of Natick (Boston, 1892).

**NATIONAL ANTHEMS OR HYMNS.** The selection of some particular songs, words and music, as the formal expression of national patriotism, is a comparatively modern development of ceremonial usage. In the Europe the chief national anthems are: The United Kingdom: "God save the King" (see below); France: "The Marseillaise," by Rouget de Lisle; Germany: "Hoch im Lande," by Balthasar Gerhard Schumacher, music of "God save the King?"; Switzerland: "Rufst du, mein Vaterland," music of "God save the King?"; Italy: the "Royal March" by G. Gabetti; Austria: "Gott erhalte unser Kaiser," words by L. H. Haschka, music by Haydn; Hungary: "Isten ald meg a Magyart?"; Belgium: "La Brabançonne," by F. Camenhoupt; Holland: "Wien Niederlans"; Denmark: "Hai der dem Liebenden," words by H. Harries, music of God save the King," and King Kristian stod ved højen mast," words by Ewald, music by Hartman; Sweden: "Ur Svenska hjertan," Russia: "Bozhe Zarja chran," words by J. J. Canas, music by D. Jenko; Rumania: "Traescea Regale," words by V. Alexandru, music by E. A. Hliboc; Spain: "Himno de Riego," music by Herta. In the United States, the "Star Spangled Banner" (1814; words by F.S. Key, music by J. S. Smith) and "Hall Columbia" (1798; words by Joseph Hopkinson, music by Fyles) share the duties of a national anthem, while the tune of "God save the King" is sung to words beginning "My country, 'tis of thee," by Samuel F. Smith (1808-1895). The most celebrated national anthem in the English language is "The King," which is said to have been first sung as his own composition by Henry Carey in 1740; and a version was assigned by W. Chappell (Popular Music) to the Harmonia Anglicana of 1742 or 1743, but no copy exists and this is now doubted. Words and music were printed in the Gentleman's Magazine for October 1745. There has been much controversy as to the authorship, which is complicated by the fact that earlier forms of the air and the words are recorded. Such are an "Ayre" of 1619, attributed to John Bull, who has long been credited with the origin of the anthem; the Scottish carol, "O Remember, O thou man," in Raynecroft's Malestrom, 1611; the ballad "Franklin is fled away" (printed 1660; and a piece in Purcell's Choice Collection for the Harpsichord (1669). The words or part of them are also found in various forms from the 16th century. The question was discussed in Richard Clarke's Account of the National Anthem (1832), and has been re-investigated by Dr W. H. Cummings in his God save the King (1903). Carey and Bull, in the general opinion of musical historians, divide the credit; but in his Minstrelsy of England (1901) Frank Kidson introduced a new claimant, James H. Askey, a Scotman who sang all national anthems worked for the Harpsichord, the publisher of the early copies of God save the King, and who became chamber composer to George III. What appears to be certain is that 1745 is the earliest date assignable to the substantial national anthem as we know it, and that both words and music had been evolved out of earlier forms. Bull's is the earliest form of the air; Carey's claim to the re-modelling of the anthem rests on an unauthorized tradition; and, on general probabilities, Oswald is a strong candidate. The tune was adopted by Germany and by Denmark before the end of the 18th century.

**NATIONAL DEBT.** Details as to the recent figures of the national debts of individual countries are given under the heading of each country, and the reader is also referred to the article Finance. Here the subject is considered in its technical aspects—including the special character of the institution, the different classes of debt, the various methods of raising loans, interest, funding systems, comparative statistics of national debts and other points.

National debt is so universal that it has been described as the first stage of a nation towards civilization. A nation, so far as its finances are concerned, may be regarded as a corporate body or even as an individual. Like the one or the other it may borrow money at rates of interest, and with securities, general or special, proportionate to its resources, credit and stability. But, while in this respect there are certain points of analogy between a state and an individual, there are important points of difference so far as the question of debt is concerned. A state,
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for example, may be regarded as imperishable, and its debt as a permanent institution which it is not bound to liquidate at any definite period, the interest, unless specially stipulated, being thus of the nature of transferable permanent annuities. While an individual who borrows engages to pay interest to the lender personally, and to reimburse the entire debt by a certain date, a state may have an entirely different set of creditors every six months, and may make no stipulation whatever with regard to the principal. A state, moreover, is the sole judge of its own solvency, and is not only at liberty either to repudiate its debts or compound with its creditors, but even when perfectly solvent may materially alter the conditions on which it originally borrowed. These distinctions explain many of the peculiarities of national debts as contrasted with those of individuals—though nations, like an individual, may by reckless bad faith utterly destroy its credit and exhaust its borrowing powers.

A well-organized state ought to have within itself the means of meeting all its ordinary expenses; where this is not the case, either through insufficiency of resources or maladministration, and where borrowing is resorted to for what may be regarded as current expenses, a state imperils, not only its credit, but, when any crisis occurs, its very existence; in illustration of this we need only refer to the cases of Turkey in Europe and some of the states of Central and South America. Even for meeting emergencies it is not always inevitable that a state should incur debt; its ordinary revenue is generally proportioned so as not to exceed its ordinary expenses as to enable it to accumulate a fund for extraordinary contingencies. This, it would seem, was a method commonly adopted in ancient states. The Athenians, for example, amassed 10,000 talents in the interval between the Persian and the Peloponnesian wars, and the Lacedaemonians are said to have done the same. At Susa and Ecbatana Alexander found a great treasure which had been accumulated by Cyrus. In the early days of Rome the revenue from certain sources was accumulated as a sacred treasure in the temple of Saturn; and we know that this fund was used for the purpose of leaving behind him the public treasury, which fell into the hands of Caesar. In later times, also, the more prudent emperors were in the habit of amassing a hoard. We find that the method of accumulating reserves prevailed among some of the early French kings, even down to the time of Henry IV. This system long prevailed in Prussia. Frederick II., when he ascended the throne, found in the treasury a sum of 8,700,000 thalers, and it is estimated that at his death he left behind him a board of from 60 to 70 million thalers. And similarly, in our own time, of the five milliards of indemnity paid by France as a result of the Franco-German war, 150 millions were set apart to be invested in annuities to re-institute the traditional war-treasury. The German empire, apart from the individual states which comprise it, had in 1882 a debt of about £24,000,000, while its invested funds amounted to £37,350,000, including a war-treasure of £6,000,000. The majority of economists disapprove of such an accumulation of funds by a state as a bad financial policy, maintaining that the remission of a proportionate amount of taxation would be much more for the real good of the nation. At the same time the possession of a moderate war-fund, it must be admitted, could make a state a great advantage in the case of a sudden war. In the case of England, apart from the private hoardings of a few sovereigns, there does not seem to have existed any deliberately accumulated public treasure; before the time of William and Mary English monarchs borrowed money occasionally from Jews and from the city of London, but emergencies were generally met by “benevolences” and increased imposts.

All modern states, it may be said, have been compelled to have recourse to loans, either to meet war expenses, to carry out great public undertakings or to make up the recurrent deficits of a rapidly increasing public expenditure. Resources obtained in this way are what constitute national debt proper. Loans have been divided into forced and voluntary. Forced loans can, of course, only be raised within the bounds of the borrowing country; and, apart from the injustice which is sure to attend such an impost, it is always economically unwise.

Loans which the kings of England were wont to exact from the Jews were really of the character of forced loans, though the method has never been used in England in modern times so extensively as on the continent. There the mode sought to be adopted in this way has never been anything like realized. In 1703, for example, a loan of this class was imposed in France, on the basis of income; and of the milliard (francs) which it was sought to raise only 100 millions were realized. In Austria and Spain, also, recourse has been had at various times to forced loans, but invariably with unsatisfactory results. Other methods of a more or less compulsory character have been and are made use of in various states for obtaining money, which, as they involve the payment of interest, may be regarded as of the nature of loans; but the debt incurred by such methods is comparatively insignificant, and some of the methods adopted are peculiarly irritating and mischievous. On the other hand, it has occasionally been attempted to raise voluntary loans by appeals to a nation’s patriotism; the method has been confined almost exclusively to France. After the revolutions of 1830 and 1848 appeals were thus made to the patriotism of French capitalists to buy 5% direct from the government at par, at a time when the French 5% were selling at 80; but the results were quite insignificant. In short, the only economically sound method of meeting expenses which the ordinary resources of a state cannot meet is by borrowing in the open market on the most advantageous terms obtainable. On this normal method of borrowing loans are divided into different categories, though there are really only two main classes, which may be designated perpetual and terminable. Borrowing in quasi-perpetuity has hitherto been the mode adopted by most states in the creation of the bulk of their debt. Not that any state ever borrows with the avowed intention of never paying off debts; but either no definite period for reimbursement is fixed, or the limit has been so extended as to be practically perpetual, or in actual practice the debt has been got rid of by the creation of another of equal amount under similar or slightly differing conditions as to interest. Of course a state is not bound to retain any part of its debt as a perpetual burden; it is at liberty to liquidate whenever it suits its convenience. This quasi-perpetuity of debt in the case of a state in a sound financial condition involves no hardship upon its creditors, who may at any moment realize their invested capital by selling their titles as creditors in the open money market, it may be at the price they paid, or it may be a little below or a little above it, according to the state of the market at the time. Loans, again, contracted on the terminable principle are of various classes; the chief of these are (1) life annuities, (2) reversionary annuities, (3) loans repayable by instalments at certain intervals, (4) loans repayable entirely at a fixed date.

From the time of William III. life and terminable annuities have been a favourite mode in England either of borrowing money or of commuting, and thus gradually paying off, the existing funded debt. At first, and indeed until comparatively recent times, the system of life annuities resulted in serious loss to the country, owing to the calculation of the rate of annuity on too high a scale, a result arising from imperfect data on which to base estimates of the average duration of life. The system of life annuities was sometimes combined in England with that of perpetual annuities, or interest on the rent of land, life annuity forming a sort of additional inducement to lenders of limited means to invest their money. At one time the form of life annuities known as tontine was much in vogue both in England and France, the principle of the tontine being that the proceeds of the total amount invested by the contributors should be divided among the survivors, the last survivor receiving the whole interest or annuity. The results of this system were not, however, encouraging to the state. In England, at least, the terminable annuity has been a favourite mode of borrowing from the time of William II.; it has been generally conjoined with a low rate of permanent interest on the sum borrowed. Thus in 1700 the interest on the consolidated debt amounted to only £260,000, while the terminable annuities payable amounted to £308,407. In 1780 a loan of 12 millions was raised
at 4% per annum, with the additional benefit of an annuity of £1, 165. 3½. at the end of eighty years. Even so late as the Crimean War in 1855, a loan of £6 millions at 3% per annum was contracted, the contributors receiving in addition an annuity of 1½. 6d. per £100 for thirty years.

The third method of contracting terminable loans, that of gradual repayment or amortization within a certain limit of years, has been a favourite one among certain nations, and specially commends itself to those whose credit is at a low ebb. When the final term of repayment is fixed upon, a calculation is easily made as to how much is to be paid half-yearly until the expiry of the term, so that at the end the whole, principal and interest, may be paid. The amount which therefore will be paid will largely represent interest, but, as at each half-yearly drawing of the numbers of the bonds to be finally paid off the principal will be gradually reduced, there will be more and more money set free from interest for the reduction of the actual debt. This method, as we have said, has its advantages, and when conjoined with stipulations as to liberty of conversion to debt bearing a lower rate of interest than that originally offered, and when the bonds are not issued at a figure much below par, might be the most satisfactory method of raising money for a state whose financial condition is in a state of temporary or even permanent emergency. What is known as the "Morgan loan" of France in 1870 was contracted on such conditions.

The last form of temporary loan, that repayable in bulk at a fixed date, is one which, when the sum is of considerable amount, is apt to be attended with serious disadvantages. The repayment may have to be made at a time when a state may not be in a position to meet it, and so to keep faith with its creditors may have to borrow at a higher rate in order to pay their claims. It has, however, worked well in the United States, most of the debt of which has been contracted on the principle of optional payment at the end of a short period, say five years, and compulsory payment at the end of a longer period, say twenty years. Thus the loan of £15 millions of dollars contracted in 1862 was issued on this principle, at 6%, and so with other loans between that year and 1868. In European states, however, the risks of embarrassment are too great to permit of the application of this method on an extensive scale; and for loans of great amount the methods most likely to yield satisfactory results are loans bearing quasi-perpetual interest, or those repayable by instalments on the basis of half-yearly drawings within a certain period.

What are known as lottery loans are greatly favoured on the continent, either as an independent means of raising money, or as an adjunct to any of the methods referred to above. These must not be confounded with the lottery pure and simple, in which the contributors run the risk of losing the whole of their investment. The lottery loan has been found to work well for small sums, when the interest is but little below what it would have been in an ordinary loan, and when the percentage thus set aside to form prizes of varying amounts forms but a small fraction of the whole interest payable. The principle is that each contributor of such a loan has a greater or less chance of drawing a prize of varying amount, over and above the repayment of his capital with interest.

What are known in England as eschequer bills and treasury bills may be regarded as loans payable at a fixed period of short duration, from three months upwards, and bearing very insignificant interest, even so low as ¾%. They are a useful means of raising money for immediate wants and for local loans, and form handy investments for capitalists who are reserving their funds for a special purpose. Eschequer bills are simply a special form of the funded debt, to be paid off generally within a certain period of years.

There are two principal methods of issuing or effecting a loan. Either the state may appeal directly to capitalists and invite subscriptions, or it may delegate the negotiation to one or more bankers. The former method has been occasionally followed in France and Russia, but in practice it has been found to be attended with so many disadvantages to the borrowing state or city that the best financial authorities consider it unsound. The great banking-houses have such a command over the money-market that it is difficult to keep even a direct loan out of their hands. The majority of loans, therefore, are negotiated by one or more of these houses, and the name of Rothschild is familiar to every one in connexion with such transactions. By this method a borrowing state can assure itself of having the proceeds of the loan without any delay and with the minimum of trouble. A loan may be issued at, above, or below par, though generally it is either at or below par—par being the normal or theoretical price of a single share in the loan, which has itself been contracting only when the market is undertaking a risk of losing its certainty of making a profit by the back for back share on reimbursement, without discount or premium. Very generally, as an inducement to investors, a loan is offered at a greater or less discount below par the credit of the borrowing government. Sometimes a state may offer to pay at the tender of the highest bidders; for example, the city of Auckland in 1875 invited subscriptions through the Bank of New Zealand to a loan of £100,000 at 5% ½ per cent. which was accepted at par, but which was accepted at the rate of 96% or above. The rate of interest offered generally depends on the credit of the state issuing the loan. England, for example, would have no difficulty in raising any amount at 3½% even less, while less stable states may have to pay 8 or 9%. The nominal percentage is by no means, however, always an index of the cost of a loan to a state, as the history of the debt of England doubtlessly shows. During the 17th century various expedients were employed, besides that of terminable annuities already referred to, to raise money for the great wars of the period, at an apparently low percentage. For example, from 1675 to 1685 a loan of £25,000 was issued at 6½% and ¾ per cent. allotted being sometimes 107½ or even 111½; so that between 1776 and 1785, for the £917,632 actually borrowed by the government, £115,267,993 was to be paid back. In 1797 a loan of £250,000 was issued at 5½%, and 6½% was actually borrowed, at 5½%, the sum of £219 was allotted to the lender. In 1793 a 3½% loan of 45 millions was offered at the price of 7½%, but the lender was satisfied with 6½%, eventhough the rate of par, resulting to this reckless method the debt of Great Britain in 1815 amounted to over 900 millions. France in this respect has been quite as extravagant as England; many of her loans during the 18th century were issued at 7½% and 8½%, took in 9½%, and were actually purchased at 3½%, the sum of £219 was allotted to the lender. In 1793 a 3½% loan of 45 millions was offered at the price of 7½%, but the lender was satisfied with 6½%, eventhough the rate of par, resulting to this reckless method the debt of Great Britain in 1815 amounted to over 900 millions. France in this respect has been quite as extravagant as England; many of her loans during the 18th century were issued at 7½% and 8½%, took in 9½%, and were actually purchased at 3½%, the sum of £219 was allotted to the lender. 

Government has almost uniformly maintained that it is in the long run it is much better for a state to borrow at high interest, even than at an apparently low interest much below par. A state of even the highest rank may find itself in the midst of a crisis that will for a time shake its credit, but when the crisis is past and its credit revives it will be in a much more sound position with a high interest for a debt contracted at par than with a comparatively low interest on a debt much in excess of what it really received. If a state, for example, borrows at 7½% and the interest is paid, and then when again in a flourishing condition reduce the interest on its debt to 4 or even 3%, The United States government actually did so with the debt it had accumulated in the War of 1812 by the practicing the custom of the debt is evidently no injustice to the creditors of a government, when used in a legitimate way. A state is at liberty at any time to pay off its debts, and, if it can raise new money at 4½% to pay off its old debt at 6½% and offer its creditors the option of payment of the principal or of holding it at a reduced interest. Government debts are, however, sometimes reduced after a fashion by no means so legitimate as this. Other states have been even more unprincipled, and have got rid of their debts at one sweep by the simple method of repudiation.

When a state has a variety of loans at varying rates of interest, it may consolidate them into a single debt at uniform interest. For example, in 1751 several descriptions of English debt were consolidated into one fund bearing a uniform interest of 3½%, an operation which gave origin to the familiar term "consol" ("consolidated certificates") by which a loan was known. A special tax or fund was appropriated to the payment of the interest on each particular loan. This was the original meaning of the "funds," a term which has now come to signify the national debt of the country. The origin of the term "funded" to express the idea of a debt which has been recognized as at least quasi-permanent, and for the payment of the interest on which regular provision is made. Unfunded or floating debt, in the other hand, means a loan whose provision requires to be made, which has been obtained for temporary purposes with the intention of paying them off within a brief period. Exchequer and treasury bills are included in this category, as also the unsecured portion of the national debt which has been regarded as at least semi-permanent, and for the payment of the interest on which regular provision is made. National debt, again, is divided into eternal and internal, according as the loans have been raised within or without the country—
some states, generally the smaller ones, having a considerable amount of exclusive internal debt, though it is obvious that the bulk of national debts are both external and internal.

We referred above to various ways of reducing the burden of a debt, and also to methods of contracting loans by which within a certain period they are amortized or extinguished. Most states, however, are burdened with enormous quasi-permanent debts, the reduction or extinction of which gives ample scope for the financial skill of statesmen. A favourite method of accomplishing the establishment of what is known as a sinking fund, formed by the setting aside of a certain amount of national revenue for the reduction of the principal of the debt.

(J. S. F.)

The following table shows the general state of the world's public indebtedness at the beginning of the 20th century, divided according to the more important countries, the bracketed figures in black type indicating the position of the country referred to under each heading in the list. The figures are given by preference for the year 1900, as more representative, in a case like this, than for some later years; for the Boer War, as regards the United Kingdom, and also the Russo-Japanese War, introduced new debt and new considerations, hardly fair to the comparison, while this stands at the end of a long period of peace. The figures in every case are not to be supposed to be absolutely accurate; statistics of national debts differ, often remarkably, and it is practically impossible to give a perfectly satisfactory comparison, owing partly to difficulties of computing the exchange, partly to inaccurate accounts, and partly to the varieties of debt (reproductive or non-reproductive, &c.).

The Principal Public Debts of the World, 1900.

<table>
<thead>
<tr>
<th>Country</th>
<th>Population</th>
<th>Total Debt</th>
<th>Per Head</th>
<th>Annual Charge</th>
<th>Per Head</th>
</tr>
</thead>
<tbody>
<tr>
<td>Britain</td>
<td>60,999,925</td>
<td>£528,978,782</td>
<td>£15 7 6</td>
<td>£23,216,657</td>
<td>£1 1 4</td>
</tr>
<tr>
<td>India</td>
<td>230,000,000</td>
<td>210,323,037</td>
<td>9 18 6</td>
<td>6,595,732</td>
<td>23 0 6</td>
</tr>
<tr>
<td>Australia</td>
<td>3,707,905</td>
<td>195,342,717</td>
<td>5 13 7</td>
<td>7,395,074</td>
<td>2 1 0</td>
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<tr>
<td>New Zealand</td>
<td>5,329,883</td>
<td>47,347,152</td>
<td>12</td>
<td>3,157,687</td>
<td>1 0 7</td>
</tr>
<tr>
<td>Canada</td>
<td>14,577,224</td>
<td>28,748,087</td>
<td>15</td>
<td>6,713,737</td>
<td>1 7 5</td>
</tr>
<tr>
<td>Natal</td>
<td>10,392,035</td>
<td>1,010,143</td>
<td>10</td>
<td>10,000,000</td>
<td>0 0 0</td>
</tr>
<tr>
<td>France</td>
<td>38,857,075</td>
<td>1,086,215,535</td>
<td>28</td>
<td>40,944,552</td>
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<tr>
<td>Russia</td>
<td>129,211,131</td>
<td>66,000,000</td>
<td>5 2</td>
<td>29,000,000</td>
<td>0 0 0</td>
</tr>
<tr>
<td>Austria</td>
<td>25,886,000</td>
<td>353,488,000</td>
<td>13 16 11</td>
<td>14,067,000</td>
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<tr>
<td>Hungary</td>
<td>19,283,511</td>
<td>184,000,000</td>
<td>9 14</td>
<td>11,977,644</td>
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<tr>
<td>Italy</td>
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<td>856,000,000</td>
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<td>37,700,000</td>
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<tr>
<td>United States of America</td>
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<td>292,216,265</td>
<td>10</td>
<td>6,709,026</td>
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<tr>
<td>Spain</td>
<td>18,080,500</td>
<td>233,843,000</td>
<td>5</td>
<td>16,742,285</td>
<td>0 1 8</td>
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<tr>
<td>Portugal</td>
<td>23,990,000</td>
<td>170,000,000</td>
<td>7</td>
<td>11,188,000</td>
<td>0 1 8</td>
</tr>
<tr>
<td>Egypt</td>
<td>9,734,000</td>
<td>103,372,000</td>
<td>13</td>
<td>5,475,000</td>
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</tr>
<tr>
<td>Prussia</td>
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<td>329,584,000</td>
<td>17</td>
<td>13,923,170</td>
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<tr>
<td>German Empire</td>
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<td>7,394,461</td>
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<td>5,197,752</td>
<td>177,322,252</td>
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<td>14,434,257</td>
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<td>Holland</td>
<td>5,107,134</td>
<td>96,561,287</td>
<td>18</td>
<td>2,926,553</td>
<td>0 1 1</td>
</tr>
<tr>
<td>Belgium</td>
<td>6,744,000</td>
<td>104,551,000</td>
<td>15</td>
<td>3,260,400</td>
<td>0 0 0</td>
</tr>
<tr>
<td>Japan</td>
<td>43,729,577</td>
<td>53,909,000</td>
<td>12</td>
<td>3,176,759</td>
<td>0 0 0</td>
</tr>
<tr>
<td>China</td>
<td>300,000,000</td>
<td>53,000,000</td>
<td>16</td>
<td>3,000,000</td>
<td>0 0 0</td>
</tr>
<tr>
<td>France</td>
<td>4,400,000</td>
<td>103,000,000</td>
<td>6</td>
<td>6,301,419</td>
<td>0 1 7</td>
</tr>
<tr>
<td>Brazil</td>
<td>17,000,000</td>
<td>81,710,000</td>
<td>4 16</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
the amount required for payment of interest forming a (new) sinking fund devoted to repayment of capital. This fixed charge was gradually reduced from about 20 millions to 26 millions in 1888, to 25 millions in 1890, and to 23 millions in 1899. The amount paid off during this period by means of old sinking fund, terminable annuities and new sinking fund, down to March 1900, was £153,288,693, or an annual average of £6,468,276.

It will be observed that the burden of the debt incurred previously to 1874 has thus been borne very unequally by different generations of posterity. While the generations immediately succeeding the Napoleonic war paid off about £2,000,000 a year, the taxpayers between 1876 and 1900 paid at three times that rate. They did so largely without knowing it, since a large part of the amount was wrapped up in the terminable annuities; but it is very questionable justice that so large a proportion of the burden should have been imposed upon them.

The great bulk of the funded national debt consists of what are known as "consols." This name dates from 1753, when the first government stock or Consols, consisting of £140,000 in a consolidated into one, amounting to £373,821. These "consolidated annuities" formed the germ of what has since become the type of British government stock. At the same time some of the annuities at a higher rate of interest were combined and the interest reduced to 3% and this stock was known as "reduced," the two 3% stocks remaining side by side, until in 1854 the 3% government stock was also converted into 3% under the style of "new threes." "Consol," "reduced," and "new threes" formed thenceforward a solid body of British 3% stock, until in 1888 the whole amount was converted (see Conversions below) by Mr. (afterwards Lord) Goschen into 2 1/2% "Consols" were added to from time to time when fresh loans were needed: from 39 millions in 1771 they rose to 71 millions in 1781, to 101 millions in 1783, 278 millions in 1801, 334 millions in 1811, and 400 millions in 1818; but in 1888 they had decreased, by redemptions, to £122,681,035. "Reduced" were also added to: from 17 millions in 1754 they rose to 61 millions in 1811, and the annual annuities at 3% were diminished to 102 millions in 1869, and to £68,917,433 in 1887, when they were converted with "consols" into the new consols (or "Goschen") at 2 1/2% to be reduced to 2 1/2% in 1903.

The lowest price ever quoted for "consols" was 47½ on 20th September 1797, owing to the mutiny at the Nore; the highest was £112 in 1896 owing to scarcity of stock, the operation of the sinking funds, and the demand for investment of savings bank moneys. The high premium to which consols rose towards the end of the century may be briefly explained. *Part passe* with the reduction of the debt went a dwindling of the amount of consols open to investors, and hence occurred a continued normal appreciation of the stock. In 1877 the amount of British government stock per head of the population was £40, 106; in 1896 this figure had decreased to £14, 125. The ordinary law of supply and demand would therefore in any case tend to increase the price of government stock. This has always happened. The amount of 3% diminished from 528 millions in 1817 to 498 in 1827, and to 497 in 1837, and the average prices in these years were 73, 83 and 90; additions were made to the stock, and in 1847 (the amount being 510 millions) the price was 86½; again the amount decreased, and in 1852 (500 millions) the price was 98½; then a great conversion raised the amount to 734 millions in 1854, and the price went down to 90½; but as the amount decreased again to 480 millions, and the price rose well above par; and though the reduction in interest in 1888 set back the price, it rose again as the amount of available stock diminished. Many causes, into which it is not necessary to enter here, but in keeping with the demand for money, have reduced it to the level of the government stock. Moreover, apart from the fact that in 1882 there were 689 millions of 3% and in 1900 only 501 millions of 2 1/2%, in existence, the amount held by government departments and therefore practically locked up from the market, gradually increased, until from this cause alone the amount of available stock was diminished by upwards of 200 millions; and a large amount more was practically locked up by being held by trustees, or by banks, insurance societies, &c. The savings banks deposits, increasing as they did by about £1,000,000 per month (owing partly to the sinking of 1894 of the maximum limit), had a large attraction in government securities; and the compulsory activity of the government as a buyer of consols, both on this account and also for sinking fund purposes (in order to obtain stock to redeem debt on the increased scale from time to time), was an abnormal cause for sending the price of consols high above par. Even at that figure (the average prices for consols being 101½, in 1894, 106⅓ in 1895, 110 in 1896, 114⅓ in 1897, 110½ in 1898 and 103½—having fallen owing to war prospects—in 1899) it was difficult for the government brokers to obtain consols, and it was principally owing to this state of things that in 1899 Sir Michael Hicks-Beach reduced the current charge for the consols (and pro bands the new sinking fund) from £25,000,000 to £23,000,000.

It may be useful to give the figures for the British national debt in 1902, after the disturbance due to the South African War. During the years 1901 and 1902 the new sinking fund was suspended, as well as the payments on the terminable annuity debt applicable to repayment of capital (except in so far as annuities to individuals were concerned); so that the debt was not reduced, as it would otherwise have been, by £4,547,000 in 1900 and £4,631,000 in 1901. On the contrary, it was increased by fresh borrowings. Consols were raised (in 1901 and 1920) to the extent of £52,000,000; a "War Loan" of 2% stock and bonds, redeemable in 1910, was raised (1900) to the amount of £3,000,000; 21% exchequer bonds were raised (in 1900) to the amount of £24,000,000, and treasury bills (in 1899 and 1900), £13,000,000. The total war borrowing amounted accordingly to £59,000,000, raised at a discount of (£6,585,000) 4-14%. This includes the whole new borrowing in 1902, a portion of which was intended after the peace to be paid back in the current year, but for this no allowance can here be made. The accompanying table shows the totals for the "dead-weight debt" in 1900, 1901 and 1902, and, for convenience, also the "other capital liabilities."

<table>
<thead>
<tr>
<th>31st March 1900</th>
<th>July 1902</th>
</tr>
</thead>
<tbody>
<tr>
<td>£628,978,782</td>
<td>747,876,000</td>
</tr>
<tr>
<td>£690,092,021</td>
<td>779,876,000</td>
</tr>
<tr>
<td>£652,478,782</td>
<td>701,902,021</td>
</tr>
</tbody>
</table>

"Other liabilities" 1
- War Loan: £50,000,000
- Exch. Bonds: £24,000,000
- Treas. Bills: £5,000,000
- Consols: £60,000,000
- Consols: £32,000,000

British National Debt Conversions.—The great bulk of the funded debt of the United Kingdom consists of annuities, which are described as perpetual, because the state is under no obligation to pay off at any time the capital debt which they represent. All that the public creditor can claim is to receive payment of the instalments of annuity as they fall due. On the other hand, the government has the right to redeem the annuities ultimately by payment of the capital debt; though it may, and frequently does, bind itself not to exercise that right as regards a particular stock of annuities until after a definite period. So long as a stock is thus guaranteed against redemption, the only way in which the annual charge for that portion of the debt can be reduced is by the government buying back the annuities in the open market at their current price, which may be more or may be less than the nominal debt, according to general financial conditions and to the state of the national credit. The liability of the stock to redemption at par, when the period of guarantee has expired, prevents its market price from rising materially above that level. To enable the right of compulsory redemption to be enforced, it is only necessary that the government should

1 Other causes are redemption of land tax, variation in capital value of terminable annuities and minor treasury operations.
have command of sufficient funds for the purpose of paying off the stockholders, or should be able to raise those funds by borrowing at a rate of interest lower than that borne by the stock. Any circumstances which might tend to raise the price of the stock above par would also assist the government in raising its redemption money on more favourable terms. When the amount of stock to be dealt with is large, the raising by a fresh loan of the amount required for redemption would occasion great disturbance in the money market, and would leave quite out of account the value of the existing stock to a lower rate of interest by agreement with the stockholders, whose reluctance to accept a reduction of income is overborne by their knowledge that the power of redemption exists and will be put in force if necessary. The opportunity for conversion may be looked for when the price of a redeemable stock stands steadily at or barely above par. Observation of the movements in the price of other securities will serve to show whether this stationary price represents the real market value of the stock, or whether that value is subject to depression owing to an expectation of the stock being converted or redeemed. Accordingly, the course of prices of other government stocks which are free from the liability to redemption, of the stocks of foreign countries and the colonies, and of the large municipalities, must be watched by government in order to determine, first, whether the conversion of a redeemable stock is feasible, and, secondly, to what extent the reduction of the interest in the stock may be carried.

The credit for the first measure of conversion belongs to Walpole, though it was carried through by Stanhope, his successor as chancellor of the exchequer. In 1714 the legal rate of interest for private transactions, which had been fixed at 6% in the year of the Restoration, was reduced to 5% by the act 12 Anne, stat. 2, c. 16. But the bulk of the national debt still bore interest at the nominal rate of 8% in the currency of Anne and the frequent irregularities in public payment had hitherto precluded any considerable borrowing at lower rates. Walpole saw that the first requirement was to give increased confidence to the public creditor by reducing the rates of interest. The act 24 was passed to this end. It was introduced through the medium of the House of Commons, which invited advances not exceeding £60,000, to be repaid with interest at 4% out of the first supplies of the year. The result was none of the supplies was made, and the rate of interest, as only a sum of £45,000 was offered on those terms. A further resolution was then passed, substituting 5% as the rate of interest. It was then suggested to the public creditors that this rate might be reduced to 4%, after which the reduction of interest on their own debts, the Bank of England and the South Sea Company. The Bank of England agreed to assist the government by advancing 4½ millions at the reduced rate, to be employed in paying off any of the general creditors who might refuse assent to the conversion. The assistance was not required, as all the creditors signed assent. The debts thus dealt with amounted altogether to about 25½ millions, and the annual saving of interest effected (that is, the difference between the old rate and the 4% for which bills for which the Bank had been receiving over 7%) was £29,000.

Walpole had a further opportunity of effecting a conversion in 1737. In that year he was again left to his own devices in the scheme for the gradual reduction of the 4%. As a financial measure the scheme would doubtless have succeeded; but Walpole, moved against the day by the consideration for his capitalist supporters, opposed and for the time defeated, a measure which, accomplished by a subsequent bill of 1739, was afterwards carried through by Pelham as chancellor of the exchequer in 1740 and embodied in the act 23 Geo. II. c. 1. By that act holders of the 4% securities were to be allowed to exchange them for 3½% securities on the 1st of January next following the passing of the act, a further reduction to 3% thereafter. It was necessary to continue the rate of 4% for the first year, as any objecting stockholders could not be paid off without a year’s notice. Three months were allowed for signifying assent to the proposal. At first it was viewed with disfavour, and both the Bank and the East India Company opposed it. But the pens of the government pamphleteers were busily occupied in showing the advantages of the offer, and at the end of one month those holding nearly 39,300,000 of the 4% and 3½% were more than two-thirds of the whole. A further opportunity was afforded to waverers by a second act of 1740. Private creditors were allowed three months more for consideration; but for holders accepting the act it was to be in the intermediate period of 3½% interest was reduced from seven years to five. These terms brought in an additional £15,600,000 of stock; and the amount of stock at which the conversion was paid off at par by means of a new loan. The annual saving of interest on the stock converted was at first £272,000, increasing to £344,000 after seven years.

Three-quarters of a century no further conversion was attempted. In that period the total debt had been increased tenfold, and the practice of borrowing in times of war by the issue of funded capital. In 1812, however, the low rate of interest, prevented recourse to conversion, the fear of reducing the burden after peace was restored. But in 1822 Mr. Vansittart — who four years earlier had effected a conversion in the opposite sense of the national debt — succeeded in securing a low rate of interest, and thus prevented recourse to conversion for a number of years reducing the burden after peace was restored. In 1822 Mr. Vansittart, who for four years earlier had effected a conversion in the opposite sense of the national debt, succeeded in securing a low rate of interest. In 1830 and 1840 the annual saving in interest was £5,810,000.

In 1830 the guarantee given on the 4½% stock of 1822 had expired, and the stock stood at a price of 101. Mr. Goulburn decided to attempt its conversion without delay, and accordingly by the act 11 Geo. IV. c. 13 holders were offered in exchange for each £100 of the stock, either £100 of a 3½% stock, irredeemable for ten years, or £70 of a 5% stock, irredeemable for forty-two years, these two options being considered of approximately equal value. The conversion was only partially successful. Thus after ten years the stock was converted, almost wholly into the 3½% stock; the balance of less than £3,000,000 was paid off, and an annual saving of £754,000 in interest was the result.

Following Mr. Goulburn’s fortune to carry out a large and successful conversion in 1844. At that date the funded debt was made up of 3% and 3½% stocks in the proportions of one to three, the latter amounting to £9,000,000, or a trilling amount of 5% stock created in connection with the conversion of 1830. The price of 3% consols ranged about 98, and that of the new 3½%, created in 1830, about 102. A reduction straight-way from 3½ to 3% was not to be looked for, but it was hoped to ensure that reduction ultimately by offering 3½% for the first few years and a guarantee against redemption for a long term. Accordingly the holders of the several 3½% stocks were offered an exchange, as may be seen by the following table, of these stocks for 3% stocks in the following twenty years. Practically the whole of the stock, amounting to £23,000,000, was converted on these terms, only one or two per cent. being left behind. The annual saving of interest was £622,000 a year for ten years, and twice that rate in subsequent years (acts 7 & 8 Vict. cc. 4 and 5).

Mr. Gladstone’s only attempt at the conversion of the debt was made in 1864. In the year 1861 Parliament, after the passage of the act of 1861 making provision for exchange, passed the deed of exchange, which provided for exchanging every £100 for either 8½, 10s. of a 3½% stock guaranteed for 40 years, or £10 of a 2½% stock guaranteed for the same period and at the same rate. Of the amount of £1,500,000 was converted, and the remaining £8,000,000 had to be paid off at par, with some apparent loss of capital, as the current market price of the 3% was less than par. The failure was largely owing to the fact that, between the initiation and the execution of the scheme, the train of events leading up to the Crimean War had become manifest, with unfavourable results.
NATIONALITY—NATIONAL WORKSHOPS

to the public credit. Mr Gladstone had also included, as an optional portion of his plan, liberty to holders of the larger 3% stocks to exchange them, at the market price, for the 3% consols. The consent in 1882, and the whole of the 3% stocks, at a total of £58,000,000, made up as follows: £27,000,000 of consols, a stock which dated from 1752, and which was only redeemed at the end of the year, or without more than 600,000 millions, but no attempt was made to compel acceptance. There was offered for exchange in each £100 of 3% stock a sum of £12 at 22 1/2 or 15 1/2 per cent. The whole amount was irredeemable for twenty-one years. But the amount exchanged into the new stocks was only 22 millions, of which more than one- tenth was stock held by government departments.

The conversion of 1884, with which the British debt was effected by Mr Goschen in 1888. It applied to the whole of the 3% stocks, amounting to a total of £60,000,000, made up as follows: £23,000,000 of consols, a stock which dated from 1752, and was then formed by the consolidation of a number of minor stocks; £59,000,000 of reduced 3% of which the nucleus was the stock reduced from 4% to 3% by Peltam's conversion in 1879, and £20,000,000 of consols new 3%, which dated from 1844. All the three stocks were, and had been for a considerable time, well over par. But for the past few years they had remained, in almost the stationary position, relatively to the upward movement shared by the government debentures, and the new 3% loan, of foreign governments, of British colonies and of the leading municipalities. It was clear that the anticipation of a conversion or redemption of anything of the kind had been never made. During this fact was afforded by the course of a new 3% stock, the local loans stock, which Mr Goschen had created in 1887. Thence bearing the same interest and resting upon the same ultimate security as consols, and being both convertible and redeemable after five years, rose at once to a higher level of price. The opportunity for a great scheme of conversion had evidently come. The risk to be incurred by government in undertaking the liability to pay off such an enormous body of stock, though less in comparison with the resources of the nation than that which Mr Goulburn had faced in 1844, was still very great, and it was rendered more formidable by the fact that the consols had already lost 3% of their value at the time to a year's notice before their stocks could be redeemed. If that right of notice were to be enforced as regards any large proportion of the stocks, no precaution could adequately guard against the inevitable democratic consequences by which any such act affecting the stockholders' rights would affect the market, or the large number of new mortgages and other security, before the year expired. Mr Goschen proposed to offer to the holders of each of the three stocks an exchange at par into a new stock bearing interest at 3% for the first year, at 2% for the next fourteen years and at 2 1/2 for twenty years thereafter, the stock to be irredeemable for the whole of that period, namely till 1923. Acceptance was made compulsory for holders of the new 3%, with the result that they had either paid or given notice; but it was made optional for the holders of the other two stocks, and a bonus of 5% was offered to them as an inducement to forego their right of notice. These provisions were duly enforced by the Act of 1884. It has, on the whole, been found that practically all the holders of the new 3% and by the great majority of the holders in consols and reduced 3%, the amount left outstanding being only £70,000,000 of consols, which are convertible and redeemable after five years, was passed providing for the compulsory redemption or conversion of the outstanding stock at the expiry of the statutory notice. The funds required for this further operation were raised by the issue of treasury bills and exchequer bonds, by temporary advances from the bank and from the national debt commissioners, and by the creation of an additional half-million of the new stock. In the result it was only necessary to find cash for paying off dissentients to the amount of £10,000,000. The final outcome of the whole operation was a saving in the annual charge of interest of £1,412,000, increasing to twice that amount after fourteen years.

The conversion of 1884, which was greatly facilitated by the exercise of a power, which the act conferred, to pay to recognized agents, such as stockbrokers, bankers and solicitors, a commission of 1 1/2% on stocks in respect of which they lodged their clients' assents. These agents were thus afforded an inducement to get their clients payment and advice, without which many of the fundholders would probably not have moved in the matter. The commission paid amounted to more than £34,000 representing stocks to the amount of £1,412,000. The government would not again be confronted with this difficulty of having to give long preliminary notice of the intention to convert or redeem the stock. In 1888, when the second part of the Conversion Act 1888 that the present consols should be redeemable after 1923 on such notice and in such manner as parliament might direct, was passed.


NATIONALITY, a somewhat vague term, used strictly in international law (see International Law, Private) for the status of membership in a nation or state (for the conditions of which see State, Aligiance, Naturalization, Aliens), and in a more extended sense in political discussion to denote an aggregation of persons claiming to represent a racial, territorial or economic interest by their mutual adherence to the same political entity. In this latter sense the word has often been applied to such people as the Irish, the Armenians and the Czechs. A "nationality" in this connexion represents a common feeling and an organized claim rather than distinct attributes which can be comprised in a strict definition.

NATIONAL WORKSHOPS (Fr. Ateliers Nationaux), the term applied to the workshops established to provide work for the unemployed by the French provisional government after the revolution of 1848. The political crisis which resulted in the abdication of Louis Philippe was naturally followed, in Paris, by an acute industrial crisis, and this, following upon the agricultural and commercial distress which had prevailed throughout 1847, rendered the problem of unemployment in Paris very acute. The provisional government under the influence of one of its members, Louis Blanc, and on the demand of a deputation claiming to represent the people passed a decree (Feb. 25, 1848) from which the following is an extract:—

The provisional government of the French Republic undertakes to provide work for the unemployed by work by work. It undertakes to guarantee work for every citizen.

For the carrying out of this decree, Louis Blanc wanted the formation of a ministry of labour, but this was shelled by his colleagues, who as a compromise appointed a government labour Commission under the presidency of Louis Blanc, with power of inquiry and consultation only. The carrying out of the decree of Feb. 25th was entrusted to the minister of public works, M. Marie, and various public works were immediately started. The earlier stages of the national workshops are sufficiently interesting to justify the following detailed account:—

"The workman first of all obtained a certificate from the landlord of his house, or furnished apartments, showing his address, whether in Paris or the department of the Seine. This certificate was issued and stamped by the police commissary of the district. The workman could only be employed in repairing or constructing public works, and in delivering this document, received in exchange a note of admission to the national works, bearing his name, residence and calling, and a note of recommendation to be kept in the workshops in which vacancies existed. All went well while the number of the unemployed was less than 6000, but as soon as that number was exceeded the workmen of each arrondissement, after having visited the workshops, returned to the mairie's offices tired, starving and discontented. The workmen had been promised bread when work was not to be had, which was reasonable and charitable; the great mistake was, however, that of giving them money, and distributing it in public at the offices of the maires instead of distributing assistance in kind, which might have been done so easily through the agency of the bureaux de bienfaisance. Each mairie's office was authorized to pay every unemployed workman 1-50 frs. per day on production of a ticket showing that there was no vacancy for him in the national works. The fixed sum of 2 francs was paid to any workman engaged on the works of the city, and a sum of 1 franc to any workman who returned to the city without result. The works opened by the minister of public works being far distant from each other, and the workmen not being able to visit them, the committee of the city of Paris, under the presidency of M. Wissocq, a member of the city council, divided them, two central bureaux were established, one at the Halle-aux-Veaux under M. Wissocq, the other near the mairie's office in the 

2 The term is also incorrectly applied to the proposed Ateliers sociaux of Louis Blanc (q.v.), state-supported co-operative productive societies.

3 Clearing the trench of Clamart and conveying the earth to Paris for the construction of a railway station on the chemin de fer de l'Ouest; construction of the Paris-Chartres railway; improvement of the navigation of the Oise; extension of the Seine railway to Vesly.
The mineral also often occurs in compact fibrous aggregates, the fibres having a divergent or radial arrangement (hence the name radiolite for one variety). From other fibrous zeolites, natrolite is readily distinguished by its optical characters: between crossed nicols the fibres exhibit parallel to their length, and they do not show an optic figure in convergent polarized light. Natrolite is usually white or colourless, but sometimes reddish or yellowish. The lustre is vitreous, or in finely fibrous specimens sometimes silky. The spec. grav. is 2-2, and the hardness 5-5. The mineral is readily fusible, melting in a candle-flame, to which it imparts a yellow colour owing to the presence of sodium. It is decomposed by hydrochloric acid with evolution of gaseous silicon fluoride.

Natrolite occurs with other zeolites in the amygdaloid cavities of basic igneous rocks. The best specimens are the diverging groups of white prismatic crystals found in compact basalt at the Puy-de-Marmuz, 230 m. de Doué, France. The largest crystals are from Brevig in Norway. The walls of cavities in the basalt of the Giant's Causeway, in Co. Antrim, are frequently encrusted with slender needles of natrolite, and similar material is found abundantly in the volcanic rocks (basalt and phonolite) of Salessel, Ausias and several other places in the north of Bohemia.

Several varieties of natrolite have been distinguished by special names. Fargite is a red natrolite from Glenfarg in Perthshire, Benjaminite or Spectophane is a specimen from Laraha, and Enrichite by the alteration of other minerals, chiefly sodalite, in the augite-eynite of southern Norway.

NATTIER, JEAN M Arc (1685-1760), French painter, was born in Paris in 1685. The son of Marc Nattier, a portrait painter, and of Marie Courtois, a miniaturist. He received his first instruction from his father, and having applied himself to copying pictures at the Luxembourg Gallery, he refused to proceed to the French Academy in Rome, though he had taken the first prize at the Paris Academy at the age of fifteen. In 1715 he went to Amsterdam, where Peter the Great was then staying, and painted portraits of the tsar and the empress Catherine, but declined an offer to go to Russia. Between 1715 and 1720 he devoted himself to compositions like the "Battle of Pultawa," which he painted for Peter the Great, and the "Petification of Phineas," of his countrymen, which he sold to the Academy. The financial collapse of 1720 caused by the schemes of Law all but ruined Nattier, who found himself forced to devote his whole energy to portraiture. He became the painter of the artificial ladies of Louis XV.'s court. The most notable examples of his straightforward portraiture are the "Marie Leczinska" at the Dijon Museum, and a group of the artist surrounded by his family, dated 1730. He died in Paris in 1766. Many of his pictures are in the public collections of France. Th us at the Louvre is his "Magdalen," and at Nantes the portrait of "La Camargue," a Lady of the Court of Louis XV. At Orleans a "Head of a Young Girl," at Marseilles a portrait of "Mme de Pompadour," at Perpignan a portrait of "Louis XV.," and at Valenciennes a portrait of "Le Duc de Boufflers." The Versailles Museum owns an important group of two ladies, and the Dresden Gallery a portrait of the "Maréchal de Saxe." At the Wallace collection Nattier is represented by "The Comtesse de Dillières," "The Bath (Mdlle de Clermont)," "Portrait of a Lady in Blue," "Marie Leczinska" and "A Prince of the House of France." In the collection of Mr Lionel Phillips are the duchess of Flavacourt as "Le Silence," and the duchess of Châteauroux as "Le Couronnement." In the Royal Library are two portraits of the "Comtesse de Neubourg and her Daughter" formed part of the Vaile Collection, and realized 4,500 gu. at the sale of this collection in 1903. Nattier's works have been engraved by Leroy, Tardieu, Lépicié, Audran, Dupin and many other noted craftsmen.


NATURAL BRIDGE, a small village of Rockbridge county, Virginia, in the western part of the state, 170 m. by rail W. of Richmond, and about 16 m. S.E. of Lexington, the county-seat. It is served by the Chesapeake & Ohio and the Norfolk & Western Railways. In the vicinity of the village, which is about 1500 ft.
natural gas—naturalism

above sea-level, is the great natural curiosity from which it derives its name—a bridge of natural rock 90 ft. long and from 50 to 150 ft. wide, which spans Cedar Creek at a height of 215 ft. above that stream. It consists of horizontal limestone strata, and is the remains of the roof of a cave or underground tunnel through which the stream once flowed. It is crossed by a public road. In the village are magnesite and lithia springs and a salt-petre cave, which was worked during the War of 1812 and the Civil War. A royal grant dated the 5th of July 1774 conveyed to Thomas Jefferson a tract of 157 acres, "including the Natural Bridge on Cedar Creek," and it did not pass from his estate until 1833.

natural gas, the name given to the inflammable gas occurring in petrolierous formations. It consists mainly of hydrocarbons of the paraffin series, principally marsh gas, which constitutes from 50 to 90% of the Pennsylvanian gas. Members of the olefine series are also present, especially in the gas of Baku. Varying amounts of carbon dioxide, sometimes as much as 10% or more, and small quantities of carbon monoxide, nitrogen, hydrogen and oxygen are also found. For particulars of the geological occurrence, and the collection and distribution, of natural gas, see PETROLEUM.

naturalism. "Nature" is a term of very uncertain extent, and the "natural" has accordingly several antitheses, often more or less conflicting, and only to be learnt from the context in which they occur. Thus, though Man and the World are often opposed as respectively subject and object, yet the word nature is applied to both: hence Naturalism is used in both terms and in both senses. In the subjective sense the natural, as the original or essential, is opposed to what is acquired, artificial, conventional or accidental. On this opposition the casuistry and paradoxes of the Sophists largely turned; it determined also, at least negatively, the conduct of the Cynics in their contempt for the customary duties and decencies; and it led the Stoics to seek positive rules of life in "conformity to nature." This deference for the "natural" generally, and distrust of traditional systems of thought and even of traditional institutions, has played a large part in modern philosophy, especially British philosophy. It was perhaps the inevitable outcome of the reaction, which began with the Renaissance, against the medieval domination of mere authority. "L'homme qui médite est un animal dépravé," said Rousseau; and again, "Tout est bien sortant des mains de l'auteur des choses, tout dégénère entre les mains de l'homme."

In psychology and epistemology, "no one," as Green has said, "is more emphatic than Locke in opposing what is real to what we 'make for ourselves'—the work of nature to the work of the mind. Simple ideas or sensations we certainly do not 'make for ourselves.' They therefore, and matter supposed to be the cause of them, are, according to Locke, real. But relations are neither simple ideas nor their material archetypes. They therefore, as Locke explicitly holds, fall under the head of the work of the mind, which is opposed to the real."

This opposition again led Hume, in the first place, to distinguish between natural and philosophical relations—the former determined simply by association, the latter by an abiotic union of two ideas, which we may think proper to compare—and then, in the next, to reduce identity and causality, the two chief "philosophical relations," to fictions resulting from "natural relations," that is to say, from associations of similarity and contiguity. Subjective naturalism thus tended to become, and in the end became, what is more commonly called Sensationalism or Associationism, thereby approximating towards that objective naturalism which reduces the external world to a mechanism describable in terms of matter and motion—a result already foreshadowed when Harteley connected ideas and their association with brain vibrations and vibratulences. In ethics, also, the striving to get back to the natural entailed a similar downward trend. From the Cambridge Platonists, from Locke and Clarke, we hear much of rational principles of conduct, comparable in respect of intelligibility with the truths of mathematics; but already we find that in Shaftesbury the centre of ethical interest is transferred from the Reason, conceived as apprehending either abstract moral distinctions or laws of divine legislation, to the "natural affections" that prompt to social duty; and when we reach Bentham, with pleasure and pain as "sovereign masters," and the Mills, who love of virtue is inspired by the laws of association, it all seems to be non-rational. There is much resemblance, as well as some historical connexion, between the naturalism of moralists such as Shaftesbury and Hutcheson and the Common-Sense metaphysics of Reid and his school. Hence Kant, distinguishing between a "naturalistic" and "scientific" or critical method in metaphysics, styles Reid and his followers "naturalists of pure reason," satirically comparing them to people who think they can settle the size and distance of the moon by direct eyesight better than by the roundabout calculations of mathematics.

So far we have seen the natural approximating to the non-rational. But when used in a subjective sense in opposition to the supernatural, it means the rational as opposed to what is above reason, or even contrary to reason. It is in this sense that the term Naturalism most frequently occurs; and it was so applied specially to the doctrines of the English Deists and the German Illuminati of the 17th and 18th centuries: those of them who held that human reason alone was capable of attaining to the knowledge of God were called theological naturalists or rationalists, while those who denied the possibility of revelation altogether were called philosophical naturalists or rationalists simply. In these controversies the term Naturalist was also sometimes used in an objective sense for those who identified God and Nature, but they were more frequently styled Spinozists, Pantheists or even Atheists. But it is at once obvious that dispute as to what is natural and what supernatural is vain and hopeless till the meanings of reason and nature are clearly defined. "The only distinct meaning of the word "natural," said Butler, "is stated, fixed or settled; since what is natural as much requires and presupposes an intelligent agent to render it so, i.e. to effect it continually, or at stated times, as what is supernatural or miraculous does to effect it once. And from hence it must follow that persons' notion of what is natural will be enlarged in proportion to their greater knowledge. ... Nor is there any absurdity in supposing that there may be beings in the universe, whose capacities ... may be so extensive, as that the whole Christian dispensation may to them appear natural, i.e. analogous or conformable to God's dealings with other parts of His creation; as natural as the visible known course of things appears to us." 9

The antithesis of natural to spiritual (or ideal) has mainly determined the use of the term Naturalism in the present book. It is in the sense of the antithesis of spiritual and rationalism, though these terms are often used synonymously, as by Hegel, Ueberweg and other historians of philosophy; nor yet pantheism, if by that is meant the immanence of all things in God. We know only material phenomena, it is said; matter is an abstract conception simply, not a substantial reality. It is therefore meaningless to describe mind as its effect. Moreover, mind also is but an abstract conception; and here again all our knowledge is confined to the phenomenal. To identify the two classes of phenomena is, however, impossible, and indeed absurd; nevertheless we find a constant concomitance of naturalism and rationalism in our psychology, the easier it becomes to correlate the

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1 Quoted by Eisler, *Wörterbuch der philosophischen Begriffe* (1890), s.v. Naturwissenschaften.

2 T. H. Green, *Prolegomena to Ethics* (1883), § 20.


4 Cf. also R. Sorley, *The Ethics of Naturalism* (1885), pp. 16 sqq.


6 Kant, *Rationalistische Abhandlung über den Begriff der Wahrheit in Religion*.


8 In aesthetics we find Naturalism used in a cognate sense: the Flemish painters, such writers as Flaubert or Zola, for example, being called naturalistic or realistic, in contrast to the Italian painters or writers like George Sand or the Brontës.
psychical and the physical as but "two aspects" of one and the same fact. It is therefore simplest and sufficient to assume an underlying, albeit unknown, unity connecting the two. A monism—so far neutral, neither materialistic nor spiritualistic—is thus a characteristic of the prevailing naturalism. But when the question arises how best to systematize experience as a whole, it is contended that we must begin from the physical side. Here we have precise conceptions, quantitative exactness and thoroughgoing continuity; every thought that has ever stirred the hearts of men, not less than every breeze that has ever rippled the face of the deep, has meant a perfectly definite redistribution of matter and motion. To the mechanical principles of this redistribution an ultimate analysis brings us down; and—beginning from these—the nebular hypothesis and the theory of natural selection will enable us to explain all subsequent synthesis. Life and mind now clearly take a secondary place; the cosmo-llogical mechanism determines them, while they are powerless to modify it. The spiritual becomes the "epiphenomenal," a merely incidental phosphorescence, so to say, that regularly accompanies physical processes of a certain type and complexity. (See also Psychology.)

This absolute naturalism, as we may call it, the union, that is, of psychological and cosmological naturalism, is in fact a species of Fatalism, as Kant indeed entitled it. It is the logical outcome of a sensationalist psychology, and of the epistemology which this entails. As long as association of ideas (or sensory reactions) is accepted as the predominant form of explanation, and conscience, so long may naturalism stand.

The naturalistic work of chief account at the present day is E. Haeckel's Die Weltreligionen, gemeinsamenstandige Studien über monistische Philosophie (5 th ed., 1900), of which an English translation has appeared. Effective refutations will be found in the works of two of Haeckel's colleagues, O. Liebmann, Zur Analyse der Wirklichkeit (3 rd ed., 1900); R. Eucken, Die Einheit des Geisteslebens in Beusswein und Thod der Menschheit (1888, Eng. trans.): Der Kampf um einen geistigen Lebensinhalt (1898). See also A. J. Balfour, Foundations of Belief (8 th ed., 1901); J. Ward, Naturalism and Agnosticism (1899). (J. W.*)

NATURALIZATION, the term given in law to the acquisition by an alien of the national character or citizenship of a certain state, always with the consent of that state and of himself, but not necessarily with the consent of the state to which he previously belonged, which may refuse to its subjects the right of renouncing its nationality, called "expatriation," or may allow the right only on conditions which have not been fulfilled in the particular case. Hence although nationality in direct theory is always single, as liege homage was and allegiance in its proper sense is, it often happens that two states claim the same person as their national or subject. This conflict arises not only from naturalization having, been granted without the corresponding expatriation having been permitted, but also from the fact that birth on one side becomes a matter of nationality by feudal law, and still is so by the laws of England and the United States (jus soli), while the nationality of the father is its leading determinant in those countries which have accepted Roman principles of jurisprudence (jus sanguinis). The conflict is usually solved for practical purposes by an understanding which is approximately general, namely that, in cases not provided for by treaty, no state shall protect those whom it claims as its nationals while residing in the territory of another state which claims them as its own nationals by any title, whether jus soli, jus sanguinis, naturalization, or the refusal to allow expatriation. On this footing the British foreign office, while it grants passports for travel to naturalized persons, will extend no protection to them against a claim of their former country, if they return to it, to exact military service due to it. The United States, asserting that expatriation is an inalienable right of man, maintains that, to lose his right to American protection, the emigrant who has been naturalized in the United States must have done that for which he might have been tried and punished at the moment of his departure; it claims to protect him against the exaction of what at that moment was merely a future liability to military service, and this doctrine has been practically accepted by France in her dealings with America. Germany also accepted it by the treaty of 1868 between the United States and the North German Confederation, now in force for the German empire, subject to provisions that the emigrant's fixing his domicile in the old country shall be deemed a renunciation of his naturalization in the new, and that his living in the old country for more than two years may be deemed to imply the absence of an intention to return to the new. Between the United States and Great Britain the convention of the 13 th of May 1870 provides that naturalization in either is to be valid for all purposes immediately on its completion, but that if the resident shall renew his residence in his old country he may be readmitted to his old nationality, on his application and on such conditions as the readmitting government may impose.

The Naturalization Act 1870, which now governs the matter for England, does not say that the person naturalized becomes thereby a British subject, to which, if it had been said, a proviso might have been added saving the above-mentioned policy of the foreign office as to not protecting him in his old country, although even without such a proviso the foreign office would have been free to follow that policy. The act in question (s. 7) gives him the rights and imposes on him the duties of a natural-born British subject in the United Kingdom, and provides that, when within the limits of his old country, he shall not be deemed a British subject unless he has ceased to be a subject of that domicile by a claim of nationality. In 1876 it has been maintained that British naturalization is not really naturalization at all; but leaves the naturalized person as he was with the addition of a certain quality within the United Kingdom; and on that ground it has been considered in France that a Frenchman, obtaining naturalization in England, does not fall within the French law (Code Civil, Art. 17) which pronounces the expatriation of citizens who cause themselves to be naturalized abroad. This is the Bourgeois Case, 41 Ch. D. 310, in which, when it came before the English courts, Mr Justice Kay inclined to the same view, but the court of appeal without giving an opinion on the point, Professor Dicey leans to the same view (5 Law Quarterly Review, 438); but Sir Thomas Barclay (4 L.Q.R. 226), Sir Malcolm McIlwraith (6 L.Q.R. 379), and Professor Westlake (International Law—Peace, 2nd ed. p. 234; Private International Law, 4th ed. p. 350) adopt the view that the Naturalization Act 1870 makes the naturalized person a full British subject, only to be treated in his old country in accordance with the international principles recognized by the British executive. And the foreign office, by granting passports to naturalized persons, acts on the same view. The point is important with reference to the question whether the naturalization of the father in the United Kingdom confers the character of British subjects on his children afterwards born abroad. (See Alien.)

An analogous question arises on the provision in the Naturalization Act 1870, sec. 16, that the legislature of any British possession may make laws "for imparting to any person the privileges of naturalization, to be enjoyed by such person within the limits of such possession." This, in accordance with the wider view of the effect of naturalization in the United Kingdom, may mean that naturalization in pursuance of a colonial law confers the character of a subject, or confers rights, including disabilities, such as that to hold land, under which the naturalized person may have lain as an alien in any other British possession. On that footing the foreign office grants passports to the holders of colonial certificates of naturalization, and protects them in all foreign countries but that of their origin; and the Merchant Shipping Act 1894, sec. 1, allows persons naturalized in British possessions to be owners of British ships. On the other hand, those who maintain the narrower view of the effect of naturalization in the United Kingdom naturally hold that colonial naturalization has no effect at all outside the British possession in which it is granted.

Naturalization in India is regulated by the British Indian Naturalization Act, No. 30 of 1852, under which it may be granted to subjects of the several princes and states in India
as well as to those who are entirely aliens to the British empire. The former, however, are treated for several purposes as British subjects even without being so naturalized.

In most countries a lengthened sojourn is a condition precedent to naturalization. In Belgium, the United Kingdom, North America and Russia the period of such sojourn is fixed at five years, in France, Greece and Sweden at three, in the Argentine Republic two, while in Portugal a residence of one year is sufficient. In Germany, Austria and Italy no period of residence is prescribed, while in Austria a ten years' residence confers *per se* the rights of citizenship. In the United States an alien desiring to be naturalized must declare on oath his intention to become a citizen of the United States; two years afterwards must declare on oath his intention to support the constitution of the United States and renounce allegiance to every foreign power, including that of which he was before a subject; must prove residence in the United States for five years, and in the state where his application is made for one year, as a good citizen; and must renounce any title of nobility. In France an alien desiring naturalization, if he has not resided continuously in the country for ten years, must obtain permission to establish his domicile in France; three years after (in special cases one year) he is entitled to apply for naturalization, which involves the renunciation of any existing allegiance.


**NAUCRATIA**

**NAUARCHIA**

—NAUCRATIS

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as a people of Attica, which was the only area among the 500 tribes of the Athenian democracy that persisted without being amalgamated during the time of the empire. The word is derived either (1) from naux (a ship) and designates the duty imposed upon each naucracy, of providing one ship and two (or, more probably, ten) horsemen; or (2) from παύω (to dwell), in which case it has to do with a household census. The former is generally accepted in view of the fact that the naucrae were certainly the units on which the Athenian fleet was based. The view once held (on the strength of a fragment of Aristotle, quoted carelessly by Photius) that the naucracy was invented by Solon may now be regarded as obsolete (see the Aristotelian *Constitution*, viii. 3). Each of the four Athenian tribes was divided into three naucraei (thirds), each of which was subdivided into four naucraeis; there were thus 48 naucraeis. The earliest mention of them is in Herodotus (v. 71), where it is stated that the Cylonian conspiracy was put down by the "Prytaneis (chief men) of the Naucraeis." Although it is generally recognized that in this passage we can trace an attempt to shift the responsibility for the murder of the suppliants from the archon Megacles, it is highly improbable that the Prytaneis of the Naucraeis did not play a part in the tragedy. Thucydides is probably right, as against Herodotus, in assuming that the naucracy was formed by a process of amalgamation at this period. It may be conjectured, however, that the military forces of Athens were organized on the basis of the naucraeis, and that it was the duty of the presidents of these districts to raise the local levies. It is certainly remarkable that the Aristotelian *Constitution of Athens* does not connect the naucracy with the fleet or the army; from chapter viii. it would appear that its importance was chiefly in connexion with finance (ἀρχή ταταγμή πρὸς το ἀρκεῖον τῆς διαπερασμάτος). The naucracy consisted of a number of villages, and was, therefore, a local unit very much in the power of the naucrarioi, who was selected by means of wealth. The land of the naucracy was divided into "tributaries" ("thirds") and the "Prytaneis." The construction of, and afterwards captained, the ship, and also assessed and administered the taxes in his own area. In the reforms of Cleisthenes, the naucraeis gave place to the demes as the political unit. In accordance with the new decimal system, their number was increased to fifty. Whether they continued (and if so, how long) to supply one ship and two (or ten) horsemen each is not certainly known. Cheidemus in Photius asserts that they did, and his statement is to a certain extent corroborated by Herodotus (vi. 59) who records that, in the Athenian War before the Persian Invasion, the Athenian fleet numbered only fifty sail.

See *Photius* (s.e.), who is clearly using the *Ath. Pol.* (he quotes from it the last part of his article *tolidem verbis*); *Schenck, Antiq.* (p. 326, Eng. trans.)—quoted by J. E. Sandy (Ath. Pol. viii., 12)—refutes Gilbert, Greek Constitutional Antiquities (Eng. trans., 1895), and in *Jrh., Class. Phil. stud.* (ed. 1875) p. 9 seq.; A. H. J. Greenidge, *Handbook of Greek Const*, Hist. p. 134; history of Greece in general; for derivation of name, G. Meyer, *Curtius’ Studien* (vii. 75), where *Weckel, Geschichtliche Faktion* (J. M. M. —

**NAUCRATIS**

an ancient Greek settlement in Egypt. The site was discovered by Professor W. M. Flinders Petrie in 1884, on the eastern bank of a canal, about 10 m. W. of the present Rosetta branch of the Nile. In ancient times it was approached by the Canopic mouth, which was farther to the west. The identification of the site is placed beyond doubt by the discovery of inscriptions, with the name of the town, and of great masses of early Greek pottery, such as could not have existed anywhere else. The site was excavated in 1884–1885 by the Egypt Exploration Fund, and the report of the expedition appeared in *The British School at Athens* in 1899. A list of the temples of Naucratis is given by Herodotus (ii. 178); they were the Hellenion, common to all the colonizing cities, and those dedicated to *Cleisthenes* (1), *ad fin.*
by the Aeginetans to Zeus, by the Samians to Hera, and by the Milesians to Apollo. A temple of Aphrodite is also mentioned by Athenaeus. Traces of all these temples, except that of Zeus, or at least dedications coming from them, have been found in the excavations, and another has been added to them, the temple of the Dioscuri. The two chief sites to be cleared were the temples of Apollo and of Aphrodite, in both of which successive buildings of various date were found. Both were remarkable for the great mass of early painted pottery that was found; in the temple of Apollo this had been buried in a trench; in that of Aphrodite it was scattered over the whole surface in two distinct strata. A great deal of it was local ware, but there were also imported vases from various Greek sites. In addition to these temples, there was also found a great fortified enclosure, about 580 ft. by 750, in the south-eastern part of the town; within it was a square tower or fort; a portico of entrance and an arc of rows of sphinxes inlaid in t. Ptolemaic, as is shown by the foundation deposits found at the corners of the portico; these consisted of models of the tools and materials used in the buildings, models of instruments for sacrifice or ceremonies, and cartouches of King Ptolemy Philadelphus. Professor Petrie naturally supposed this great enclosure to be the Hellenion or common sanctuary of the Greeks, but Mr. Hogarth subsequently found traces of another great walled enclosure to the north-east of the town, together with pottery dedicated 70377. Εὐλαργός 666, and he claims with reason that this enclosure was in Greece, and the Mazarin, as he thought, of the early Greek antiquities have been found in the southern part of the town, which seems rather to have been a native settlement. The cemetery of the ancient town was found on two low mounds to the north, but was mostly of Ptolemaic date.

Apart from the historic interest of the site, as the only Greek colony in Egypt in early times, the chief importance of the excavations lies in the rich finds of early pottery and in the inscriptions upon them, which throw light on the early history of the alphabet. The most flourishing period of the town was from the accession of Amathus II. in 341 B.C. to the Persian invasion of 620 B.C., when the contents of the temples must have been destroyed. The earlier chronology has been much disputed. There are clear traces of a settlement going back to the 7th century, including a scarab factory, which yielded numerous scarabs, not of native Egyptian manufacture, bearing the names of the kings that preceded Amasis. Among these were fragments of early Greek pottery. It seems a fair inference that the makers of these were Greeks, and that they probably represent the early Milesian colony, settled here in the time of Psammethichus I., before the official assignment of the site by Amasis to the Greek colonists of various cities. The most important of the antiquities found are now in the British Museum.

See W. M. F. Petrie, &c., "Naukratis I.", third Memoir of the Egypt Exploration Fund (1886); E. A. Gardner, &c., "Naukratis II.", sixth Memoir of same (1889); D. G. Hogarth, &c., "Annual of the British School at Athens" (1896-1899). (E. Gr.)

NAUDÉ, GABRIEL (1600-1653), French librarian and scholar, was born in Paris on the 2nd of February 1600. He studied medicine at Paris and Padua, and became physician to Louis XIII. In 1629 he became librarian to Cardinal Bagni at Rome, and on Bagni's death in 1641 librarian to the Cardinal Barberini. At the desire of Richelieu he began a wearisome controversy with the Benedictines, denying Gerson's authorship of De Imitatione Christi. Richelieu intended to make Naudé his librarian, and on his death Naudé accepted a similar offer on the part of Mazarin, and for the next ten years devoted himself to bringing together from all parts of Europe the noble assemblage of books known as the Bibliothèque Mazarine. Mazarin's library was sold by the parlement of Paris during the troubles of the Fronde, and Queen Christina invited Naudé to Stockholm. He was not at all induced by this appeal that he should re-form his scattered library Naudé returned at once. But his health was broken, and he died on the journey at Abbeville on the 30th of July 1653. The friend of Gui Patin, of Pierre Gassendi and all the liberal thinkers of his time, Naudé was no mere bookworm; his books show traces of the critical spirit which made him a worthy colleague of the humorous and scholars who prepared the way for the better known writers of the siècle de Louis XIV.

Including works edited by him, a list of ninety-two pieces is given in the Nauadana. The chief are Le Marfore, ou discours contre les libelles (Paris, 1620), very rare, reprinted 1658; Instruction à la France sur la vérité de l'histoire des Frères de la Rose-Croix (1660), &c., disbelieving their impurities; Apologie pour tous les grands personnages faussement soupçonnés de magie (1625, 1629, 1669, 1712), Pythagoras, Socrates, Thomas Aquinas and Solomon are among those defended. Avis pour dresser une bibliothèque (1629), an essay on the arrangement of libraries; Naukratis (1639), full of sound and learned views on librarianship; Addition à l'histoire de Louis XIV. (1630), this includes an account of the origin of printing; Bibliographia polymaths, sive aenigmatica (1633, 1639, 1642), a mere catalogue of the bibliographical value; De studio liberali syntagma (1632, 1654), a practical treatise found in most collections of directions for studies; De studio militari syntagma (1657), esteemed in its day; Considerations politiques sur les coups d'état (Rome [Paris], 1639; first edition rare, augmented by Dumay, 1752), this contains an apology for the massacre of St Bartholomew; Biblioth. Cordesianae Catalogus (1643), classified, Jugement de tout ce qui a été imprimé contre le Cardinal Mazarin (1646), Naudé's best work, and one of the ablest defenses of Mazarin; it is written in the form of a dialogue between Saint-Angé and Mascaret, and is usually known under the name of the latter.

AUTHORITIES.--L. Jacob, G. Naucaedu tumultus (1659); P. Hallé, Elogium Naucaedum (1661); Nicéon, Mémontes, vol. ix.; L. Jacob, Tracté des plus belles bibliothèques (1644); Gui Patin, Lettres (1846); Naukratis and Patiens (1709); M. HoulŒague, Portraits Lith. vol. ii.; F. Brun, Franklin, History of the Bib. Mazarine (1868).

NAUGATUCK, a township and borough of New Haven county, Connecticut, U.S.A., on the Naugatuck river, 5 m. S. of Waterbury, with an area of 17 sq. m. in 1906. Pop. (1890) 6218, (1900) 10,541, of whom 3342 were foreign-born, (1910 census) 12,722. It is served by the New York, New Haven & Hartford railroad and by interurban electric railways. Among the principal public buildings are the Whittmore Memorial Public Library (1852), a fine high school and the large Salem school (part of the public school system), all given to the borough by John Howard Whittmore of Naugatuck, who in addition endowed the library and the high school. The town furnishes water-power. Among the manufactures are rubber goods, chemicals, iron castings, woollen goods, cutlery, &c. The value of the factory products increased from $8,886,676 in 1900 to $11,009,573 in 1905, or 23.9%. The prominence of the rubber industry here is due to Charles Goodyear (q.v.), who in 1821 entered into partnership with his father Amasa Goodyear for the manufacture of hardware. Vulcanized rubber overshoes were first made in Naugatuck, and in 1843 the Goodyear's Metallic Rubber Shoe Company was chartered by the Connecticut legislature. The town was formed from parts of Waterbury, Bethany and Oxford, and was incorporated in 1844; the borough was chartered in 1893; and the two were combined in 1895.

NAUHEIM, or BAD-NAUHEIM, a watering-place of Germany, in the grand-duchy of Hesse-Darmstadt, situated on the north-east slope of the Taunus Mountains, 23 m. by rail N. of Frankfurt-on-Main on the main line of railway to Cassel. Pop. (1905) 5054. It has three Evangelical, a Roman Catholic and an English church. Its thermal waters (84° to 95° F.), although known for centuries, were, prior to 1835, only employed for the treatment of hydrophobia and a few other diseases. The town has several parks, the largest being the Kurpark, 125 acres in extent, in which are the Kurhaus and the two chief springs. The waters, which are saline, strongly impregnated with carbonic acid, and to a less extent with iron, are principally used for bathing, and are specific in cases of gout and rheumatism, but especially for the treatment of heart affections. Three smaller springs, situated outside the Kurpark, supply water for drinking. In 1899-1900 a new spring (saline) was tapped at a depth of 682 ft. Another attraction of the place is the Johannisberg, a hill 773 ft. high, immediately adjoining the Kurpark, which was bestowed by Napoleon upon Marshal Davout, became a town in 1854. From 1815 to 1866 it belonged to the electorate of Hesse-Cassel, but in 1866 it was ceded to
The grand-duchy of Hesse-Darmstadt. It was the scene of fighting between the French and the Germans in 1752 and again in 1792.

See Grödel, Bad Nauheim, seine Kurmittel (9th ed., Friedberg, 1903); Credner, Die Kurmittel in Bad Nauheim (Leipzig, 1894); Bogd, Bad Nauheim, seine Kurmittel und Erfolge (Wiesbaden, 1889); and Seubner, Die Park- und Waldanlagen von Bad Nauheim (Nauheim, 1906).

NAUPELLE, a large cavelon on the left bank of the Lesse, which joins the Meuse above Dinant, Belgium. Here in 1866 Edouard Dupont discovered an imperfect human lower jaw, now in the Brussels Natural History Museum. It is of a very ape-like type in its extreme projection and that of the teeth such as have been known in fossils. He is distinguished for his Florilegium, which was now at Dinant in 1885.

NAUMACHIA, the Greek word denoting a naval battle (nau, ship, naukû, battle). These entertainments took place in the amphitheatre, which was flooded with water, or in specially constructed basins (also called naumachie). The first on record, representing an engagement between a Tyrian and an Egyptian fleet, was given by Julius Caesar (46 B.C.) on a lake which he constructed in the Campus Martius. In 2 B.C. Augustus, at the dedication of the temple of Mars Ultor, exhibited a naumachia between Athenians and Persians, in a basin probably in the Hortus Caesaris, where subsequently Titus gave a representation of a sea-fight between Corinth and Corea. In that given by Claudius (A.D. 52) on the latus Fucius, 19,000 men dressed as Rhodians and Sicilians manoeuvred and fought. The crews consisted of gladiators and condemned criminals; in later times, even of volunteers.

See L. Friedländer in J. Marquart, Römische Staatsverwaltung, iii. (1885) p. 558.

NAUMACHUS, a Greek gnomic poet. Of his poems 73 hexameters (in three fragments) are preserved by Stobaeus in his Florilegium; they deal mainly with the duty of a good wife. From the remarks on celibacy and the allusion to a mystic marriage it has been conjectured that the author was a Christian. The fragments, translated anonymously into English under the title of Advice to the Fair Sex (1730), are in Gaisford's Pòtæa minores Græci, iii. (1823).

NAUEN, GEORG AMADEUS CARL FRIEDRICH (1707–1783). German mineralogist and geologist, was born at Dresden on the 30th of May 1707, the son of a distinguished musician and amateur. He received his early education at Worms, studied at Freiberg under Werner, and afterwards at Leipzig and Jena. He graduated at Jena, and was occupied in 1823 in teaching in that town and in 1824 at Leipzig. In 1826 he succeeded Mohs as professor of crystallography, in 1835 he became professor also of geology at Freiberg; and in 1842 he was appointed professor of mineralogy and geology in the university of Leipzig. At Freiberg he was charged with the preparation of a geological map of Saxony, which he carried out with the aid of Bernhard von Cotta in 1846. He was a man of encyclopaedic knowledge, lucid and fluent as a teacher. Early in life (1811–1822) he travelled in Norway, and his observations on that country, and his subsequent publications on crystallography, mineralogy and geology established his reputation. He was awarded the Wollaston Medal by the Geological Society of London in 1868. He died at Leipzig on the 26th of November 1873.

He published Beiträge zur Kenntnis Norwegens (2 vols., 1824); Lehrbuch der Mineralogie (1828); Lehrbuch der reinen und angewandten Krystallographie (2 vols. and atlas, 1830); Elemente der Mineralogie (1845; ed. 9, 1874; the 10th ed. by F. Zirkel, 1877); Lehrbuch der Geognosie (2 vols. and atlas, 1849–1854, ed. 2, 1858–1877).

NAUMBURG, a town of Germany, in the province of Prussian Saxony, the seat of the provincial law courts and court of appeal for the province and the neighbouring districts. It is situated on the Saale, near its junction with the Unstrut, in the centre of an amphitheatre of vine-clad hills, 29 m. S.W. from Halle, on the railway to Weimar and Erfurt. Pop. (1905) 25,137.

The cathedral, an imposing building in the Romanesque Transition style (1207–1243), has a Gothic choir at each end, and contains some interesting medieval sculptures. It is remarkable for its large crypt and its towers, a fourth having been added in 1804, the gift of the emperor William II. There are also four other Protestant churches (of which the town church, dedicated to St Wenceslaus and restored in 1892–1894, possesses two pictures by Lucas Cranach the elder), a Roman Catholic church, a gymnasium, a modern school, an orphanage and three hospitals. A curious feature of the town is the custom, which has not yet died out, of labelling the houses with signs, such as the "swan," the "leopard" and the "lion." The industries of the place are the spinning of cotton and woollen fabrics, chemicals, combs, beer, vinegar and leather. On the hills to the north of the town, across the Unstrut, lies Schenkemburg, once the residence of the poet Gellert, and noticeable for the grotesque carvings in the sandstone rocks.

In the 10th century Naumburg was a stronghold of the margraves of Meissen, who in 1029 transferred to it the bishopric of Zeitz. In the history of Saxony it is memorable as the scene of various treaties; and in 1561 an assembly of Protestant princes was held there, which made a futile attempt to cement the divided Protestants. The city was seized and destroyed in 1613 by the last bishop died, and the bishopric fell to the elector of Saxony. In 1631 the town was taken by Tilly, and in 1632 by Gustavus Adolphus. It became Prussian in 1814. An annual festival, with a procession of children, which is still held, is referred to an apocryphal siege of the town by the Hussites in 1432, but is 'probably connected with an incident in the 'brothers' war (1447–51), between the elector Frederick II. of Saxony and his brother Duke William. Karl Peter Lepsius (1775–1853), the antiquary and his more distinguished son Richard the Egyptologist, were born at Naumburg.

See E. Borkowski, Die Geschichte der Stadt Naumburg an der Saale (Stuttgart, 1897); E. Hoffmann, Naumburg an der Saale im Zeitalter der Reformation (Leipzig, 1900); S. Braun, Naumburger Annalen vom Jahre 799 bis 1613 (Naumburg, 1892); Patrich, Naumburg an der Saale, sein Dom und andere allertümliche Bauwerke (Leipzig, 1841–1843); and Wispel, Entwicklungsgeschichte der Stadt Naumburg an der Saale (Naumburg, 1903).

NAUNTON, SIR ROBERT (1563–1635). English politician, the son of Henry Naunton of Aulterton, Suffolk, was educated at Trinity College, Cambridge, becoming a fellow of his college in 1585 and public orator of the university in 1594. Walter Devereux, earl of Essex, enabled him to spend some time abroad, sending information about European affairs. Having returned to England, he entered parliament in 1606 as member for Helston, and he sat in the five succeeding parliaments; in 1614 he was knighted, in 1616 he became master of requests and later surveyor of the court of wards. In 1618 his friend Buckingham procured for him the position of secretary of state. Naunton's strong Protestant opinions led him to favour more active intervention by England in the interests of Frederick V., and more vigorous application of the laws against Roman Catholics. Gondomar, the Spanish ambassador, complained to James, who censured his secretary. Consequently in 1623 Naunton resigned and was made master of the court of wards. He died at Letheringham, Suffolk, on the 27th of March 1635. Naunton's valuable account of Queen Elizabeth's reign was still in manuscript when he died. As Fragmenta regalia, written by Sir Robert Naunton, it was printed in 1641 and again in 1642, a revised edition, Fragmenta Regalia, or Observations on the late Queen Elizabeth, Times and Favourites, being issued in 1653. It was again published in 1832. He was a Fellow of the Society of Antiquaries, and died without issue in 1656. It has also been printed in several collections and has been translated into French and Italian. There are several manuscript copies extant, and some of Naunton's letters are in the British Museum and in other collections.

See Memoirs of Sir Robert Naunton (1814).

NAUPACTUS (Ital. Lepanto, mod. Gr. Epako). A town in the district of Acarnania and Aetolia, Greece, situated on a bay on the north side of the straits of Lepanto. The harbour, once the best on the northern coast of the Corinthis Gulf, is now
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almost entirely choked up, and is accessible only to the smallest craft. Naupactus is an episcopal see; pop. about 2300. In Greek legend it appears as the place where the Heracleidae built a fleet to invade Peloponnese. In historical times it belonged to the Ozolian Locrians; but about 435 B.C., in spite of a partial resettlement with Locrians of Opus, it fell to the Athenians, who peopled it with Meanean refugees and made it their chief naval station in western Greece during the Peloponnesian war. In 404 it was restored to the Locrians, who subsequently lost it to the Achaenians, but recovered it through Epaminondas. Philip II of Macedon gave Naupactus to the Aetolians, who held it till 197, when it was captured by the Roman army. The mouth of the Gulf of Lepanto was the scene of the great sea-fight in which the naval army of Turkey was defeated. It was still flourishing about A.D. 170, but in Justinian's reign was destroyed by an earthquake. In the middle ages it fell into the hands of the Venetians, who fortified it so strongly that it was never taken and was captured in 1678 by the Venetians, and again in 1699, by the French. In the war of independence it finally became Greek once more (March 1829).

See Strabo ii. pp. 426-427; Pausanias x. 38. 10-13; Thucydides iii. passim; Livy, bk. xxxvi, passim; E. L. Hicks and G. F. Hill, Greek Hierarchical Inscriptions (Oxford, 1901), No. 25.

NAUPLIA, a town in the Peloponnese, at the head of the Argolic Gulf. In the early part of the war it was of no importance, and when Pausanias lived, about A.D. 150, it was deserted. At a very early time, however, it seems to have been of greater note, being the seaport of the plain in which Argos and Mycenae are situated, and several tombs of the Mycenaean age have been found. A hero Nauplius took part in the Argonautic expedition; another was king of Euboea. The mythic importance of the town revived in the middle ages, when it became one of the chief cities of the Morea. It was captured in 1211 by Godfrey Villehardouin with the help of Venetian ships; a French dynasty ruled in it for some time, and established the feudal system in the country. In 1386 it was Venetian; but after the fall of the Empire it passed into the hands of the Turks. It was captured by Venice in 1686, and Palamidi on the hill overlooking the town was made a great fortress. In 1715 it was taken by the Turks; in 1770 the Russians occupied it for a short time. The Greeks captured it during the War of Independence on the 12th of December 1822, and it was the seat of the Greek administration till 1833, when Athens became the capital of the country. It is the chief town of the department of Argolis (pop. in 1867 81,943); pop. about 6000.

NAUSEA, (from Gr. ναυαχία, a ship), sea-sickness, or generally any disposition to vomit; also used figuratively to denote feelings of strong aversion or dislike.

NAUSICAÆ, in Greek legend, daughter of Alcinous, king of the Phaeacians in the island of Scheria (Odyssey, vi. 15: 352; viii. 457.) When Odysseus (Ulysses) was swept in the sea from the raft on which he had left the home of Calypso, he swam ashore to Scheria, where he fell asleep on the bank of a river. Here he was found by Nausicaa, who supplied him with clothes and took him to her father's palace, where he was hospitably entertained. She said to him, "You are not the son of Telamon, who is the father of Telemachus." The incident of Odysseus and Nausicaa formed the subject of a lost play by Sophocles and was frequently represented in ancient art.

NAUTCH, (Hindostani nāch), an Indian ballet-dance. The nautch is performed by nautch-girls, who move their feet but little, and the dance consists of swaying the body and posturing with the arms.

NAUTULUS. The term nautilus, meaning simply "the sailor," was applied by the ancient Greeks to the genus of eight-armed cephalopods which is now known as the paper nautilus, and whose scientific name is Aragonia (see CEPHALOPODA).

This animal is not uncommon in the Mediterranean, and from its habit of floating at the surface attracted the attention of the fishermen and sailors of the Aegean Sea from the earliest times. The popular belief that the expanded arms are raised above the water to act as sails and that the other arms are used as oars was not based on any actual observation of the living animal, and it is now known that although the animal floats at the surface it does not sail, the expanded arms being applied to the exterior surface of the shell, which is secreted by them. The eggs are carried in the shell, and as this structure is entirely absent in the males, there is good reason to conclude that the habit of carrying the eggs and using one pair of arms for that purpose gave rise to the modification of those arms and the secretion of the shell by them. Huxley once expressed the truth of the matter with characteristic felicity in the remark that if the shell of the Argonaut is to be compared to anything of human invention or construction at all, it should be compared, not to a ship or boat, but to a perambulator.

The shell of Argonauta (see fig. 1) is spirally coiled and symmetrical, and thus bears a remarkable resemblance to the shell of the pearly nautilus and the extinct ammonites, especially as it is like that of the pearly nautilus coiled towards the dorsal or anterior surface of the animal. It is ornamented by ridges and furrows which pass in transverse curves from the inner to the outer margin of the coil. The outer margin or keel is somewhat flattened and the whole shell is compressed from side to side. It differs entirely from the shell of the pearly nautilus in the absence of internal septa and siphuncle and in the absence of any attachment between it and the body. It is in fact entirely different in origin and relations to the body from the typical molluscan shell secreted by the mantle in other Cephalopods and other types of Mollusca. It is a structure sui generis, unique in the whole phylum of Mollusca.

The only description of the living animal by a competent observer which we have is that of Lacaze-Duthiers, made on a single specimen on the Mediterranean coast of France, and published in 1892, and even this is in some respects incomplete. The specimen after capture was carried in a bucket, and became separated from its shell. When placed with the shell in a large aquarium tank the animal resumed possession of the shell and assumed the attitude shown in fig. 1. The shell floated at the surface, doubtless in consequence of the inclusion of some air in the cavity of the shell. It is not known with certainty that the animal is able in its natural state to descend below the surface; the specimen here considered never did so of its own accord, and when pushed down always rose again.

FIG. 1.—The Argonaut in life. (After Lacaze-Duthiers.)

Tr, Float; Br. a, ventral or posterior arms; Br. p, dorsal or anterior arms; V, the expanded portion of them, once called the sails; B, the beak; C, the shell; E, the funnel.
The siphon or funnel is unusually large and prominent, and is the chief or only organ of locomotion, the water which is expelled from it driving the animal backwards. The arms are usually turned backwards and carried inside the shell, to the inner surface of which the suckers adhere, but one or two arms are from time to time extended in front. This does not apply to the dorsal arms which are applied to the outside of the shell, and the expanded membrane of these arms covers the greater part of its surface. The dorsal arms are turned backwards, and each is twisted so that the oral surfaces face each other and the suckers are in contact with the shell. The membrane or velum is thin, and is really a great expansion of a dorsal membrane similar to that which is found along the median dorsal line of the two posterior arms. The suckers of the originally posterior series of each dorsal arm lie along the external border of the shell, and the arm with its two rows of suckers extends round the whole border of the membrane, the arm being curved into a complete loop, so that its extremity reaches almost to the origin of the membrane near the base of the arm, the extremity being continued on to the internal surface of the membrane. The external row of suckers, originally the posterior row, are united by membrane which is continuous with the velum. The smaller suckers on the more distal part of the arm, which extends along the edge of the shell-aperture, are quite sessile. In the figure of Lacaze-Duthiers (fig. 1) the suckers appear to be turned away from the shell, but this is erroneous. A figure showing the natural position is given in the Monograph of the Cephalopoda in the series of Monographs issued by the Zoological Station of Naples.

The animal described by Lacaze-Duthiers lived a fortnight in captivity, during which time it devoured with avidity small fishes that were presented to it, seizing them, not by throwing out all the ventral arms, but by means of the suckers near the mouth. Judging from these observations, Argonauta is a pelagic animal which lives and feeds near the surface of the ocean. Several species of Argonauta are known, distributed in the tropical parts of all the great oceans. The male is much smaller than the female, not exceeding an inch or so in length. It secretes no shell and its dorsal arms are not modified. The third arm on the left side, however, is modified in another way in connexion with reproduction. Argonauta is one of the Cephalopods in which the process known as hectocotylization of one arm is developed to its extreme degree, the arm affected becoming ultimately detached and left by the male in the mantle cavity of the female where it retains for some time its life and power of movement. The hectocotylus or copulatory arm in the Argonaut is developed at first in a closed cyst (fig. 2), which afterwards bursts, allowing the arm to uncloil; the remains of the cyst form a sac on the back of the arm which serves to contain the spermatozoa.

The animal known as the Pearly Nautilus was unknown to the ancient Greeks, since its habitat is the seas of the far East, but in the middle ages, when its shell became known in Europe, it was called, from its superficial similarity to that of the original nautilus, by the same name. It was Linnaeus who, in order to distinguish the two animals, took the name "nautilus" from the animal to which it originally belonged and bestowed it upon the very different East Indian Mollusc, giving to the original nautilus the new name Argonauta. Zoological nomenclature dates from Linnaeus, and thus the nautilus is now the name of the only living genus of Tetrabranchiate Cephalopods. A detailed description of this animal is given in the article Cephalopoda (p. 8); it is only necessary to add here a brief account of its mode of life and habits.

Four species are known from the Indian and Pacific oceans; they are gregarious and nocturnal animals living at some depth and appearing only after dark. The greatest interest attaches to the great Nautilus pompilius, the largest marine animal as represented by Dr Willey with the oral surface downwards, the tentacles spread out, and the shell vertical. The chambers of the shell have no communication with one another nor with the siphon; the nautilus is therefore always the same age, but grows by the addition of new large chambers. These are filled with a nitrogenous gas. This necessarily very much reduces the specific gravity of the animal, but it is still heavier than the water and does not seem capable of rising to the surface any more than an octopus. Nautilus pompilius is the largest animal at present known in the East Indian Archipelago, for example at Amboyna in the Moluccas. In 1901-1902 Dr Arthur Willey of Cambridge University spent some time in that region for the purpose of investigating the reproduction and development of the animal. He stationed himself at New Britain, known to the Germans as Neu Pommer, an island of the Bismarck Archipelago off the coast of Papua. The natives of this island use the nautilus for food, capturing them by means of a large fish-trap similar in construction to the cylindrical lobster-traps used by British fishermen. Fish is used for bait. Dr Willey found the males more numerous than the females; of a hundred specimens captured on one occasion only two were females. He kept specimens alive both in vessels on shore and in large baskets moored at the bottom of the sea. He found that when they were placed in a vessel of sea-water, a small pump of fresh water was used to suck for the mantle cavity. Some of the females laid eggs in captivity, but these were found not to be fertilized; they were about 3.5 centimetres long and attached singly by a broad base to the sides of the cagliari, in which the animals could be kept for some time.


NAUVOO, a city of Hancock county, Illinois, U.S.A., on the Mississippi river at the head of the lower rapids and about 50 m. above Quincy. Pop. (1900) 13,521; (1910) 10,200. On the opposite bank of the river is Montrose, Iowa (pop. in 1910, 708), served by the Chicago, Burlington & Quincy railway. Nauvoo is the seat of St Mary’s Academy and Spalding Institute (1907), two institutions of the Benevolent Sisters. “Commerce City” was laid out here in 1834 by Connecticut speculators; but the first settlement of importance was made by the Mormons in 1839-1840; they named it Nauvoo,1 in obedience to a "revelation" made to Joseph Smith, and secured a city charter in 1840. Four years later its population was about 15,000, and a large Mormon temple had been built, but internal dissensions arose, “gentile” hostility was aroused, the charter of Nauvoo was revoked in 1845, two of the leaders, Joseph Smith and his brother Hyrum, were killed at Carthage, the county-seat, by a mob, and in 1846 the sect was driven from the state. Traces of Mormonism, however, still remain in the ruins of the temple and the names of several of the streets. Three years after the expulsion of the Mormons Nauvoo was occupied by the remnant (some 250) of a colony of French communists, the Icarians, who had come out under the leadership of Etienne Cabet (q.v.). For a few years the colony prospered, and by 1855 its membership had doubled. It was governed under a constitution, drafted by Cabet, which vested the legislative authority in a general assembly composed of all the males twenty years of age or over and the administrative authority in a board of six directors, three of whom were elected every six months for a term of one year. Each family owned its own home, but property was held in common, all ate at the common table, and the children were taught in the community school. In December 1855 Cabet proposed a revision of the constitution to give him greater authority. This resulted in rending the colony into two irreconcilable factions, and in October 1856 Cabet with the minority (172) withdrew to St Louis, Mo., where he died on the 8th of November. In May 1858 the surviving members of his faction took a few fresh arrivals from France established a new

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1 The Mormons said the name was of Hebrew origin and meant "beautiful place"; Hebrew "naveh" means "pleasant."
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Icarian colony at Cheltenham near St Louis, but this survived only for a brief period. Nauvoo was never intended to be more than a temporary home for the Icarians. Soon after the schism of 1856 those who had rebelled against Cabet began to prepare a permanent home in Adams county, Iowa. There too in 1879 the community split into two factions, the Young Party and the Old Party. Some time before this separation a few members of the colony removed to the vicinity of Cloverdale, Sonoma county, California, and here most of the members of the Young Party joined them early in 1884 in forming the Icaria-Speranza Community. This society tried a government quite different from that first adopted at Nauvoo, but it ceased to exist after about three years. The Old Party also adopted a new constitution, but it too was dissolved in 1895.

See Albert Shaw, Icaria: A Chapter in the History of Communism (New York, 1884); Jules Frondhommeaux, Icaria et son fondateur Etienne Cabet (Paris, 1907); and H. Lux, Etienne Cabet et der Ikarische Kommunismus (Stuttgart, 1894).

NAVAHO, or Navajo, a tribe of North American Indians of Athabaskan stock. They inhabit the northern part of Arizona and New Mexico. The majority live by breeding horses, sheep and goats. They are well known for their beautiful blanket weaving. (See INDIANS, NORTH AMERICAN.)

NAVAN, a market town of county Meath, Ireland, situated at the confluence of the Blackwater with the Boyne. Pop. (1901) 3839. It is a railway junction of some importance, where the southern and Kildare branches of the Dublin and Waterford railway cross the Drogheda and Oldcastle branch of the Great Northern. By the former it is 30 m. N.W. of Dublin. Navan is the principal town of county Meath (though Trim is the county town), and has considerable trade in corn and flour, some manufacture of woollens and of agricultural implements, and a tannery. Navan was a barony of the patrimony of Meath, was walled and fortified, and was incorporated by charter of Edward IV. It suffered in the civil wars of 1641, and returned two members to the Irish parliament until the Union in 1800. It is governed by an urban district council, and is a favourite centre for rod-fishing for trout and salmon.

NAVARINO, BATTLE OF, fought on the 20th of October 1827, the decisive event which established the independence of Greece. By the treaty signed in London on the 6th of July 1827 (see GREECE, HISTORY), England, France and Russia agreed to demand an armistice, as preliminary to a settlement. Sir Edward Codrington, then commander-in-chief in the Mediterranean, received the treaty and his instructions on the 10th/11th of August at Smyrna, and proceeded at once to Nauplia to communicate them to the Greeks. His instructions were to demand and an armistice, to intercept all supplies coming to the Turkish forces in the Morea from Africa or Turkey in general, and to look for directions to Straitford Canning (Lord Straitford de Redcliffe), the British ambassador at Constantinople. The ambassador's instructions reached Codrington on the 7th of September. He was accompanied to Nauplia by his French colleague, Rear-Admiral de Rigny. The Greek government agreed to accept the armistice. Admiral de Rigny left for a cruise in the Levant, and Sir Edward Codrington, hearing that an Egyptian armament was on its way from Alexandria, and believing that it was bound for Hydra, steered for that island, which he reached on the 19th of September, but on the 20th of September found the Egyptians at anchor with a Turkish squadron at Navarino. The Turkish government refused to accept the armistice. On the 19th of September, seeing a movement among the Egyptian and Turkish ships in the bay, Codrington informed the Ottoman admiral, Tahir Pasha, that he had orders to prevent hostile movements against the Greeks. Admiral de Rigny joined him immediately afterwards, and a joint note was sent by them on the 22nd of September to Ibrahim Pasha, who held the supreme command for the sultan. On the 25th an interview took place, in which there gave a verbal engagement not to act against the Greeks, pending orders from the sultan. The allies, who were in want of stores, now separated, Codrington going on to Zante and de Rigny to Cervi, where his store ships were.

Frigates were left to watch Navarino. The British admiral had barely anchored at Zante before he was informed that the sultan's forces were putting to sea. On the 29th of September a Greek naval force, commanded by an English Philhelene, Captain Frank Abney Hastings, had destroyed some Turkish vessels in Salamis; on the north side of the Gulf of Corinth, off the 3rd to the 5th of October Codrington, who had with him only his flagship the "Asia" (84) and some smaller vessels, was engaged in turning back the Egyptian and Turkish vessels, a task in which he was aided by a violent gale. He resumed his watch off Navarino, and on the 13th was joined by de Rigny and the Russian rear-admiral Heiden with his squadron. By general agreement among the powers the command was entrusted to Codrington, and the allied force consisted of three British, four French and four Russian sail of the line, if the French admiral's flagship the "Sirène" (60), which was technically "a double banked frigate," be included. There were four British, one French and four Russian frigates, and six British and French brigs and schooners. The Egyptians and Turks had only three line of battleships and fifteen large frigates, together with a swarm of small craft which raised their total number to eighty and upwards. Ibrahim Pasha, though unable to operate at sea, considered himself at liberty to carry on the war by land. His men were actively employed in burning the Greek villages, and reducing the inhabitants to slavery. The flames and smoke of the destroyed villages were clearly seen from the fleet. On the 17th of October, an expostulation was sent in to Ibrahim Pasha, but was returned with the manifestly false answer that he had left Navarino, and that his officers did not know where he was. The admirals, therefore, decided to stand into the bay and anchor among the Egyptian and Turkish ships. A French officer in the Egyptian service, of the name of Letellier, had anchored the vessels of Ibrahim and the Turkish admiral in a horseshoe formation, of which the points touched the entrance to the bay, and there were forts on the lands at both sides of the entry. The allies entered in two lines—one formed of the French and British led by Codrington in the "Asia," the other of the Turks and Russians. After the expostulation was sent in, Ibrahim Pasha anchored in the free water in the midst of Ibrahim's fleet. The officer commanding the British frigate "Dartmouth" (42), Captain Fellowes, seeing a Turkish fireship close to windward of him, sent a boat with a demand that she should be removed. The Turks fired, killing Lieutenant G. W. H. Fitzroy, who brought the message, and several of the boat's crew. The "Dartmouth" then opened "a defensive fire," and the action became general at once. The allies, who were all closely engaged, were anchored among their enemies, and the result was obtained by their heavier artillery; and their better gunnery. These four days of Turkish and Egyptian vessels were sunk by the assailsants, or fired by their own crews. On the allied side the British squadron lost 73 killed and 197 wounded; the French 43 killed and 183 wounded; the Russians 59 killed and 139 wounded. In the British squadron Captain Walter Bathurst of the "Ganoa" (74) was slain. The loss of the Turks and Egyptians was never accurately reported, but it was certainly very great.

In its effects on the international situation Navarino may be reckoned one of the decisive battles of the world. It not only made the efforts of the Turks to suppress the Greek revolt hopeless, but it made a much difficult to heal the traditional friendship between Great Britain and Turkey, which had its effect during the critical period of the struggle between Mehemet Ali and the Porte (1831-1841). It precipitated the Russo-Turkish war of 1828-1829, and, by annihilating the Ottoman navy, weakened the resisting power of Turkey to Russia and later to Mehemet Ali.


NAVARRE (Span. Navarro), an inland province of northern Spain, and formerly a kingdom which included part of France. The province is bounded on the N. by France (Basses Pyrénées) and Guipúzcoa, E. by Huesca and Saragossa, S. by Saragossa.
and Logroño and W. by Álava. It is traversed from east to west by the Pyrenees and the Cantabrian Mountains, and almost the whole of the province is overrun by the ramifications of these ranges. From Navarre there are only three practicable roads for carriages into France—those by the Puerta de Vera, the Puerta de Maya and Roncesvalles. The highest summit in the province is the Monte Adi (4031 ft.). The chief river flowing towards the Atlantic is the Bidasoa, which rises near the Puerta de Maya, and after flowing southwards through the valley of Baxtán takes a north-easterly course, and for a short distance above its outset at Fuenterribiana constitutes the frontier between France and Spain (Güipúzcoa); by far the larger portion of Navarre is drained by rivers which flow towards the western Pyrenean stock. Game, both large and small, is plentiful in the mountains, and the streams abound with trout and other fish. Gypsum, limestone, freestone and marble are quarried; there are also mines of copper, lead, iron, zinc and rock salt. Mineral and thermal springs are numerous, but none is of more than local fame. The other industries include manufactures of arms, paper, chocolate, candles, alcohol, leather, coarse linens and cloth. The exports both by rail and by the passes in the Pyrenees consist of live stock, oil, wine, wool, leather and paper. As the Basques and Gascons, who occupied the southern slope of the western Pyrenees, crossed the border and skirts the western frontier, sends out a branch line from Castejón to Pamplona and Alsasua junction, where it connects with the Northern railways from Madrid to France. Narrow-gauge railways convey timber and ore from the mountains to these main lines. Pamplona, the capital (pop., 1900, 28,886), and Tudela (9449) are described in separate articles. The only other towns with more than 5000 inhabitants are Baxtán (9234), Corella (6793), Estella (5736) and Tafalla (5490).

History.—The kingdom of Navarre was formed out of a part of the territory occupied by the Vascones, i.e. the Basques and Gascons, who crossed the border and occupied the southern slope of the eastern Pyrenees, and part of the shore of the Bay of Biscay. In the course of the 6th century there was a considerable emigration of Basques to the north of the Pyrenees. The cause is supposed to have been the pressure put upon them by the attacks of the Visigoth kings in Spain. Yet the Basques maintained their independence. The name of Navarre is derived by etymologists from „navar” a flat valley surrounded by hills (a commonplace name in Spain; cf. Navas de Tolosa to the south of the Sierra Morena) and „erri” a region or country. It began to appear as the name of part of Vascobobo Valley the end of the Visigoth epochs in Spain in the 9th century. Its early history is more obscure than usual. In recent times ingenious attempts have been made to trace the descent of the first historic king of Navarre from one Semen Lupus, duke of Aquitaine in the 6th century. The reader may consult La Vasconie by Jean de Jaurgain (Paris, 1898) for the latest example of this reconstruction of ancient history from fragmentary and dubious materials. Jaurgain has been subjected to very damaging criticism by L. Barray-Dhíengo (Revue Hispanique, t. vili. 141). The first historic king of Navarre was Sancho Garcia, who ruled at Pamplona in the early years of the 8th century. Under him and his immediate successors Navarre reached the height of its power and its extension (see Spain: History, for the reign of Sancho El Mayor, and the establishment of the Navarrese line as kings of Castile and Leon, and of Aragon). When the kingdom was at its height it included all the modern province of the name; the northern slope of the western Pyrenees called by the Spaniards the „Ultra-pueblos” or country beyond the passes, and now known as French Navarre; the Basque provinces; the Bureba, the valley between the Basque Mountains and the peak of Monte Bucorg; the Rioja and Taranza in the upper valley of the Ebro. In the 13th century the kings of Castile gradually annexed the Rioja and Álava. While Navarre was reunited to Aragon—1076-1114—(see Spain: History) it was saved from aggression on the east, but did not recover the territory taken by Castile. About the year 1200 Alfonso VIII of Castile annexed the other two Basque provinces, Biscay (Vizcaya) and Guipúzcoa. Taranza remained in possession of Aragon. After 1234 Navarre, though the crown was claimed by the kings of Aragon, passed by marriage to the line of the French kings. In 1316 Spanish Navarre was finally annexed by Ferdinand and the Catholic Kings. Navarre as a state survived as an independent little kingdom till it was united to the crown of France by Henry IV. founder of the Bourbon dynasty. From 1510 until 1833, when it was fully incorporated with Spain, Navarre was a viceroyalty.

As originally organized, Navarre was divided into Merindades, or districts, governed by a Merino (mayorino) as representative of the king. This system was replaced in the 16th century by the feudal system, in which the head of the household was called the vassal. In 1629 the district of Biscay was added to Navarre; this was afterwards taken from the crown of France and united to the Spanish territory of the kingdom of Biscay, which was separated from the rest of the kingdom to prevent the latter from falling into the hands of the French.

See Historia Compendiosa de Navarra by Don J. M. Yanguas, (San Sebastian, 1832).

NAVARRETE, JUAN FERNANDEZ (1526-1570), surname El Mudo (The Mute), Spanish painter of the Madrid school, was born at Logroño in 1526. An illness in infancy deprived him of vocal faculty, but he began to express his wants by sketching objects with a piece of charcoal. He received his first instructions in art from Fray Vicente de Santo Domingo, a Hieronymite monk at Estella, and afterwards he visited Naples, Rome, Florence and Milan. According to the ordinary account he was for a considerable time the pupil of Titian at Venice. In 1568 Philip II summoned him to Madrid with the title of king’s painter and a salary, and employed him to execute pictures for the Escorial. The most celebrated of the works he there produced were a Nativity (in which, as in the well-known work on the same subject by Correggio, the light emanates from the Infant Saviour), a “Baptism of Christ” now in the Madrid Picture Gallery, and “Abraham Receiving the Three Angels” (one of his last performances, dated 1570). He executed many other altarpieces, all characterized by boldness and freedom in design, and by the rich warm colouring which has acquired for him the surname of “the Spanish Titian.” He died at Toledo in February 1570.

NAVARRETE, MARTIN FERNANDEZ DE (1675-1844), Spanish historian, was born at Abalos on the 9th of November 1705, and entered the navy in 1758. He was engaged in the service of the fleet and the operations of the army in the war of the Austrian Succession. In 1774 he wrote a history of the suppression of Algerine pirates. Ill-health compelled him for a time to withdraw from active service, but he devoted this forced leisure to historical research, and in 1789 he was appointed by the crown to examine the national archives relating to the maritime history of Spain. Rejoining the navy in 1793, he was present at the siege of Toulon, and afterwards received command of a frigate. From 1797 to 1805 he held in succession various
important posts in the ministry of marine. In 1808 the French invasion led to his withdrawal to Andalusia, and the rest of his life was entirely devoted to literature. In 1819 appeared, as an appendix to the Academy's edition of Don Quijote, his Vida de Cervantes, and in 1825 the first two volumes of the Colección de los Viajes y Descubrimientos que hicieron por Mar los Españoles desde fines del Siglo XV. (3rd vol., 1829; 4th vol., 1837). In 1837 he was made a senator and director of the academy of history. At the time of his death, on the 8th of October 1844, he was assisting in the preparation of the Colección de Documentos Inéditos para la Historia de España. His Disertacion sobre la Historia de la Nautica (1846) and Biblioteca Maritima Española (1851), were published posthumously.

NAVARRO, PEDRO (c. 1460–1528), Spanish military engineer and general, of obscure parentage, was born probably about 1460. He began life as a sailor; and was employed later as mazo de espuela, or running footman, by the Cardinal Juan de Aragon; on the death of his employer in 1485 he enlisted as a mercenary in a war between Florence and Genoa; and was subsequently engaged for some years in the warfare between the Genoese corsairs and the Mahommedans of Northern Africa. Navarro was not more scrupulous than others, for in 1490 he was at Civitavecchia, recovering from a gunshot wound in the hip received in a piratical attack on a Portuguese trading ship. When Gonzalo de Córdoba was sent to Sicily, to take part with the French in the partition of Naples, Navarro enlisted under his command. There was some talk of appointing him from Cephalonia in 1500 he helped by laying mines to breach the walls, though not at first with much success. The Spanish commander gave him a captain's commission. During the campaigns of 1502 and 1503 he came to the front among the Spanish officers by the defence of Canosa and of Taranto, by his activity in partisan warfare on the French lines of communication, and by the part he took in winning the battle of Cerinola. But his great reputation among the soldiers of the time was founded on the vigour and success of his mining operations against the castles of Naples held by French garrisons, in 1502, and he was undoubtedly recognized as the first military engineer of his age. When the French were expelled from Naples he received from Gonzalo a grant of land and the title of count of Olivetto. In 1506 he was in Spain, and for several years he was employed in wars on the north coast of Africa. In 1508 he took Velez de Gomera, largely by means of a species of floating battery which he invented. In 1509 he accompanied Ximenez in the conquest of Oran, and did excellent service. Till 1511 he continued in service in Africa, and took Bougie and Tripoli in 1510. The disasters at Gerba and Kerkena did not materially affect his reputation. There was some talk of appointing him to command the army of the league formed against the French in 1512; but his humble birth was thought to disqualify him. He was, however, sent as subordinate general. At the battle of Ravenna he covered the orderly retreat of the Spanish foot, and was struck from his horse by a shot which failed to pierce his armour. Being taken prisoner by the French, he was sent to the Castle of Loches. Ferdinand, whom the soldiers called an Aragonese skilful, would not pay his ransom, and after three years of imprisonment he entered the service of Francis I. In a peace. The death of Francis Milan is said to have saved him. Generalized, in the battle of Marignano, by the taking of the citadel of Milan, and in the long siege of Brescia. He was at the battle of Pavia, and in 1512 was taken prisoner at Genoa by his own countrymen. He was confined at Naples till the peace of 1526, but beyond the confiscation of his estate at Oliveto no punishment was inflicted for his treason. His last service was in the disastrous expedition of Lautrec to Naples in 1527, which was ruined by the plague. He died near the end of 1528.

A life of Navarro by Don Martin de los Heros, is published in the Documéntos inéditos para la Historia de España, vol. xxv. (Madrid, 1854).

NAVE, ecclesiastically considered, that part of a church appropriated to the laity as distinguished from the chancel, the choir or the presbytery, reserved for the clergy. In a 14th-century letter (quoted in Gasquet's Parish Life in Medieval England, 1906, p. 43) from a bishop of Coventry and Lichfield to one of his clergy, the reason for this appropriation is given. "Now the decreet of the holy fathers but the approved existing customs of the Church order that, when the clerks sing and serve God according to their offices be divided by screens from that in which the laity devoutly pray. In this way the nave of the church ... is alone to be open to lay people, in order that, in the time of divine service, clerics be not mixed up with lay people, and more especially with women, nor have communication with them, for in this way devotion may be easily diminished." The word " nave" has been generally derived from Lat. navis, ship. Du Cange (Glossarium, s. v. "Navis") quotes from the Chronicon Moriniacense, of the 12th century, as to the popular origin of the name, Eustesius, etiam tabernaculum, quod ecclesiae navis a populo vocatur ... Salmassius in his commentary on Solinus (1629) finds the origin in the resemblance of the vaulted roof to the keel of a ship, and refers to Sallust (Jugurtha, 18, 8) where is noticed a similar resemblance in the huts (maspálic) of the Numidians. The use of the word navis may, however, be due to the early adoption of the "ship" as a symbol of the church (see Skeat's note on Piers Plowman, xl. 32). The Greek ναός, Attic νόος (nous, to dwell), the inner shrine of a Greek temple, the cela, has also been suggested as the real origin of the word. This derivative was taken by the Greeks to mean a Latinized corruption into navis; for the early application of the word for ship to this part of a church building is undoubted.

Architecturally considered the nave is the central and principal part of a church, extending from the main front to the transepts, or to the choir or chancel in the absence of transepts. When the nave is flanked by aisles, light is admitted to the church through clerestory windows, some of the most ancient examples being the basilica at Bethlehem and the church of St Elias, at Thessalonica, both of the 4th century; numerous churches in Rome, dating from the 6th century, the two great basilicas at Ravenna; in all these cases the sills of the clerestory windows were raised sufficiently to allow of a sloping roof over the side aisles. When, however, a gallery was carried above the side aisles, another division was required, which is known as the triforium, and this subdivision was retained in the nave even when it formed a passage only in the thickness of the wall. In Late Gothic work in England, the triforium was suppressed altogether to give more space for the clerestory windows, and roofs of low pitch were provided over the side aisles.

The longest nave in England is that of St Albans (300 ft.), in which there are thirteen nave arches, thirty bays; at Florence which is 230 ft. long, but as there are no transepts this dimension includes nave and choir. Cluny was 250 ft. with eleven bays; Reims is 235 ft. with ten bays; Paris 170 ft. with nine bays; Amiens 160 with ten bays; and St Ouen, Rouen, 200 ft. with ten bays. In Germany the nave of Cologne cathedral is only 190 ft., including the two bays between the towers. The cathedral at Seville in Spain is 200 ft. long, with only five bays. In Italy the nave of the cathedral at Bologna is 400 ft. long, with nine bays, and the church of St Peter's in Rome 300 ft. long with four bays. On the other hand, the vaults in the nave of the continental cathedrals are far higher than those in England, that of Westminster Abbey being only 103 ft. high, while the choir of Beauvais is 150 ft. The result is that the naves of the English cathedrals not only are longer in actual dimensions, but appear much longer in their apparent height.

1 Vessels resembling boats or ships are familiar in medieval art and later. Thus "Incense-boats" (naretas) somewhat of this ship, 12th-century, of a 9th-century, or 11th-century form; they approximated still more closely to a model of a ship. A large vessel, also in the shape of a boat or ship, and known as a nef, was used at that table of princes and great personages, as in the knights' tables, spoons, &c. Some very elaborate examples of these survive, such as the 15th-century nef of St Ursula in the treasure of the cathedral at Reims, and that of Charles V. of France in the Musee Cluny. A very fine nef, of the 13th century, is in the hands of the Department of Antiquities of England; in the British Museum. (See DRINKING VESSELS.)
NAVEL—NAVIGATION

The then backward state of navigation is best understood from a sketch of the few rude appliances which the mariner had, and even these were only imperfectly understood or used. The accurate knowledge of finding the longitude proved unattainable for many years after the time of the Armada, and the very inaccurate knowledge existing of the positions of the heavily bodies themselves fully explains the mariner's exaggeration of his position and his great repute, at the time, where the writer observes, "Now there be some that are very inquisitive to have a way to get the longitude, but that is too tedious for seamen, since it requireth the deep knowledge of astronomy and distance of the sun, moon, and stars."

NAVIGATION (from Lat. navigo, to navigate, and aeger, to move), the science or art of conducting a ship across the seas. The term is also popularly used by analogy of boats on rivers, &c., and of flying-machines or similar methods of locomotion. Navigation, as an art applied properly to ships, is technically used in the restricted sense dealt with below, and has therefore to be distinguished from "seamanship" (q.v.), or the general methods of rigging a ship (see RIGGING), or the management of sails, rudder, &c.

History.

The early history of the rise and progress of the art of navigation is very obscure, and it is more easy to trace the gradual advance of geographical knowledge by its means than the growth of the practical methods by which this advance was attained. Among Western nations before the introduction of the mariner's compass the only practical means of navigating ships was to keep in sight of land, or occasionally, for short distances, to direct the ship's course by referring to it the sun or stars; this very rough mode of procedure failed in cloudy weather, and even in short voyages in the Mediterranean in such circumstances the navigator generally became hopelessly bewildered as to his position.

Over the China Sea and Indian Ocean the steadiness in direction of the monsoons was very soon observed, and by running directly before the wind vessels in those localities are able to "traverse long distances out of sight of land in opposite directions at different seasons of the year, aided in some cases by a rough compass (q.v.). But it is surprising when we read of the progress made among the ancients in fixing positions on shore by practical astronomy that so many years should have passed without its application to solving exactly the same problems at sea, but this is probably to be explained by the difficulty of devising instruments for use on the unsteady platform of a ship, coupled with the lack of scientific education among those who would have used them.

The association of commercial activity and nautical progress shown by the Portuguese in the early part of the 15th century marked an epoch of distinct progress in the methods of practical navigation, and initiated that steady improvement which in the 20th century has raised the art of navigation almost to the position of an exact science. Up to the time of the Portuguese exploring expeditions, sent out by Prince Henry, generally known as the "Navigator," which led to the discovery of the Azores in 1419, the rediscovery of the Cape Verde Islands in 1447 and of Sierra Leone in 1456, navigation had been conducted in the most rude, uncertain and dangerous manner, and it is possible to conceive. Many years had passed without the least improvement being introduced, except the application of the magnetic needle about the beginning of the 14th century (see COMPASS and MAGNETISM). Prince Henry did all in his power to bring together and systematize the knowledge then obtained upon nautical affairs, and also established an observatory at Sagres (near Cape St Vincent) in order to obtain more accurate tables of the declination of the sun. John II., who ascended the throne of Portugal in 1481, followed up the good work. He employed Roque de Viga in his physico-mathematical mission to the Cape Verde Islands, and sent him, from Fayal, to act as a committee on navigation. They calculated tables of the sun's declination, and improved the astrolabe, recommending it as more convenient than the cross-staff. The Ordenanzas of the Spanish council of the Indies record the course of instruction prescribed at this time for pilots; it included the De Sphaera Mundi of Sacrobosco, the spherical triangles of Regiomontanus, the Almagest of Ptolemy, the use of the astrolabe and its mechanism, the adjustments of instruments, cartography and the methods of observing the movements of heavenly bodies.

Whether the property of the lodestone was independently discovered in Europe or introduced from the East, it does not appear to have been generally utilized in Europe earlier than about A.D. 1400 (see COMPASS). In Europe the card or 'field' appears to have been attached to the magnet from the first, and the whole suspended as now in gimbal-rings within the "bittacle," or, as we now spell the word, "binnacle." The direction of a ship's head by compass was termed how she "capes." From the description of the stores supplied to ships in 1588, they appear to have usually had two compasses, costing £3. 4d. each, which were kept in charge by the helmsman. The fact that the north point of true magnetic measurement in most places, point to the true pole but eastward or westward of it, by an amount which is termed by sailors "variation," appears to have been noticed at an early date; but that the amount of variation was accurately determined between different localities was not apparent to navigators before 1600. It was observed at sea either from Cape or Cabot about 1490, and we find it used to be the practice to ascertain this error when at sea either from a bearing of the pole star, or by taking a mean of the compass bearings of the sun at noon and rising and setting, the deviation of the compass in the ships of those days being too small a quantity to be generally noticed, though there is a very suggestive remark on the effect of moving the compass in the interior of a ship in the "Siue Aurea" of Cassiporus noted in "ludus de Navigatione," printed at Bristol in 1679. In order, partially to obviate the error of the compass (variation), the magnets, which usually consisted of two steel wires joined at both ends and opened out in the middle, were not always fastened to the nose of the ship, but with the ends about a point eastward of north and westward of south, the variation in London when first observed in 1580 being about 11°. That of the voyage year by year at the same base was first noted by Gellibrand in 1635.

The "cross-staff" appears to have been used by astronomers at a very early period, and subsequently by seamen for measuring
Navitation was one of the few instruments possessed by Columbus and Vasco da Gama. The old cross-staff, called by the Spaniards "ballestilla," consisted of two light battens. The part we may call the staff was about 1½ in. square and 3½ in. long. The cross was made to fit closely and to slide on the staff. It had the following angles; its length was a little over 26 in., so as to allow the "pinules" or sights to be placed exactly 26 in. apart. A sight was also fixed on the end of the staff for the eye to look through so as to see both those on the cross and the objects whose distances were to be measured. It was made by describing the angles on a table, and laying the staff upon it (fig. 1). The scale of degrees was marked on the upper face. Afterward shorter crosses were introduced, so that smaller angles could be taken by the same instrument. These angles were marked on the sides of the staff.

To observe with this instrument a heavenly object, the cross staff was held vertically, the sun being taken by compass, to ascertain when it was near the meridian; then the end of the long staff was placed close to the observer's eye, and the transversary, or cross, moved until one spoke of the cross touched the horizon, and the other the sun's centre. This was continued until the sun was dipped, when the meridian altitude was observed.

Another primitive instrument in common use at the beginning of the 16th century was the astrolabe (fig. 2), which was more convenient than the cross-staff for taking altitudes. Fig. 2 represents an astrolabe as described by Martin Cortes, who was 60 in. in diameter, and was circular except at one place, where a projection was provided for a hole by which it was suspended. Weight was considered desirable in order to keep it steady when in use. The face of the metal having been well polished, a plum line from the point of suspension marked the vertical line, from which derived the horizontal and meridian line and centre. The upper left quadrant was divided into degrees. The second part was a pointer pt of the same metal and thickness as the circular plate, about ½ in. wide, and in length equal to the diameter of the circle. The centre was bored, and a line was drawn across it the full length, which was called the line of confidence. On the ends of that line were fixed plates, s, s, having each a small hole, both exactly over the line of confidence, as sights for the sun or stars. The center moved inside the circle the size of a goose quill. When the instrument was suspended the pointer was directed by hand to the object, and the line read on the one quadrant only. Some years later the opposite quadrant was also graduated, to give the benefit of a second reading. The astrolabe was used by Vasco da Gama with his flagship on his voyage round the Cape of Good Hope in 1497; but the movement of a ship rendered it very uncertain, and the habit of giving it was increased by the necessity for three observers. One held the instrument by a ring passed over the thumb, the second measured the altitude, and the third read it.

For finding latitude at night by altitude of the pole star taken by cross-staff or astrolabe, use was made of an auxiliary instrument called the "nocturnal." From the relative positions of the two stars in the constellation of the Little Bear, farthest from the pole (Polaris, or the Pole Star), and that of the pole star with regard to the pole could be inferred, and tables were drawn up termed the "Regiment of the Pole Star," showing for eight positions of the guards how much should be added or subtracted from the altitude of the pole star; thus, "when the guards are in the N.W. bearing from each other north and south add half a degree," &c. The bearings of the guards, and also roughly the hour of the night, were found by the nocturnal, first described by M. Coignet in 1551.

The nocturnal (fig. 3) consisted of two concentric circular plates, the outer being about 3 in. in diameter, and divided into twelve equal parts corresponding to the twelve months, the being divided into groups of five days. The inner circle was graduated into twenty-four equal parts, corresponding to the hours of the day, and again subdivided into quarters; the handle of the upper circle in such a way that the middle of it corresponded with the centre of the month on which the guards had the same right ascension as the sun—or, in other words, crossed the meridian at noon. From the common centre of the two circles extended a long index bar, which, together with the inner circle, turned freely and independently, about this centre, which was pierced with a round hole. To use the instrument, the projection at twelve hours on the inner plate was turned until it coincided with the day of the month of observation, and the instrument held with its plane roughly parallel to the equinoctial or celestial equator, the observer looking at the pole star through the hole in the centre, and turning the long central index bar until the guards were seen just touching its edge; the hour in which this edge coincided with the inner plate was, roughly, the time. Occasionally the nocturnal was constructed so as to find the time by observations of the pointers in the Great Bear.

The rough charts used by a few of the more expert navigators, as the time we refer to will be more fully described later (see also Map and Geography). Nautical maps or charts first appeared in Italy at the end of the 15th century, but it is said that the first seen in England was brought by Bartholomew Columbus in 1489.

Among the earliest authors who touched upon navigation was John Werner of Nuremberg, who in 1534, in his notes upon Ptolemy's geography, describes the cross-staff as a very ancient instrument, but says that it was only of recent beginning to be generally introduced among seamen. He recommends measuring the distance between the moon and a star as a means of ascertaining the longitude; but this (though developed many years after into the method technically known as "lunars") was of no practical use owing to the then imperfect knowledge of the true positions of the moon and stars and the non-existence of instrumental means by which such distances could be measured with the necessary accuracy.

Thirty-eight years after the discovery of America, when long voyages had become comparatively common, R. Gemma Frisius wrote upon astronomy and cosmography, with the use of the globes. His book comprised much valuable information to mariners of that day, and was translated into French fifty years later (1582) by Claude de Bosiere. The astronomical system adopted is that of Ptolemy. The following are some of the points of interest relating to navigation. There is a good description of the sphere and its circles; the obliquity of the ecliptic is given as 23° 30'. The distance between the meridians is to be measured on the equator, allowing 15° to an hour of time; longitude is to be found by eclipses of the moon and conjunctions, and reckoned from the Canary Islands (Azores). Latitude should be measured from the equator, with the use of "as Clarense says." The use of globes is very thoroughly and correctly explained. The scale for measuring distances was placed on the equator, and 15 German leagues, or 60 Italian leagues, were to be considered equal to one degree. The Italian league was 8 stadia, or 1000 paces, therefore the degree is taken much too small. We are told that, on plane charts, mariners drew lines from various centres (i.e. compass courses), which were very useful since the virtue of the lodestone had become recognized; it must be remembered that parallel rulers were unknown, and they invented the Mercators' and other maps are in the day. The confusion of lines has been continued upon sea charts till comparatively recently. Gemma gives rules for finding the course and distance correctly, except that he treats difference of longitude as departure. For instance, if the difference of latitude and difference of longitude are equal, the course prescribed is between the two principal winds—that is, 45°. He points out that the courses thus followed are not straight lines, but curves, because they do not follow the great circle, and that distances could be more correctly measured on the globe than on charts. The tide is to be reckoned with until high water being when it is on the meridian and 12 hours later. From a table of latitudes and longitudes a few examples are here selected, by which it appears that even latitude was much in error. The figures in brackets
represent the positions according to modern tables, counting the longitude from the western extremity of St. Michael. (Flores is 2° 8' farther west.)

<table>
<thead>
<tr>
<th>City</th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athens</td>
<td>31° 0' N</td>
<td>31° 13' E</td>
</tr>
<tr>
<td>Babylon</td>
<td>37° 0' N</td>
<td>59° 20' E</td>
</tr>
<tr>
<td>Danzig</td>
<td>54° 0' N</td>
<td>22° 30' E</td>
</tr>
<tr>
<td>London</td>
<td>52° 0' N</td>
<td>0° 0' E</td>
</tr>
<tr>
<td>Malta</td>
<td>34° 0' N</td>
<td>40° 30' E</td>
</tr>
<tr>
<td>Rome</td>
<td>41° 50' N</td>
<td>15° 30' E</td>
</tr>
</tbody>
</table>

The latitude of Cape Clear is given 34° in error, and the longitude 43°; the Scilly Islands are given with an error of one degree in latitude and 2° 20' in longitude; while Madeira is placed 3° 8' too far south and 4° 20' too far west, and Cape St. Vincent 3° 25' too far south and 6° too far west.

In 1534 Gemma produced an "astronomical ring," which he dedicated to the secretary of the king of Hungary. He admitted that it was not entirely his own invention, but asserted that it could accomplish all that had been said of quadrants, cylinders and astrolabes—also that it was a pretty ornament, worthy of a prince. As it displayed great ingenuity, and was followed by many similar contrivances during two centuries, a sketch with brief description is here given (fig. 4).

The outer and principal sustaining circle EPO represents the meridian, and is about 6 in. in diameter. The Pw are the poles. The upper quadrant is divided into degrees. It is suspended by fine cord or wire, placed at the supposed latitude. The second circle EQ is fixed at right angles to the first, and represents the equinoctial line. The upper side is divided into twenty-four parts, representing the hours from noon or midnight. The inner side of this circle are marked the months and weeks. The third ring CC is attached to the first at the poles, and revolves freely within it. On the interior are marked the months, and on another side the corresponding signs of the zodiac; another is graduated in degrees. It is fitted with a groove which carries two movable sights. On the fourth side are twenty-four unequal divisions (tangents) for measuring heights. Its use is illustrated by twenty problems showing the manner of doing roughly all that any instrument for taking angles can. Thus, to find the latitude, set the sights C, C to the place of the sun in the zodiac, and shut the circle till it corresponds with 12 o'clock. Look through the sights and after the point of suspension till the greatest elevation is attained; that time will be noon, and the point of suspension will be the latitude. The figure is represented as slung at lat. 40°, either north or south. To find the hour of the day, the latitude and declination being known: the sights C, C being set to the declination as before, and the suspension on the latitude, turn the ring CC freely till it points to the sun, when the index opposite the equinoctial circle will indicate the time, while the meridional circle will coincide with the meridian of the place.

There is in the museum attached to the Royal Naval College at Greenwich an instrument described as Sir Francis Drake's astrolabe. It is not an astrolabe, but may be a combination of astronomical rings as invented by Gemma with additions, probably of a later date. It has the appearance of a large gold watch, about 21 in. in diameter, and contains several parts which fall back on hinges. One is a sun-dial, the gnomon being in connexion with a graduated quadrant, by which it could be set to the latitude of the place. There are a small compass and an hour circle. It is very neat, but too small for actual use, and may be simply an ornament representing a larger instrument. There is a small brass case inside one lid; that given for London is 51° 34', about 3 m. too much.

Though clocks are mentioned in 1484 as recent inventions, watches were unknown till about 1530, when Gemma seized the idea of using them for the purpose of ascertaining the difference of longitude between two places by a comparison between their local times at the same instant. They were too inaccurate, however, to be of practical use, and their advocate proposed to correct them by water-clocks or sand-clocks. For rough purposes of keeping time on board ship sand glasses were employed, and is curious to note that hour-glasses were used for this purpose in the British Navy until 1839. The outer margin of the compass card was early divided into twenty-four equal parts numbered as hours until the error of thus determining time by the bearings of the sun was pointed out by Davis in 1607.

In 1537 Pedro Nunez (Nonius), cosmographer to the king of Portugal, published a work on astronomy, charts and some points of navigation. He recognized the errors in plane charts, and tried to rectify them. Among many astronomical problems given is one for finding the latitude of a place by knowing the sun's declination and altitude when on two bearings, not less than 40° apart. Gemma did a similar thing with two stars; therefore the problem now known as a "double altitude" is a very old one. It could be mechanically solved on a large globe within a degree. To Nunez has been erroneously attributed the present mode of reading the exact angle on a sextant, the scale of a barometer, &c., the credit of which is due, however, to Vernier nearly a hundred years later. The mode of dividing the scale which Nunez published in 1542 was the following. The arc of a large quadrant was furnished with forty divisions, or scales. Those graduated to 90°, the others to 89, 88, 87, &c., divisions. As the fine edge of the pointer attached to the sights passed among those numerous divisions it touched one of them, suppose the fifteenth division on the sixth scale, then the angle was \( \frac{1}{2} \) of 90° = 15° 32'. This was a laborious method; Tycho Brahe tried it, but abandoned it in favour of the diagonal lines then in common use, and still found on all scales of equal parts.

In 1545 Pedro de Medina published Arde de navigar at Valla-dolid, dedicated to Don Philipo, prince of Spain. This appears to be the first book ever published professedly on navigation. It was soon translated into French and Italian, and many years after into English by John Frampton. Though this pretentious work came out two years after the death of Copernicus, the astronomy is still that of Ptolemy. The general appearance of the chart given of the Mediterranean, Atlantic, and part of the Pacific is in its favour, but examination shows it to be very incorrect. A scale of equal parts, near the centre of the chart, extends from the equator to what is intended to represent 75° of latitude; by this scale London would be in 55° instead of 51°, Lisbon in 37° instead of 38° 42'. The equator is made to pass along the coast of Guinea, instead of being over four degrees farther south. The Gulf of Guinea extends 15° too far east, and Mexico is much too far west. Though there are many vertical lines on the chart at unequal distances they do not represent meridians; and there is no indication of longitude. A scale of 600 leagues is given (German leagues, fifteen to a degree). By this scale the distance between Lisbon and the city of Mexico is 1740 leagues, or 6900 miles; by the vertical scale of degrees it would be about the same; whereas the actual distance is 4820 miles. Here two great wants become apparent—a knowledge of the actual length of any arc, and the means of representing the surface of the globe on flat paper. There is a table of the sun's declination to minutes; on June 12th and December 11th (o.s.) it was given as 23° 33'. The directions for finding the latitude by the pole star and pointers appear good. For general astronomical information the book is inferior to that of Gemma.

In 1556 Martin Cortes published at Sevilla Arte de navigar. He gives a good drawing of the cross-staff and astrolabe, also a table of the sun's declination for four years (the greatest value being 25° 33'), and a page of astronomical tables. The motions of the heavens are described according to the notions then prevalent, the earth being considered as fixed. He recommends
the altitude of the pole being found frequently, as the estimated distance run was imperfect. He devised an instrument whereby to tell the hour, the direction of the ship's head, and where the sun would set. A very correct table is given of the distances between the meridians at every degree of latitude, whereby that became to reduce the difference of longitude to departure. In the rules for finding the latitude by the pole star, that star is supposed to be 3° from the pole. Martin Cortes attributes the tides entirely to the influence of the moon, and gives instructions for finding the time of high water at Cadiz, when by means of a card with the moon's age on it, revolving within a circle showing the hours and minutes, the time of high water at any other place for which it was set would be indicated. Directions are given for making a compass similar to those then in common use, also for ascertaining and allowing for the variation. The east is here spoken of as the principal point, and marked by a cross.

The third part of Martin Cortes's work is upon charts; he laments that wise men do not produce some that are correct, and that pilots and mariners will use plane charts which are not true. In the Mediterranean and "Channel of Flanders" the want of good charts is (he says) less inconvenient, as they do not navigate by the altitude of the pole.

As some subsequent writers have attributed to Cortes the credit of first thinking of the enlargement of the degrees of latitude on Mercator's principle, it is proper here to premise that in the first edition of Mercator's work, Bore's latitude was divided into 24 divisions, and Coignet recommended Richard to very earnestly divide it into 30. A table of the meridians was accordingly given: it is divided into 15 parts from 15° to 105°; and the meridian from 0° to 15° is 21', from 15° to 30° 41', from 30° to 45° 61', and so on to 105°, which he left unmeasured, in order "that no one" might measure it in 3° steps. He recommended the use of the small meridian, which with other improvements, he called the "true Mercator's projection," as against the "false Mercator's projection," used by the same authors in a former edition, which he divided into only 11 divisions. He introduced a new table for finding the position of a ship, and another for finding the distance of a ship from the land. He also divided the world into 14 parts, the sea being divided into 20 parts.

William Cunnigham published in 1559 a book called his Astronomical Glass, in which he teaches the making of charts by a central meridional line divided into equal parts, with other meridians on each side, distant at top and bottom in proportion to the departure at the highest and lowest latitude, for which purpose a table of departures is given very correctly to the third place of sexagesimals. The chart would be excellent were it not that the parallels are drawn straight instead of being curved. In another example, which shows the position of a ship on the earth, he assumes the meridians and parallels to be all curved; it would be better if it were not that the former are too long. The hemisphere is also shown upon a projection approaching the stereographic; but the eighteen meridians cut the equator at equal distances apart instead of being nearer together towards the primitive. He gives the drawing of an instrument like an astrolabe placed horizontally, divided into 32 points and 360 degrees, and carrying a small magnetic needle to be used as a prismatic compass, or even as a theodolite.

In 1581 Michael Colgnet of Antwerp published a sea chart, and also a small treatise in French, wherein he exposes the errors of Medina, and was probably the first who said that rhumb lines form spirals round the pole. He published also tables of declination of the sun and observed the gradual decrease in the obliquity of the ecliptic. He described a cross-staff with three transverse pieces, which was then in common use at sea. Colgnet died in 1623.

The Dutch published charts made up as atlases as early as 1585, with a treatise on navigation as an introduction.

In 1585 Roderico Zamorane, who was then lecturer at the naval college at Seville, published a concise and clearly-written compendium of navigation; he follows Cortes in the desire to obtain better charts. Andres Garcia de Cespedes, the successor of Zamorano at Seville, published a treatise on navigation at Madrid in 1606. In 1592 Petrus Plancius published his universal map, containing the discoveries in the East and West Indies and towards the north pole. It possessed no particular merit; the degrees of latitude are equal, but the distances between the meridians are varied. He made London appear in 51° 32' N. and long. 2°, by which his first meridian shall have been more than 3° east of St Michael.

For Mercator's great improvements in charts at about this date see Map; from facsimiles of his early charts in Jomard, Les Monuments de la géographie, the following measurements have been made. A general chart in 1569 of North America, from lat. 25° to lat. 70°, is 2 ft. long north and south, and 20 in. wide. Another of the same date, from the equator to 60° south lat. is 15° 8 in. long. The charts agree with each other, a slight allowance being made for remeasuring. As compared with Jammes's table of meridional parts, the spaces between the parallels are all too small. Between 6° and 10° the error is 8'; at 20° it is 5'; at 30°, 16'; at 40°, 39'; at 50°, 61'; at 60°, 104'; at 70°, 158'; and at 70°, 182—that is, over three degrees upon the whole chart. As the measures are always less than the truth it is possible that Mercator was afraid to give the whole.

In a chart of Sicily by Romoldus Mercator in 1580, on which two equal degrees of latitude, 36° to 38°, extend 93 in., the degree of longitude is quite correct at one-fourth from the top; the lower part is 1 in. too long. One of the north of Scotland, published in 1595, by Romoldus, measures 103 in. from 58° to 61°; the divisions are quite equal and the lines parallel; it is correct at the centre only. A map of Norway, 1595, lat. 60° to 70° = 93 in., has the parallels curved and equidistant, the meridians straight converging lines; the spaces between the meridians at 60° and 70° are quite correct.

In 1594 Blundeville published a description of Mercator's charts and globes; he confesses to not having known upon what rule the meridians were separated by Mercator, unless upon such a table as that given by Wright, whose table of meridional parts is published in the same book, also an excellent table of sines, tangents and secants—the former to seven figures, the latter to eight. These tables are now used in all navigation in making the principles of such sailing were not unknown at an earlier date; indeed it is said that S. Cabot projected a voyage across the North Atlantic on the arc of a great circle in 1405.
The list of instruments given by Davis as necessary to a skilful seaman comprises the sea compass, cross-staff, chart, quadrant, astrolabe, an "instrument magnetic" for finding the variation of the compass, and a plane table and cross-staff for use in lieu of a compass. The first three are said to be sufficient for use at sea, the astrolabe and quadrant being uncertain for sea observations. The importance of knowing the times of the tides when approaching tidal or creek waters, and the compass being only partially pointed by the magnetic needle governing them by the moon's age. A table of the sun's declination is given for noon each day during years 1593-1597, from the ephemerides of Flamsteed. He lays down that given for the latitude of 28° Christmas, Brazil, we read, "the compass varied 9°, the south point westward. He states that the first meridian passed through St Michael, because there is no variation at that place, and therefore that this meridian passed through the magnetic pole as well as the pole of the earth. He makes no mention of Mercator's chart by name nor of Cortes or other writers on navigation. Rules are given for finding the latitude by two altitudes of the sun and intermediate azimuth, also by two fixed stars, using a globe. There is a drawing of a quadrant, with a plumb line, for measuring the zenith distance, and one of a modification of a cross-staff using which the observer stands with his back to the sun and places his horizon on a right line through the staff, while the shadow of the top of a movable projection, falls on the right; this, known as the back-staff, was an improvement on the compass for use on land. He also says that he had the rough idea of the principle of the quadrant and sextant. This remained in use till superseded in 1731 by Hadley's quadrant. The eighth edition of Davis's work was printed in 1657. Edward Wright, of Caius College, Cambridge, published in 1599 a valuable work entitled Certain Errors in Navigation Detected and Corrected. One part is a translation from Roderico Zamberti's Latin work, the other was composed for the use of English seamen, there considered to be the chief navigations which had then recently come in use "could hardly be amended," as they were growing to "perfection"—especially the sea chart and the compass, though he expresses a hope that the latter may be "free'd from that rude and gross manner of handling in the making." He gives a table of magnetic declinations (variation) and explains its geometrical construction. He states that Medina utterly denied the existence of variation, and that it was not to be learned by the seamen, but it was the same as the "true observation". He expresses a hope that a right understanding of the dip of the needle would lead to a knowledge of the latitude, "as the variation did of the longitude." He gives a table of declination of the horizon at noon, by English seamen at London, the greatest given being 23° 31' 30". The latitude of London he made 51° 32'. For these determinations a quadrant over 6 ft. in radius was used. He also includes tables of the times of the sun's elevation, refraction, parallax and the sun's motions. With all this knowledge the earth is still considered as stationary—although Wright alludes to Copernicus, and says that he omitted to allow for parallaxes. Wright ascertained the declinations of thirty-two stars, and made many improvements or additions to the art of navigation, considering that all the problems could be performed trigonometrically, without globe or chart. He devised sea rings for taking observations, and a sea chart, as the result of two years' work, which is in some respects similar to that by Davis. While portraying the neglected state which navigation had been in, he rejoices that the worshipful society at the Trinity House (truly well established in 1514), under the patronage of the king (Henry VIII.), had removed many gross and dangerous errors. He joins the brethren of the Trinity House in the desire that a lecturership should be established on navigation, as at Seville and Cadiz; also that a grand pilot should be appointed, as Sebastian Cabot had been in Spain, to examine pilots (i.e. mates) and navigators. Wright's desire was partially fulfilled in 1645, when an Act of Parliament was passed for the establishment of a college of masters and mates of ship's masters; but such was the opposition by shipowners that it was even then left voluntary for a few years. England was in this respect more than a century behind Holland. It was not till the reign of George I, in 1717, that a college of the first class was established at Trinity House. The great mark which Wright made was the discovery of a correct and uniform method of dividing the meridional line and making charts which are still called after the name of Mercator. He considered such charts as true as the globe itself; and so they were for all practical purposes. He commenced by dividing a meridional line, in the proportion of the sectants of the latitude, for every ten minutes of arc, and in the edition of his work published in 1610 his calculations are for every minute. His method was based upon the fact that the radius bears the same proportion to the sectant of the latitude as the difference of longitude does to the meridional difference of latitude—a rule strictly correct for small arcs only. One minute is taken as the unit of time, and the arc of a degree is divided into sixty minutes, the second of arc becomes 20,000, 3' = 30,000, &c., increasing uniformly till 90', which is equal to 400,000; 3° is 600,012. The sectant of 20° is 12,251,102, and for 20° 1' it will be 12,251,102+1,642—practically the same as that used in modern tables. The principle is simply explained by fig. 5, where b is the pole and of the meridian. At any point a a minute of longitude: a min. lat.: ea (the semi-diameter of the parallel): k' (the radius). Again ea,: k': k': ki : radius: sec. lat. The disc on which the projection is made is divided in parallel circles, each parallel increasing successively from the equator towards either pole until it is of equal diameter to the cylinder, and consequently the meridians widening apart until they are everywhere as distant from each other as the equator is from the latitude of that circle. Such a spherical surface is thus by extension made cylindrical, and consequently a plane parallelodromic surface, since the surface of a cylinder is nothing else but a plane parallelodromic surface wound round it. Such a cylinder on being opened into a flat surface will have upon it a representation of a Mercator's chart of the world." This great improvement in the principle of constructing charts was adopted slowly by seamen, who, putting it as they supposed to a practical test, found good reason to be disappointed. The positions of most places in the world had been originally laid down erroneously, by very rough courses and estimated distances upon the plane chart, and from this they were transferred to the projection. The parallels and distances, really due to erroneous positions, were wrongly attributed to the new and accurate form of chart. When Napier's Canon Mirrorius appeared in 1614, Wright at once recognized the value of logarithms as an aid to navigation, and undertook a translation of the book, which he did not live to publish (see Napier). Gunter's tables (1620) made the application of the new discovery to navigation possible, and this was done by Addison in his Arithmetical Navigation (1623), as well as by Gunter in his tables of 1624 and 1636, which gave logarithmic sines and tangents, to a radius of 1,000,000, with directions for their use and application to astronomy and navigation, and also logarithms of numbers from 1 to 10,000. Several editions followed, and the work retained its reputation over a century. Gunter invented the sector, and introduced the meridional line upon it, in the just proportion of Mercator's projection. The means of taking observations correctly, either at sea or on shore, was about this time greatly assisted by the invention bearing the name of Pierre Vernier, the description of which was published at Brussels in 1631. As Vernier's quadrant was divided into half degrees only, the author, he called it, spread over 14° 2′ degrees, amounting that space carried thirty equal divisions, numbered from 0 to 30. As each division of the sector contained 29 min. of arc, the vernier could be read to minutes. The verniers now commonly adapted to sextants can be read to 10 secs. Shortly after the invention it was recommended for use by P. Bouguer and Jorge Juan, who describe it in a treatise entitled La Construction, &c., du quadrant Nouveau. About this period Gascoigne applied the telescope to the quadrant as used on shore; and Hevelius invented the tangent screw, to give slow and steady motion when near the desired position. These
practical improvements were not applied to the rougher nautical instruments until the invention of the sextant in 1731.

In 1635 Henry Cellibrand published his discovery of the annual change in variation of the needle, which was effected by comparing the results of his own observations with those of W. Borough and Edmund Gunter. The latter was his predecessor at Gresham College.

In 1637 Richard Norwood, a sailor, and reader in mathematics, published an account of his most laudable exertions to remove one of the greatest stumbling-blocks in the way of correct navigation, that of not knowing the true length of a degree or nautical mile, in a pamphlet styled The Seaman's Practises. Norwood ascertained the latitude of a position near the Tower of London in June 1633, and of a place in the centre of York in June 1635, with a sextant of more than 5 ft. radius, and, having carefully corrected the declination of the sun and allowed for refraction and parallax, made the difference of latitude 2° 26'. He then measured the distance with a chain, taking horizontal angles of all windings, and then made it on a tape four feet long, correcting elevations and depressions. A few places which he was unable to measure he paced. His conclusion was that a degree contained 367,176 English feet; this gives 2040 yds. to a nautical mile—only about 12 yds. too much. Norwood's work went through numerous editions, and retained its popularity over a hundred years. In a late edition he says that, as there is no means of discovering the longitude, a seaman must trust to his reckoning. He recommends the knots on the log-line to be placed 51 ft. apart, as the just proportion to a mile when used with the half-minute glass. To Norwood is also attributed the discovery of the "dip" of the magnetic needle in 1576.

The progress of the art of navigation was and is still of course inseparably connected with that of map and chart drawing and the correct astronomical determinations of positions on land. While we as have seen at an early period simple practical astronomical means of finding the latitude at sea were known and in use, no mode could be devised of finding longitude except by the rough method of estimating the run of the ship, so that the only mode of arriving at a port of destination was to steer so as to get into the latitude of such a port either to the eastward or westward of its supposed position, and then approach it on that parallel of its latitude. The success of this method would of course greatly depend upon the accuracy with which the longitude of such a port was known. Even with the larger and more accurate instruments used in astronomical observatories on shore the means of ascertaining latitude were far in advance of those by which longitude could be obtained, and this equally applied to the various heavenly bodies themselves upon which the terrestrial positions depended, the astronomical element of declination (corresponding to latitude) being far more accurately determined than that of right ascension (corresponding to longitude).

Almanacs were first published on the continent of Europe in 1457, but the earliest printed work of that kind in England is dated 1497. The only portions of their contents of use to seamen were tables of the declination of the sun, rough elements of the positions of a few stars, and tables for finding latitude by the pole star.

No accurate predictions of the positions of the moon, stars and planets could, however, be made until the laws governing their movements were known, such laws of course involving a knowledge of their actual positions at different widely separated epochs.

In 1699 Edmund Halley (subsequently astronomer royal), in command of the "Paramour," undertook a voyage to improve the knowledge of longitude and of the variation of the compass. The results of his voyage were the construction of a number of lighthouses, and the perfection of the longitude of stars. As a result of this voyage, and proposals for finding the longitude by observations of fixed stars.

The necessity for having more correct charts being equally by the pressing need of obtaining the longitude by some simple and correct means available to seamen, many plans had already been thought of for this purpose. At one time it was hoped that the longitude might be directly discovered by observing the variation of the compass and comparing it with that laid down on charts. In 1674 Charles II. actually appointed a commission to investigate the possibility of making such a discovery of a scientific kind; the proposal was adopted by Henry Bond, and the same idea appears as late as 1777 in S. Du Châtel's "Pélerinage." Nor did the only accurate method of ascertaining the longitude be known by the difference of time at the same instant at the meridian of the observer and Greenwich. The invention of the chronometer and the perfecting of chronometers this could only be done by finding at two such places the apparent time of the same celestial phenomenon.

A class of phenomena whose comparative frequency would give them a helpful clue, viz., the sun's eclipses, became known through Galileo's discovery of these bodies (1610). Tables for such eclipses were published by Domini Cassini in 1668, and in 1699 they were published at Paris by his son, who was followed by J. Pount, J. Bradley, W. Wargentin, and many other astronomers. But this method, though useful on land, is not suited to mariners; when W. Whiston, for example, in 1737, recommended its use for the purpose of observing a reflecting telescope, he did not sufficiently consider the difficulty of using a telescope at sea.

Another method proposed was that of comparing the local time of the moon's crossing the meridian of the observer with the predicted time of the same event at Greenwich, the difference of the two depending upon the moon's motion during the time represented by the longitude; thus Heron's Longitude Unmeiled (1588), proposes to find the time of the moon's meridian passage at sea by equal altitudes with the cross-staff, and then compare apparent time at ship with London time. The accuracy of this, as in the case of lunar problems, would depend upon the perfect knowledge of the laws of the moon's motion than that existed.

The celebrated problem of finding longitude by lunars (or by measurement of "lunar distances") occupied the attention of those who, like Clavius and Galileo, were interested in the more simple and accurate method by the use of chronometers, and was the principal reason for establishing the Royal Observatory at Greenwich. The subsequent publication of the Nautical Almanac was the simple determination, the distances of the moon from those at any instant of time at Greenwich would be obtained by finding that if such predictions were published in advance, an observer at any instant of time by simply measuring such distances, could accurately determine the Greenwich time, a comparison of which with the local time (which in clear weather can be frequently and simply determined) would give the longitude. This, as previously mentioned, was foreseen by J. Werner as early as 1514, but very great difficulties attended its practical application for many years. Until the establishment of the astronomical observatory at Greenwich in 1675, it was impracticable to make the vast number of observations necessary to fulfill the astronomical conditions, and until the invention of the sextant no instrument was devised which would be accurately suited to the necessity, while the accuracy of the predictions required with the necessary accuracy, while even up to the time when the problem had attained its greatest practical accuracy the calculations involved were far too intricate for general use among those for whom it was chiefly intended. The very Imperfectness of the movements of the moon were unknown before Newton's time, when the lunar problem begins to have a chief place in the history of navigation; the places of stars were formerly derived from various and widely discrepant sources.

The study of the lunar problem was stimulated by the reward of 1000 crowns offered by Philip III. of Spain in 1598 for the discovery of a method of finding longitude at sea; the States-General followed with an offer of 10,000 florins. But for a long time nothing practical came of this; a proposal by J. B. Morin, submitted to Richelieu in 1633, was pronounced by commissioners appointed to investigate the question to be impracticable through the expense of the necessary tables, and the same objection applied when the question was raised in England in 1674 by a proposal of St Pierre to find the longitude by using the altitudes of the moon and two stars to find the time each observed, and the meridian of the ship's place calculated by the king's astronomers, John Moore, Sir J. Moore and Sir C. Wren to establish an observatory for the benefit of navigation, and especially that the moon's exact position might be calculated a year in advance. Flamsted gave his judgment that the lunar tables then in use were quite useless, and the positions of the stars erroneous. The result was that the king decided upon establishing an observatory in Greenwich Park, and Flamsted was appointed astronomer royal, and of the salaries of £200 a year, which was a considerable sum in those days. The moon's movement is $200 a year, for which also he was to instruct two boys from Christ's Hospital. While the small building in the Park was in course of erection he resided in the Queen's House at the central point of Greenwich Hospital School, and removed to the house on the hill on the 10th of July 1767, which came to be known as "Flamsted House." The institution was placed under the surveyor-general of ordnance,—perhaps because that office was then held by Sir John Moore, himself an eminent mathematician. Though this was not the first observatory in Europe, it was destined to become the most useful, and has amply fulfilled the important duties for which it was
designed. It was established to meet the exigencies of navigation, as was clearly stated on the appointment of Flamsteed, and on several subsequent occasions; we see now what an excellent foster-mother it has been to the higher branches of that science. This has been shared by many other navigators. In England originally the most suitable man in the kingdom was placed in charge, it was so starved and neglected as to be almost useless during many years. The government did not provide a single large mural arc which a proved a failure. Seven years after another mural arc was erected at a cost of £120, with which he set to work in earnest to verify the latitude, and to determine the position of the equinox and to ascertain the right ascensions and declinations of the stars; he obtained the positions of 2883 which appeared in the "British catalogue" in 1723 (see Flamsteed).

Flamsteed died in 1719, and was succeeded by Halley, who paid particular attention to the motions of the moon with a view to the longitude problem. A paper which he published in the Phil. Trans. (1729) contains observations that were made by him (Halley) in 1683-1684 for ascertaining the moon's motion, which he thought to be the only practical method of that. He himself had at that time made some observations, but not better than those before his time as well as those of Tycho, Kepler, Bullialdus and Horrox, were uncertain; sometimes the errors would compensate one another; at others they fell the same way, and it was right leading to an error on being corrected. He hopes that the tables will be so amended that an error may scarce exceed 3 minutes of arc (equal to 1° of longitude). Sir Isaac Newton's tables, corrected by himself (Halley) and others up to 1713, would admit of errors of 5 minutes, when the moon was in the third and fourth quarters. He blames Flamsteed for neglecting that portion of astronomical work, as he was at the observatory more than at the board. He had and should have been, during the whole period of the moon's apogee—less than nine years—during which he observed the right ascensions at her transit, with great exactness, almost fifteen hundred times, or as often as Tycho Brahe, in about 1590, with his instruments and tables, to be able to compute the moon's position within 2 minutes of arc with certainty, which would reduce errors of position to 20 leagues at the equator and 15 in the Channel; he thought Hadley's quadrant might be applied to determine lunar distance at sea with the desired accuracy.

The rise of modern navigation may be fairly dated from the invention of the sextant in 1731 and of the chronometer in 1735; the former a complete nautical observatory in itself, and the latter an instrument which in its modern development has become an almost perfect time-keeper. It was a curious coincidence that these two invaluable instruments were invented at so nearly the same time. Until 1731 all instruments in use at sea for measuring angles either depended on a plumb line or required the observer to look in two directions at once.

True imperfections are clearly pointed out in a paper by Pierre Bouguer (1729) which received the prize of the Paris Academy of Sciences for the best method of taking the altitude of stars at sea. Bouguer himself proposes a modification of what he calls the English quadrant, probably the one suggested by Wright and improved by Davis. Fig. 6 represents the instrument as proposed, capable of measuring fully 90° from E to N. A fixed pinacle was recommended to be used in the same, which a ray from the sun would make upon the sight C. The sight F was movable. The observer, standing with his back to the sun would look through F and C at the horizon, shifting the sight F up or down till the ray from the sun coincided with the horizon. The distance E to F would represent the altitude, and the remaining part of F to N the zenith distance. The English quadrant which this was to supersede differed in having about half the arc from E towards N, and, instead of the pinacle being fixed at E, it was on a smaller arc represented by the dotted line e8, and movable. It was placed on an even number of degrees, considerably less than the altitude; the remainder was measured on the larger arc, as described.

Fig. 6. Halley's observations were published posthumously in 1742, and in 1741, Commissioners of Longitude paid his daughter £400 for M.S. supposed to be useful to navigation. As the moon passes the stars lying in her course through the heavens at the mean rate of 33° in one minute of time, it is obvious that an error to that amount in measuring from a star a minute of time will produce a difference of one degree in longitude. As the moon's motion with regard to the sun is nearly one degree a day less, a similar error in the distance would produce still more effect.

Hadley's instrument, on the other hand, described to the Royal Society in May 1731 (Phil. Trans.) embodies Newton's idea of bringing the reflection of one object to coincide with the direct image of the other. He calls it an octant, as the arc is actually 45°, or the eighth part of a circle; but, in consequence of the angles of incidence and reflection both being changed by a movement of the index, it measures an angle of 90°, and is graduated accordingly; the same instrument has therefore been called a quadrant. It was very slowly adopted, and no doubt there were numerous mechanical difficulties of centring, graduating, &c., to be overcome before it reached perfection. In August 1732, in pursuance of an order from the Admiralty, observations were made with Hadley's quadrant on the East India Company's yacht of 60 tons, sheeress, in rough weather, by persons—except the master attendant—an unaccustomed to the motion; still the results were very satisfactory. A year later Halley published (Phil. Trans., 1733) the description of an instrument for taking altitudes when the horizon is not visible. The sketch represents a curved tube or spirit-level, attached to the radius of the quadrant, since which time many attempts have been unsuccessfully made to construct some form of artificial horizon adapted to use at sea on board ship, a discovery which would greatly facilitate observations at night and at the many times when the natural or sea horizon is imperfectly visible.

From the year 1714 the history of navigation in England is closely associated with that of the "Commissioners for the discovery of longitude at sea," a body constituted in that year with power to grant annually sums not exceeding £2000 to assist experiments and reward minor discoveries, and also to judge on applications for much greater rewards which were from time to time offered to open competition. For a method of determining the longitude within 60 geographical miles, to be used by a vessel of 100 tons, the sum of £10,000 was offered; within 40 m., £5,000; within 30 m., £3,000. £10,000 was also to be given for a method that would determine longitude within 80 m. near the shores of greatest danger. No action seems to have been taken before 1737; the first grant made was in that year, and the last in 1815, but the board continued to exist till 1828, having disbursed in the course of its existence £101,000 in all. In the interval a number of other acts had been passed either dealing with the powers, constitution and funds of the commissioners or encouraging nautical discovery; thus the act 18 George II. (1745) offered £20,000 for the discovery by a British ship of the North-West Passage, and the act 16 George III. (1775) offered the same reward for a passage to the Pacific either north-west or north-east, and £5000 to any one who should approach by sea within one degree of the North Pole. All these acts were swept away in 1828, when the longitude problem had ceased to attract competitors, and voyages of discovery were nearly over.

The suggestions and applications sent in to the commissioners were naturally very numerous and often very trifling; but they sometimes furnish useful illustrations of the state of navigation. Thus, in a memorial by Captain H. Lanoue (1736), he records a number of recent casualties, which shows how desperately the largest ships were then navigated. Several men-of-war off Plymouth in 1691 were

1 This total comprises the large sums awarded to Harrison and to the widow of Mayer, the cost of surveys and expeditions in various parts of the globe, large outlays on the Nautical Almanac and on subsidiary calculations and tables, rewards for new methods and solutions of problems, and many minor grants to watchmakers or for improvements in instruments. Thus Jesse Ramsden received in 1775 and later about £1600 for his improvements in graduation (q.v.), and E. Massey in 1804 got £200 for his log (see Log).
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wrecked through mistaking the Deadman for Berry Head. Admiral Wheler's squadron in 1694, leaving the Mediterranean, ran on Griffin Rock after they thought they were the South Seas. Cloudesley Shaw's squadron, in 1707, was lost on the rocks off Scilly, by erring in their latitude. Several transports, in 1711, were lost near the river St Lawrence, having erred 15 leagues in the reckoning. The lead in the Lizard, the ship, the Lizard, on the 17th of November 1721, the same day on which he sailed from Plymouth.

Many rewards were paid by the commissioners for methods by which it was proved that calculations involved in “clearing the lunar distance” could be abbreviated; thus Israel Lyons (1730-1775) received £10 for his solution of this problem from the commissioners in 1760; and in 1772 he and Richard Duth rivals, each obtained £50. George Whitchell, master of the Royal Naval Academy, Portsmouth, conceived a plan whereby the correction could be taken from a table by inspection. In October 1765 the commissioners awarded him £100 for this work. He gives his own plan of taking and printing 1000 copies of his table. On the following April he gave him £200 more. The work was continued on the same plan by Antony Shepherd, the Plimton professor of astronomy, Cambridge, with some additions by the astronomer-roial. The total cost of the ponderous 4 to volume up to the time of publication in June 1772 was £3100, after which £500 more was paid to the Rev. Thomas Parkinson and Israel Lyons for examining the results. It was a very large and expensive volume—ill-adapted for ship's use. Considerable sums were paid by the commissioners from time to time for other tables to facilitate navigation—not always in judicious arrangement of lofty tables. Michael Taylor and those of Mendoza, published in 1815. The proposals submitted to the board to find the longitude by the time of the transit of Venus were of every number.

One of the first points to which the attention of the commissioners was directed was the survey of the coasts of Great Britain, which was pressed on them by Whiston in 1737. He was appointed surveyor of coasts and headlands, and in 1741 received a grant for instruments. An act passed in 1740 enabled the commissioners to spend money on the survey of the coasts of Great Britain and the “plantations.” At a later date they bore part of the expenses of Cook's scientific voyages, and of the publication of their results. Indeed it is to them that Cook's own survey of the south coast of Africa is due. He gives his own plan of taking and printing 1000 copies of his table. On the following April he gave him £200 more. The work was continued on the same plan by Antony Shepherd, the Plimton professor of astronomy, Cambridge, with some additions by the astronomer-roial. The total cost of the ponderous 4 to volume up to the time of publication in June 1772 was £3100, after which £500 more was paid to the Rev. Thomas Parkinson and Israel Lyons for examining the results. It was a very large and expensive volume—ill-adapted for ship's use. Considerable sums were paid by the commissioners from time to time for other tables to facilitate navigation—not always in judicious arrangement of lofty tables. Michael Taylor and those of Mendoza, published in 1815. The proposals submitted to the board to find the longitude by the time of the transit of Venus were of every number.

Before we pass on to these two important topics we may with advantage take a view of the state of practical navigation in the middle of the 18th century as shown in two of the principal treatises then current. When Roberton's Elements of Navigation passed through six editions between 1755 and 1796. It contains good teaching on arithmetic, geometry, spherical trigonometry, astronomy, geography, winds and weather. There are two good traverse tables, one to quarter points, the other to every 15 minutes of arc; the distance to each is 120 m. There is a table of meridional parts to minutes, which is more minute than customary. Book iv, upon what is now called "the day's work" or dead-reckoning, appears to embrace all that is necessary. A great many methods, we are told, were then used for measuring a ship's range of latitude: the late Captain Henry showed that the half-minute glass were generally used. Bouger and La Caselle proposed a log with a diver to avoid the drift motion (1753 and 1760). Robertson's rule of computing the equation of equal altitudes is as good as any. It is well established that time it is a proper instrument of an equal-altitude instrument, having three horizontal wires, probably such as was used at Portsmouth for testing Harrison's timekeepers. The mechanical difficulties must have been great in preserving a perpendicular stem and a truly horizontal sweep for the time between the equal altitudes of the sun—all good, as is also the remark that "the greater the moon's meridian altitude the greater generally the tides will be." He states that Lacaille recommends equal altitudes being observed and worked separately, in order to find the time from noon, and the mean of the results taken as the truth. There is a sound article on chronology, the ancient and modern modes of reckoning time. A long list of latitudes, longitudes and distances, with their sources and references, is given. The second volume was published by the author to treat of navigation mechanical and theoretical; by the former he means seamanship. He gives instructions for all kinds of vessels. In particular, the treatment of the Dead Reckoning is good. There are two good traverse tables, one to quarter points, the other to every 15 minutes of arc; the distance to each is 120 m. There is a table of meridional parts to minutes, which is more minute than customary. Book iv, upon what is now called "the day's work" or dead-reckoning, appears to embrace all that is necessary. A great many methods, we are told, were then used for measuring a ship's range of latitude: the late Captain Henry showed that the half-minute glass were generally used. Bouger and La Caselle proposed a log with a diver to avoid the drift motion (1753 and 1760). Robertson's rule of computing the equation of equal altitudes is as good as any. It is well established that time it is a proper instrument of an equal-altitude instrument, having three horizontal wires, probably such as was used at Portsmouth for testing Harrison's timekeepers. The mechanical difficulties must have been great in preserving a perpendicular stem and a truly horizontal sweep for the time between the equal altitudes of the sun—all good, as is also the remark that "the greater the moon's meridian altitude the greater generally the tides will be." He states that Lacaille recommends equal altitudes being observed and worked separately, in order to find the time from noon, and the mean of the results taken as the truth. There is a sound article on chronology, the ancient and modern modes of reckoning time. A long list of latitudes, longitudes and distances, with their sources and references, is given. The second volume was published by the author to treat of navigation mechanical and theoretical; by the former he means seamanship. He gives instructions for all kinds of vessels. In particular, the treatment of the Dead Reckoning is good.
two at Greenwich Observatory, to be 3° 54' 20" west of Greenwich. In February 1705 the commissioners of longitude expressed an opinion that the trial was satisfactory, but required the principles to be disclosed and other watches made. Half the great reward was paid to him at once. A few years later, this year 1767, he gave up everything to them within six months. The second half was not paid till 1773, after trials had been made with five watches. The watch was made at Greenwich by Maskelyne, who, as we shall see, was a great advocate of lunars, and was not ready to admit more than a subsidiary value to the watch. A bitter controversy arose, and Harrison in 1767 published a book in which he championed Maskelyne with exposing his watch to undue criticism. The feud between the astronomer-royal and the watchmakers continued long after this date.

Even after Harrison had received his £20,000, doubts were felt as to the certainty of his achievement, and fresh rewards were offered in 1774 both for timekeepers and for improved lunar tables or other methods. But the tests proposed for timekeepers were very discouraging, and the watchmakers complained that this was due to Maskelyne. A fierce attack on the astronomer's treatment of himself and other watchmakers was made by Thomas Mudge in 1792, in A Narrative of Facts, addressed to the first lord of the Admiralty, and it is not surprising that the complaint did not meet with much justice. Harrison at this date still says that he would prefer an occultation of a bright star by the moon and a number of correspondent observations of transits of the moon calculated to the moon centre, and that the best way would be by two parallel and remote places, to any timekeeper. The details of these controversies, and of subsequent improvements in timekeepers, need not detain us here. The names of J. R. Dollond and T. F. Rother, who, as watchmakers are prominent, each of whom received, up to 1805, £2000 reward from the commissioners of longitude. It was Arnold who introduced the name chronometer. The French emulated the English efforts for the production of good timekeepers, and favourable trials were made between 1768 and 1772 with watches by Le Roy and F. Berthoud.

The marvellous accuracy with which the modern chronometer is constructed is doubtless greatly stimulated by the annual competition at Greenwich, from which the Admiralty purchase for the British navy. These chronometers are all fitted with secondary compensation balances, and it is therefore unusual in the navy to apply any temperature correction to the rate. The perfection obtainable in compensation may be illustrated by the performance of a chronometer at the Royal Observatory in 1886, which at a mean temperature of 50° F. had a weekly rate of 1-6 secs. losing; and on being further tested at a mean temperature of 92° F., it only changed its weekly rate to 2-9 secs. losing. In the mercantile marine cheaper chronometers without secondary compensation are more commonly used, and temperature corrections applied, calculated from a formula originally proposed by Hartnup, formerly of the Liverpool Observatory. Great attention has been paid to this mode of compensation, as illustrated by the following facts. From the discussion of the records of performance of the chronometers of the Pacific Steam Navigation Company during twenty-six voyages from London to Valparaiso and back, by giving equal weight to each of the three chronometers carried by each ship, the mean error of longitude for an average voyage of 101 days was less than three minutes of arc. As a single instance, in the s.s. Orelana, on applying temperature rates during a voyage of 63 days, the mean accumulated error of all three chronometers was only 2-3 sec. of time.

While we were thus rapidly approaching their present perfection the steady progress of astronomy both by the multiplication and increased accuracy of observations, and by corresponding advances in the theory, had made it possible to construct greatly improved tables. In observations of the moon Greenwich still took the lead; and it was here that Halley's successor Bradley made his two grand discoveries of aberration and nutation which have added so much to the precision of modern astronomy. Kepler's Rudolphine tables of 1627 and Street's tables of 1661, which had held their ground for almost a century, were rendered obsolete by the observations of Halley and his successors. At length, in 1753, in the second volume of the Commentarii of the Academy of Göttingen, Thaddeus Mayer printed his new solar and lunar tables, which were to have so great an influence on the history of navigation. Mayer afterwards constructed and submitted to the English government in 1755 improved MS. tables. Bradley found that the moon's place by these tables was generally correct within 1', so that the error in a longitude found by lunar would not be much more than half a degree if the necessary observations could be taken accurately at sea. Thus the lunar problem seemed to have at length become a practical one for mariners, and in England it was to the prime of its development. The father of all lunar navigation—"the father," as he has been called, "of lunar observations."

In 1761 Maskelyne was sent to St Helena to observe the transit of Venus. On his voyage out and home he used Mayer's printed tables for lunar determinations of the longitude, and from St Helena he wrote a letter to the Royal Society (Phil. Trans., 1762), in which he described his observations made with Hadley's quadrant of 20 in. radius, constructed by John Bird, and the glasses ground by Dollond. He took the observations both ways to avoid errors. The arc and index were of brass, the latter made of mahogany, and so adjusted as to divide into minutes. The telescope was 6 in. long, magnified four times the ordinary magnification. Very few seamen in that day possessed so good an instrument. He considered that his ship's time should be ascertained within twelve hours before or after observing the lunar distance, as a good common watch will scarcely vary above a minute in that time. This shows that he must have intended the altitudes to be calculated—which would lead to new errors. He considered that his observations would give the longitude within 15 degrees. On the 11th of February he took ten observations; the extremes were a little over one degree apart.

On his return to England Maskelyne prepared the British Mariner's Guide (1763), in which he undertakes to furnish complete and easy instructions for finding the longitude at sea or on shore, within a degree, by observing the distance between the moon and sun, or a star, by Hadley's quadrant. How far that promise was fulfilled, and the practicality of the instructions are points worth consideration, as the book took a prominent place for some years. The errors which he said were inseparable from the dead-reckoning, "even in the hands of the ablest and most skilful navigators," amounting at times to 15 degrees, appear to be overestimated in this book. He attempted to determine the moon's position at time of observation from Mayer's tables, would, he believed, always determine the longitude within a degree, and generally to half a degree, if applied to careful observations. He recommends the two altitudes and distance being taken simultaneously when practicable. The probable error of observation in a meridian altitude he estimated at one or two minutes, and in a lunar distance at two minutes. He then gave clear rules for finding the moon's position and distance by ten equations, too laborious for seamen to undertake. Admitting the requisite calculations for finding the moon's place to be difficult, he desired to see the moon's longitude and latitude computed for every twelve hours, and hence her distance from the sun and from a proper star on each side of her carefully calculated for every six hours, and published beforehand.

In 1765 Maskelyne became astronomer-royal, and was able to give effect to his own suggestion by organizing the publication of the Nautical Almanac. The same act of 1765 which gave Harrison his £5,000 gave the commissioners authority to publish tables of corrections for the longitudes of the HMS. The improvements up to his death in 1762, were bought from his widow for £3000; £500 was granted to the mathematician L. Euler, on whose theory of the moon Mayer's later tables were formed; and the first Nautical Almanac, that for 1767, was published in the previous year, at the cost and under the authority of the commissioners of longitude. In 1766 the French nautical almanac for the following year appeared, an improvement on what had been before issued by private persons, but it did not
attempt to give lunar distances. 1 In the English Nautical Almanac for 1767 we find everything necessary to render it worthy of confidence, and to satisfy every requirement at sea. The great achievement was that of giving the distance from the moon's centre to the sun, when suitable, and to about seven fixed stars, every three hours. The mariner has only to find the apparent time at ship, and clear his own measured lunar distance from under letter patent from the king dated 24th March 1679, then laid by the editor of the book are the methods of Lyons and Dunthorne, and then by simple proportions, or proportional logarithms, find the time at Greenwich. The calculations respecting the sun and moon were made from Mayer's last manuscript tables under the inspection of Maskelyne, and were so continued till 1804. 2 The calculations respecting the planets are from Halley's tables, and those of Jupiter's satellites from tables made by Wargentin and published by Lalande in 1739 (except those for the fourth satellite). The original Nautical Almanac contained all the principal points of information which the seaman required, but the great value of such an authentic publication to the whole astronomical world led soon to a considerable increase to its contents. As much of this was unnecessary for the ordinary requirements of navigation, since 1903 it has been issued in two forms, the larger for observatory purposes, the smaller for the class for whom it was originally intended.

Various useful rules and tables were added to early volumes of the Almanac. Thus that for 1771 contains a method and table for determining the position of the sun's parallactic altitude at any time, published by Cornelis Donnes of Amsterdam in 1740. At the end of the Almanac for 1772 Maskelyne and Whewell gave three special tables for clearing the lunar distance; still their rule is not exact, and improvement Dunthorne's solution is also given. In the edition for 1773 a new table for equations of equal altitude was given by W. Wales. In those for 1779 and 1800 tables were added by John Brinkley for rendering the observations for double altitudes easier. The plan of the Nautical Almanac was soon imitated by other nations. In France the Académie Royale de Marine had all the lunar distances translated from the British Nautical Almanac for 1773 and following years. As for China, the British Almanac for 1792 is the last seen, and ten thousand copies were soon sold. A second edition, prepared by Wales, appeared in 1781, an octavo of 237 pages, in the preface of which it is stated that it contains everything necessary for computing the latitude and longitude by observation. There are in all twenty-three tables, the traverse table and table of meridional parts alone being deficient as compared with modern works of the kind; dead-reckoning Maskelyne did not touch. He gave practical methods for working several problems; that for computing the lunar

especially an improvement on those by Lyons and Dunthorne, and a rule given for clearing the distance, called Dunthorne's improved parallactic altitude. Remarkably, short was Maskelyne's rule for finding the latitudes by two altitudes and the elapsed time also is good. The third edition of the Tables was issued in 1802.

The publication of the Requiæ Tables met a great want, and the existence of such accurate and conveniently arranged methods of tables for the special purposes of nautical calculations led to the more general use of many refinements which had been previously neglected. They form the original of many subsequent and greatly extended collections, of which those by J. W. Norie are the more generally used in modern times in the mercantile marine, and the very accurate and comprehensive tables by James Inman (originally published in 1823) are now largely used in the Royal Navy.

Until the middle of the 17th century mariners generally employed small collections of Dutch charts, known as "waggoners" from Wagener, the name of a celebrated Dutch hydrographer in 1684. In 1671 appeared the English Pilot by John Scoles, who is styled the "Hydrographer Royal." It forms a collection of rude sketches of the coasts of England, the North Sea, France and Spain, with sailing directions, and on its appearance the importation of Dutch charts was prohibited. Private enterprise, for many years after that, supplied both the British navy and the British mercantile marine with constantly improving charts, especially latterly, under the powerful patronage of the East India Company, whose hydrographer (Alexander Dalrymple), in 1795, was selected as the first hydrographer of the Admiralty. This post has since been occupied by a succession of distinguished naval officers under whom have grown up the School of Hydrography surviving for the safe navigation of the ship," while on the completion of a voyage of discovery it was customary for the results to be published for the benefit of the public.

The establishment of the Admiralty Hydrographical Office in 1795 marked a great step in the advancement of the art of navigation. On the 12th of August of that year an order in council placed all such nautical documents as were then in the possession of the Admiralty in charge of Dalrymple, whose catalogue, compiled for the use of the East India Company in 1786, contained 347 charts between England, the Cape, India and China; thus the germ of the present hydrographical department was established. The expense was then limited to £50 a year. The first official catalogue of Admiralty charts was issued in 1830, the total number being then 962. In close of the war devastating in 1815 both trade and science revived, and several governments besides that of Great Britain saw the necessity of surveying the coasts in various parts of the globe; the greater portion of the work fell to the English hydrographical department, which took under its charge nearly every place where the inhabitants were not able to do it for themselves. Since that time its carefulness has steadily developed, and it not merely undertakes the constant improvement of the charts of the whole world, but periodically issues for the use of the seafaring community a vast amount of most accurate and practical nautical information on the various closely allied subjects of navigation, tides, compass adjustment and ocean meteorology.

A knowledge of the times and heights of high and low water and the directions of the tidal streams due to those phenomena are in many parts of the world (especially round our own coasts) of great importance. The tide tables have been laid down by Newton and Laplace, and in Phil. Trans., 1683, there is an account of Flamsteed's tide table for London Bridge, which gave the times of each high tide on every day in the year. For a long subsequent period empirical tide tables for a few places in England were published by private individuals, but in 1832 the researches of Dr W. Whewell and Sir J. W. Lubbock enabled official tide tables to be issued for Liverpool and Grimsby. They were advanced in detail and accuracy, being now in many cases based on continuous tidal observations for a whole lunar period of 18½ years, and represent the practical epitome of our knowledge of the tides and currents. The formule and tables on which these predictions are based are given in the introduction to each annual volume (see Tide).

Modern Navigation

Having thus sketched the progress of the art of navigation from an early period to the present time, we will now describe the modern methods by which it is brought into practical use,
referred to in more technical information to the professional text-books enumerated at the end of this article. The great development in both speed and size of modern ships enormously increases the responsibilities of those who command and navigate them, and has led to a careful examination of the existing modes of determining a ship's position at all times by day or night, both when in sight of land and on the open ocean. An examination of the present text-books on the subject of navigation shows how problems and methods which were formerly considered chiefly as theoretical exercises have now, from the altered conditions of the navigation of very fast ships, become methods of frequent practice, while corresponding improvements have been made in instruments of observation and chronometers, by the aid of which more satisfactory results are now attained. Much has also been done to advance the study of this and its numerous allied subjects by the development of the Royal Naval College at Greenwich and the United Service Institution; also by the establishment of shipmasters' societies (of which the well-known society in London is typical), where during the year valuable papers are read and useful discussions take place among those actually carrying out the practice of navigation.

In coming out in advance a long ocean voyage the experienced navigator would first, by laying down the track from port to port on a great circle chart, ascertain the shortest route between them, remembering that the greatest saving in distance over other routes is when the ports are far apart in longitude and both in high latitudes of the same name. On examining such a track in conjunction with the wind and current charts it will be seen what modifications the intervention of land, unfavourable currents or winds, ice or unduly high latitude render necessary, and such modified route would be finally adopted subject to possible change as the voyage progressed. The judgment forming the basis of this course laid down for the voyage can be shown by the remarks in the volumes of Sailing directions or "Pilots" relating to the region about to be traversed, while among the many excellent modern publications of the Hydrographic Office of the Admiralty perhaps the Ocean Passage Book is one of the most generally useful, since, when used in combination with the admirable charts of suggested full-powered and auxiliary tracks, it very greatly assists all navigators in planning out a successful voyage. Finally the intended route would be transferred from the great circle chart to one on Mercator's projection, which is more convenient for purposes of navigation since in constructing the former for the sake of simplicity a projection of the coast's surface is adopted on which great circles are correctly shown as straight lines (gnomonic), while for practical purposes in navigation such a representation on which a ship's track when steering a continuous course (technically termed a rhumb line) is truly shown as a straight line (Mercator) is the most convenient, although in high latitudes giving a very distorted representation of the surface depicted. It is well to remember that on great circle charts rhumb lines become curves and great circles straight lines, and, vice versa, on Mercator charts, the rhumb line of one projection being that nearer to the equator, all meridians and the equator on both projections are shown as straight lines.

Ships rarely steer on great circles, which would generally theoretically involve continually altering course, but a series of chords of such circles are described of lengths such as involve a practical change of course of one or two degrees on the completion of each.

Great circle charts are very useful for drawing what is known as a composite track where if the great circle route would lead into too high a latitude the shortest route to and from the highest desirable parallel is readily laid down, the intervening track being pursued on that parallel.

A method of drawing approximate great circles directly on Mercator charts was proposed by Airy in 1858, and is sometimes very useful. The excellent idea, originally suggested by M. F. Maury, of establishing steam "lanes" in localities where there is much ocean traffic, so as to minimize the risks of collision between outward and homeward bound ships, has been successfully carried out in the North Atlantic. The leading transatlantic steamship companies now agree to follow great circle routes from the Irish coast to points on the Banks of Newfoundland, which vary somewhat in position with the season of the year, but are published in advance. These "lanes" being avoided by sailing vessels, risks of collision are materially lessened.

Having thus planned the most desirable general track to pursue, three methods are employed to ascertain the position of the ship at any time during such voyage: these are (1) projecting the track on charts; (2) simple trigonometrical calculation of the port of arrival where the ship then is, the course steered and distance run; and (3) astronomical observations, which form an entirely independent method.

Of these the first is the least trustworthy, owing to the usual difficulties attending accurate graphic methods and the small scales on which ocean charts are necessarily drawn. When near the land the larger scale coast charts are used, and in the approaches to harbours still larger scale plans give increasing accuracy to this record of a ship's position. Index charts of all parts of the world are provided, by referring to which the navigator ascertains where the chart begins to employ, always preferably using that on the largest scale.

On leaving harbour, and while near the coast, the position is not found by calculation but by frequently observing (when a variety of objects is in sight) (1) simultaneous sextant angles between suitably situated objects subsequently laid down on the chart by a station pointer; (2) simultaneous compass bearings of two or more objects (technically known as cross bearings); or (3) a combination of both methods by employing one bearing and one angle. All such methods are capable of considerable accuracy if the observations are made simultaneously. Frequent observation of objects, or sometimes only one, be visible (as frequently occurs at night) other and rougher methods are practised, depending upon the change of bearing of an object while a certain distance in a certain direction is traversed by the ship, such knowledge being based in many cases on an estimate of the action of the tide. When a ship is steaming at the rate of 20 knots the navigator remembers that a mile is passed over in three minutes, and that if in sight of land and fixing positions by objects on shore, it is essential to adopt some rapid method; otherwise when laid down on the chart the position shows where the ship was, and not where she is. This difficulty has led to the more general use of methods of obtaining positions by angles instead of bearings, and laying them down on the chart by the aid of the station pointer. Many advantages accrue from this, as the observer is not restricted in position on board, as is the case when using the compass, and especially if a double sextant (having two index glasses and one horizon glass) is employed two angles can be measured simultaneously, the result on the chart being very rapidly arrived at. An ingenious combination of sextant and station pointer in one has been proposed, and most simply carried out by attaching vertical sights to the legs of a station pointer, which is put on a suitable horizontal stand, and the legs moved until the sights are in line with the objects observed. To assist the navigator in the choice of suitable objects between which to measure the angles, a very useful pamphlet is issued by the Admiralty, from the diagrams in which it can be seen at a glance which combination of objects in sight gives the most favourable result, always remembering as a broad principle that nearer objects are more suitable than distant ones, and that the accuracy of position determined depends on the relative distances of the objects as well as on the magnitude of the angles between them.

In these circumstances, which render these rougher methods those only available, and especially in hazy weather in many known localities (such as the English Channel), a continuous line of deep sea soundings at fairly even distances apart affords an additional verification of position, remembering that only an occasional sounding might prove very misleading.

The chronicle of progress in the art of navigation would be very
incomplete without reference to the extended use of Lord Kelvin's sounding machines, either in the original form, where the increased pressure at different depths is recorded by dis-coloration of chemical tubes, or in the later form known as the "depth recorder," where similar results are obtained by the automatic record of the position of a piston forced upwards in a tube by this increased pressure. Very satisfactory results can be obtained at speeds of 15 or 16 knots, enabling that great safeguard of navigation in many places, viz. a continuous line of soundings, to be accurately and rapidly obtained. In connexion with this should be mentioned a most ingenious invention known as the "submarine sentry," which on being set for any desired depth and towed overboard remains at that depth whatever the speed of the ship may be. On striking bottom it at once floats to the surface and rings a warning bell. Such an instrument is of obvious value in ships where, owing to the small number of available men, it is difficult to maintain a continuous line of soundings. To avoid an unnecessarily wide détour in rounding points and shoals, extensive use is now made of both horizontal and vertical danger angles; the former is the angle on the arc of a horizontal circle passing through a point at the rector to the horizontal diameter and the latter to the vertical diameter through two previously selected, easily recognized, fixed objects. Should circumstances enable the selection to be made of an angle of about 90°, the ship by continually measuring the angle may be steered on the arc of such a circle with great precision, and may even be safely taken through a channel between two dangers. The vertical danger angle enables similar results to be attained by measuring the vertical angle subtended by a known height; but except where the selected object is one whose height is well determined, such as a lighthouse, this method is not so trustworthy as the former.

Before losing sight of land the latitude and longitude of the last well-determined position found by the methods referred to is taken from the coast chart, transferred to the ocean or small scale chart, and considered to be the "departure" or starting-point of the ocean voyage, and from that point the course and distance run by the ship is laid down, being rectified on every occasion when the position is more accurately determined by astronomical means. To obviate the inevitable inaccuracies attending this graphic method and as a corroboration of the ship's position, the changes of latitude and longitude involved in each alteration of course are daily calculated by plane trigonometry and the results are reduced to the same scale, are then the basis of the Traverse Table, which is a tabulated expression of the solutions of right-angled plane triangles.

The foregoing modes of keeping account of a ship's position are technically known as "dead reckoning." The general introduction of compasses with short needles and slow periods of vibration has done very much towards improving the accuracy with which a ship's "dead reckoning" is kept. The original model of these was that patented by Lord Kelvin in 1876, and since adopted in the British navy as the standard. In this instrument we have a compass specially designed to enable the principles of compensation or correction proposed by Sir G. B. Airy in 1837 to be accurately carried out, while its slow period of swing renders it in all circumstances extremely steady.

The record of distance run is always obtained from the patent log, usually in the form of the Cherub or Taffrail log introduced in 1878. The common or hand log has ceased to be regarded as anything but the very roughest of guides, and the patent log in its original form, in which it recorded the revolutions of a small screw ship, does not give satisfactory results at great speeds, nor can anything more favourable be said of those forms where pressure on known areas is employed. The revolutions of the engines, with due allowance made for the condition of the ship's bottom, afford now perhaps the best means of estimating speed (see Log).

Astronomical observations afford the most accurate means of ascertaining positions at sea, other methods (dead reckoning) being only relied upon when the weather does not admit of the practice of these, though by utilizing twilight and night observations of moon, stars and planets, the navigator in most parts of the world need seldom proceed far without the means of astronomically rectifying his position either in latitude, longitude or both at the same time.

The practical problems involved are precisely those employed at astronomical observatories, but it is not possible to attain similar accuracy of results, for though the sextant (the instrument always employed at sea in making such observations) is capable of marvellous accuracy, yet, as practically all such observations depend directly upon altitudes measured above the ocean surface, and consequently on the height of the ship above the Great Sea Level, the results of this, due to the changing effects of refraction, much affect observations made at any one time. This error in practice is greatly reduced by methods of combining several observations made at different times and using their mean or average result.

A notable feature of the progress of the art of modern navigation is the greatly increased practice of star navigation, and many of the supposed difficulties of night observations are found to be removed by experience. Determinations of positions at sea by twilight observations, when the brighter stars become visible while the horizon is still well defined, are probably the most practicable. By combining altitude and distance, the position of the ship may be determined. For purposes of combining for latitude stars passing north and south of the zenith, and for longitude those near the prime vertical both east and west, can generally depend upon a good result, especially if suitable stars can be found for each pair at about the same altitudes. For these purposes the armillary sphere is extremely useful: this is a small celestial globe on which are depicted the principal stars visible to the naked eye. On elevating the pole to the approximate latitude of the observer, and turning the sphere until the sidereal time is under the fixed meridian, a correct representation of the heavens at the time of observation is obtained; the stars are then easily identified by their bearings and altitudes. This valuable instrument is not merely useful when at twilight, only a few of the brighter stars being visible, the constellations to which they belong are difficult of recognition, but it enables arrangement to be made in advance for such observations as are desired to be taken during the night. By marking in pencil on the globe the positions of the planets in right ascension and declination, the same sphere is also available for their identification. The heavenly bodies commonly observed at sea are: The Sun, Moon, Venus, Mars, Jupiter, Saturn, the stars, and the planets. The chief astronomical observations made at sea are those for ascertaining (1) latitude, (2) time and thence longitude, (3) error of compass, and (4) latitude and longitude simultaneously.

The chief latitude observations made at sea are those for determining (1) latitude, (2) time and thence longitude, (3) error of compass, and (4) latitude and longitude simultaneously. For astronomical latitude observations made at sea are those for determining (1) latitude, (2) time and thence longitude, (3) error of compass, and (4) latitude and longitude simultaneously.
observations of it can be taken at any time when it is visible, and from a convenient table given in the Nautical Almanac the altitude of the sun at any place, with the exception of the time interval for sunrise or sunset, may be assumed in all well found modern ships that on applying the known errors and accumulated rates to the times shown by the chronometers taken at the time of departure, the longitude may be ascertained as accurately known, and as the distance east or west of any place is merely the difference between the two local times at any instant expressed in degrees, so also is the distance east or west of Greenwich [longitude] obtained by the difference between the time at place and the time at Greenwich at any instant. The connexion between time and degrees depends upon the complete rotation of the earth in twenty-four hours, causing meridians 15° apart to pass under the same fixed point in the heavens at intervals of one hour. In the calculations, those errors and differences are considered as small quantities, and those west later, resulting in local time being in advance of Greenwich time in east longitude and vice versa in west longitude.

The navigator gains or loses the same number of seconds as the rate of the chronometer referred to are known from observations made on shore prior to the beginning of the voyage with a sextant and artificial horizon, and these observations are capable of almost as great accuracy as those taken at sea, an essential element of the navigator's position. The error of the chronometer is absolutely an essential opportunity is taken at each principal port visited of either repeating such observations or obtaining the information from time balls dropped from observatories on shore at the Greenwich meridian, and thus in the The calculation of the longitude can only be found with fair accuracy from calculations based on altitudes of heavenly bodies, when they are nearly east or west of the observer or any place at which they are approximately seen from the azimuth diagrams or from tables of true bearings of heavenly bodies, and the error involved by using such to the position of the horizon can be greatly obliterated in twilight or at periods of observation when nearest the meridian of the ship's course during the voyage. The observations of bodies bearing east and west. In the usual case of determining time by observations of the sun the results arising from morning observations are compared with those similarly obtained by the observer at noon. If the time taken for this observation as made by any unallowed-for error in the chronometer exist it will affect the determining longitude by its full amount.

In considering the foregoing methods of astronomical fixing a ship's position, there are the twain, when the two elements of latitude and longitude are determined at different times, and generally, as we shall presently see, when they are determined together (though usually for a shorter period the navigator has to depend for some time on the accuracy of the course steered and estimated distance run; also when cloudy weather prevails he has to depend entirely on those elements for a knowledge of the ship's position. The frequent astronomical observation of the error of the compass is therefore a most important and fortunately simple duty. In practice the error is found by a comparison between the compass bearing of a heavenly body and its true bearing, obtained either by calculation, or more accurately by the use of directographic diagrams of azimuths and bearing tables from which at practically any time when above the horizon the true bearings of the principal heavenly bodies are taken by inspection of the Mercurius chart involving total errors thereby. The ship observed when the body observed is bearing nearly east or west true if not too high, but if clouds prevent observations at such times, fairly good results can be obtained by observing the compass bearing when the object observed is the meridian (if too high) and therefore lying north or south true.

The causes of the changing errors of a compass in an iron ship are described elsewhere (see COMPASS), but by making comparisons as above the navigator can at once ascertain what is termed the "total" error, and if he takes from that the portion of error due to the earth, or what is termed variation (known from a chart of such elements), the remaining error is what is called deviation. The latter method of procedure has the great advantage of enabling the navigator to ascertain during a voyage whatever magnetic changes in the ship are taking place other than that arising from the earth's magnetic field, and the error is the total error that is applied to compass courses. Deviations greater than a few degrees are not merely inconvenient but in modern compasses produce unsteadiness or oscillation of the compass cards and necessitate the use of compensating magnets which reduces such errors by adjusting the compensating magnets when favourable occasions offer. Recognizing the great value of a sound knowledge of the compass and its measurement, the subject has been included among the compulsory subjects of examination for the rank of master, thus following the example of the navy, where all navigating officers have to attend a practical course of study on the subject.

The practical problem of finding both latitude and longitude at the same time is the most important of all in modern navigation, and is rapidly superseding other modes of ascertaining a ship's position. The principle involved depends upon the fact that every heavenly body is at each particular instant of time directly overhead or in the zenith of some place on the earth. Thus, if we take the sun as an instance, it is noon at all places on the meridian of 60° W. when it is exactly 12 noon at Greenwich, and at the one spot on that meridian where the sun's rays are most perpendicular to the earth's surface at the instant the sun's altitude must equal the sum's declination and its longitude in time equal the time since noon at Greenwich. Now at a distance of 60 m. in every direction on the sun's meridian we have a point at which the sun will have an altitude of 89° and in all directions at a distance of 1200 m. its altitude will be 70° (≈90° − 20°), so that on this globe, by marking the position where at a certain instant the sun is vertical and taking the position at noon, the concentric circles may be drawn, on all points of each of which the sun's altitude will be the same. When, therefore, at sea we measure with a sextant at any time the altitude of the sun (say 60°10') we at once know we are somewhere on the arc of a great circle joining the position at noon and the position at that instant, and for radius distance equal to 1790° (≈90°−60°10'). Such information, combined with the best and most recent knowledge we have of the ship's latitude at the time, will of itself afford valuable information as to the position, but by making two such observations, separated by a sufficiently long interval for the position of the sun vertical to have moved considerably (owing to the rotation of the earth), we are able to determine with certainty that we must be at one or other of the widely separated intersections of two such circles, the movement of the ship in the interval between the two observations being duly allowed for. The dead reckoning affords information as to the position of the ship, and hence the two observations, when noted, will determine the ship's position, or using a Mercator chart involves two suppositions: (i) that the concentric circles we have referred to will be correctly represented as circles on a Mercator chart (ii) that the sun's altitude at noon is, say 100 m. of arc may be considered to be a straight line coincident with the tangent to the circle and therefore at right angles to the direction of the sun. Except in high latitudes (above 60°) Mercator's projection fulfills the first condition sufficiently well for practical purposes, and, except when the altitude is greater than 70°, the second condition is also approximately true since the radii of such circles will exceed 1000°.

Now even on a large globe it would be practically impossible to obtain very accurate results from this problem by drawing such circles, but on a large scale chart (or ordinary squared paper) much greater accuracy may be obtained by the use here of a Mercator chart and the construction of concentric circles, which may be used on the chart either as base or side. The Mercator chart involves two suppositions: (i) that the concentric circles we have referred to will be correctly represented as circles on a Mercator chart (ii) that the sun's altitude at noon is, say 100 m. of arc may be considered to be a straight line coincident with the tangent to the circle and therefore at right angles to the direction of the sun. Except in high latitudes (above 60°) Mercator's projection fulfills the first condition sufficiently well for practical purposes, and, except when the altitude is greater than 70°, the second condition is also approximately true since the radii of such circles will exceed 1000°.

If we suppose the latitude of the ship to be right the position will be at B, if not correct it must still be on the line ab, and if near land or any danger the direction of this line, even if no subsequent observation in the same manner be made, will give a trustworthy indication of the direction of the ship. A line cd drawn through C parallel to ab will represent an arc on which the position lies when it is probable that C is correct, and the position at this instant (in 60°) is the position of the ship. If another observation of the sun for longitude is now made and the resulting position is D (lying of course in the same latitude as C), on drawing through D a line ef at right angles to the bearing of the ship, the intersection of the two arcs will be somewhere on an arc as is represented by this line. Hence the intersection of the two arcs on which the position lies and the distance of the ship from the arc where the last observation was taken at the supposed position D, the discrepancies being entirely due to the original unknown error in the assumed latitude of A, for had that been accurate the position on the original line ab would have been off the course and distance from that position C would have coincided with E.

Errors in the assumed latitude of as much in many cases as 30 m. will often be found to produce no practical difference in a majority of cases, but the error in the longitude is often dependent upon the chronometer, and in such cases as arise when the intersecting arcs make a small angle with each other great accuracy...
NAVIGATION

is required in the course and distance run between the times of observation.
This method of finding both latitude and longitude at the same time is commonly known as "Sumner's" method from the publication given to the public by Sumner in 1847. It is subject to an error and is not generally considered as a good method, but it is the only one which has been developed by the American mercantile marine, although in a modified form it was practised at a much earlier date in the British navy under the name of "cross bearings of the sun." This method, in its original form, was more lengthy and troublesome, the work being practically doubled.

We have taken an illustration from observations of the sun, but the method is obviously applicable to all heavenly bodies provided they are so situated that the arcs drawn will intersect at a great angle; this is true at night or at night-time is readily done by selecting two heavenly bodies whose positions do not coincide at the same time. In these cases the small complication of allowing for the run of the ship is often obviated by making the observations simultaneously.

The armillary sphere or star globe is useful in selecting objects suitably situated.

The principle of Sumner's method has of recent years received a very important and valuable development under the name of "new navigation." In this method, originally proposed by M. Hilaire, a comparison is made between the altitude of a heavenly body as actually observed and that calculated from the supposed position of the ship. For instance, the position of an observer at the instant the body is vertically overhead is given by the equation of 45°, and if the body is observed at an angle of 30°, the position of the ship is just somewhere on a portion of the circumference of a circle (usually of such size that the portion considered may be represented on a chart by a straight line) having its centre in latitude equal to the sun's degree and in longitude equal to the meridian of the place at which the observation was made. The altitude of the body is considered to be the radius of such a circle, and the point aloft considered to be the radius of such a circle, and the point halfway up the arc. It is evident that a greater altitude means the ship is nearer to the centre of the circle (above the horizon) and a smaller altitude means the ship is farther from the centre of the circle (below the horizon) than at the instant of observation. This is used when there are two heavenly bodies whose positions do not coincide at the same time.

A careful record of everything pertaining to the navigation of the ship, with the results of all observations and calculated positions, is kept in the ship's log, an official book of great importance, a rough draft of which is usually kept in some convenient place in the ship as an event of the time of their occurrence. A copy of the headings of a page of this as transferred into the official log is here given:

<table>
<thead>
<tr>
<th>Course</th>
<th>Wind</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Direction</td>
<td>Force</td>
<td>Temperature</td>
</tr>
</tbody>
</table>

The course entered here is that which would be indicated by the "standard" compass of the ship (placed in the most favourable magnetic position on the vessel); that actually steered by the officer in charge is the "true" one. When the true course is entered in the log, the position on the chart is plotted. When the officer in charge observes that the "true" course is considerably different from the "standard" course, it is necessary to correct the compass for deviation. This is done by the use of a magnetic compass and weather glass, and the method is described in "Practical Navigation," published by the English government. The log contains also the time, the wind direction and force, the barometer reading, and other matters of importance. The log is usually kept by the ship's master, and the entries are made by his watch-officer, who is responsible for the correctness of the observations.

The course and distance made good each day are calculated by trigonometry between the best determined positions. If two successive noons, such positions in fine weather being always those of the given time, are utilised for this purpose, the latitude is calculated between the two lines of position, and the longitude is calculated by the difference in the positions of the ship at the time of noon. This method is used for the dead reckoning since the previous noon; such differences, however, obviously include the errors of all kinds. The latitude and longitude found by dead reckoning are entered under that heading (D.R.). The next column is usually the "observations," and the "true" or "obs." or "by observation" are seldom both determined at noon, but are carried up or back to that instant by calculation from the intervening dead reckoning. The variation is taken from the published variation chart, on which the latest results of such observations are embodied at intervals of about ten years with the annual changes (as far as known) in different localities, thus enabling the master to obtain the correct variation for the position at which the course and distance are calculated from the position of the ship at noon to the port of destination or some prominent position or danger near which the vessel must pass. This is entered under the heading of "true bearing observed."

AUTHORITIES.—The following list of some of the writers on navigation whose works have not been already mentioned may be found useful to refer to: Thomas Addison, Arithmetic Navigation (1625)—he was the first to apply logarithms; Antonio de Naja (Lisbon, 1628) follows Nuñez and Cespedes, but corrects the declination of the sun and stars; Sir R. Dudley, L'arzo de maro (1630-1645, 2nd ed., Florence, 1771)—too technical to be considered; E. H. Sumner (1681)—one of the best books of the period; William Jones (1702)—a most important treatise containing trigonometry applied to the various rules, the use of tables, and other matters of importance; P. F. S. de la Trinité (Paris, 1676)—too large; M. Pimental, L'Art de naviger (Lisbon, 1712); P. Bouguer, jun., Nouveau traité de navigation (1753)—without tables, published at the time of the last change, improved, and shortened in 1769 under the supervision of the French Academy of Sciences; Nathaniel Colson, The Mariner's New Calendar (1735)—a good book; Seller, Practical Navigation—a book very popular in its time (there was an edition as late as 1739); Samuel Dunn published good star charts and tables of latitude and longitude (1732), and framed concise rules for many problems on navigation (published by the board of longitude); John H. Moore, The Practical Navigator and Seaman's New Daily Assistant (1732)—very popular, and generally used in the British navy—the 18th and 19th editions (1810, 1814) were improved by J. Deiss; W. Wilson (Edinburgh, 1775)—a treatise on navigation—very useful; E. S. B. Kersley, Practical Navigation, or Guide to the Indian Seas (1777)—for the longitude he depends chiefly on a variation chart from observations made by East Indiamen, and he still makes no mention of the Nautical Almanac or of parallel rulers; Samuel Dunn (probably a son of the last named, 1781) is the last writer who gives instructions for the use of the astrolobe; he also wrote on "lunars" (1783, 1793), a name which was generally adopted about this time, and published an excellent treatise on the "lunars" (1796, 4th ed., 1813)—clear and simple; N. Bowditch, Practical Navigator (1800)—passed through many editions and is now (in a revised form) the standard of all who deal with the subject; John J. Kelly, Spherical Trigonometry and Nautical Astronomy (1795, 4th ed., 1813)—clear and simple; N. Bowditch, Practical Navigator (1800)—passed through many editions and is now (in a revised form) the standard of all who deal with the subject; John J. Kelly, Epitome of Navigation (1803, 21st ed. 1878)—still a favourite in the mercantile marine from its simplicity, and because navigation can be learned from it without a teacher; T. Kergin, The Young Navigator's Guide to Nautical Astronomy (1821); Inman, Epitome of Navigation (1821)—with an excellent volume of tables, formerly
NAVIGATION LAWS.

The laws grouped under this title are a branch rather of municipal law than of the general maritime law. They are based upon the right of a state to regulate the navigation of its own waters and to protect its own commerce.

One of the most curious early books on the subject is Captain G. St Lo, England’s Safetie or a Bridele to the French King, proposing a sure Method for encouraging Navigation (London, 2nd ed. 1693). Navigation laws may be divided into two classes. The first class includes all laws designed to secure a commercial monopoly to the state which enacted them. In Great Britain the Acts of 1840, 1843, and 1850 were of this description, and the powers of the Merchant Shipping Acts 1862; the rules at present in force are those contained in the order of the 27th of November 1896, L.G. No. 1892, as amended by subsequent orders in council. The second class includes all laws designed to secure to the ships of most foreign countries, with a special provision as to China. In the case of a state which has not assented to them, the only rules that apply are those of the sea, gradually ascertained by individual cases before courts of admiralty.

1. Of the navigation of its tidal waters—as far as they are territorial—a state may legislate without the assent of other states. An example of such legislation is afforded by the Territorial Waters Jurisdiction Act 1878, a measure passed in consequence of the celebrated case of R. v. Keyn, L.R. 2 Ex. D., 126 (the “Franconia” case), in 1876. Under the head of territorial waters would fall the “narrow seas” (as the Bristol Channel, Great Belt or Straits of Messina), bays and harbours, estuaries and arms of the sea, navigable tidal rivers, and the sea for the distance of a marine league from the shore. Such waters being res publicae though not res communes, as are the water-bodies below, subject to the same law as the state. In England the soil under such waters, or at least under all but the last kind, is prima facie vested in the crown, subject to the public rights of fishery and anchorage. For the distance of a marine league from the shore the law of admiralty is applicable. As to revenue purposes, this is a rule of general international law. It may be noted that the Institut de Droit International proposed to double this limit. See Hall, International Law (1920), 381, p. 154. In England the navigation of most of the principal tidal waters is governed by rules contained in acts of parliament and orders in council, the latter for the most part promulgated under the authority given by the Merchant Shipping Act 1852. For instance, there are numerous orders relating to the Thames, Mersey, Tees and other important rivers.

2. The navigation of non-tidal waters, even though navigable, are in Great Britain practically dealt with as a matter of internal public law, and do not exist as a public franchise, but can only be acquired by prescription founded on a presumed grant by an owner. In Roman law and in the Code Napoléon it is otherwise. Navigable rivers in those systems are publica, subject to public control, and a navigable river is a navigable river by definition, however differently it may be described in private law. In England, navigation of non-tidal waters in the United Kingdom, whether natural or artificial, is now almost entirely regulated by various Navigation and Conservancy Acts, e.g. the Thames Conservancy Acts, the Shannon, Tees, Tweed, etc. Acts, and the Canal Acts, especially the Manchester Ship Canal Act 1885. It may be noticed that the crown is empowered by the Merchant Shipping Act 1862 to make such rules in respect of the internal navigation of the whole country as may be found expedient on the application of the proprietors. Examples of such rules are the orders in council regulating the Mersey and Irwell navigation and the Bridgewater navigation, 18th May 1870. Such waters being private property as a public utility, the permission for the rules by the proprietors is required in the order in council.

The distinction drawn in the United States between navigable and boatable rivers seems to be peculiar to that country, unless indeed it would be possible to lend itself to such navigable or flottable "waters" of the Code Napoléon, § 538. It is at least unknown in Great Britain.

Remedies for Obstruction and Pollution.—These may be either criminal or civil—the criminal by indictment or information, the civil by action for damages or for an injunction, in addition to the criminal remedy, where special damage has been sustained. Pollution is expressly provided for by the Rivers Pollution Prevention Acts, which gives jurisdiction to county courts in cases within the act.

International Law.—The international law as to the navigation of the high seas has been sketched above. Reference should also be made to the late book by Dr. Martin, The Territorial Sea and its Legal Problems.

The leading case is The Immune (1799). 2 C. Robison’s Rep. 186. Regulations for the coasting trade may be made by the government of India under the powers of the Customs Consolidation Act 1894, and the Act of 1896 by which commissioners were appointed for the possession under the Merchant Shipping Act 1894, § 736. As to territorial waters, it is the general rule that no universal opinion of jurists that the state to which the territorial waters belong has a right to regulate their use. The look of the navigation laws is in many cases has often been the subject of treaties, almost necessarily so, where a river is the boundary between two states. In such a case if a state were to maintain the strict letter of its rights, navigation is subject to the middle line of the bed of the river, the medium flumina aequum or thalweg.
NAVIUS—NAVY AND NAVIES

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By the treaty of Vienna in 1815 it was provided that the navigation of the Mississippi should be open to all the vessels of all the nations, subject to a uniform system of police and tolls. The treaty of Paris, 1836, extended this principle to the Danube. In America the case of the Mississippi is vested exclusively in the State of Louisiana, the treaty of Versailles, 1783, it was provided that "the navigation of the Mississippi shall for ever remain free and open to the subjects of Great-Britain and the citizens of the United States." But the United States afterwards acquired Louisiana and Florida; and, the stipulation as to British subjects not being renewed in the treaty of Ghent, 1814, the United States maintains that the right of naviga-
ing the river is vested exclusively in the United States. The Panama Canal, which is subject to peculiar engagements by treaty or convention. The former depends on the Convention of Con-
stantinople, 1855; the latter—as far as regards the United Kingdom and the United States—on the Hay-Pauncefote Treaty, 18th of November 1901. But as a rule it may be said that in peace the territorial waters of a state are open to foreigners for commercial purposes, subject to observance of any rules as to police, pilotage, &c., imposed by the state. Tolls may be imposed by the state upon foreigners. This right is expressly recognized in most commercial treaties. A notable instance was the claim of Denmark to a monopoly of freight on the Baltic, which Sir Robert Peel in the St. Elsiure, though the Sound was not strictly her territorial water. The right was not universally recognized, though it had prescription in Great-Britain. The Sound was still, in its origin, a Royal right, and has been, and is, subject to various engagements. The Sound was abolished, and compensation paid to Denmark for the loss of her alleged right.

NAVIIUS, ATTUS, in Roman legendary history, a famous augur during the reign of Tarquinius Priscus. When the latter desired to double the number of the equestrian centuries, Navius opposed him, declaring that it must not be done unless the omen were propitious, and, as a proof of his powers of divination, cut through a whetstone with a razor. Navius's statue with veiled head was afterwards shown in the comitium; the whet-
stone and razor were buried in the same place, and a putel placed over them. Hard by was a sacred fig-tree, called after him the Navian fig-tree. It was reported that Navius was subse-
quently put to death by Tarquinius. According to Schwegler, the putel originally indicated that the place had been struck by lightning, and the story is a reminiscence of the early struggle between the state and ecclesiasticism.

See Livy i. 65; Dion. Halic. iii. 54; Aurelius Victor, De viris illustribus, 6; Schwegler, Römische Geschichte, bk. xv. 16.

NAVY, a labourer employed in the digging and excavating of earth, &c., in the construction of railways, docks, canals or other engineering operations. The word is a shortened form of "navigator," applied during the 18th and early part of the 19th centuries to a labourer at work on canals, to which the name "navigation" is often applied. Power-machines (excavators) for performing such work are consequently known as "steam-
navies."

NAVY and NAVIES. The navy of a country was in its original meaning the total body of its shipping, whether used for war, for oversea and coasting traffic, or for fishing—the total in fact of its ships (Lat. navis). By custom, however, the word has come to be used only of that part of the whole which is set aside for purposes of war and police. Every navy consists of a material part (see SHIP), i.e., the vessels, with their means of propulsion and their armament, and of a human organization, namely the crews of all ranks, by which the vessels are handled. Ships and men are combined in divisions, and are ruled by an organ of the government to which they belong (see ADMIRALTY ADMINISTRATION).

PERSONNEL

The personnel of the British navy is composed of two different bodies of men, the seamen and the marines, each of which has its appropriate officers. The marines are the subject of a separate article.

The officers of the navy are classed as follows in the order of their rank: flag-officers (see ADMIRAL), commodores, captains, staff captains, commanders, staff commanders, lieutenants, sub-lieutenants, chief gunners, chief boatswains, chief carpenters, gunners, boatswains, carpenters, midshipmen, naval cadets.

Flag-officers are divided into three ranks, viz. rear-admiral, vice-
admiral, admiral. There is also the rank of "admiral of the fleet": such a ship could in theory uniform all the ships of the fleet. All flag-officers, commanders-in-chief, are considered as responsible for the conduct of the fleet or squadron under their command. They are bound to keep them in perfect condition for service; to exercise the regular inspection of the design of the officers, and in performing all such evolutions as may occur in the presence of an enemy; to direct the commanders of squadrons and divisions to inspect the state of each ship under their command; to see that the regulations for the discipline of the men are properly observed; and occasionally to inquire into these and other matters themselves. They are required to correspond with the secretary of the admiralty, and to send a report.

Every flag-officer serving in a fleet, but not commanding it, is required to superintend all the ships of the squadron or division placed under his orders—to see that their crews are properly managed and supplied, and that they are ready for action. Seamen, as above stated, are provided, in time of peace, with provisions and water, and, in the case of these stores, the ships are exclusively responsible for the food of the seamen, is normal. The admiral is supposed to have every reason to believe the ship will do his duty, and, if he is not satisfied, he may order her to be shifted, or the crew may be transferred to the next ship. But the ship is responsible for the colour of the flag.
NAVY AND NAVIES

Reports of the Secretary of the Navy in the United States, and the Reports of the Budget Committee of the French-Chamber contain masses of information. The Naval Annual, founded by Lord Brassey at 1869, is a model of publication which we believe the every country which possesses a navy. Mr. F. T. Jane's All the World's Fighting ships is a survey of the materiel of navies since 1898.

History of Navies

Every navy was at its beginning formed of the fighting men of the tribe, or city, serving in the ship or large boat, which was used differently for fishing, trade, war or piracy. The development of the warship as a special type, and the formation of organized bodies of men set aside for military service on the sea, was the work of the Peloponnesian War. We must follow the process of development, particularly in the case of the naval powers of the dark and middle ages, the Norsemen, the Venetians, the French, the English fleet and others. But centuries, and indeed millenniums, before the modern world emerged from darkness the nations of antiquity who lived on the shores of the Mediterranean had formed navies and had seen them culminate and decline. The adventures of the Argonauts and of Ulysses give a legendary and poetical picture of an "age of the Vikings" which was coming to an end two thousand years before the Norsemen first vexed the west of Europe. At a period anterior to written history?" is a matter of pure speculation and conjecture. In the years 650-600 B.C., the Persian empire was starting on the eastern route, the Greek was starting on the western route, and the Phoenician was starting on the northern. Long ships built for speed (μακροπόδες, naves longae) as distinguished from round ships for burden (στοργυρίδαι νῆρα, naves omerariae) are of extreme antiquity (see Siren). Greek tradition credited the Corinthians with the invention, but it is probable that the Hellenic peoples, in this as in other respects, had a Phoenician model before them. So little is known of the other early navies, whether Hellenic or non-Hellenic, that we must be content to take the Athenian as our example of them all, with a constant recognition of the fact that it was the most highly developed, and that we cannot safely argue from it to the rest.

The Athenian navy began with the provision of warships by the state, because private citizens could not supply them in sufficient numbers. The approach of the Persian attack in 483 B.C. drove Athens to raise its establishment from 50 to 100 long ships, which were paid for out of the profits of the mines of Morocca (see Themistocles). The Persian danger compelled the Greeks to form a league for their common naval defence. The League had its first headquarters at Peloponnesus and there were several quite independent, and the Hellenotamiai, or trustees of the public fund. Her superiority in maritime strength gave Athens a predominance over the other members of the League like that which Holland enjoyed for the same reason in the Seven United Provinces. The Hellenotamiai were chosen from among her citizens, and Pericles transferred the fund to Athens, which became the mistress of the League. The allies sank in fact to subjects, and their contributions, aided by the produce of the mines, went to the support of the Athenian navy. The hundred long ships of the Persian War grew to three hundred by the end of the 5th century B.C. (see Peloponnesian War, and a century later period (when, however, the quality of ships and men alike had sunk) to three hundred and sixty. The ancient world did not attain to the formation of a civil service— at least until the time of the Roman Empire—and Athens had no admiralty or navy office. In peace the war-vessels were kept on ships under cover in sheaths. In war a stratēgos was appointed to the general command, and he chose the trierarch, whose duty it was to commission them partly at their own expense, under supervision of the state exercised by special inspectors (ἀρκονομίτες). The hulls, or rigging, of all the vessels were navigated by the state, but it is certain that heavy charges fell upon the trierarch, who had to fit the ships for sea and return them in good condition. The burden became so heavy that the trierarchies were divided, first between two citizens in the Peloponnesian War, and then among groups (συντελείαι) consisting of five to sixteen persons. Individual Athenians who were wealthy and patriotic or ambitious might fit out ships or spend freely on

the crime has been committed, which must be specified in the warrant ordering the punishment. He may delegate this authority to a limited extent to certain officers. All the officers and the whole ship are to be present at every punishment, which must be inserted in the log-book, and an abstract sent to the admiral every quarter.

The commander has the chief command in small vessels. In larger vessels he is chief of the staff to the captain, and assist him in maintaining discipline, and in sailing and fighting the ship.

The lieutenants take the watch by turns, and are at such times captains of the ship. They take the wheel of the ship, and control her. The one on duty is to inform the captain of all important occurrences which take place during his watch. He is to see that the whole of the duties of the ship are carried on with the same punctuality, with the same degree of intelligence and in the same order. While the captain, the commander or senior executive officer is responsible for everything done on board.

The navigating officer receives his orders from the captain or the second officer. He is entrusted, under the command of the captain, with the charge of navigating the ship, bringing her to anchor, ascertaining the latitude and longitude of her place at sea, surveying harbours, and making such nautical remarks and observations as may be useful in navigation in general.

The warrant-officers of the navy may be compared with the non-commissioned officers of the army. They take rank as follows, viz. gunner, boatswain, topman, coppersmith, gunner's assistant, and midshipmen. They take rank after sub-lieutenants and before midshipmen.

The midshipmen are the principal subordinate officers, but have no specific duties assigned to them. In the smaller vessels some of the seamen are allowed to serve in the rigging, and in the larger ships, the engineers, who had entered at different ages, had been trained in separate schools, and had formed three co-operating but independent lines.

For instance, Joseph Hill wrote, [October 16], 1892, from the desire to give a more scientific character to naval education, and to achieve complete unity among all classes of officers, it was decided to replace the triple by a single system of entry, and to coalesce all classes of officers, apart from the purely civil lines—surgents and paymasters (formerly "pursers"—"persons")—into one. Lads were in future to be entered together, and at one training establishment at Osborne in the Isle of Wight, on the distinct understanding that it was to be at the discretion of the admiral to assign them to executive, marine or engine duties at a later period. After a period of training at Osborne, and at the Naval College at Dartmouth, they were transferred through the different branches, and later by the same examination for lieutenant. When in the intermediate position of sub-lieutenant, they were to be assigned to their respective branches as executive officer, marine or engineer. The engineers under the same conditions were to continue as a civil branch, as they had been before, and become known as lieutenant, commander, captain or rear-admiral (Engineer).

The station officer consists of leading seamen, able seamen, ordinary seamen, engine-room artificers, other artificers, leading stokers, stokers, coal-trimmers, boys and marines. The artificers and stokers and the marines are always entered voluntarily, the latter in the same manner as soldiers, by enlisting into the corps, the former at some rendezvous or on board particular ships. The supply of boys for the navy, from whom the seamen class of men and petty officers is recruited, is also obtained by voluntary entry.

Men are assigned to the naval reserve, receive an annual payment by way of retainer, perform drill on board His Majesty's ships, and are engaged to serve in the navy in case of war or emergency.

There are two schemes for forming reserves. The Royal Naval Reserve scheme draws men from the mercantile marine and fishing population of the United Kingdom. The Royal Fleet Reserve scheme includes the reserve of all sailors who have entered into the reserve, to the pensioners, was mainly designed to obtain the services in war of the men who had quitted the navy after the expiration of their two years' service.

So far as other countries are concerned, the staff of officers does not differ materially from one navy to another. In all it consists of admirals, captains, lieutenants, midshipmen and cadets receiving their early training in staff schools. In the United States, the United States, all the important naval forces of the world are raised by conscription.

The strength and general condition of navies of any given time must be learnt from the official publications of the various powers, and from privately composed books founded on them. The yearly statements of the First Lord of the Admiralty in Great Britain, the
their command. But these voluntary gifts were insufficient to maintain a great navy. The necessity which compelled modern nations to form permanent state navies, instead of relying on a levy of ships from the ports, and such vessels as English nobles and gentlemen sent to fight the Armada, prevailed in Athens also. The organization of the crews bore a close resemblance in the general lines to that of the English navy as it was till the 16th and even the 17th century. The hierarchy, either the citizen named to discharge the duty, or some one whom he paid to replace him, answered to the captain. There was a sailing master (μαρτυρων), a body of petty officers, mariners and oarsmen (σπουδαστηρες), with the soldiers or marines (κουβαρας). As the ancient warship was a galley, the number of rowers required was immense. A hundred triremes would require twenty thousand men in all, or more than the total number of crews of the twenty-seven British line of battleships which fought at Trafalgar. And yet this would not have been a great fleet, as compared with the Roman and Carthaginian forces, which consisted with hundreds of vessels and multitudes of men, numbering one hundred and fifty thousand or so, on each side, in the first Punic War.

Until the use of broadside artillery and the sail became universal at the end of the 16th century, all navies were forcibly organized on much the same lines as the Athenian, even in the western seas. In the Mediterranean the differences were in names and in details. The war fleets of the successors of Alexander, of Carthage, of Rome, of Byzantium, of the Italian republics, of the Arabs and of Aragon, were galleys relying on the power of the ram. The triremes of the Roman and the Byzantine, elements—a chief who is a general, captains who were soldiers, or knights, sailing masters and deck hands who navigate and tend the few sails used, marines and rowers. A few words may, however, be said of Rome, which transmitted the tradition of the ancient world to Constantinople, and of the Constantinopolitan or Byzantine navy, which in turn transmitted the tradition to the Italian cities, and had one peculiar point of interest.

As a trading city Rome was early concerned in the struggle for predominance in the western Mediterranean between the Etruscans, the Greek colonies and the Carthaginians. The Romans of the 2nd century B.C. called for the services of navy commissioners as early as 311 B.C. (Duumiri latae). In the first Punic War it had to raise great fleets from its own resources, or from the dependent Greek colonies of southern Italy. After the fall of Carthage it had no opponent who was able to force it to the same efforts. The prevalence of piracy in the 1st century B.C. again compelled it to attend to its navy (see Pompey). The obligation to keep the peace on sea as well as on land required the emperors to maintain a navy for police purposes. The organization was very complete. Two main fleets, called the Praetorian, guarded the coasts of Italy at Ravenna and Misenum (classes Praetoriarum), other squadrons were stationed at Forum Iulii (Fréjus), Seleucia at the mouth of the Orontes (Nahr-el-Aasy), called the classis Syriaca, at Alexandria (classis Augusta Alexandrina), at Carpathos (Scarpanto, between Crete and Rhodes), Aquileia (the classis Veneta at the head of the Adriatic), the Black Sea (classis Pontica), and Britain (classis Britannica). River flotillas were maintained on the Rhine (classis Germanica), on the Danube (classis Pannonica and Maeciana) and in later days at least on the Euphrates. All these squadrons did not exist at the same time. The station at Forum Iulii was given up soon after the reign of Augustus, and the classis Veneta was formed later. But an organized navy always existed. A body of soldiers, the classici, was assigned for its service. The commander was the Praefectus Classis.

When Constantine founded his New Rome on the site of Byzantium, the navy of the Eastern Empire may be said to have begun. Its history is obscure and it suffered several eclipses. While the Vandal kingdom of Carthage lasted (425–534), the eastern emperors were compelled to attend to their fleet. After its fall their navy fell into neglect till the rise of the Mahommedan power at the end of the 7th century again compelled them to guard their coasts. The eastern caliphs had fleets for purposes of conquest, and so had the emirs and caliphs of Cordova. The Byzantine navy reached its highest point under the able sovereigns of the Macedonian dynasty (867–1056). It was divided into the imperial fleet, commanded by the Great Drungarios, the first recorded lord high admiral, and the provincial or thematic squadrons, under their strategoi. Of these there were three, the Cithyraeotic (Cyprus and Rhodes), the Samian and the Aegean. The thematic squadrons were maintained permanently for police purposes. The imperial fleet, which was more powerful when in commission than all three, was kept for war. A peculiar feature of the Byzantine navy was the presence in it of a corps answering to the seaman gunners and gunnery officers of modern navies. These were the siphonarioi, who worked the siphons (σιφώνες) used for discharging the "Greek fire." When the Turkish invasions disorganized the Eastern Empire in the 12th century, the Byzantine navy withered, and the emperors were driven to rely on the help of the Venetians. The Italian republics of the middle ages, and the monarchical states bordering on the Mediterranean, always possessed fleets which did not differ in essential particulars from that of Athens. There is, however, one fact which must not be overlooked. It is that the seamen of some of them, and more especially of Genoa, served the powers of western Europe from a very early date. Diego Gelmi, the first bishop of Santiago in Galicia, employed Genoese to construct a dockyard and build a squadron at Vigo in the 15th century.

Edward III. of England employed Genoese, and others were employed to create a dockyard for the French kings at Rouen. By them the naval science of the Mediterranean was carried to the nations on the shores of the Atlantic. The Mediterranean navies made their last great appearance in history at the battle of Lepanto (1571). Thenceforth the main scene of naval activity was on the ocean, with very different ships, other armaments and organizations.

The great navies of modern history may best be discussed by taking first certain specially important national navies in their earlier evolution, and then considering those which are of present day interest in their relations to one another.

The British Navy.

The Royal Navy of Great Britain stands at the head of the navies of the modern world, not only by virtue of its strength, but because it has the longest and the most consistent historical development. The Norse invasions of the 9th century forced the English people to provide for their defence against attack from overseas. Though their efforts were but partially successful, and great Norse settlements were made on the eastern side of the island, a national organization was formed. Every shire was called upon to supply ships "in proportion to the number of hundreds and from the produce of what had been the folkland contained in it" (Stubbs, Const. Hist. i. 116). Alfred and his successors had also ships of their own, maintained out of the royal revenue which they had complete control. Before the Conquest the system of contribution by the shires had largely broken down. Yet in its main lines the method of providing a navy adopted by Alfred and his immediate successors remained in existence. There were the people's ships which represented the naval side of the fyrd—i.e. the general obligation to defend the realm; and there were the king's own vessels which were his property. By the 12th century a third source of supply had been found. This was the feudal array. Towns on the sea coast were endowed with privileges and franchises, and rendered definite services in return.

The Norman Conquest introduced no fundamental difference. In the 12th century the kings of the Angevin dynasty made the military resources of their kingdom available in three ways; the feudal array, the national militia and the mercenaries. Dover, Sandwich, Romney, and the other towns on the southeast coast which formed the Cinque Ports represented the naval part of the feudal array. In the reign of Henry III. (1216–1272) their service was fixed at 57 ships, with 1,197 men and boys, for
fifteen days in any year, to count from the time when they weighed anchor. During these fifteen days they served at the expense of the towns. Beyond that date they were maintained by the king. The Cinque Ports Squadron has been spoken of as the foundation of the Royal Navy. But a feudal array is wholly alien in character to a national force. The Cinque Ports, after playing a prominent part in the 13th century, sank into insignificance. They were always inclined to piracy at the expense of other English towns. In 1297, during one of the expeditions to Flanders, they attacked and burnt twenty vessels belonging to Yarmouth under the eyes of Edward I. (1272-1307). The national militia had a longer life. The obligation of the coast towns and counties to provide ships and men for the defence of the realm was enforced till the 17th century. Nor did the method of enforcing that obligation differ materially. In the reign of King John (1109-1216), when the records began to be regularly kept, but when there was no radical change in system, the reeves and bailiffs of the seaports were bound to ascertain by a jury the name, size and quality of all ships belonging to the port. When the ships were required for the king, the bailiff was to assemble them, and the king's ships were embarked. The local authorities were then bound to see that they were properly equipped and manned. It was the duty of the reeves and bailiffs to arrange that they should reach the place named by the king as rendezvous at the time fixed by him. These embargoes inflicted heavy loss even when they were honestly imposed, and loud complaints were heard in Parliament from the later years of Edward III. (1327-1377) that they afforded the king's officers many openings for oppression and corruption.

The ancestors of the modern navy must be sought in the third element of the navy of the middle ages—the king's ships and his "mercenaries." Under King John we find the full record of a regular organization of a Royal Navy as apart from the feudal array of the Cinque Ports or the fyrd. In 1205 he had in all 50 "galleys"—long ships for war—distributed in various ports. William of Wrotham, archdeacon of Taunton, one of the king's "clerks," or ecclesiastical persons who formed his civil service, is named, sometimes in combination with others, as "keeper of the king's ships," "keeper of the king's galleys" and "keeper of the king's seaports." The royal vessels cannot have differed from the private war ships of the Cinque Ports, and at first his navy was preferable to the feudal array, or the levy from the counties, mainly because it was more fully under his own control. They were indeed so wholly his that he could hire them out to the counties, and at a much later period the ships of Henry V. (1413-1422) were sold to pay his personal debts after his death. Yet though the process by which the king's ships became the national navy was slow, the affiliation is direct from them to the fleet of to-day, while the permanent officials at Whitehall are no less the direct descendants of William of Wrotham and the king's clerks of the 13th century. When on active service the command was exercised by representatives of the king, who were not required to be bred to the sea or even always to be laymen. In the crusade of 1190 the fleet of Richard the Lion Hearted (1189-1199), drawn partly from England and partly from his continental possessions, was governed by a body of which two of the members were churchmen. They and their lay colleagues were described as the ductores et gubernatores totius nauigraph Regis. The first commanders of squadrons were known as justiciariss nauigraph Regis, ductores et constabularii Regis.

The crusade of 1190 doubtless made Englishmen acquainted with the title of "admiral"; but it was not till much later that the word became, first as "admiral and captain," then as "admiral" alone, the title of an officer commanding a squadron. The first admirals of all England was Sir John Beauchamp, appointed for a year in 1360. The permanent appointment of a lord admiral dates from 1406, when John Beaufort, natural son of John of Gaunt, and marques of Somerset and Dorset, was named to the post. The crews consisted of the two elements which, in varying proportions and under different names, have been and are common to all navies—the mariners whose business it was to navigate the ship, and the soldiers who were put in to fight. Until the vessel had been developed and the epoch of ocean voyages began, the first were few and subordinate. As the seas of Britain were ill adapted for the use of the galley in the proper sense, though the French employed them, English ships relied mainly on the sail. They used the oar indeed but never as a main resource, and had therefore no use for the "tarma" (ciurma in Italian, choume in French, and chusma in Spanish) of rowers formed in the Mediterranean craft. Crews were obtained partly by enlistment, it is also to a great extent, by the press (see IMPRESSION). The code of naval discipline was the laws of Oleron (see SEA LAWS), which embodied the general "custom of the sea." By the reign of Edward III. (1327-1377) the duties and jurisdiction of the admirals were fixed. He controlled the returns of the ships made by the reeves, selected them for service, and chose his officers, who had their commission from him. A rudimentary code of signals by lights or flags was in use.

The history of the middle ages bears testimony to the general efficiency and economy of the navy. Under weak kings, and at certain periods, for instance in the latter years of Edward III. and the reign of his grandson Richard II. (1377-1399), it fell into decay, and the coast was ravaged by the French and their allies the Basque seamen, who manned the navy of Castile. Henry IV. (1399-1413), though an astute and vigorous ruler, was driven to make a contract with the merchants, mariners and shipowners, to take over the duty of guarding the coast in 1406-1407. Their admirals Richard Citheron and Nicholas Blackburne were appointed, and exercised their commands. But the experiment was not a success, and was not renewed. Apart from these periods of eclipse, the navy as an element, feudal, national and royal, was more than a match for its enemies. The destruction of the fleet prepared by Philip Augustus, the French king, for the invasion of England in 1213 at Damme, the defeat of Eustace the Monk in 1217 off Dover, the victory over the French fleet at Sluys in 1340, and the defeat of the Spaniards off Winchelsea in 1530, were triumphs never quite counterbalanced by any equivalent overthrown. Still better proofs of the ability of any navy to discharge its duties were the long retention of Calais, and the constant success of the fleet of England in their invasions of France. The claim to the sovereignty of the seas has been attributed on insufficient evidence to King John, but it was enforced by Edward III.

Under the sovereigns of the Tudor dynasty (1485-1603) the development of the navy was steady. Though Henry VII. (1483-1509) made little use of his fleet in war, he built ships. His son Henry VIII. (1509-1547) took a keen interest in his navy. Shipbuilding was improved by the importation of Italian workmen. The large resources he obtained by the plunder of the Church enabled Henry VIII. to spend on a scale which had been impossible for his predecessors, and was to be impossible for his successors without the aid of grants from Parliament. But the most vital service which he rendered to the navy was the formation of, or rather the organization of existing officials into, the navy office. This measure was taken at the very end of his reign, when the board was constituted by letters patent dated 24th of April 1546. It consisted of a lieutenant of the admiralty, a treasurer, a comptroller, a surveyor, a clerk of the ships, and two officials without special title. A master of the ordinance for the ships was also appointed. Henry's board, corresponding to the modern board of admiralty, was, with some periods of suspension, and with the addition of different departments—the Victualling board, the transport board, the pay office, &c., added at various times—to be the administrative machinery of the navy till 1832. They were all theoretically subject to the authority of the lord high admiral, or the commissioners for discharging his office, who had the military and political control of the navy and issued all commissions to its officers. In practice the boards were very independent. The double government of the navy, though it lasted long, was undoubtedly the cause of much waste—partly by the creation
of superfluous officials, but more by the opening it provided for corruption.

The 16th century in England as elsewhere saw a great development in the size and capacity of ships, in the length of voyages, and consequently in the sciences of navigation and seamanship, which brought with them the predominance of the seaman element hitherto subordinate. In the reign of Henry VIII., when a squadron was commissioned in 1512, out of a total of 3,000 men, 1,730 were soldiers. By the end of the reign of his daughter Mary (1553-1558) it was calculated that of the 8,546 men required to man her fleet 5534 were seamen, 804 were gunners, and only 2008 were soldiers. In the early years of his reign Henry VIII. equipped his squadrons on a system which bears some resemblance to the Athenian triarchies. He made a contract with his admiral Sir Edward Howard (1477-1513), by which the king supplied ships, guns and a sum of money. The admiral, who had full power to "press," named the officers and collected the crews. Among them are named contingents from particular towns—the representatives of the fiefs. With the exception of the captain, who received eighteen pence a month, all were paid at the same rate, 5s. wages and 5s. for rations per month. Extra sums called "dead shares," the wages of so many imaginary men, and rewards, were provided for the master and warrant officers. Until the regular returns known as the "weekly progress of the dockyards" and the "monthly lists of ships in sea pay" were established in 1773, no constant strict account of the strength of the navy was kept. The figure must therefore be accepted as subject to correction, but King Henry's navy is estimated to have consisted of 53 vessels of 11,268 tons, carrying 557 brass guns and 1548 of iron. It sank without leaving the agitated hearts of his successors Edward VI. (1547-1553) and Mary (1553-1558). By Elizabeth it was well restored. In mere numbers her navy never equalled her father's. At the end of her reign it was composed of 42 vessels, but they were of 17,025 tons, and therefore on the average much larger. The military services rendered by the great queen's fleet were brilliant. No organic change was introduced, and fleets continued to be made up by including vessels belonging to the different ports.

The two most notable advances in organization were the establishment of a graduated scale of pay by rank in 1582, and the formation of a fund for the relief of sick and wounded seamen. This was not a grant from the state but a species of compulsory insurance. All men employed by the navy, including shipwrights, were subject to a small deduction from their pay. The amount was kept in the chest at Chatham, from which the fund took its name, and was managed by a committee of five, each of whom had a key, and of whom four were elected by the contributors. The commissioner of the dockyard presided.

It was between the accession and the fall of the House of Stuart (1603-1688) that the navy became a truly national force, maintained out of the revenue voted by parliament, and acting without the co-operation of temporary levies of trading ships. The reign of James I. (1603-1625) is a period of great importance in its history. The policy of the king was peaceful, and he only once sent out a strong fleet—in 1620 when an expedition was despatched against the Barbary pirates. He took, however, a lively interest in shipbuilding, and supported his master shipwright Phineas Pett (1507-1647) against the rivals whom he offended by disregarding their rules of thumb. Under the lax administration of the lord high admiral Nottingham, better known as Lord Howard of Effingham, many abuses crept into the navy. Though more money was spent on it than in the reign of the queen, it had sunk to a very low level of effective strength in 1618. In 1619 the old lord admirals was persuaded to retire, and was succeeded by George Villiers, duke of Buckingham, the king's favourite. Nottingham's retirement was made compulsory by the report of a committee appointed to inquire into the condition of the navy in 1618. They reported that while numbers of new offices had been created at a cost treble the whole expense of the permanent staff of Queen Elizabeth's time, the dockyards had become nests of pillaging and corruption.

Ships were rotting, and money was yearly drawn for vessels which had ceased to exist. The committee undertook to meet the whole ordinary and extraordinary charges of the navy (upkeep and new building) for £30,000 a year. The ships in commission at that time during peace were confined to the diminutive winter and summer guards, whose duty was to transport ambassadors and fru across the Channel and to hunt the pirates who still swarmed on the coast. Buckingham left the admiralty of the navy in the hands of the commissioners, who by dismissing superfluous officers and paying better salaries had by 1624 fulfilled their promise to restore the fleet. The establishment they proposed was only of 30 ships, but they were larger in aggregate tonnage by 3050 tons than Queen Elizabeth's.

Charles I. (1625-1649) carried on the work of his father as far as his limited resources allowed. The pay of the sailors, fixed in 1585 at 10s., was increased to 15s. A captain received from £4, 6s. 8d. a month of 28 days (the standard of the navy) to £14, according to the size of his ship. Lieutenants, who were only carried in 16 larger ships, received from £2 16s. to £3 12s. 6d. The sailing-master from £3, 6s. 8d. to £4 13s. 9d., and the warrant officers from £1, 3s. to £2 4s. The rating of ships by the number of men carried was introduced in this reign. Vessels of good quality were built for the king, and he showed a real understanding of the necessity for maintaining a strong fleet.

But the time was coming when the hereditary royal revenue was no longer adequate to meet the expense of a navy. By the middle of the 17th century a costly warship, far larger than the trading-ship in size and much more strongly built, had been developed. The great size of British commerce called for protection which an establishment of 40 to 50 vessels could not give. When the Great Rebellion broke out in 1641 the navy of King Charles consisted of only 42 vessels of 22,411 tons. At the Restoration (1660) it had grown to 254 ships for sea service, of 57,463 tons. Such a force could only be maintained out of taxes granted by the parliament. The efforts of King Charles to obtain funds for his navy had a large influence in provoking the rebellion (see Ship Money). The government of the navy during this reign remained in the hands of the committee of 1618, under the lord high admiral Buckingham, till he was murdered in 1628. It was then entrusted to a special commission appointed by the king; who were to have held it till the king's second son James, duke of York, was of age. In 1638 the king restored the office of lord high admiral "during pleasure" in favour of Algernon Percy, 10th earl of Northumberland, by whom the fleet was handed over to the parliament.

During the Great Rebellion and the Protectorate the navy was governed by parliamentary committees, or by a committee named by the Council of State, or by Cromwell. The need, first for cutting the king off from foreign support, and then for conducting successive struggles in Ireland, or with the French, depended on the size of the fleet. Both admirals and officers were to have held it till the king's second son James, duke of York, was of age. In 1638 the king restored the office of lord high admiral "during pleasure" in favour of Algernon Percy, 10th earl of Northumberland, by whom the fleet was handed over to the parliament.
With the restoration of Charles II. (1660-1685) the modern period in the history of the navy began. The first steps were taken to form a corps of officers. Lads of gentle birth were sent on board ships in commission with a letter of service—from which came their popular name of "king's letter boys"—to the captain, in whose service they were to be trained and made officers. The pay was fixed by the admiralty. Promotion from them to flag rank was not at first limited by strict rules, but it tended to be by seniority. During the war of the Austrian Succession, in 1747, a regular system was introduced by which when a captain was promoted for active service—to hoist his flag, as the phrase went—he was made rear-admiral of the Blue squadron. Captains senior to him were promoted rear-admiral in general terms, and were placed on the retired list. They were familiarly called "yellow admirals," and to be promoted in this way was to be "yelowed." Promotion to lieutenant's commission could, obtained by officers who had served, or whose name had been on the books of a seagoing ship, for five years. Whether he entered with a king's letter of service or from the naval academy at Portsmouth, as a sailor or as a ship's boy, he was equally qualified to hold a commission if he had fulfilled the necessary conditions and could pass an examining board of captains, a test which in the case of lads who had interest was generally a pure formality. He was supposed to show that he knew some navigation, and was a practical seaman who could handle, reef and steer. As captains were a retinue of privy councilors, a custom arose by which they put the pay of absent captains to the charge of the men who served under them, and drew the pay allowance for them. It was quite illegal, and constituted the offence known as "false masters," punishable by dismissal from the service. But this regulation was even less punctually observed than the rule which forbade the carrying of women. Till the beginning of the 19th century many distinguished officers were borne on a ship's books for two or three years before they went to sea. The navigation was entrusted to the sailing-master and his mates. He had often been a merchant captain or sailor. The captains and lieutenants were supposed to understand navigation, but it was notorious that many of them had forgotten the little they had learnt in order to pass their qualifying examination. As the navy was cut down to the quick in peace, the supply of officers was insufficient at the beginning of a war, and it was found necessary to give commissions to men who were illiterate but were good practical seamen. Officers who had not begun as gentlemen "on the quarter deck" were said to have come in "through the hawse hole"—the hole by which the cable runs out at the bow. Some among them rose to distinction. The accountant's boy, who had to call himself "boy," and in bad times was said to be often in league with the mariners to extort both from the merchants and the crew. The medical service in the navy during the 18th century was bad. The position of the surgeons who were appointed by the navy office was not an enviable one, and the medical staff of the navy was much recruited from licentiates of Edinburgh, or Apothecaries Hall. Finally it is to be observed that when a ship was paid off only the commissioned officers, masters and surgeons were entitled to half-pay, or had any further necessary connexion with the navy.

The crews were formed partly by free enlistment and partly by being "brought together" in the "commonality" of the navy. By this method men who had served and were "leaders" of the commonality, or "lads," were allowed to volunteer or were drafted from the jails. The Patriotic Society, formed at the beginning of the Seven Years' War, educated boys for the navy. During the Revolutionary and Napoleonic Wars the counties were called upon to supply quotas, which they commonly secured from the debtors' prison or the workhouse. A ship was supposed to be well manned when she had one-fifth of her crew of marines, and one-third of men bred to the sea. This proportion of seamen was rarely reached. As the navy did not train its men from boyhood in peace, but the navy commanders were known as "prime seamen" and "sailormen," who were the skilled artificers of the time, had to be sought for among those who had served their apprenticeship in the merchant service. They never enlisted voluntarily, for they disliked the discipline of the navy, and the pay was indicating only the seniority of the flag-officers. It was the intention of parliament to confine the flag list to these nine officers, but as the navy grew this was found to be impossible. The rank of admiral of the fleet remained a solitary distinction. The captains, commanders and lieutenants were the commissioned officers who received their commissions from the admiralty. Promotion from them to flag rank was not at first limited by strict rules, but it tended to be by seniority. During the war of the Austrian Succession, in 1747, a regular system was introduced by which when a captain was promoted for active service—to hoist his flag, as the phrase went—he was made rear-admiral of the Blue squadron. Captains senior to him were promoted rear-admiral in general terms, and were placed on the retired list. They were familiarly called "yellow admirals," and to be promoted in this way was to be "yelowed." Promotion to lieutenant's commission could, obtained by officers who had served, or whose name had been on the books of a seagoing ship, for five years. Whether he entered with a king's letter of service or from the naval academy at Portsmouth, as a sailor or as a ship's boy, he was equally qualified to hold a commission if he had fulfilled the necessary conditions and could pass an examining board of captains, a test which in the case of lads who had interest was generally a pure formality. He was supposed to show that he knew some navigation, and was a practical seaman who could handle, reef and steer. As captains were a retinue of privy councilors, a custom arose by which they put the pay of absent captains to the charge of the men who served under them, and drew the pay allowance for them. It was quite illegal, and constituted the offence known as "false masters," punishable by dismissal from the service. But this regulation was even less punctually observed than the rule which forbade the carrying of women. Till the beginning of the 19th century many distinguished officers were borne on a ship's books for two or three years before they went to sea. The navigation was entrusted to the sailing-master and his mates. He had often been a merchant captain or sailor. The captains and lieutenants were supposed to understand navigation, but it was notorious that many of them had forgotten the little they had learnt in order to pass their qualifying examination. As the navy was cut down to the quick in peace, the supply of officers was insufficient at the beginning of a war, and it was found necessary to give commissions to men who were illiterate but were good practical seamen. Officers who had not begun as gentlemen "on the quarter deck" were said to have come in "through the hawse hole"—the hole by which the cable runs out at the bow. Some among them rose to distinction. The accountant's boy, who had to call himself "boy," and in bad times was said to be often in league with the mariners to extort both from the merchants and the crew. The medical service in the navy during the 18th century was bad. The position of the surgeons who were appointed by the navy office was not an enviable one, and the medical staff of the navy was much recruited from licentiates of Edinburgh, or Apothecaries Hall. Finally it is to be observed that when a ship was paid off only the commissioned officers, masters and surgeons were entitled to half-pay, or had any further necessary connexion with the navy.

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Navy and Navies

both bad and given in an oppressive way. The pay of a seaman was 22s. 6d. a month for able seamen, the rate fixed in the reign of Charles II., and at 10s. for ordinary seamen. This sum was not paid at fixed dates, but at first only at the end of a commission, and after 1758 whenever a ship which had been a year in commission returned home—up to months before the date of her arrival, the balance being kept as a security against desertion, which was then incessant and enormous. As men were often turned over from ship to ship they had a sheaf of pay notes to present to their next ship. The task of working up accounts was slow, and the men were often driven to sell their pay notes to low class speculators at a heavy discount. Discipline was mainly enforced by the lash, and the abuse of their power by captains was often gross.

These grievances led to a long series of single ship mutinies, which culminated in the great mutiny of 1797. The fleets at Spithead, the Nore, Plymouth, the South of Ireland and Cape of Good Hope mutinied one after another. The government had aggravated the danger by drafting numbers of the United Irish into the fleet, and the demands from the irate sailors became menacing in consequence. These crisis which seemed to threaten the country with ruin passed away. Concessions were made to the just claims of the men. When political agitators endeavoured to make use of the discontent of the sailors for treasonable ends, the government stood firm, and the patriotism of the great bulk of the men enabled it to restore discipline. The "breeze at Spithead," as the mutiny was nicknamed in the navy, was the beginning of the reforms which made the service as popular as it was once hateful.

The administration of the navy throughout the 18th century, as in a large degree after 1756 up to 1812, was in many respects slowly, and was generally corrupt. The different branches, military and civil, were scattered and worked in practical independence, though the board of admiralty was supposed to have absolute authority over all. The admiralty was at Whitehall, the navy office in Seething Lane near the Tower, and after 1780 at Somerset House. The victualling office was on Tower Hill, the pay office in Broad Street, where also was the Sick and Hurt office. In 1749, when the state of the navy excited just discontent, the admiralty first established regular visitations of the dockyards which in a time of general laxity became nests of corruption. These visits were, however, not regularly made. By the end of the century, and in spite of sporadic efforts at reform, the evil had become so generally recognized that Earl St Vincent, then first lord, persuaded parliament in 1802 to appoint a parliamentary commission of inquiry. Its reports, thirteen in number, were given between 1804 and 1806. They revealed much waste, bad management and corruption. The tenth report showed that money voted for the navy was used by the then treasurer, Henry Dundas (Lord Melville), for purposes which he refused to reveal. In 1806 another commission was appointed to revise and digest the civil affairs of the navy, and a considerable improvement was effected. Much remained to be done. There was no strict appropriation of money. Accounts were kept in complicated, old-fashioned ways which made it impossible to strike a balance.

In 1832 Sir James Graham, first lord in Earl Grey's administration, obtained the support of parliament for his policy of sweeping away the double administration of the navy, by admiralty and navy office, and combining them into one divided into five departments. With this great organic change the navy entered on its modern stage.

Subject to the warning that for the reason given above, the figures do not deserve absolute confidence, the material strength of the British navy from the death of Queen Anne to the fall of Napoleon was:

<table>
<thead>
<tr>
<th>Year</th>
<th>Ships</th>
<th>Tons</th>
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<tr>
<td>At the death of Queen Anne, 1714</td>
<td>747</td>
<td>167,819</td>
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<tr>
<td>&quot;</td>
<td>733</td>
<td>170,862</td>
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<tr>
<td>George I., 1760</td>
<td>412</td>
<td>321,104</td>
</tr>
<tr>
<td>&quot;</td>
<td>617</td>
<td>500,781</td>
</tr>
<tr>
<td>In 1793</td>
<td>411</td>
<td>402,555</td>
</tr>
<tr>
<td>In 1816</td>
<td>776</td>
<td>724,810</td>
</tr>
</tbody>
</table>

The figures for 1783, and for 1816, are swollen by prizes and worn out ships. All the figures include vessels unfit for service, or useful only for harbour work, or ordered to be built, but not actually in existence. The number of men varied enormously from a peace to war establishment. Thus in 1755 on the eve of the Seven Years' War the navy was for war for voters of 70,000 men, including 19,061 marines—the corps having been created in the interval. In 1775, on the eve of the American War of Independence, the vote was for 18,000 men for the sea service, including 4354 marines. At the close of the war in 1783 the vote was for 110,000 men, including 25,291 marines, from which it fell in 1784 to 26,000 (marines 4495 included) and in 1786 to 18,000 men, of whom 3860 were marines. In 1812, when the navy was at the highest level of strength it reached, the vote was for 113,000 seamen and 31,400 marines. From this level it fell in 1816 to 24,000 seamen and 9000 marines. These figures represent paper strength. Owing to the prevalence of desertion, and the difficulty of obtaining men, the actual strength was always appreciably lower.

The French Navy.

Before the French monarchy could possess a fleet, its early kings, whose rule was effective only in the centre of the country, had first to conquer their sea coast from their great vassals. Philip Augustus (1180-1223) began by expelling King John of England from Normandy and Poitou. The process was not completed until Louis XII. (1468-1515) had assumed the crown by his marriage with the duchess Anne. Long before the centralization of authority had been completed the French kings possessed a fleet, or rather two fleets of very distinct character. Her geographical position has always compelled France to draw her navy from two widely different sources—from the Channel and the coast of the Atlantic on the north and west and on the south from the Mediterranean. This separation has imposed on her the difficult task of concentrating her forces at times of crisis, and the concentration has always been hazardous. Like their English rivals, the French had a long tradition of the mutual hatred of their naval forces from the feudal array, the national levy and their own ships. But the proportion of the elements was not the same. Many of the great vassals owed the service of ships, and their obedience was always less certain than that of the Cinque Ports. The trading towns were less able, and commonly less willing, than the English to supply the king with ships. He was thus driven to trust mainly to his own vessels—and they were drawn at first exclusively, and always to a great extent, from the Mediterranean seaboard. His own territories in the south were insufficiently provided with seamen, and the French king had to hire them at Rouen, again by buying the services of Brittany, Lancashire, or by subsidies from Genoa, or in a less degree from Aragon.

When Saint Louis (1226-1270) sailed on his first crusade in 1249, he formed the first French royal fleet, and created the first French dockyard at Aigues Mortes. Ships and dockyard were bought from, or were built by, the Genoese at the king's expense. His admirals, the first appointed by the French crown, Ugo Lercari and Jacobo di Levante, were Genoese. Saint Louis created the office of admiral of France. When in later times Aigues Mortes was cut off from the sea by the encroachment of the land, Narbonne and Marseilles were used as ports of war. This fleet was purely Mediterranean in character. It consisted of galleys, and though the sail was used it was dependent on the oar, and therefore on the "tarma" (chiarome) of rowers, who in earlier times were hired men, but from the middle of the 15th century began to be composed of galley slaves—prisoners of war, slaves purchased in Africa, criminals and vagabonds condemned by the magistrate to the chain and the oar. Philip IV. le Bel (1285-1314) was led by his rivalry with Edward I. of England to create a naval establishment on the Channel. He found his materials in the existing Mediterranean fleet. A dockyard was built for them at Marseilles, and French ships bought or by subsidies from Genoa. These ships were purchased by the Tartaro and Albierino Spinola. It was officially known as the Tersental or Dorstenaal, but was commonly called the cloods de galéres or galley yard, and it existed from 1294 to 1419. The French navy has always suffered from alternations of attention and neglect. In times of disastrous wars on land it has fallen into confusion and obscurity. Except when Francis I. (1515-1547) made a vigorous attempt to revive it at the very close of his reign, the French navy languished till the 17th century. Its very unity of administration disappeared in the 15th century, when
the jurisdiction of the admiral of France was invaded and defied by the admiralties of Guyenne, Brittany, and the Levant. These local admiralties were suppressed by Francis I.

Richelieu, the great minister of Louis XIII., found the navy extinct. He was reduced to seeking the help of English ships against the Huguenots. From him dates the creation of the modern French navy. In 1626 he abolished the office of admiral of France, which had long been more than a lucrative place held by a noble who was too great a man to obey orders. He himself assumed the title of grand maître et surintendant de la navigation, and the military command was entrusted to the admirals du Ponant, i.e., of the west or Atlantic and Channel, and du Levant, i.e., of the Mediterranean. But Richelieu's establishment soon decayed. It was revived by the pride and policy of Louis XIV. (1643-1715). Under him a direction a numerous and strongly organized navy was created. A very full code of laws—the ordonnance—was framed by Colbert and Lyonne with the advice of the ablest officers, and was promulgated on the 5th of April 1689. Though modified by other ordonnances in 1705, 1722, 1776, and 1786, in the main lines it governed the French navy till the Revolution.

By this code the French navy was based on the inscription maritime, a very severe law of compulsory service, affecting the inhabitants of the coast and of the valleys of rivers as far up as their sources. It was the raison d'être of the whole body of officers and officers was divided into the civil branch known as la plume, and the military branch called l'épée. The first had the entire control of the finances, and the dockyards of Toulon, Brest and Rochfort, with an intendant de la marine at the head of each. The general chief was the sous secrétaire au département de la marine, the title of the French minister of marine till the Revolution. Under Louis XIV. a civil officer, the intendant des armées navales, who ranked as an admiral, sat on councils of war and reported on the conduct of the naval officers. He must not be confused with the intendant de la marine. The military branch had at its head the admiral of France, the office being re-created in 1669 by Louis XIV. in favour of his natural son the duc de Vermandois. In theory the admiral was the administrative military and judicial head of the admiralty. In practice the admirals were princes of the blood, who drew pay and fees, but who never went to sea, with the one exception of the count of Toulouse, another natural son of Louis XIV. Two vice-admirals of France du Ponant and du Levant commanded in the Mediterranean and on the ocean. A third office of vice-admiral of France was created for Suffren. The lieutenant général (vice-admiral) came next, and below him the chef d'escadre (rear-admiral), capitaine de vaisseau (post captain), capitaine de brilol (freships) or de frégate (commander), and the major, a chief of the staff on board who commanded all landing parties. There was no permanent body of marines in the French navy, the infanterie de la marine being troops for service in the colonies, which were administratively connected with the navy and governed by naval officers. The lieutenant needs no explanation, and the enseigne was a sub-lieutenant. The corps of officers was recruited from les gardes de la marine, answering more or less to the English men-of-war. It received a careful professional education and were required to be of noble birth. Besides the grand corps de la marine there was a fleet of galleys with a general at its head, and a staff of officers also of noble birth. It was suppressed in 1748 as being a useless expense. Officers not belonging to the grand corps were sometimes taken in from the merchant service. They were known as officiers bleus, because their uniform was all blue, and not, as in the case of the noble corps, blue and red.

On paper the organization of the French royal navy was very thorough. In reality it worked ill; the severity of the inscription maritime made it odious, and owing to the prevailing financial embarrassment of the crown after 1692 the sailors were ill-paid, ill-fed and defrauded of the pensions promised them. They fled abroad, or went inland and took up other trades. The military and civic branches were always in a state of hostility to one another, and their pay also was commonly in arrears. The noble corps was tenacious of its privileges, and extremely insolent towards the officiers bleus. By Louis XV. (1715-1774) the navy was neglected till the last years of his reign, when it was revived by the duc de Choiseul. Under Louis XVI. (1774-1792) when the Revolution broke out the long accumulated hatred felt for the mariners only made the free play. Louis XVI. had indeed relaxed the rule imposing the presentation of proofs not only of all naval officers, but the change was made only in 1786 and it came too late. The majority of the noble officers were massacred by the Jacobins or driven into exile.

The Revolution subjected the French navy to a series of disorganizations and reorganizations by which all tradition and discipline were destroyed. Old privileges and the office of Grand Admiral were suppressed. The attempt to revive the navy in the face of the superior power of England was hopeless. Neither the Republic nor the Empire was able to create an effective navy. They had no opportunity to form a new body of officers out of the lads they educated.

The strength of the French Royal Navy is difficult to estimate, since for long periods of the 18th century it was rotting in harbour and its ships were rarely commissioned. Louis XIV. is credited with 95 ships of the line and 29 frigates, together with many smaller vessels, in 1692. At the close of the Seven Years' War it had sunk to 44 ships of the line and 9 frigates. By 1778 the French navy had risen to 78 of the line with frigates and smaller vessels which brought the total to 264. In 1793 on the outbreak of the revolutionary war, it was estimated to consist of 82 ships of the line, mostly line vessels, and of frigates with lesser craft which brought it to a total of 250. Under Napoleon the mere number was very much more impressive, but the ships had comparatively little size, but they were largely constructed of green timber, were meant merely to force England to maintain blockades, and were never sent to sea.

Spanish Navy.

The administrative history of the Spanish navy is singularly confused and broken. It might almost be said that the country had no navy in the full sense of the word—that is to say, no regularly organized military sea arm. Of its origin we are not accurately informed. Some writers maintain that the state for warlike purposes only—until one was created on the French model by the sovereigns of the Bourbon dynasty i.e. after 1700. Yet the kings of the Spanish peninsula, whether they wore the crown of Castile and Leon or of Aragon, had fleets, formed, like all the others of the middle ages, partly of ships supplied by the coast towns and populations, partly of the royal vessels. Aragon was a purely Mediterranean power. Its fleets, which were chiefly supported by Barcelona, a flourishing commercial city, were composed of galleys. With the union of the crown in 1479 Aragon fell into the background, and its navy continued to be represented only by a few galleys, for service in the Mediterranean against the pirates. The dominions of Castile stretched from the Bay of Biscay to the Mediterranean. Its kings, therefore, had need both of ships (naos) and galleys. The first beginnings of the Castilian navy were not due to the king, but to the foresight and enterprise of Diego Gelmiere, bishop and afterwards first archbishop of Santiago in Galicia. In or about 1280 he employed the Genoese Oczillo to form a dockyard at Aria, and to build vessels. The naval activity of the coast of the Bay of Biscay developed so rapidly that in 1147 a squadron from the northern ports took part in the conquest of Andros by Alfons VII. (1120-1148) in alliance with the Pisans. A century later (1248) another squadron constructed at the expense of the king Fernando III. El Santo (1217-1252), and commanded by Count Ramon Bonifaz of Burgos, the first admiral of Castile, took a decisive part in the conquest of Seville. The annexation of Andalusia and the necessity for guarding against invasions from Africa called for a great extension of the navy of Castile. Alfonso X. El Sabio (1252-1284) founded the great galley dockyards of Seville—the arenal. It was also the work of Genoese builders and administrators. In the course of the 13th century the towns of the northern coast formed one of the associations so common in Spanish history, and known as hermandades (brotherhoods). The first meeting of its delegates took place at Castoridales near Bilbao in 1296, when the towns of Santander, Laredo, Bermeo, Guetaria, San Sebastian and Vitoria were represented. The hermandad de la marisma (of the seafarers)
NAVIES AND NAVY

of Castile supplied the squadrons which took an active part in the wars of the 14th and 15th centuries between France and England as allies of the French. Its history is obscure, and it came to an end with the establishment of the full authority of the crown by the Catholic sovereigns Ferdinand and Isabel.

The discovery of America, the acquisition by marriage or conquest of Sicily, Naples and Flanders, gave the kings of Spain a yet stronger motive for maintaining a powerful navy. The maxim that their ships were the bridges which joined their wealth and power and were defended against rivals through the power they conveyed by them and their servants. But neither the Catholic sovereigns nor the Habsburgs who held the throne till 1700, made any attempt to organize a common navy. The sources from which the naval armaments of Spain were drawn during the greatness and decline of the country were these. Galleys were maintained in the Mediterranean, but they were mainly found by Sicily and Naples, or by the contracts which the kings of Spain made with the Genoese house of Doria. On the ocean the chief object of the Spanish government was to conduct and protect the severely regulated trade with America. Thus it was mainly concerned to keep to obtain the outward and inward commerce with the Spanish colonies. For "galleons," first designed by Alvaro de Bazan, marquess of Santa Cruz, which were rather armed traders than real warships. The crown did not build its own ships, but contracted for them with its admirals. The American convoys sailed from and returned to the Bay of Cadiz. One squadron, the fleta, carried the trade, was navigated by the admiral, with whom was associated a general, who commanded the few warships proper, and was answerable for the protection of the whole. Another squadron, called of Cantabria, was maintained on the north coast, and was employed to see the convoy on its way and meet it on its return home. It had its own admiral and general. The ships were always treated as if they were transports for carrying soldiers. The seamen element was neglected. The command was divided between the capitan de mar (sea captain) who was responsible for the navigation and the capitan de guerra (soldier captain) who fought the ship. The same division went through all ranks. The soldiers would neither help to work the ship nor fight the guns. They used musketry only, or relied on a chance to board with sword and pike. Properly speaking there was no class of naval officers, and the overworked and deeply laden vessels with their crews was the main element of general naval administration existed. The office of admiral of Castile became purely ornamental and hereditary in the family of Henriquez. It was not replaced by a navy office. One of the innumerable juntas or boards, through which the Spanish kings governed, looked after the making of contracts, and co-operated with the council of the Indies which was specially concerned with the American convoys. After the disasters of the later years of Philip II. (see AMERICA) some efforts at improvement were made. Better ships were built, and something was done to raise the condition of the seamen. But no thorough-going organization was ever created, and in the utter decadence of the 17th century the Spanish navy and seafaring population alike practically disappeared.

Under the Bourbon dynasty which attained the throne in 1700 the Spanish navy was revived, or rather a navy was created on the French model. Don Jose Patiño, a very able man, was named intendente de la marina in 1715, and in 1717 he drew up a draft naval organization and code, founded on the French ordonnance of 1669. Patiño's draft was the basis of the ordenanzas generales (general code) issued in 1748. The Spanish navies even set up a scheme of galleys with a separate staff of officers, also on the French model, which was, however, suppressed in the year of the issue of the ordenanzas generales. Fine arsenals were organized at Ferrol and Cartagena. The navy thus created produced some distinguished officers, and fought some brilliant single ship actions. But the embarrassments of the treasury, the tendency of several of the kings to sacrifice their navy to political schemes requiring mainly the employment of troops and the ruin of the seafaring population during the 17th century, prevented it from ever attaining to a high level of efficiency. During the Peninsular War the new navy all but disappeared as the old had done. The want of pecuniary resources and internal instability have prevented its revival on any considerable scale.

The navy created by Patiño consisted in 1737 of 56 ships in all, of which 28 were of the line, of from 50 to 80 guns, with one of 114 guns. In 1746 the number of ships of the line had increased to 37. In 1759 the list of line of battle ships was 50,—of which the majority, if not all, had been constructed by English shipbuilders, in the service of the Spanish government. In 1776, when at the height of its power, it contained 62 ships of the line.

Dutch Navy.

The Dutch fleet arose out of the great struggle with Spain in the 16th century. The Netherlanders had been a maritime people from the earliest antiquity. Under their medieval rulers, the counts of Holland and of Flanders and the House of Burgundy, they had rendered service at sea. The freemen owed the service known as the rembrandt (pennies, an oat). An admiralty office was established in 1597. But during the revolt against Philip II. of Spain, new navy services were formed which, after the fall of the Southern Netherlands, became the corps of states-general. The governments established in the different states which afterwards formed the Seven Provinces took possession of the jurisdiction and the dues of the medieval admiralty. The naval part of the war with Spain was for long conducted by the adventurers known as the "beggars of the sea," and was mainly confined to the coasts and rivers. In 1597, when the Confederation was formed and had provided itself with a common government in the states-general, the need for a regularly organized sea-going fleet was felt. In that year the banner of the states-general was raised. The admiral, with the arrows in its paw, was first hoisted during the expedition to Cadiz in alliance with England. On the 13th of August 1597 the states-general issued the decree (Instructie) which regulated the naval administration of the Republic until 1795. The attachment of the Netherlanders to their local franchises was too strong to permit of the establishment of a central authority with absolute powers. It was therefore necessary to make a compromise by which some measure of unity was secured while the freedom of the various confederate states was effectually guarded. Five boards of admiralty (Admiraltiteits collegien) were recognized. They were: South Holland and West Friesland; South Holland, and Amsterdam; West Friesland (the western side of the Zuyder Zee), at Hoorn or Enkhuizen on alternate years; Zealand at Middelburg; and Friesland at Dokhum, or after 1645 at Harlingen. These bodies enjoyed all the rights of the admiralty and collected the port dues, out of which they provided for the current expenses of their respective squadrons. Extraordinary charges for war were met by grants from the province to which each board belonged. Some measure of unity was secured among these five independent authorities by three devices. Each board consisted of seven persons, of whom four were named by the province and required confirmation by the states-general, while three were chosen from other provinces to secure a representation of the commonwealth. The members of the boards took an oath of fealty to the states-general. The stadholder was admiral-general. He presided at the board, and commanded the squadron. In his absence his place was taken by his lieutenant admiral-general. An oath of fealty was also taken to him, and all armed ships whether men-of-war or privateers sailed with his commission. He chose the captains from two candidates presented to him by the board. Delegates were sent to the admiralty at Amsterdam, and the Hamburg, or Amsterdam, or the Medimnavy, save in far more than ever was the case in former times. The admiralty was suspended in 1659, when the powers of the admiral-general were absorbed by the high mightinesses (Huene Hogen Mogen) of the states-general. The staff of officers began with the lieutenant admiral-general and descended through the vice-admiral, the quinny named Schout-bij-nacht, who was and is the rear-admiral, and whose title means "commander by night." These flag officers were named by the admiral-general or states-general. The captain (Zeecapitain) was selected from the provincial list. The lieutenants
were appointed by the local boards. No regular method of recruiting the corps of officers existed.

This compromise was in itself a bad system. With the exception of the board of North Holland, which was supported by the wealth of Amsterdam, the admiralties were commonly distressed for money. Unity of action was difficult to obtain. Much of the work of convoy which the state squadrons should have performed was thrown in the 17th century on directorates (Directorien) of merchants who fitted out privateers at their own expense. When there was no statholder, the local governing bodies trenched on the authority of the states-general, and indulged in a great deal of favouritism. In one respect the navy of the Dutch共和国 departed eight hundred years as rapidly as any of its neighbours. The feeding of the crews was contracted for by the captains, who were required to enter into securities for the execution of the contract, and who had a reputation for probity. The Dutch crews, being better fed and looked after than the English, suffered less from disease. The clumsy organization of the Dutch navy put it at a disadvantage in its wars with England, but the seamanship of the crews, their good gunnery, and the great ability of many of their admirals made them at all times formidable enemies. No organic change was made till 1795, when the victories of the French revolution's armies led to the formation of the Batavian republic. The five admiralties were then swept away and replaced by a committee for the direction of naval affairs, with a unified administration, organized by Pieter Paulus, a former official of the board of the Maas. As Holland was now swept into the general convulsion of the French Revolution, it followed the fortunes of France.

Its navy, after belonging to the Batavian republic, passed to the epemeral kingdom of Holland, created by Napoleon in favour of his brother Louis in 1806 and annexed to France in 1810. The Dutch navy then became absorbed in the French. After the fall of Napoleon a navy was created for the kingdom of the Netherlands out of the Dutch fragments of the Imperial force.

- The United States.

The American navy came into existence shortly after the Declaration of Independence. As early as October 1775 Congress authorized the construction of two national cruisers, and, at the same time, appointed a marine committee to administer naval affairs. The first force, consisting of purchased vessels, was bottled and built, and insufficiently equipped and manned, embraced two ships of 24 guns each, six brigs carrying from 10 to 12 guns, two schooners each with 8 guns, and four sloops, three of 10 guns and one of 4 guns. On December 22d a personnel of officers was selected, one of the lieutenants being the well-known Paul Jones. Esek Hopkins was made commander-in-chief, but, having incurred the censure of Congress, he was dismissed early in 1777, and since then the title has never been revived except in the person of the president. In November 1776 the grades of admiral, vice-admiral, rear-admiral and commodore were assimilated in rank and precedence to relative army titles, but they were never created by law until 1862. During the war a number of spirited engagements occurred, but there was a great lack of efficient material at home, and agents abroad were not able to enlist the active sympathies of nations or rulers. Benjamin Franklin did manage to equip one good squadron, but this was rendered almost useless by internal dissensions, and it required the victory of Paul Jones in the "Bon Homme Richard" over the "Saratoff" to bring about any tangible result for the risk taken. During the war 800 vessels of all classes were purchased, but the navy lost by capture 11 vessels of war and a little squadron of gunboats on the lakes; and, with 13 ships destroyed to avoid capture by the British, 5 condemned, and 3 wrecked at sea, the country was practically without a naval force between 1780 and 1785.

Owing to the depredations upon commerce of the Barbary powers, Congress in 1794 ordered the construction of six frigates, prescribing that four of them should be armed with 44 guns and two with 36 guns; but, the Berbers having made peace, the number of vessels was reduced one-half, and no additions were made until 1797, when the "Constitution," "United States" and "Constellation" were built. The navy was at first placed under the war department, but a navy department with a secretary of its own was created in 1798. From 1815 to 1842 the secretary was aided by a board of commissioners chosen from among the naval officers, but in the latter year the department was reorganized into five bureaus, which were increased to eight in 1862. Each has a naval officer at its head. They deal with navigation, ordnance, equipment, navy yards, medicines, provisions, steam engineering and construction. Of the 46 vessels of the navy, 10 were built on the Potomac by the then secretary of the navy, G. Bancroft. The war college for officers at Coasters Harbor, Newport, R.I., dates from 1884.

The Balance of Navies in History.

The five navies above discussed claim special notice on various grounds: the British, Dutch and French because they have been leaders and models; the Spanish because it has been closely associated with the others; the American because it was the first of the extra-European sea forces. But these great examples may no means exhaust the list of navies, old and new, which have played or now play a part. Every state which has a coast has also desired to possess forces on the sea. Even the papacy maintained a fighting force of galleys which took part in the naval transactions of the Mediterranean for centuries. The Turkish sultans have fitted out fleets which once were a menace to southern Europe. But in a survey of general naval history it is not necessary to give all these navies special mention, even though some of them have a certain intrinsic interest. Some, the Scandinavian navies for instance, have been confined to narrow limits, and have had little influence either by their organization or, save locally, by action. Others again have been the purely artificial creation of governments. Instances of these on a small scale are the navies of the grand duchy of Tuscany, or of the Bourbon kings of Naples.

A much greater instance is the navy of Russia. Founded by Peter the Great (1689-1725), it has been mainly organized and has been most successfully led by foreigners. When the Russian government has desired for political reasons to make a show of naval strength, it has been numerous. In 1770, during the reign of Catherine II. (1762-1796), a Russian squadron was especially formed by the empress's favourite Orloff, but in reality directed by two former officers of the British navy, John Elphinstone (1722-1785) and Samuel Greig (1735-1788), gained some successes against the Turks in the Levant. But when opposed to formidable enemies, as in the Crimean War, it has either remained in port, or has, as in the case of the war with Japan (1904-1905), proved that its vitality was not in proportion to its size.

The innumerable navies of South American republics are small copies of older forces.

The 19th century did indeed see the rise of three navies, which are of a very different character—the Italian, which was the result of the unification of Italy, the German, which followed the creation of the German Empire, and the Japanese. But all three are contemporary in their origin, and have inevitably been modelled on older forces—the British and the French. With them must go the Austrian navy, excellent but unavoidably small.

If we look at the relations which the navies of the modern world have had to one another, it will be seen that the great discoveries of the later 15th century shifted the seat of naval power from the Mediterranean to the Atlantic. In the first place they imposed on all who wished to sail the wider seas opened to European enterprise by Vasco da Gama and Columbus the obligation to use a vessel which could carry water and provisions sufficient for a large crew during a long voyage. The Mediterranean states and their seamen were not prepared by resources or habit to meet the call. But there was a second and equally effective reason. The powers which had an Atlantic coast were incomparably better placed
than the Italian states, or the cities of the Baltic, to take advantage of the maritime discoveries of the great epoch which stretches from 1492 to 1526. In the natural course the leadership fell to Portugal and Spain. Both owed much to Italian science and capital, and the profit fell inevitably to them. The reasons why Spain failed to found a permanent naval power have been given, and they apply equally to Portugal. Neither achieved the formation of a solid navy. The claim of both to retain a monopoly of the right to settle in, or trade with, the New World and Asia was in due course contested by neighbouring nations. France was torn by internal dissensions (the Wars of Religion and the Fronde) and colonized the territories of the English and Dutch. England and Holland were able to prove the essential weakness of the Spaniards at sea before the end of the 16th century. In the 17th century the late allies against Spain now fought against one another. Her insular position, her security against having to bear the immense burden of a war on a land frontier, and the superiority of her naval organization over the divided administration of Holland, gave the victory to Great Britain. She was materially helped by the fact that the French monarch attacked Holland on land, and exhausted its resources. Great Britain and France now became the competitors of Spain, and so remained from 1659 till the fall of Napoleon in 1815.

During this period and a quarter Great Britain again had the most material advantage: that her enemy was not only contending with her at sea, but was engaged in endeavouring to establish and maintain a military preponderance over her neighbours on the continent of Europe. Hence the necessity for her to support great and costly armies, which led to the sacrifice of her fleet, and drove Holland into alliance with Great Britain (Wars of the League of Augsburg, of the Spanish Succession, of the Austrian Succession and the Seven Years War). During the War of American Independence France was in alliance with Spain and Holland, and at peace on land. She and her allies were able to impose terms of peace by which Great Britain surrendered positions gained in former wars. But the strength of the British navy was not broken, and in quality it was shown to be essentially superior.

The French Revolution undid all that the government of France had gained between 1778 and 1793 by attention to its navy and abstinence from wars on land. The result of the upheaval was first to launch her into schemes of universal conquest. Other nations were driven to fight for existence with the help of Great Britain. In that long struggle all the navies of Europe disappeared except the French, which was broken by defeat and rendered inept by inaction, and the victorious British navy. When Napoleon fell, the navy of Great Britain was not merely the first in the world; it was the only powerful navy in existence.

The pre-eminent position which the disappearance of possible rivals had given to Great Britain lasted for several years unchallenged. But it was too much the consequence of a combination of circumstances which could neither recur nor endure. The French navy was vigorously revived under the Restoration and the government of Louis Philippe (the periods from 1815 to 1830 and 1830 to 1848). The emperor Nicholas I. of Russia (1825-1855) built ships in considerable numbers. As early as 1838 the fear that the naval superiority of Great Britain would be destroyed had already begun to agitate some observers. The "extremely reduced state" of the British navy, and the danger that an overwhelming force would be suddenly thrown on the English coast, were vehemently set forth by Commander W. H. Craufurd, and by an anonymous flag-officer. The peril to be feared, it was argued, was an alliance between France and Russia. In 1838 the British navy contained, built and building, 90 ships of the line, 93 frigates and 12 war steamers; the French, 49 of the line, 60 frigates and 37 war steamers, including armed packets; Russia, 50 of the line, 25 frigates and 8 steamers; the United States, 15 of the line, 35 frigates and 16 war steamers. The agitation of 1838 passed away, and the Crimean War, entailing as it did the destruction of a great part of the Russian fleet at Sebastopol, and proving the weakness of the Baltic fleet, and having, moreover, been conducted by an alliance of France and Great Britain against Russia, would seem to have shown that the anxieties of 1838 were exaggerated. But the rivalry which is inherent in the very position of states possessing sea coasts and maritime interests could not cease. The French imperial government was anxious to develop its navy. By the construction of the armoured floating batteries employed in bombardment of Kinburn in October 1855, and by the launch of the first seagoing ironclad "La Gloire" in 1859, it began a new race for superiority at sea, which has shown no sign of abatement. This was the stage of high tension in the political events in Europe which brought forward new competitors, while great navies were developed in America and Asia.

The year 1871 was the beginning of a vast growth of naval armaments. It saw the completion of the unity of Italy and the formation of the German empire, two powers which could not dispense with strong fleets. But for some years the Italian and German navies, though already in existence, were still in a youthful stage. The rapid growth of the United States navy dates from about 1825. For a long time the Japanese, the Dutch, the French, Russia and Great Britain, in answer to them, began the race in which the efforts of each had a stimulating effect on the others. Though the alliance between France and Russia was not formed till later, their common interests had marked them out as allies from the first, and it will be no less convenient than accurate to treat Great Britain and the partners in the Dual Alliance as for some time opposed to one another.

In the general reorganization of her armaments undertaken by France after the war of 1870-1, her navy was not neglected. Large schemes of construction were taken in hand. The instability of French ministries, and the differences of principle which divided the authorities who favoured the construction of battleships from those who were partisans of cruisers and torpedo-vessels, militated against a coherent policy. Yet the French navy grew in strength, and Russia began to build strong vessels. As early as 1874 the approaching launch of a coast-defence ironclad at Kronstadt (the "Peter the Great" designed by the English constructor Sir E. J. Reed) caused one of the successive "naval scares" which recurred frequently in the coming years. It was, however, a more lasting result of the Crimean War, and the lessons of the Turkish conflict of that year, that the production of warships was ordered. In 1878 the prospect of a war arising out of the Russian and Turkish conflict of that year, again stirred doubts as to the sufficiency of her naval armaments in England. Yet it was not till about 1885 that an agitation for the increase of the British fleet was begun in a consistent and continuous way. The controversy of the succeeding years was boundless, and was perhaps the more heated because the controversialists were not controlled by the necessity for using terms of definite meaning, and because the lists published for the purpose of making comparisons were inevitably of doubtful value; when ships built, building and ordered to be built, but not begun, were counted together, or as not infrequently happened, were all added on one side, but not on the other. The belief that the British navy was not so strong as it should be, in view of the dependence of the British empire on strength at sea, spread steadily. Measures were first taken to improve the opportunities for practice allowed to the fleet by the establishment of yearly naval manoeuvres in 1885, and the lessons they afforded were utilized to enforce the necessity for an increase of the British fleet. In 1888 a committee of three admirals (Sir W. Dowell, Sir Vesey Hamilton and Sir R. Richards), appointed to report on the manoeuvres of that year, gave it as their opinion that "no time should be lost in placing the British navy beyond comparison with that of any two powers." This verdict met a ready acceptance by the nation, and in 1889 Lord George Hamilton, then first lord of the admiralty, introduced the Naval Defence Act, which provided for the addition to the navy within four and a half years of 70 vessels of 316,000 tons at a cost of £21,500,000. The object was to obviate the risk of sudden reductions for reasons of economy in the building vote.
Later experience proved that the practice of fixing the amount to be spent for a period of years operated to restrict the freedom of government to make additions, for which the necessity had not been foreseen when the money was voted. But the act of 1889 on which Britain was less in 1904 than she was in 1889, while as inevitable it stimulated other powers to increased efforts.

The rivalry between Great Britain and the states composing the Dual Alliance may be said to have lasted till 1904, when the course of the war in the Far East removed Russia from the field. It must be borne in mind that during the latter part of these twenty years Russia was largely influenced by the desire to arm against the growing navy of Japan. Comparisons between the additions to the fleets made on either side, even when supported by a great display of figures, are of uncertain value. Number is not the test of strength when taken apart from the quality, distribution, the command of coaling stations—which are of extreme value to a modern fleet—and other considerations.

But the respective lists of battleships supply a rough and ready standard, and when taken with the number of men employed and the size of the budgets (both subject to qualifications to be mentioned) does enable us to see with some approximation to accuracy how far the rivals have attained their desired aims. In 1889, before the passing of the Naval Defence Act, the British navy contained 37 battleships of 262,540 tons. The united French and Russian fleets had 29 of 356,653 tons: of these 27 were French, 7 British vessels, France and Russia having been divided with iron and therefore of no value when exposed to the fire of modern explosives. This is but one of many examples which may be given of the fallacious character of mere lists of figures. In 1894, when the Naval Defence Act had produced its effect, the comparative figures were: for Great Britain, 46 ironclads (or battleships) of 441,440 tons, and for the Dual Alliance 35 of 279,953—in which, however, the seven wooden vessels were still included. France and Russia had then large schemes of new construction—60,500 tons of ships over 10,000 tons for France, and 78,000 tons for Russia. The British figure was 7,000 tons. But the French and Russian list included mere names of vessels, of which the plans were not then drafted.

The rivalry in building went on as eagerly after 1894 as before. At the beginning of 1904 Great Britain had 67 battleships of 895,370 tons, as against 57 of 635,500 belonging to the powers of the Dual Alliance. The difference in favour of Great Britain was therefore 10 battleships, and 259,870 tons. Vessels not ready for service were included in the list, which therefore includes potential as well as actual strength. The balance in favour of Great Britain was 190,650 tons. In 1904 there were 17 British, 7 French, 7 British vessels, and 108,000 tons of them 70,000 tons. During this period the naval budget of Great Britain had risen from £12,000,000 in 1885 to £34,437,500 in 1903-1904. The number of men employed had grown from 57,000 to 127,000. The figures for the Dual Alliance cannot be given with equal confidence. France had transferred the troupes de la marine or colonial troops from the navy to the army, which introduced a confusing element into the comparison, and the figures for Russian expenditure are very questionable. The total credit demanded for the French navy in 1890, the year after the passing of the British Naval Defence Act, was frs. 217,147,462. By 1904, before the passing of the revised scheme, it was frs. 577,855,126. But the figures of the French credit for 1890 are not attainable, but her budget for 1903 was frs. 11,067,889 sterling. A comparison in numbers of men available is wholly misleading, since the British navy contains a large number of voluntarily enlisted men who serve for many years, and a small voluntary reserve, while France and Russia include all who are liable to be called out for compulsory service during a short period. There is no equality between them and the highly trained men of the British navy. The immense increase in its staff represents an addition to real power to which there is nothing to correspond in the case of continental states.

While this vast growth of naval power was going on in Great Britain, France and Russia, other rivals were entering into the lists with various fortunes. Italy may be said to have been the first comer. Her national navy, formed out of the existing squadrons of Sardinia, Tuscany and Naples, had stood the strain of war in 1866 very ill. The conditions in which the unity of the country had been achieved during the Franco-Prussian War of 1870-71, together with the obvious need for a navy in the case of a nation with a very extended sea coast, animated the Italians to give their scheme of naval construction, and efforts. Their policy was controlled by the knowledge that they could not hope to rival France in numbers, and they therefore aimed at obtaining individual vessels of a high level of strength. Italy may be said to have set the example of building monster ships, armed with monster guns. But she was unable to maintain her position in the race. The too hopeful finance in which she had indulged in the first enthusiasm of complete political unification led to serious embarrassment in 1894. Her naval budget sank from £4,650,000 in 1891 to £3,776,655 in 1897-1898, and Italy voted only £5,610,652 in 1895-1906. As a candidate in the race for naval strength she necessarily held a subordinate place, though always to be ranked among the important sea powers. In 1903, when the rivalry of Great Britain and the Dual Alliance was at its height, her strength in battleships was 18, of 226,630 tons. In number, therefore, they did more than cover the balance in favour of Great Britain as against the Dual Alliance, but not in tonnage, in which the difference in favour of Great Britain was 329,870.

The history of the German navy is one of foresight, calculation, consistency and therefore steady growth. The small naval force maintained by Prussia before the German Federation after the war of 1866, and the Imperial navy after 1871. Until 1853 it had been wholly dependent on the war office. In that year an admiralty was created in favour of Prince Albrecht, but this office was abolished in 1861, and the navy was again placed under the war office. The first ministers of the navy under the North German Federation were generals; so was the first imperial minister, General Stosch (1871). Admiral Tirpitz, appointed in 1887, was the first minister who was bred a seaman. His predecessor, General Stosch, had been an excellent organizer, and had done much for the improvement of the service. It has been the rule of the German government, both before and since the foundation of the empire, to advance by carefully framed plans, without adhesion to them pedantically when circumstances called for a modification of their lines. As early as 1867 a scheme had been formed for the construction of a navy of 16 ironclads and 50 smaller vessels, at a cost of £5,395,533. It was not sufficiently advanced in execution to allow Germany to make any efforts at sea in the war of 1870-71. In 1872 a supplementary grant of £3,791,666 was made for construction in view of the increased cost of armour and armament. In 1882 there were 201 men and 102 officers still under the construction of 100 vessels, and it was completed in 1888 by another which provided for the construction of 28 vessels, of which 4 should be battleships of the largest size, within the next six years. In 1894 and for some years afterwards the Reichstag showed itself hostile to a heavy expenditure on the navy, and refused many votes asked for by the government. Under the pressure of ambition and of the real needs of a nation with an extensive and growing maritime commerce, the expenditure grew in spite of the opposition of the Reichstag. Between 1874 and 1882 the number of vessels under construction had increased from 20 to 28. In the following year to £3,500,000, from which figure it advanced by 1888 to £5,756,135. Another building scheme was framed in that year, but it was swept aside in 1900, under the combined influence of the exhortations of the emperor William II, and of the anger caused in Germany through the arrest by a British cruiser of a German steamer (the "Breslau") on the coast of Africa on a charge of carrying contraband of war to the Boers. The emperor was now able to obtain the consent of the Reichstag to an extended Naval Defence Act. By the terms of this measure it was proposed to spend £7,000,000 on construction, and £10,000,000 on the dockyards. With this money, by the year 1917 Germany was to be provided with a fleet of 38 battleships, together with a proportionate number of cruisers and other smaller vessels. Rapid progress was made not only with the programme itself but with the equipment of German dockyards.
and other establishments for providing the material of a great navy. In the spring of 1896 the serious menace to British supremacy at sea, represented by the growth of the new German fleet of battleships, led in England to a "scare" which recalled that of 1888, and to an energetic campaign for additional expenditure on the British navy.

During the years following on the American Civil War (1862–66) the United States paid small attention to the navy. In 1881 a board was appointed to advise on the needs of the navy, and in 1890, the board recommended the formation of a fleet of 100 vessels of which 20 should be battleships of the largest class. The reviving interest in the navy was further stimulated by the diplomatic difference with Great Britain which arose over the frontier question between her and the republic of Venezuela in 1896. Resolutions were passed in congress approving of an increase of the navy. The war with Spain in 1898 completed the revival of American interest in the navy. The acquisition of Porto Rico, and the protectorate of Cuba in the West Indies, together with the annexation of the Philippines, and the visible approach of the time when the relations of the powers interested in the Pacific would call for regulation, confirmed the conviction that a powerful fleet must be maintained. In 1889 the United States possessed no modern battleship. The 1860s were devoted to the building of these. At the close of 1893 there were built and building 27 of 35,380 tons, only two of them being of less than 10,000 tons. From $5,119,850 in 1890 the expenditure grew to $16,355,380 in 1903.

The navy of Japan, the last comer among the great naval forces of the world, may be said to date from 1895, from, in fact, the eve of the war with China. As an insular power with a large seafaring population, Japan is called upon to possess a fleet. Even in the days of its voluntary isolation it had a known capacity for maritime warfare. Its capacity for harnessing the ideas and mastering the mechanical skill of Europe have been in no respect better shown than in naval matters. From the moment it was compelled to open its ports it began not only to acquire steamers but to apply itself under European guidance to learning how to make and use them. A navy on the western model was already organized by 1895, but it was still of trifling proportions. In 1896 the Japanese navy had become an object of serious attention to the world. A plan was drafted in that year, and confirmed in the next, by which Japan arranged to supply itself, mainly by purchase in Europe, with a fleet containing 4 of the most powerful battleships, the scheme were a built and 8 building in 1898, when the decision was taken to increase the tonnage of the vessels. A little later additions were arranged for, and vessels building for South America states in English ports were purchased. The British model was carefully followed in naval organization, the alliance with England giving special facilities for this. And by 1904, when the war with Russia began, the unknown Japanese fleet proved its competence by victories at sea which put the seal on her position as a naval power.

Conclusion.—When we look over the whole period from the end of the Napoleon wars, one great fact is patent to our view. It is that this was an epoch of revival or development in the naval power of the whole world, in the course of which the position held by Great Britain in 1816 was almost entirely lost by the growth of other powers. The situation in this year was by its very nature temporary, and a quotation of the respective numbers of warships then possessed by the world would have no value. An instructive comparison can, however, be made between the year 1838, when Great Britain began to be seriously concerned with the rise of possible enemies at sea, and the year of the war between Russia and Japan. Battleships may again be taken as the test of strength, since nothing happened in the Russo-Japanese War to show that they do not still form the most vital element of naval power. We may also leave aside the many small vessels which cannot act collectively, and which individually do not weigh in the balance. The figures for 1838 are given above, but may be repeated for comparison. In that year Great Britain possessed, built and building, 90 ships of the line; France 49; Russia 56; the United States 15. In 1903 the number of vessels recognized as battleships, possessed by the great powers, was for Great Britain 67; for France 39; for Russia 18; for the United States 27; for Germany 27; for Italy 18; for Japan 5. At the first date the British fleet was among great powers as 90 to 114. At the latter it was as 67 to 134.

Such comparisons, however, as these become much more complicated in later years, when the importance of the preponderance of "Dreadnoughts"—the new type of battleship—(see SHIP and SHIPBUILDING)—was realized. By the invention of this type Great Britain appeared to obtain a new lead; and in 1907, when it was calculated that by 1910 there would be ten British "Dreadnoughts" actually in commission while neither in Europe nor America would a single similar ship have been completed by any foreign power, the situation seemed to be entirely in favour of complete supremacy at sea for the British fleet. But the progress of German and American construction, and particularly the experience gained of German ability to build and equip much more rapidly than had been supposed, showed by 1909 that, so far as "Dreadnoughts" were concerned at all events, the lead of Great Britain could only be maintained by exceptional effort and exceptional expenditure. It was admitted by the prime minister, Lord Esher, that a new race thus began, of which it is impossible here to indicate more than the start. It was no longer a question of completed ships, but one still more of programmes for building and of the rate at which these programmes could be accomplished. At the beginning of 1910, while Great Britain had her ten "Dreadnoughts," it was not the case that other powers had none; Germany already had four and the United States two; and a knowledge of the naval programmes of both these countries, to speak of no others, showed that, unless either their policy was altered, or the British shipbuilding programme was modified so as to keep up with their progress, it would not take many years before the theory of the equality of the British fleet in "capital ships" to those of the next two naval powers would have to be abandoned. In England this situation created a profound sensation in 1909, since it was common ground that her fleet was her all in all, on which her empire depended; and the result was seen, not only in a considerable increase in the Naval Estimates of 1910–11, but also in the beginning of a serious attempt to organize their fleets on the part of the British colonial dominions, which should co-operate with the mother country.

The British Admiralty figures for the state of the principal fleets as on March 31st, 1910, are summarized below. The letters at the heads of the columns have the following significations: E., England; F., France; R., Russia; G., Germany; I., Italy; U., United States; and J., Japan:

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<th>SHIPS BUILT</th>
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<tr>
<td>Battleships</td>
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<td>Arm. C.D. Vessels</td>
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<td>Protected Cruisers</td>
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<tr>
<td>Unprotected Cruisers</td>
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<td>Submarines</td>
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<td>Torpedo Vessels</td>
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<td>T. B. Destroyers</td>
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<td>85</td>
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<td>116</td>
<td>245</td>
<td>63</td>
<td>82</td>
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<tr>
<td>Submarines</td>
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BIBLIOGRAPHY.—Ancient and Contemporary Accounts of the naval organizations of the ancient world, and of the sea-fighting of the time are to be found in the histories of Greece and Rome: Signor G. Corazzini has written a Storia della marina militare antica (Livorno, 1880). The Great British navy and of the Byzantine navy will be found in Professor Bury’s appendices to his edition of Gibbon’s Decline and Fall, vol. i. apx. 5, and vol. vi. apx. 5. General histories of the naval powers of the world written to be little more than jargon reviews of the dates, and results of battles. This is certainly the case with the great folio of the English writer Josiah Burchett, A Complete History of the most remarkable transactions at sea, from the earliest accounts of time to the conclusion of the last war with France, wherein is given an account of the most considerable Naval Expeditions, Sea Fights, Stratagems, Discoveries and other Maritime Occurrences that have happened, and also of all navigation and seamen’s stories; and in a more particular manner of Great Britain from the time of the Revolution in 1688 to the oyslaird period (1750). The later part is however valuable, for Burchett, who was a naval officer himself, had command of the admiralty, had authority for his time, and had served as sea secretary to Russell, Lord Orford. There is an Histoire de la marine de tous les peuples, by M. A. du Sein (Paris, 1879) which is of no more value than the previous work. Menu, C. J. Keary, The Vikings of Western Christendom (1891). The medieval period of Western navies are treated in their respective naval histories.

Medieval:—As regards the medieval navies the first place may be allowed to the Italians. A general bibliography of Italian naval literature, Saggio de una bibliografia marittima italiana, occupying fifty-eight pages, drawn up by Signor Emilio Cestaro, will be found in the Revista marittima, supplement for 1894 (Rome). The histories of the different Republics of the middle ages record their maritime enterprises. Of excellent books, which give much of the details and promises, is the Storia della marina pontificia de A. Guglielmotti, G.P.T., in 10 volumes published at different times, and in two editions, at Florence 1856, &c. The general maritime history of the Mediterraneans in the middle ages is well done by E. Badenie, La marine commerce y artes de Barcelona (1779-1792) by Don A. Capmany. The naval enterprises of the Norsemen are dealt with in a scholarly fashion by M. G. B. Deppe. Histoire des expéditions maritimes des Normands (1841), and with newer knowledge by C. F. Keary, The Vikings of Western Christendom (1891). The medieval period of Western navies are treated in their respective naval histories.

Great Britain:—The History of the Royal Navy to the French Revolution, by Sir N. Harris Nicolas (1847), is unfortunately incomplete. It ends at the year 1422, but is the work of a most laborious writer, and one who had wide experience in the navy. The administrative history of the British navy until 1660 is the subject of the History of the Administration of the Navy and of Merchant Ships, the first edition to 1660, by John Tinctoris (1735). The British Historical society—a valuable collection of materials. The campaigns and battles of the navy are told, generally from the public letters of the admirals, and with no great measure of criticism in several compilations. The Naval History of England (1735) by Mr T. Ledard, is copious and useful. The Naval Chronicle, or an Historical Summary of Naval and Maritime Events from the Time of the Romans to the Treaty of Peace 1802, by Captain Isaac Schomberg (1802), contains a mass of valuable information, lists of ships, dates of construction, &c., and some administrative details. Less comprehensive, but still useful, is such a compilation as The General History of the Late War (that is, the Seven Years War), by Dr John Entick, and other materials (1765). A much better book is The Naval and Military Memoirs of Great Britain 1727 to 1783 (1804) by Mr R. Beatson, a very careful and well-informed writer who had seen some service as a marine officer. The Life of the British Admirals, consists of a more accurate Naval History from the earliest periods, by Dr J. Campbell (1779), may be profitably consulted, with caution, for it by no means justifies its claim to novelty and accuracy in all parts. A History of the British Navy, from the time of King George IV., by Mr W. James (1827), republished with a continuation by Captain Chamber in 1837, is a standard authority. A far less useful work, which is not to be recommended, is The Naval History of Great Britain by Captain W. P. Brenton, first published in 1823, and republished in 1836. The Field of Mars, a compilation in dictionary form published in 1781, with an enormous title-page, is a valuable volume for the history of navies during the 18th century. The History of the British Navy from the Earliest Period to the Present Time (1863) by Dr C. D. Yonge, contains some original matter for the naval transactions of the 19th century. The Royal Navy, in 7 large volumes (1897-1903), edited and partly written by Sir W. L. Clowes, is a compilation of unequal value. Some of

Naval Strategy and Tactics

Sir W. L. Clowes’s coadjutors, notably Captain Mahan and Sir C. R. Markham, are of high standing and authority. The book is copiously illustrated. The Naval Chronicle, 1799–1818, a magazine, contains masses of useful matter, for the Revolutionary and Napoleonic Wars. The Royal Naval Biography of Captain John Marshall, giving the lives of all officers on the list in 1823 or promoted later (1824–1835), with a supplement (1827–1830), may be consulted, but is too unorthodox and too uniformly laudatory. The Naval Biographical Dictionary of William H. Davis, a limited number of copies being issued, and unsigned, the contents are rather meagre. W. R. O’Byrne, is a solid book of reference. The publications of the Naval Record Society (1854 and subsequent years) contain large and important questions of naval strategy, by authorities matched by similar authorities, such as Sir W. Monson’s Tracts, which were difficult of access. See also A Short History of the Royal Navy, by David Hanay.

Naval Strategy and Tactics

The naval history of France has been much written about since 1840. Not many of the books published have been of considerable value. The Histoire maritime de la France of M. Léon Guérin (1844), was meant to meet a popular demand. The writer was a naval officer, and is of more value, but is somewhat wanting in criticism. The Précis historique de la marine française of M. Chassarion (1843); the Histoire générale de la marine (1853); the Histoire de la marine française de M. le Saint (1877); and the Histoire de la marine française of M. Sartorius, are compilations of M. Troussel are compilations. La Marine de guerre, ses institutions militaires depuis son origine jusqu’à nos jours, by Capts. Gougeard (1877); and La marine de guerre du royaume de France by M. Lambert de Sainte Croix (1892); and the excellent little book of M. Lorrain La Marine royale, 1789 (n.d.), may be consulted with pleasure and profit. The three books of M. de Saint-Yves, of the Academy of Sciences, Histoire et philosophie des navires, and Abraham du Queude la marine de son temps (1827) are all of high value. Les Batailles navales de la France de Capts. Troude (1867), is a carefully written account of naval actions. The Histoire de la marine française, pendant la guerre de l’indépendance américaine (1877); Sous la première république (1886); Sous le consulat et l’empire (1886); De 1815 à 1870 (1900); and La marine française et la guerre de la Indes (1859) are works of a more popular character, though and critical. M. G. Lacour-Gayet, Professor at l’École supérieure de la Marine, has published two books of serious research, but marked by some national prejudice, La Marine militaire de la France sous la révolution de Juillet (1880), and La Marine militaire de la France sous le régime de Louis XVI. (1905). The Recherches sur l’ancien clos des galères de Rouen (1864) of M. C. de Robillard de Beaurieux, and the life of Jean de Vienne by the Marquis Terrier de Lézay (1834), is a valuable monograph and on the valor of early French naval history. The Projets et tentatives de débarquement aux Iles britanniques by Capts. Desbrière (1900 seq.) is a most valuable authority. A very valuable book is L’Histoire de la marine française was born in 1890 by M. C. de la Roncière.

Miscellaneous:—The standard authorities for Spanish naval history are, La Marina de Castilla (1832), and La Armada Española desde la unión de Castilla y Aragón hasta la era de la Infanta Isabel de Braganza y don Juan de Orléans-Duro. The Geschiedenis van het Nederlandsche Zeemacht by Mr J. C. de Jonghe (1858), is an admirable and exhaustive history of the Dutch navy, The History of the Mariner’s Data by Mr M. R. hij (1876). The History of the Sea by Hugh Chalmers Hasted by Mr J. Mitchell for the Oriental Translation Fund (1831). may be read with curiosity and some profit. There are two general histories of the navy of the United States, by Captain Posthumus (1851) and by Mr E. M. Clay (1840); the second is the fuller, and the more critical. Captain Mahan’s Influence of Sea Power on History 1660–1783 (1890), and his Influence of Sea Power upon the French Revolution and Empire 1793–1812 (1892), must be classed apart as studies of the general inter-action of navies on one another and on international relations. The long series of readable monographs by Admiral Junier de la Gravière, covering the whole field of naval warfare in the American War to his own time, contain much information and sound criticism.

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Historical Evolution.—That the methods of conducting war at sea have been conditioned by the capacity of the ships and their armament, and that capacity and armament have interacted upon one another, may appear to be platitude. We have done the indication in our other remarks and are therefore in mind when we are considering the history of naval strategy, that is, of the large movements by which a commander secures the advantage of fighting at a place convenient to himself, or of tactics—which are the movements he makes in battle. Throughout antiquity and the middle ages till the 16th century, the weapons relied on were (1) the ship itself, used as a ram, (2) the swords of the crew, (3) such missile weapons as bolts from heavy crossbows.
The yard gangway time to follow the trade of Syracusean too, vessels at A.D. 1571 questioned, the strategy and fixed found to not run battle. Therefore, while fleets depended on the methods of battle at close quarters, two conditions were imposed on the warship. She must be small and light, so that her crew could row her with effect, and she must carry a numerous crew to work her oars and board or repel boarders. Sails were used by the triremes and other classes of warship, ancient and medieval, when going from point to point—to relieve the rowers from absolutely exhausting toil. They were lowered in action, and when the combatant had a secure port at hand, they were left ashore before battle. These conditions applied alike to Phormio, the Athenian admiral of the 5th century B.C., to the Norse king Olaf Tryggveson of the 10th century A.D., and to the chiefs of the Christian and Turkish fleets which fought the battle of Lepanto in A.D. 1571. There might be, and were, differences of degree in the man of war and sail respectively. Outside the Mediterranean, the sea was unfavourable to the long, narrow and light galleys of 120 ft. long and 20 ft. of beam. But the Norse ship found at Gokstad, though her beam is a third of her length, and she is well adapted for rough seas, is also a light and shallow craft, to be easily rowed or hauled up on a beach. Some medieval vessels were of considerable size, but these were the exception; they were awkward, and were rather transports than warships.

Given a warship which is of moderate size and crowded with men, it follows that prolonged cruises, and blockade in the full sense of the word, were beyond the power of the sea commanders of antiquity and the middle ages. Thucydides used the trade which with a favourable wind could rely on making six knots an hour—that is to say, twice the average speed attained by Captain Cook in his voyages of exploration. But a war fleet could not provide the cover, or carry the water and food, needed to keep the crews efficient during a long cruise. So long as galleys were used, that is to say, till the middle of the 18th century, they were kept in port as much as possible, and a tent was rigged over the deck to house the rowers. The fleet was compelled to hug the shore in order to find supplies. It always endeavoured to secure a basis on shore to store provisions and rest the crews. Therefore the wider operations were slowly made. Therefore too, when the enemy was to be waited for, or a port watched, some point on shore was secured and the ships were drawn up. It was by holding such a point that the Corinthian allies of the Syracusans were able to pin in the Athenians. The Romans watched Lillybeum in the same way, and Hannibal the Rhodian could run the blockade before they were launched and ready to stop him. The Norsemen hauled their ships on shore, stockaded them and marched inland. The Greeks of Homer had done the same and could do nothing else. Roger di Lauria, in A.D. 1285, waited at the Hormigas with his galleys on the beach till the French were seen to be coming past him. Edward III. in A.D. 1350, stayed at Winchester till the Spaniards were sighted. The allies at Lepanto remained at anchor near Dragonella till the last moment.

Given again that the fighting was at close quarters with ram, stroke of sword, crossbow bolt, arrow, pigs of iron or lead and wild fire blown through tubes, it follows that the formations and tactics were equally imposed on the combatants. The formation was inevitably the line abreast—the ships going side by side—for the object was to bring all the rams, or all the boarders into action at once. It was quite as necessary to strike with the prow when boarding as when ramming. If the vessels were laid side by side the oars would have prevented them from touching. It may be added that this rule prevailed equally with the sailing ship of later times, since they were built with what is technically called "a tumble home," that is to say, their sides sloped inwards from the water line, and the space from the top of the bulwarks of one to the other was too great to be traversed. The extent to which ramming or boarding would be used respectively would depend on the skill of the rowers. The highly trained Athenian crews of the early Peloponnesian War relied mainly on the ram. They aimed at dashing through an enemy's line, and shaving off the oars from one side of an opponent. When successfully practised, this manœuvre would be equivalent to the dismasting of a sailing line of battle ship. It was the δικτυα, and it enabled the assailant to turn, and ram his crippled enemy in the stern (ρήσανας). But an attack with the ram might be exceedingly dangerous to the assailant, if he were not very solidly built. His ram might be broken off in the shock. The Athenians found this a very real peril, and were compelled to construct their triremes with stronger bows, to contend with the more heavily built Peloponnesian vessels—whereby they lost much of their mobility. In fact success in ramming depended so much on a combination of skill and good fortune that it played a somewhat subordinate part in most ancient sea fights. The Romans baffled the ramming tactics of the Carthaginians by the invention of the corvo or crow, which grappled the prow of the rammer, and provided a gangway for boarders. After the introduction of artillery in the 14th century, when guns were carried in the bows of the galley, it was considered bad management to fire them until the prow was actually touching the enemy. If they were discharged before the shock there was always a risk that they would be fired too soon, and the guns of the time could not be rapidly reloaded. The officer-like course was to keep the fire for the last moment, and use it to clear the way for the boarders. As a defence against boarding, the ships of a weaker fleet were sometimes tied side to one another, in the middle ages, and a barrier made with oars and spars. But this defensive arrangement, which was adopted by Olaf Tryggveson of Norway at A.D. 1000, and by the French at A.D. 1340, could be turned by an enemy who attacked on the flank. To meet the shock of ramming and to ram, medieval ships were sometimes "bearded," i.e. fortified with iron bands across the bows.

The principles of naval warfare known to the ancient world descended through Byzantium to the Italian Republics and from them to the West. With the growth of ships, the development of artillery, and the beginning of the great sailing fleets capable of keeping the sea for long periods together, came the need for a new adaptation of old principles. A ship which depended on the wind for its motive power could not hope to ram. It could still board, and the Spaniards did for long make it their main object to run their bow over an enemy's sides, and invade his deck. In order to carry out this kind of attack they would naturally try to get to windward and then bear down before the wind in line abreast ship upon ship. But an opponent to leeward could always baffle this attack by edging away, and in the meantime fire with his broadside to cripple his opponent's spars. Experience soon showed the more intelligent sea officers of all nations, that a ship which relied on broadside fire, must present her broadside to the enemy; it was also soon seen that in order to give full play to the guns of the fleet, the ships must follow one another. Thus there arose the practice of arranging ships in the line ahead, one behind the other. For a time sea-officers were inclined to doubt whether order could be maintained among vessels subject to the forces of wind and tide. But in the very first years of the 16th century, a Spanish writer of the name of Alonso de Chaves argued with force that even an approach to order is superior to none—and that, given the accidents of
wind and tide, the advantage would rest with him who took
his precautions. The truth was so obvious that it could not but
be universally accepted. The line ahead then became
"Line of battle." This term has a double mean-
ing. It may mean the formation, but it may also
mean the ships which are fit to form parts of the line in action.
The practice of sorting out ships, so as to class those fit to be
in a line of battle apart from others, dates from the second
half of the 17th century. Its advantages had been seen before,
but the classification was not made universal till then. The
excess number of ships connected in those naval wars, their
variety in size, and the presence in the fleets of a large proportion
of pressed or hired merchant ships had led to much bad execu-
tion. But in the final battles of the first war between England
and the Dutch Republic (1652–53), the Parliamentary admiral
enforced the formation of the line by strong measures. On the
conclusion of the war, they drew up the first published code of
fighting instructions. These give the basis of the whole tactical
system of the 17th and 18th centuries in naval warfare. The
treaties of Peace of Westphalia, 1648, and Peace of Nijmegen,
1678, laid down a system of combat by line, with advanced
squadrons on either side of the line of battle, to cover the
flank of the line and give a deceptive impression of greater
strength.

"The governing principles were simple and were essentially sound.
The ships were arranged in a line, in order that each
should have her broadside free to fire into the enemy
without running the risk of firing into her own friends.
In order to remove the danger that they would
attack each other, a competent space, to allow for a
change of course in case of need, was left between them. It
was fixed at two cables—about 200 fathoms, or 100 yds.

The fleets would fight "on the wind"—that is, with the wind on the side,
because they were then under better control. With the wind
blowing from behind they would take the course of the
other's sails. When the course had to be altered, the ships
were turned by the wind, together, or by wearing—
that is, stern to wind, either together or in succession. To tack
or wear a large fleet in succession was a very lengthy operation.

The second ship did not tack, or wear, till it had reached the
place where the first had turned, and so on, down the whole line.

B. By tacking or wearing together the order of a fleet was reversed,
the van becoming the rear, and the rear the van. It must be
remembered that a fleet was divided into van, centre and rear,
which kept their names even when the order was reversed.

Orders were given by signals from the flag-ship, but as they
could not be seen by the ships in a line with her, frigates were
stationed on the side of the line opposite to that facing the
enemy "to repeat signals."

A main object which the admirals who drafted the orders
had before them was to obviate the risk that the enemy would
double on one end of the line and put it between two fires.
It is obvious that if two fleets, A and B, were sailing, both
with the wind on the right side, and the leading ship of A comes
into action with the wind more than a quarter, or even a third of B's line will be free to turn and surround the
head of A's line. This did actually happen at the battle of
Beachy Head. Therefore, the orders enjoin on the admiral the
strict obligation to come into action in such a way that his leading
ship shall steer with the leading ship of the enemy, and his rear
with the rear. The familiar expression of the British navy was
"to take every man his bird."

The regular method of fighting battles was thus set up. In
itself it was founded on sound principles. As it was framed when
the enemies kept in view were the Dutch, who in seamanship
and gunnery were fully equal to the British, its authors were
justified in prescribing the safe course. Unhappily they added
the direction that a British admiral was to keep his fleet, through-
out the battle, in the order in which it was begun. Therefore
he could take no advantage of any disorder which might occur
in the enemy's lines. When therefore the conflict came to be
between the British and the French in the 18th century, battles
between equal or approximately equal forces were for long
inconclusive. The French, who had fewer ships than the British,
were anxious to fight at the least possible cost, lest their fleet
should be worn out by severe action, leaving Great Britain
with an untouched balance. Therefore, they preferred to engage
to leeward, a position which left them free to retreat before the
wind. They allowed the British fleet to get to windward, and,
when it was parallel with them and bore up before the wind to
attack, they moved onwards. The attacking fleet had then to
advance, not directly before the wind with its ships moving
along lines perpendicular to the line attacked, but in slanting
or curving lines. The assailants would be thrown into "a bow
and quarter line"—that is to say with the bow of the second
fleet on the after part of the first and in gunnery and to end.

In the case of a number of ships of various powers of sailing,
it was a difficult formation to maintain. The result was that
the ships of the assailant line which were steering to attack
the enemy's van came into action first and were liable to be crippled
in the rigging. If the same formation was to be maintained,
the others were now limited to the speed of the injured vessels,
and the enemy to leeward slipped away. At all times a fleet
advancing from windward was liable to injury in spars, even if
the leeward fleet did not deliberately aim at them. The leeward
ships should be worn away from the wind, and their shot would
always have a tendency to fly high. So long as the assailant
remained to windward, the ships to leeward could always slip
off.

The inconclusive results of so many battles at sea excited
the attentions of a Scottish gentleman, Mr Clerk of Eldin (1728–
1812), in the middle of the 18th century. He began a
series of speculations and calculations, which he em-
bodyed in pamphlets and distributed among naval
officers. They were finally published in book form in 1790 and
1797. The hypothesis which governs all Clerk's demonstrations
is that the British navy and its gunnery and seaman-
ship to their enemy, it was their interest to produce a mêlée.

He advanced various ingenious suggestions for concentrating
superior forces on parts of the enemy's line—by preference on
the rear, since the van must lose time in turning to its support.
They are all open to the criticism that an expert opponent could
find an answer to each of them. But that must be always the
case, and victory is never the fruit of a skilful movement alone,
but of that superiority of skill or of moral strength which enables
one combatant to forestall or to crush another by more rapid
movement or greater force of blow. Clerk's theories had at
least this merit that they might infallibly tend to make battles
decisive by throwing the combatants into a furious mangled
strife.

The unsatisfactory character of the accepted method of
fighting battles at sea had begun to be obvious to naval officers,
both French and English, who were Clerk's contemporaries.
The great French admiral Suffren condemned naval tactics as
being little better than so many excuses for avoiding a real
fight. He endeavoured to find a better method, by concentrating
superior forces on parts of his opponent's line in some of his
actions with the British fleet in the East Indies in 1782 and in the
West Indies in 1783.

But his orders were ill obeyed, and the quality of his fleet was
not superior to the British. Rodney, in his first battle in the
West Indies in 1780, endeavoured to concentrate a superior
force on part of his enemy's line by throwing a greater number
of British ships on the rear of the French line. But his directions
were misunderstood and not properly executed. Moreover he
did not then go beyond trying to place a larger number of ships
in action to windward against a smaller number to leeward by
arranging them at a less distance than two-cables length. But

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CRICK's theories.
an enemy who took the simple and obvious course of closing his line could battle the attack, and while the retreat to leeward remained open could still slip away. On the 12th of April 1782 (battle of Dominica) Rodney was induced, by the disorder in the French line, to break his own formation and pass through the enemy. He took the French flag-ship and five other vessels. The favourable result of this departure from the old practice of keeping the formation intact throughout the battle ruined the French system of tactics. In the French war which began in 1793 Lord Howe (battle of 1st of June) ordered his fleet to steer through the enemy, and to put themselves on his line only as a means of bringing his fleet into action, and then played to produce a mêlée in which the individual superiority of his vessels would have free play. Throughout the war, which lasted, with a brief interval of peace, from 1793 to 1815, British admirals grew constantly bolder in the methods they adopted for producing the desired mêlée (battles of St Vincent, Camperdown, Trafalgar). It has sometimes been argued that their line of attack was rash and would have proved disastrous if tried against more skilful opponents. But this is one of those criticisms which are of value only against those who think that there can be a magic efficacy in any particular attack, which makes its success infallible. That the tactics of British admirals of the great wars of 1793-1815 had in themselves no such virtue was amply demonstrated at the engagement off Lissa in 1811. They were justified because the reliance of admirals on the quality of their fleets was well founded. It should be borne in mind that a vessel while bearing down on an enemy's line could not be exposed to the fire of three enemies at once when at a lesser distance than 350 yards, because the guns could not be trained to converge on a nearer point. The whole range of effective fire was only a thousand yards or a very little over. The chance that a ship would be dismasted and stopped before reaching the enemy's line was small.

Influence of improved ship-building. The improvements in the construction of ships, which had so much influence on the development of tactics, had its effect also on strategy. The great aims of a fleet in war must be to keep the coast of its own country free from attack, to secure the freedom of its trade, and to destroy the enemy's fleet or confine it to port. The first and second of these purposes can be attained by the successful achievement of the third—the destruction or paralysis of the hostile fleet. But till after the end of the 17th century it was thought impossible, or at least very rash, to keep the great ships out of port between September and May or June. Therefore continuous watch on an enemy by blockading his ports was beyond the power of any navy. Therefore too, as the opponent might be at sea before he could be stopped, the movements of fleets were much subordinated to the need for providing convoy to the trade. It was not till the middle of the 18th century that the continuous blockade first carried out by Lord Hawke in 1758-59, and then brought to perfection by Earl St Vincent and other British admirals between 1793 and 1815, became possible.

Modern Times. The interval of ninety years between 1815 and 1904 (the opening of the Russo-Japanese conflict) was marked by no naval war. There was fighting at sea, and there were prolonged blockades, but there were no encounters between large and well-appointed navies. During this period an entire revolution took place in the means of propulsion, armament and material of construction of ships. Steam was applied to war-ships, and also a new form of armament was developed in the 19th century. The Crimean War gave a great stimulus to the development of the guns. It also brought about the application of iron to ships as a cuirass. Very soon metal was adopted as the material out of which ships were made. The extended use of shells, by immensely increasing the danger of fire, rendered so inflammable a substance as wood too dangerous for employment in a war-ship. France has the honour of having set the example of employing iron as a cuirass, while England was the first to take it as the sole material. Changes so sweeping as these could not take place without affecting all the established ideas as to the conduct of war at sea. The time of revolution in means of propulsion, armament and construction was also a time of much speculation. Doubts and obscurities remained unsolved because they had never been brought to the test of actual fighting on an adequate scale. As the 19th century drew to a close, another element of uncertainty was introduced by the development of the torpedo. A weapon which is a floating and moving mine, capable up to a certain point of being directed on its course invisible or very hard to trace, and able to deliver its blow beneath the water-line, was so complete a novelty that its action was hard indeed to foresee and therefore particularly liable to be exaggerated. From the torpedo sprang too the submarine vessel, which aims at striking below the surface, where it itself is, like its weapon, invisible, or nearly so.

How to solve the problems which science has set has been the task of thoughtful naval officers—and of the governments which the military seaman serves. The questions to be solved may be stated in the following order. What would be the effect: 1st, of the employment of a steam, or of any substitute for steam, more rapid than the wind or the oar; 2nd, of the development of the gun; 3rd, of the use of metal as a material of construction; 4th, of the use of a weapon and a vessel acting below the surface of the water, and if not wholly invisible at least very much hidden? The belief that steam had given the lesser fleet an advantage over the greater—that it had, in a phrase once popular among Englishmen, "bridged the Channel"—need only be touched on for its historical interest. It was an intelligible, perhaps pardonable, example of the confusion produced by a novelty of improved capacity on the minds of those who were not prepared to consider it in its bearings. A more thoughtful judgment, if it have shown that where both sides had the command of steam, the proportion between them would remain what it was before; the only exception would be that the fleet which was steering in a direction already laid down would have a somewhat greater advantage than of old, over another which was endeavouring to detect its presence and course. Its movements would be more rapid, and it could steam through a fog by which it would be hidden in a way impossible for a sailing ship. On the other hand, such a fleet could be much more rapidly pursued and intercepted when on its course was known. The influence of the speed and certainty of movement conferred by steam would have on the powers of fleets and ships presented a problem less easy to dispose of. Against the advantage they conferred was to be set the limitation they imposed. The necessity for replacing indispensable fuel was a restriction unknown to the sailing ship, which needed only to renew its provisions and water—stores more easily obtained all the world over than coal. Hence doubts naturally arose as to how far a state which did not possess coaling stations in all parts of the world could conduct extensive operations over great distances. The events of the recent Russo-Japanese War lead to the conclusion that the obligation to obtain coal has not materially limited the freedom of movement of fleets. By carrying store vessels with him, by coaling at sea, and taking advantage of the friendly neutrality of certain ports on his route, the Russian admiral, Rojdestvensky, reached the Far East in 1905 in less time and with less difficulty than he could have done in days when he would have been liable to delay by calms, contrary winds and loss of spars in gales. The amount of skill on the part of the crews required to carry a fleet a long distance would even appear to be less than it was of old. From this it would seem to follow that modern fleets possess no less capacity than the old sailing fleets for the great operations of war at a distance, or for maintaining blockades. Advantage and disadvantage counterbalance one another, and the proportion remains the same. Blockade is only another name for the maintenance of a watch on an enemy's squadron in port by a force capable of fighting him if he comes out. Admiral Togo blockaded the Russian squadron at Port Arthur in 1904 as effectually as any admiral has done the work in the past. The mobility given to the blockaded fleet by steam has been exactly counterbalanced by the increased mobility of the watch. The proportions remain the same.
But if the power to undertake far-ranging operations, and to
confine an enemy to port by keeping him under observation,
and driving him back when he comes out remains the same, the
strategy of war at sea cannot have undergone any material altera-
tion. The possession of ports where stores can be accumulated and
repairs effected is an advantage as it always was. But a
powerful fleet when operating far from its own country can supply
itself with a store-house (a base) of enemy's fight, or can be
served at sea by store-ships, old and new. If beaten, it will gather
from the want of places of refuge as it always did.

Among the speculations of recent years, a good deal has been
heard of the "fleet in being." If this phrase is only used to
mean that, so long as any part of an enemy's navy is capable of acting with effect, its existence cannot be
ignored with the certainty of safety, then the words
convey a truth which applies to all war whether by land or
sea. If it means, as it was at least sometimes clearly intended
to mean, that no such operation as the transport of troops
oversea can be undertaken with success, so long as the naval
forces of an opponent are not wholly destroyed, it is con-
tary to ancient experience. The Japanese in the beginning of
1904 began transporting troops to Korea before they had beaten
the Russians, and they continued to send them in spite of the
risk of interruption by the Vladivostok squadron. There was a
risk, but risk is inseparable from war. The degree which can be
incurred with safety depends on the stake at issue, the nature of
the circumstances and the capacity of the persons, which vary
infinitely and must be separately judged.

The war of 1904–05 may also be said to have shown that the
vast change in the construction of ships, together with the develop-
ment of old and the invention of new weapons, has
done far less to alter the course of battles at sea than had been thought likely. Two calculations have been successively
made and have been supported with plausibility. The first was
that steam would enable the ship herself to be used as a projectile
and that the use of the ram would again become common.
The sinking of the "Re d'Italia," by the Austrian ironclad
Ferdinand Max at the battle of Lissa in 1866 seemed to give
force to this supposition. Accidental collisions such as those
between the British war-ships "Vanguard" and "Iron Duke,
"Victoria," and "Camerondown" have also shown how fatal a
wound may be given by the ram of a modern ship. But the sinking
of the "Re d'Italia" was largely an accident. As
between vessels both under full control, a collision is easily
avoided where there is space to move. In a mêlée, or pell-mell
battle, to employ Nelson's phrase, opportunities would occur for
the use of the ram. But the activity of science has developed
one weapon to counterbalance another. The torpedo has made
it very dangerous to keep a fleet in one line, and it cannot fire
torpedoes ahead, and when charging home
Torpedoed, at an opponent presenting his broadside would be liable
to be struck by one. The torpedo may be said therefore to have
excluded the pell-mell battle and the use of the ram except
on rare occasions. But then arose the question whether the
torpedo itself would not become the decisive weapon in naval
warfare. It is undoubtedly capable of producing a great effect
when its power can be fully exerted. A school arose, having
its most convinced partisans in France, which argued that, as a
small vessel could with a torpedo destroy a great battle-ship, the
first would drive the second off the sea. The battle-ship was
to give place to the torpedo-boat or torpedo-boat-destroyer which
was itself only a torpedo-boat of a larger growth. But the
torpedo is subject to close restrictions. It cannot be used with
effect at more than two thousand yards. It passes through a
resisting medium, which renders its course uncertain and
comparatively slow, so that a moving opponent can avoid it.
The vessel built to use it can be easily sunk by gun-fire. By
night the risk from gun-fire is less, but science has nullified
what she had done. The invention of the search-light has made
it possible to keep the waters round a ship under observation
all night. In the war between Russia and Japan the torpedo
was at first used with success, but the injury it produced fell
below expectations, even when allowance is made for the fact that
the Russian squadron at Port Arthur had the means of repair close
at hand. In the sea fights of the war it was of subordinate use,
and indeed was not employed except to give the final stroke to,
or force the surrender of, an already crippled ship. This war
(which and as much may be said for the war between the United States
and Spain) confirmed an old experience. A resolute attempt
can be made by the Americans to destroy the "modem"
phrase to "bottle-up") the entrance to Santiago de Cuba by
sinking a ship in it. The Japanese renewed the attempt on
a great scale, and with the utmost intrepidity, at Port Arthur;
but though a steamer can move with a speed and precision im-
possible to a sailing ship, and can therefore be sunk more surely
at a chosen spot, the experiment failed. Neither Americans
nor Japanese succeeded in preventing their enemy from coming
out when he wished to come.

Since neither ram nor torpedo has established the claim made
for them, the cannon remains "the heart of the battle-ship." It
may still deliver its blows at the greatest distance, and
in the greatest variety of circumstances. The change
has been in the method in which its power is applied. Now,
as in former times, the aim of a skillful officer is to concentrate
a superior force on a part of his opponent's formation. When
the range of effective fire was a thousand or twelve hundred
yards, and when guns could only be trained over a small segment
of a circle because they were fired out of ports, concentration
could only be effected by bringing a larger number of ships into
close action with a smaller one. To-day when gun-fire is effective even
at a thousand thousand yards, and when ships are fired from the main
barbettes have a far wider sweep, concentration can be effected
from a distance. The power to effect it must be sought by a
judicious choice of position. It is true that greater rapidity
and precision of fire produce concentration in one way. If of
two forces engaged one can bring forty guns to bear on a chosen
point of its opponent's formations, while that opponent can
bring fifty guns to bear on a part of it, the superiority
would seem to be with the larger number. But this is by no means
necessary to the case. The smaller number of guns may give
the greater number of blows if fired with greater speed and
accuracy. Yet no commander has a right to rely on such
a superiority as this till it has been demonstrated, as it had been
in the case of the British fleet by the time that Trafalgar was
fought. Therefore an able chief will always play for position.
He will do so all the more because an advantage of position adds
to any other which he may possess. He may dispense with it
for a particular reason at a given moment and in reliance on
other sources of strength, but he will not throw it away.

Position is to be secured the first condition to be thought
of. Torpedo or gun, the latter in another guise, cannot
be used in the same way. The word "line abreast" was
imposed on the sailing fleets by the peremptory order
"need for bringing, or at least retaining the power to
bring, all their broadsides into action. Experiments made during
manoeuvres by modern navies, together with the experience
gained in the war of 1904–05 in the Far East, have combined to
show that no material change has taken place in this respect.
It is still as necessary as ever that all the guns should be so placed
as to be capable of being brought to bear, and it is still a condition
imposed by the physical necessities of the case that this freedom
can only be obtained when ships follow one another in a line.
When in pursuit or flight, or when steaming on the look-out for
a still unseen enemy, a fleet may be arranged in the "line
abreast." A pursuing fleet would have to run the risk of being
struck by torpedoes dropped by a retreating enemy.
But it would have the advantage of being able to bring all its guns
which can fire ahead to bear on the rear-ship of the enemy.
When an opponent is prepared to give battle, and turns his broad-
side so as to bring the maximum of his gun-fire to bear, he
must be answered by a similar display of force—in other words,
the line ahead must be formed to meet the line ahead.

Both fleets being in this formation, how is the concentration
of a superior force to be effected? If the opponents are equal
in number, speed, armament, gunnery and the leadership of the
chefs, accident alone can confer an advantage on either of them. Where equal weights are tried on accurate scales one cannot force up the other, but this evenness of power is rarely met in war by land or sea. The knowledge that it existed would probably prevent an appeal to arms between nations, since no decisive result could be hoped for. It is needless to insist that superior numbers make the task of concentrating comparatively easy, unless counterbalanced by a great inferiority in speed. Speed is the quality which an admiral will wish his fleet to possess, in order that he may have the power to choose his point of attack. The swifter of two forces, otherwise equal, can always get ahead of its opponent, and then by turning inwards bring the leading ship of the force it is attacking into a curve of fire. The leader of the slower fleet can avoid the danger by also turning inwards. By so doing he will keep the assailant on his beam, opposite his side. Then the two fleets will tend to swing round in two circles having a common center, the added speed going round the outermost ring, and the slower round the inner. As the difference in length of these two lines would be always great and perhaps immense, the less speedy fleet could easily avoid the risk of being headed. On the other hand the outer fleet will be in a concave formation, and therefore able to bring all its guns to bear on the same point, while the inner fleet will be in a convex line, so that it will be unable to bring the guns of both van and rear to bear on the same mark. The advantage is obvious, but it may perhaps be easily exaggerated. The swifter fleet on the larger circle can in theory concentrate all its fire on one point, but all its ships would not be able to do it already going at its maximum rate, and the slower round the inner. In actual battle very much will depend on the respective skill of the gunners. The swifter ship would of course neutralise by the crippling of two or three of its leading ships. In such an action as this it would be, if not impossible, at least exceedingly difficult to give orders by signal. An admiral will therefore have to direct by example, which he cannot do except by placing his flag-ship at the head of the line. In that case he will be marked out as a target for the enemy's concentrated fire. He may indeed decide to direct the battle by signal from outside the line. Yet the difficulty he will find in seeing what is happening, as well as the difficulty the captains will find in seeing the signals, will always be so great, that in all probability the admirals of the future, will, like Nelson, be content to lay down the general principles on which the battle is to be fought, and trust the captains to apply them as circumstances arise. A large measure of independence must needs be allowed to the captains in the actual stress of battle. Ships must be placed at such a distance apart as will allow them room to manoeuvre so as to avoid collision with their own friends. The interval cannot be less than 800 yds. When the length of the vessels themselves is added, it will be seen that the battle will stretch six miles. Modern powder is nominally smokeless, and it certainly does not create the dense bank of smoke produced by the old explosives. Yet it does create a sufficient haze to obscure the view from the van to the rear of an extended line. The movements must be rapid, and there will be little time indeed in which to take decisions. The torpedo may not be used during the actual battle. Its part will be to complete the destruction or enforce the surrender of a beaten enemy, and to cover retreats.

The s-ecantine and submergible vessel were brought into prominence by France in the hope that by diminishing the value of battleships they would reduce the superiority of the British navy. The example of France was followed by other powers, and particularly by Great Britain; but their value as weapons of war is necessarily a matter of speculation.

BIBLIOGRAPHY.—Naval strategy can hardly be said to have been dealt with until the publication of Sir Charles Price's Manual of naval Power on History. The tactics of the ancient world are only very briefly dealt with in the De re Militari of Vegetius, in book iv. Vegetius was much copied and read in the middle ages, and was translated into French in 1584 by Jean de Moung, one of the authors of the Roman de la Rose. His translation is printed, together with the verse paraphrase of Priorats, in the Anciens Textes frangais. Naval tactics were dealt with by Jacques-Francois de Meurmis' Opera Omnia, vol. vi. They were emperors of the Maccononian dynasty. The tactics of the medieval galleys are described, with the advantages to be derived from both the galley and the galley-boat, Pontistica, and by Admiral Jurien de la Gravere in Les Derniers jours de la marine a rames (1885). The chief writers on the tactics of the sailing fleets were French. At the head of them, in time and in merit, must be put Paul Hoste, whose folio on Naval Evolutions appeared in 1607. Hoste was a Jesuit who was secretary to the Court of Tourville. Hoste's treatise was translated into English and published in Edinburgh in 1834 with numerous and excellent illustrations by Captain J. D. Boswell. A Treatise on Naval Tactics. Captain Boswell also made use of the passages relating to naval tactics in the History of the Art of War by J. G. Hoyer, an officer in the Prussian army, published 1805. Of particular note was the Manuver a de Bourde de Villeheut (1765), translated into English in 1788 under the title of The Manuverer, or Skilful Seaman. Particular attention is due to the Essay on Naval Tactics by Mr Clerk of the Naval Office, published for the society of arts (8vo). The work of the Frenchman, Vicomte de Meung, was Manuver de Bourde de Villeheut (1765), translated into English in 1788 under the title of The Manuverer, or Skilful Seaman. Particular attention is due to the Essay on Naval Tactics by Mr Clerk of the Naval Office, published for the society of arts (8vo). The work of the Frenchman, Vicomte de Meung, was Manuver de Bourde de Villeheut (1765), translated into English in 1788 under the title of The Manuverer, or Skilful Seaman. Particular attention is due to the Essay on Naval Tactics by Mr Clerk of the Naval Office, published for the society of arts (8vo).

NAWAB—NAWANAGAR

NAWAB, a Mahomedan title for a native ruler in India, answering to the Hindu raja. Nawab originally means a deputy, being the honorific plural of the Arabic naib, and it was applied to the representative of the Great Mogul, e.g., the nawab of Oudh. From this use it became a title of rank, without office, and is now sometimes conferred by the British government on Mahomedan gentlemen for distinguished service.

NAWABGANJ, the name of three towns of British India. (1) The most important is the headquarters of Bara Banki district in the United Provinces, on the Oudh and Rohilkund railway, 17 m. E. of Lucknow; pop. (1901) 14,478. It has a considerable trade in sugar and cotton goods. It was the scene of a victory by Sir Hope Grant during the Mutiny. (2) A town in Malda district, Eastern Bengal and Assam, on the Mahananda near its junction with the Ganges, a centre of river trade; pop. (1901) 17,016. (3) A town in Gonda district, United Provinces, on the Bengal and North-Western railway; pop. (1901) 7047.

NAWANAGAR, or JAMNAGAR, a native state of India, in Kathiawar, within the Gujarat division of Bombay, situated on the south of the Gulf of Cutch. Area, 3,791 sq. m. Pop. (1901) 356,779, showing a decrease of 11% in the decade due to famine. Estimated revenue, £710,000; tribute, £800. The title is that of Nawab. It was annexed by Sir B. L. Metcalfe as the rao of Cutch. Prince Ranjitsinhji (b. 1872), well known in England as a cricketer, was educated at the Rajkumar College,
Rajkot, and Trinity College, Cambridge. He had been adopted by his uncle, the Jam Shri Vihbajii, but the adoption was set aside, with British sanction, in favour of a son by a Mahomedan mother. This son succeeded, but died in 1906 aged twenty-four, and Ranjitsinjhi obtained the throne in March 1907. A branch railway, constructed at the expense of the state, was opened in 1898 from Rajkot to Nawanagar town.

The town of Nawanagar is about 5 m. from the seaport of Bedi. Pop. (1901) 53,844. Founded by Jam Rawal in 1540, it was built of stone and has manufactures of silk and gold embroidery, and perfumed oils and red powder for ceremonial purposes. Its water is supplied from a reservoir covering 600 acres and an aqueduct 8 m. long.

**Nawayi** [Abd Zakariyya bin Sharaf un-Nawayi] (1233-1278), Arabiwi writer, was born at Naway near Damascus. In the latter city he studied from his eighteenth year, and there, after making the pilgrimage in 1253, he settled as a private scholar until 1267, when he succeeded Abu Shams as professor of tradition at the Ashrafiyah school. He died at Naway from overwork.

His manual of Moslem law according to the Shar'iate school has been edited with French translation by van den Bergh, 2 vols., Batavia (1882-1884), and published at Cairo (1888). The *Takadhil al-Asma* has been edited as the *Biographical Dictionary of Illustrious Men of Egypt and the Maghrib*. It was published in 4 vols., translated into English by M. Marchand (Leipzig, 1847). The *Takrib wa Taisir*, an introduction to the study of tradition, was published at Cairo, 1890, with Suyuti's commentary. It has been in part translated into French by M. Marchand (Vienne, 1897). The *Journal asiatique*, series ix., vols. 16-18 (1909-1901). Nawayi's collection of the forty (actually forty-two) chief traditions has been frequently published with commentaries in Cairo. For other works see C. Brockelmann, *Geich der arabischen Literatur*, vol. ii. (Weimar, 1898), pp. 395-397.

**Naxos**, the largest of the Cyclades (about 22 m. by 16 m.), a fertile island in the Aegean Sea, east of Faros, with which, and adjacent smaller islands, it forms an *eparchia*. In ancient times it was also called Dia or Strongyle. It was rich in vines and famous for its wine, and a centre of the worship of Bacchus. The god found Ariadne asleep on its shore, when she was deserted by Theseus. The sculptors of Naxos formed an important school of early Greek art; several unfinished colossal statues are still to be seen in the quarries, notably one in Aplollonia Bay, to the N.E. of the island. A tyrant Lygdamis ruled Naxos in alliance with Peisistratus of Athens during the 6th century B.C. In 490 it was captured and treated with great severity. Four Naxian ships took part in the expedition of Xerxes, but deserted and fought on the Greek side at Salamis in 480. Naxos was a member of the Delian League (478); it revolted in 471, was captured by Athens, and remained in her possession till her empire was destroyed. In later times the most remarkable event was its capture, in A.D. 1297, by the Venetian Marco Sanudo, who founded the duchy of Naxos, which flourished till the Turks took the island in 1566. Since the War of Independence it has belonged to the Greek kingdom. The only ancient remains of any importance are those of a temple (Palatii), supposed to be that of Dionysus, on an island just off the town. Naxos is still rich in fruit trees, and also exports corn, wine and oil, as well as emery, its richest and most important mineral product. Pop. (1907) 23,185 (province), 2064 (commune).

**Naxos** the earliest Greek colony in Sicily, was founded by Thoecles from Chalcis in 735 B.C., on the E. coast, in Tauromenium (mod. Tarormina), in a low-lying situation just N. of the mouth of the river Alcantara, where the castle of Schio now stands. The adoption of the name of Naxos, the island in the Aegean Sea, seems to indicate that there were Naxians among its founders. Within a few years it became strong enough to found Leontini and Catana. Naxos was the warmest ally of Athens in the Sicilian expedition. In 403 B.C. it was destroyed by Dionysius and handed over to the Sicels, but was never reoccupied. Its place was supplied in 358 by Tauromenium. Scanty traces of its walls are to be seen, and irregular blocks of lava, especially on the south, parallel to the river (E. A. Freeman, *Hist. of Sic. i. 323*). Without the city stood the altar of Apollo Archegetes, at which all sacred embassies that left Sicily sacrificed before their departure (Thuc. vi. 3).

**Nay**, or Nevi, the long flute of the ancient Egyptians, held obliquely and played by directing the breath, as in the pipes of the syrinx, across the open end, which had no embouchure of any kind. Performers on the nay are represented on many of the frescoes which decorated the tombs at Thebes, their flutes reaching nearly to the ground while they are in the familiar half-kneeling posture. The acoustic principles involved in the nay are similar to those of the fipple-flute, and the narrowness of the bore in proportion to the length would facilitate the production of harmonics and so give the nay an extended compass. Victor Loret 1 has compiled a list of all the real pipes of ancient Egypt which have survived, having for the most part been preserved in mummy cases. The nay was not restricted to ancient Egypt, but has remained in general use in various parts of the East until the present day.

**Nayagarh**, a native state in India, in the Orissa division of Bengal. Area, 538 sq. m.; pop. (1901) 140,779; revenue, 1862, he joined the parliament as an officer, and remained in the same post till 1898), a revolt of the hill tribes of Kalinga against the raja required the intervention of British military police. Nayagarh village (pop. 3340) is connected by road with Khurda in Puri district.

**Nayar**, or Naik, a caste or tribe on the W. coast of S. India, who form the dominant race in Malabar. Traditionally they are soldiers, but many have taken to professions, and one was in 1810 a judge of the high court at Madras. Their total number in all India in 1901 was just over one million. Their most peculiar customs are: (1) marumakkal buwayam - a descent through sister's children, or the name of the female line; and (2) sanbandham, a loose form of union, taking the place of marriage, without any responsibility of the husband towards either wife or children. In 1866 an act of the Madras legislature enabled a sanbandham to be registered, and have the force of a legal marriage. Little advantage has been taken of this act, while it is alleged that the sanbandham now usually lasts for a lifetime.

See Malabar District Gazetteer (Madras, 1908).

**Nayler** (or Naylor), James (1618-1660), English Puritan, was born at Andersloe or Ardsley, in Yorkshire, in 1618. In 1622 he joined the parliament as a soldier, and served as quartermaster in John Lambert's horse. In 1637 he adopted Quakerism and gradually arrived at the conviction that he was a new incarnation of Christ. He gathered round him a small band of disciples, who followed him from place to place. At Appleby in 1653 and again at Exeter in 1655 he suffered terms of imprisonment. In October 1655, in imitation of Christ's procession into Jerusalem, he entered Bristol on horseback riding single—a rawboned nude figure, with lank hair reaching below his cheeks—attended by seven followers, some on horseback, some on foot, he in silence and they singing "Hosanna! Holy, holy! Lord God of Sabaoth!" At the High Cross he and his followers were arrested. His trial occupied the second parliament of Cromwell for several days, and on the 16th of December 1656 he was convicted of blasphemy and sentenced to be whipped from the Palace Yard to the Old Exchange, to be branded in the forehead with "B" (for blasphemer), to have his tongue bored with a red-hot iron, to be whipped through the streets of Bristol, and to suffer imprisonment with hard labour for two years. On his release he was readmitted into the communion of the Quakers, and spent some time in Westmorland with George Whitehead. In 1664 he published a long and obscure work set out to visit his long-forsaken family in Yorkshire, but died en route in Huntingdonshire.

A collected edition of the *Tracts* of Nayler appeared in 1716. See A Relation of the Life, Conversion, Examination, Confession, and Death of James Nayler, a Popular Preacher, in 1643, under the Title, *Trial, and Sufferings of James Nayler* (1710); and a Refutation of some of the more Modern Misrepresentations of the Society of Friends commonly called Quakers, with a Life of James Nayler, by Joseph Conyers Bevan (1800).

NAZARENES—NEAGH

NAZARENES (NAζαρεῖον), an obscure Jewish-Christian sect, existing at the time of Epiphanius (fl. A.D. 370) in Coele-Syria, Decapolis (Pella) and Basanitis (Cochae). According to that authority (Panarion, xxix. 7) they dated their settlement in Pella from the time of the flight of the Jewish Christians from Jerusalem, immediately before the siege in A.D. 70; he characterizes them as neither more nor less than Jews pure and simple, but adds that they recognized the new covenant as well as the old, and believed in the resurrection, and in the one God and His Son Jesus Christ. He cannot say whether their chirological views were identical with those of Cerinthus and his school, or whether they differed at all from his own. But Jerome (Ep. 79, to Augustine) says that they believed in Christ the Son of God, born of the Virgin Mary, who suffered under Pontius Pilate, and rose again, but adds that, "desiring to be both Jews and Christians, they are neither the one nor the other." They used the Anamalistic recension of the Gospel according to Matthew, which they called the Gospel to the Hebrews, but, while adhering as far as possible to the Mosaic economy as regards circumcision, sabbaths, foods and the like, they did not refuse to recognize the apostolicity of Paul or the rights of heathen Christians (Jer., Comm. in Isa., ix. 1). These facts, taken along with the name (cf. Acts xxiv. 5) and geographical position of the sect, lead to the conclusion that the Nazarenes of the 4th century are, in spite of Epiphanius's distinction, to be identified with the Ebionites (q.v.).

NAZARETH (mod. en-Naṣrā), a town in Galilee, in a hollow of hills on the southern border of the plain of Esdraelon. It first appears as a village (John i. 46) in which Joseph and Mary lived (Luke i. 26) and to which they returned from Egypt (Matt. ii. 23). Here the unrecorded years of Christ's boyhood were spent. From the name of the town comes naṣārā (i.e. "Nazarenes"), the ordinary Oriental word for "Christians." There was here a synagogue (Matt. xiii. 54) in which Christ preached the sermon that led to his rejection by his fellow towns- men. The growth of legends and traditional identifications can be traced in the writings of the pilgrims who have visited the town from Jerome's time till our own. For none of these can anything be said, save that it is probable that the village spring (called "St. Mary's Well") is the same as that used in the time of Christ. A large basilica stood here about A.D. 600: the crusaders transferred here the bishopric of Sycophylus. It was taken by Saladin in 1187. In 1517 it was captured by the Turks. The population is now estimated at about 3500 Moslems and 6500 Christians; there are numerous schools, hospitals, &c., conducted by Greeks, Latins and Protestants. Visitors are shown the "Church of the Annunciation" with caves (including a fragment of a pillar hanging from the ceiling, and said to be miraculously simple, which is described as the scene of the announcement, the "workshop of Joseph," the "synagogue," and a stone table, said to have been used by Christ.

NAZARITE, or rather Nazarite, the name given by the Hebrews to a peculiar kind of devotee. The characteristic marks of a Nazarite were unshorn locks and abstinence from wine (Judges xiii. 5; 1 Sam. i. 11; Amos ii. 11 seq.); but full regulations for the legal observance of the Nazarite vow are given in Num. vi., where every product of the grape-vine is forbidden, and the Nazarite is enjoined not to approach a dead body, even that of his nearest relative. The law in question is in its present form post-exilic, and is mainly directed to the regulation of a known usage. It contemplates the assumption of the vow for a limited period only, and gives particular details as to the atoning ceremonies at the sanctuary by which the vow must be recommenced if broken by accidental defilement, and the closing sacrifice, at which the Nazarite on the expiry of his vow cuts off his hair and burns it on the altar, thus returning to ordinary life. Among the later Jews the Nazarite vow, of course, corresponded with the legal ordinance, which was further developed by the scribes in their usual manner (Mishna, tractate Nazir). These are neither more nor less than Jews pure and simple, but...
streams, the river Bann alone carries off its waters, flowing northward. The principal feeders are the Main and the north, the Crumlin (whose waters have petrifying powers) on the east, the Bann and Blackwater on the south, and the Ballinderry and Moyola on the west. Antrim and Toome, at the N. E. and N.W. respectively, are the only towns immediately on the shores. The islands are few and near the shore; namely, Skiddy Island (with a castellated tower) on the coast, Ready and Coney Islands on the southwest. The loughs abound in fish, including gillaroo trout, char and pulleen or fresh-water herring. A tradition that the lough rose suddenly from a fountain, inundating a populous district, and that remains of buildings may be seen below the waters, finds place in "saps Moore's ballad Let Erin remember."

NEAL, DANIEL (1678-1743), English historian, born in London on the 14th of December 1678, was educated at the Merchant Taylors' School, and at the universities of Utrecht and Leiden. In 1704 he became assistant minister, and in 1706 sole minister, of an independent congregation worshipping in Aldersgate Street, and afterwards in Jewin Street, London, where he remained almost until his death on the 4th of April 1743. He married Elizabeth Lardner (d. 1748), by whom he had one son, Nathanael, and two daughters. In 1720 Neal published his History of New England, which obtained for its author the honorary degree of M.A. from Harvard college. He also undertook to assist Dr John Evans in writing a history of Nonconformity. For Evans he prepared a great many papers for the period before 1640. Neal wrote the whole of the work himself. This History of the Puritans deals with the time between the Reformation and 1689; the first volume appearing in 1732, and the fourth and last in 1738. The first volume was attacked in 1733 for unfairness and inaccuracy by Isaac Maddox, afterwards bishop of St Asaph and of Worcester, to whom Neal replied in a pamphlet, A Review of the principal facts objected to in the first volume of the History of the Puritans; and the remaining volumes by Zachary Grey (1688-1760), to whom the author made no reply.

The History of the Puritans was edited, in five volumes, by Dr Joshua Toulmin (1740-1815), who assisted a life of Neal in 1797. This was reprinted in 1822, and an edition in two volumes was published in New York in 1844.

NEAL, DAVID DALHOFF (1838— ), American artist, was born at Lowell, Massachusetts, on the 26th of October 1838. He was a pupil of the Royal Academy, Munich, under Max. E. Ainmiller, whose daughter he subsequently married. Later he entered the studio of Piloty, with whom he remained from 1860 to 1876. His picture, "The First Meeting of Mary Stuart and Rizzino," was accepted by the Gallery of the Royal Bavarian Academy of Art. Besides portraits his canvases include "James Watt," a large historical composition shown at the Royal Academy, 1874, "Chapel of the Kings at Westminster" (collection of F. Cutting, Boston) and "Cromwell visiting Milton" (Hurlbut collection, Cleveland, Ohio).

NEALE, EDWARD VANSITTART (1810-1892), English co-operator and Christian Socialist, was born at Bath on the 2nd of April 1810, the son of a Buckinghamshire clergyman. After receiving his earlier education at home he went to Oriel College, Oxford. In 1837 he was elected a fellow of the college. He became a member of the Christian Socialists in 1850 and also joined the council of the Society for Promoting Working Men's Associations. His wealth enabled him to carry out experiments in co-operation on a larger scale than had been previously attempted. He founded the first co-operative store in London, and advanced the capital for two builders' associations, both of which failed. In 1851, though strongly opposed by other members of the promoting "Council," he started on his own initiative the Central Co-operative Agency, similar in many respects to the Co-operative Wholesale Society of a later day. The failure of this scheme, together with that of the operatives' cause in the engineering lock-out of 1852 is said to have cost him £40,000. It is certain that until in later life he inherited the estate of Bishop Abbey in Berkshire he was, comparatively speaking, a poor man. He was closely associated with the movement which resulted in the Industrial and Provident Societies Act of 1876, and the passing of the Consolidation Act of 1882 was almost entirely due to his efforts. Besides publishing pamphlets on co-operation he served on the executive committee which afterwards developed into the Central Co-operative Board, and took an active part in the formation of the North of England Co-operative Wholesale Society in 1863. One of the founders of the Co-operative Wholesale Society in 1866, and the Agricultural and Horticultural Association in 1867, he also promoted the annual co-operative congress, afterwards becoming general secretary of the Central Board. He was also a director of the Co-operative Insurance Company and a member of the Co-operative Newspaper Society for many years. He visited America in 1875 with a deputation whose object was to open up a direct trade between the farmers of the western states and the English co-operative stores. After resigning the post of secretary to the congress board in 1891, he became a member of the Oxford University branch of the Christian Social Union. He died on the 16th of September 1892.

NEALE, JOHN MASON (1818-1886), English divine and scholar, was born in London on the 24th of January 1818, and was educated at Trinity College, Cambridge. Here he was affected by the Oxford movement, and helped to found the Camden (afterwards the Ecclesiological) Society. Though he took orders in 1841, ill-health prevented his settling in England and he went to America to receive a degree of D.D. at the Unitarian College at Philadelphia. There he died on the 12th of August 1886.

Neale was strongly high-church in his sympathies, and had to endure a good deal of opposition, including a fourteen years' inhibition by his bishop. In 1853 he founded a nursing sisterhood named St Margaret's. He occupies a high place as a hymnologist, but principally as a translator of ancient and medieval hymns, the best known being probably "Brief life is here our portion." "To thee, O dear, dear country," and "Jerusalem, the golden," which are included in the poems of Bernard of Clonfert, De Contemptu Mundi, translated by him in full. He also published An Introduction to the History of the Holy Eastern Church (1859, 2 vols.); History of the so-called Jansenist Church of Holland (1853); Essays on Liturgiology and Church History (1863); and many other works.

See Life by his daughter, Mrs Charles Toole (1907); the Memoir by his friend, R. F. Littlehead; and the Letters of John Mason Neale (1910), selected and edited by his daughter. For a complete list of Neale's works see article in Dict. Nat. Bio., xl. 145.

NEAMTZU (Neamț), town in Rumania, situated among the lower slopes of the Căpâlna Mountains, and on the left bank of the river Neamțu, an affluent of the Moldova. Pop. (1900) 8578, about half being Jews. Neamțu gives its name to the department of which Pîntea is the capital. Lying 15 m. S. by E. of Falticeni, the nearest railway station, it has little trade. Near it is the ruined fortress of Neamțu, constructed early in the 13th century by the Teutonic knights of Andrew II., king of Hungary, in order to repel the incursions of the Cumans. An hour's drive to the west of the town is the monastery of Neamțu, founded in the 14th century, and containing the tomb of Ioan, a warrior and a saint. Before the secularization of the monastic lands in 1864, it was one of the richest and most important of the Rumanian monasteries. Baltazateli, 10 m. W. by S. of Neamțu, is locally famous for its mineral springs and baths.

NEANDER, JOACHIM (1560-1680), German hymnwriter, was born at Bremen. The family name, originally Neumann, had, according to the prevailing fashion a century earlier, been Graecized as Neander. After studying at Heidelberg and Frankfort, where he formed friendships with Friedrich Spanheim (1652-1700) and Petäpp Jakob Spezer (1635-1703), he settled at Düsseldorf as rector of the Latin school in connexion with the Reformed Church. In 1676 he incurred church censure for abstaining and inducing others to abstain from joining in the celebration of the communion. It was during the term of
Neander, Johann August Wilhelm (1759-1850), German theologian and church historian, was born at Göttingen on the 17th of January 1759. His father, Emmanuel Mendel, is said to have been a Jewish pedlar, but August adopted the name of Neander on his baptism as a Christian. While still very young, he removed with his mother to Hamburg. There, as throughout life, the simplicity of his personal appearance and the oddity of his manners attracted notice, but still more, his great industry and mental power. From the grammar-school (Johanneum) he passed to the gymnasium, where the study of Plato appears especially to have engrossed him. Considerable interest attaches to his early companionship with Wilhelm Neumann and certain others, among whom were the writer Karl August Varnhagen von Ense and the poet Adelbert von Chamisso.

Baptized on the 29th of February 1806, in the same year Neander went to Halle to study divinity. Here Schleiermacher was then lecturing. Neander found in him the very impulse which he needed, while Schleiermacher found a pupil of thoroughly congenial feeling, and one destined to carry out his views in a higher and more effective Christian form than he himself was capable of imparting to them. But before the year had closed the events of the Franco-Prussian War compelled his removal to Göttingen. There he continued his studies with ardour, made himself yet more master of Plato and Plutarch, and became especially advanced in theology under the venerable G. J. Baur. The impulsive communicative character of Schleiermacher was confirmed by Planck, and he seems now to have realized that the original investigation of Christian history was to form the great work of his life.

Having finished his university course, he returned to Hamburg, and passed his examination for the Christian ministry. After an interval of about eighteen months, however, he definitely betook himself to an academic career, "habilitating" in Heidelberg, where two vacancies had occurred in the theological faculty of the university. He entered upon his work here as a theological teacher in 1811; and in 1812 he became a professor. In the same year (1812) he first appeared as an author by the publication of his monograph Über den Kaiser Julianus und sein Zeitalter. The fresh insight into the history of the church evinced by this work at once drew attention to its author, and even before he had terminated the first year of his academical labours at Heidelberg, he was called to Berlin, where he was appointed professor of theology.

In the year following his appointment he published a second monograph Der Heilige Bernhard und sein Zeitalter (Berlin, 1813), and then in 1818 his work on Gnosticism (Genetische Entwicklung der spätesten christlichen Gnostischen Systeme). A still more extended and elaborated monograph than either of the preceding followed in 1822, Der Heilige Johannes Chrysostomus und die Kirche, besonders des Orients in dessen Zeitalter, and again, in 1824, another on Tertullian (Antignostikus). He had in the meantime, however, begun his great work, to which these several efforts were only preparatory studies. The first volume of his Allgemeine Geschichte der christlichen Religion und Kirche embracing the history of the first three centuries, made its appearance in 1825. The others followed at intervals—the fifth, which appeared in 1839, bringing down the narrative to the pontificate of Boniface VIII. Aanthropological volume, edited by C. F. T. Schneider in 1852, carried it on to the period of the council of Basel. Besides this great work he published in 1832 his Geschichte der Pflanzung und Leitung der christlichen Kirche, and in 1837 his Das Leben Jesu Christi, in seinem geschichtlichen Zusammenhang und seiner geschichtlichen Entwickelung, called forth by the famous Life of David Strauss. In addition to all these he published Denkwürdigkeiten aus der geschichtlichen Erinnerung an die Christiane Religion (1816, 1820, 1824, 1846); Das Eine und Mannigfaltige des christlichen Lebens (1849); papers on Plotinus, Thomas Aquinas, Theobald Thamer, Blaise Pascal, J. H. Newman, Blanco White and T. Arnold, and other occasional pieces (Kleine Gelegenheitsschriften, 1829), mainly of a practical, exegetical and historical character. He died on the 14th of July 1850, worn out and nearly blind with incessant study. After his death a succession of volumes, representing his various courses of lectures, appeared (1856-1864), in addition to the Lectures on the History of Dogma (Theologische Vorlesungen), admirable in spirit and execution, which were edited by J. L. Jacoby in 1857.

Neander's theological position can only be explained in connexion with Schleiermacher's, and the manner in which he adopted and modified and carried out the principles of his master. Characteristically meditative, he rested with a secure footing on the great central truths of Christianity, and recognized strongly their essential bearing on life and history. In these he claimed the claims of philosophy; he was not less strongly asserted the rights of Christian feeling. "Without it," he emphatically says, "there can be no theology; it can only thrive in the necessity of a system; and the historian must explain his favourite motto: "Pectus est quod theologiam facit."" His Church History (Allgemeine Geschichte der christlichen Religion und Kirche) remains the greatest monument of his genius. In this he was chief among the writers of his time, and has made the individual in history. In the principal figures of ecclesiastical history he tried to depict the representative tendencies of each age, and also the types of the essential tendencies of human nature generally. His guiding principle in treating both of the history and of the present condition of the church was—that Christianity has room for the various tendencies of human nature, and aims at perpetuating and glorifying them. He showed that these various tendencies are to occur successively and simultaneously and to counterbalance each other, so that the freedom and variety of the development of the spiritual life ought not to be forced into a single dogmatic form ("E. Pflüger, Development of Theology, p. 280"). Several of his books have passed into new and revised editions and have been translated into English. Among these English versions may be mentioned General History of the Christian Religion and Church, by J. J. Torrey (1830-1836); History of the Planting and Training of the Church by the Apostle, by J. E. Ryland (1851); Julian and his Generation, by G. V. Cox (1850); Life of Jesus, by J. M'Clnstock and C. E. Blumenthal (1838); and the History of the Church in its General Memorial of the Christian Church during the Early and Middle Ages, by J. E. Ryland (1852).

See O. C. Kraube, August Neander (1881) and a paper by C. F. Krumeich in Studi e Ricerche storiche di j. L. Spina erinnerungen an August Neander (1882); Philipp Schaff, Erinnerungen an Neander (1886); Adolph Harnack, Rede and August Neander (1895); J. Weigand, Geschichte der Bekenntnisse (1886); W. Neander (1890); and K. T. Schneider, August Neander (1894). Cf. Herzog-Hauck, Realencyklopädie, and P. Schaff, Germany: its Universities and Theology (1852).

Neandertal, a ravine near the village of Hochdall between Düsseldorf and Elberfeld, Renish Prussia. Here in 1856 were discovered in a Quaternary bed in the Feldhohnen Cave human remains which have been referred to a type commonly called Neandertal Man. The bones found were a brain-cap, two femora, two humeri and other fragments, now in the Fuhlrott Collection, Elberfeld. The cranium, pronounced by Huxley to be the most ape-like yet discovered, was remarkable for its enormous superciliary ridges. Professor Virchow and others contended that the remarkable shape was pathological or caused by disease during the lifetime of the individual. The subsequent discovery of two other skulls, almost identical in form, at Spy in Belgium, has helped to prove its typical character. The now generally accepted view is that the Neandertal skull represents the oldest known dolichocephalic race of Europe.

Nep, a word only used of tides in which the high-water mark is at its lowest, there being the least difference in level between high and low water (tides); or, that are "springing" (See Tide). From Greek neptos, and only once alone in the expression fortganges nept, "without power of advancing." It may possibly be connected with "nip," in the sense of "pinched," "scanty."
NEARCHUS, one of the officers in the army of Alexander the Great. A native of Crete, he settled at Amphipolis in Macedonia. In 325, when Alexander descended the Indus to the sea, he ordered Nearchus to conduct the fleet to the head of the Persian Gulf. The success with which Nearchus accomplished this arduous enterprise led to his selection by Alexander for the more difficult task of circumnavigating Arabia from the mouth of the Euphrates to the Isthmus of Suez. But this project was cut short by a storm, in a length of voyage of 301 days and 11 nights. On that followed Nearchus attached himself to Antigonus, under whom he held the government of his old provinces of Lycia and Pamphylia, and probably therefore shared in the downfall (301) of that monarch.

He wrote a detailed narrative of his expedition, of which a full abstract was embodied by Arrian in his *Indica*—one of the most interesting geographical treatises of antiquity.


NEATH (Welsh, *Casll-Nedd*), a municipal and contributory parliamentary borough, seaport and market-town of Glamorgan-shire, south Wales, pretty situated near the mouth of the Neath or Nedd, on the Great Western and the Rhondda and Swansea Bay railways, 73 m. N.E. of Swansea, and 138 m. by rail from London, via Badminton. The main line of the Neath and the Brecon railway has a terminus in the town. Pop. (1901) 13,720. The principal buildings are the parish church of St Thomas (restored 1874), the church of St David (1866), a Roman Catholic church, and Baptist, Calvinistic, Methodist, Congregational and Wesleyan chapels; the intermediate and technical schools (1895), Davies's endowed (elementary) school (1786), the Gwyn Hall (1883), the town hall, with corn exchange in the basement storey, and the market-house. According to tradition Iestyn-ap-Gwrgan, the last prince of Glamorgan, had a residence somewhere near the present town, but Fibaer, son of his successor, of Glamorgan, gave the district between the Neath and the Tawe to Richard de Granville (ancestor of the Granvilles, marquesses of Bath), who built on the west banks of the Neath first a castle and then in 1129 a Cistercian abbey, to whose monks he later gave all his possessions in the district. All traces of this castle have disappeared. Another castle, built in the same century, on the east bank, was held direct by the lords of Glamorgan, as the westernmost outpost of their lordship. It was frequently attacked by the Welsh, notably in 1231 when it was taken, and the town demolished by Llewelyn ab Iorwerth. The portcullis gate and a tower are all that remain of it; of the abbey which was at one time the finest in Wales, there still exist the external walls, with parts of the chapel, vaulted chapter-house, refectory and abbot's house. This abbey was the spot where Edward II. found shelter after his escape from Caerphilly. At the dissolution the abbey and the manor of Cadocstown (part of its possessions) were sold to Sir Richard Williams or Cromwell. Its cartulary has been lost. Copper smelting has been carried on in or near the town since 1384 when the Mines Royal Society set up works at Neath Abbey; the industry attained huge proportions a century later under Sir Humphrey Mackworth, who from 1695 carried on copper and lead smelting at Melincrhydan. Besides its copper works the town at present possesses extensive tinplate, steel and galvanized sheet works as well as iron and brass foundries, steam-engine factories, brick and tile works, engineering works, flannel factories and chemical works. In the neighbourhood there are numerous large collieries, and coal is shipped from wharves on the riverside, vessels of 300 or 600 tons being able to reach the quays at high tide. The Neath Canal, from the upper part of the Vale of Neath to Britton Ferry (13 m.) passes through the town, which is also connected with Swansea by another canal. There is a large export trade in coal, copper, iron and tin, mostly shipped from neighbouring ports, while the principal imports are timber and general merchandise. Neath is included in the Swansea parliamentary district of boroughs.

The town perhaps occupies the site of the ancient Nidus or Nidum of the Romans on the Julia Martima from which a vicinal road branched off here for Brecon. No traces of Roman antiquities, however, have been found. Neath is a borough by ancient charter, 7th March 1247, and a town of 12th century from William, earl of Gloucester, who granted its burgesses the same customs as those of Cardiff. Other charters were granted to it by successive lords of Glamorgan in 1290, 1340, 1359, 1397, 1421 and 1473. By the first of these (1290) the town was granted a fair on St Margaret's Day (July 22) and as the abbey had extensive sheep walks the trade in wool was considerable. In 1685 James II. granted a charter, which, however, was not acted upon except for a short time.

NEBO, or *Nabu* ("the proclaimer"), the name of one of the chief gods of the Babylonian pantheon, the main sect of whose worship was at Borsippa—opposite the city of Babylon. It is due to the close association of Borsippa with Babylon after the period when Babylon became the centre of the Babylonian empire that the cult of Nebo retained a prominence only some degrees less than that of Marduk. The amicable relationship between the two was expressed by making Nebo the son of Marduk. In this case the expression of the relationship in this form was intended to symbolize the superiority of Marduk, different, therefore, from the view involved in making Marduk the son of Ea (see above), which meant that the prerogatives of Ea were transferred to Marduk by the priests of Babylon, in the midst of the 12th century from William, earl of Gloucester, who granted its burgesses the same customs as those of Cardiff. Other charters were granted to it by successive lords of Glamorgan in 1290, 1340, 1359, 1397, 1421 and 1473. By the first of these (1290) the town was granted a fair on St Margaret's Day (July 22) and as the abbey had extensive sheep walks the trade in wool was considerable. In 1685 James II. granted a charter, which, however, was not acted upon except for a short time.

Borsippa became in the course of time so completely a mere adjunct to Babylon that one might fairly have expected the Nebo cult to have been entirely absorbed by that of Marduk. Since that did not happen, the legitimate inference is that other deterrent factors were at play. One of these factors was the position that Nebo had acquired as the "god of wisdom" to whom more particularly the introduction of writing was ascribed. He takes his place, therefore, by the side of Ea as a cultural deity. The wisdom associated with him had largely to do with the interpretation of the movements in the heavens, and the priests of Nebo, at an early age, must have acquired widespread fame as astrologers. Assuming now, for which there is a reasonable amount of confirmatory evidence, that the priestly school of Nebo had acquired a commanding position before Babylon rose to political importance we can understand why the worshippers of Marduk persisted in paying homage to Nebo, and found a means of doing so without lowering the dignity and standing of their own god. If Assur-bani-pal, the king of Assyria (668-626 B.C.), in the subscriptions to the copies of the Babylonian literary tablets invokes as he invariably does Nebo and his consort Tashmît as the gods of writing to whom all wisdom is traced, it is fair to assume that in so doing he was following ancient tradition and that the priests of Marduk likewise were dependent upon the school at Borsippa for their knowledge and wisdom.

Nebo is therefore an older god than Marduk in the sense that his specific prerogative as the god of wisdom was too firmly recognized when Marduk became the head of the Babylonian pantheon to be set aside.

The temple school at Borsippa continued to flourish until the end of the neo-Babylonian empire, and school texts of various contents, dated in the reigns of Artaxerxes, Cambyses and Darius, furnish the evidence that the school survived even the conquest of Babylonia by Cyrus (538 B.C.). The original character of Nebo can no longer be determined with any degree of definiteness. He may have been a solar deity, but there are also decided indications which point to his being a water-deity—like Ea. It may be, therefore, that if he shows the traits of a solar deity, this may be due to the influence of the neighbouring Marduk cult, just as in return Marduk takes on attributes that belong to the city of Babylon. Thus, as the god of writing, Nebo has charge of the tables of fate on which he inscribes the names
of men and decides what their lot is to be. If in the systematized religious system, Marduk appears as the arbiter of human fates, the conclusion is warranted that Marduk is here imbued with the authority which originally was in the hands of his son. A reconciliation between the rival claims was effected by continuing Nebo in the rôle of scribe, but as writing at the dictation of the gods, thus recording what the divine assembly, gathered in the "chamber of fates" (known as Ushb Khinakku) within the precincts of E-Saggila, Marduk's temple at Babylon—under the presidency of Marduk, had decided.

Nebo also does homage to his father by paying him an annual visit during the New Year celebration, when the god was solemnly carried across to Babylon, and in return Marduk accompanied his son part way back to his shrine at Borsippa. Within E-Saggila, Nebo had a sanctuary known, as was his chief temple at Borsippa, as E-Zida, "the legitimate (or 'firm') house," and the close bond existing between father and son was emphasized by providing for Marduk within the precinct of E-Zida, a sanctuary which bore the same name, E-Saggila, "the lofty house," as Marduk's temple at Babylon. The kings, and more particularly those of the neo-Babylonian dynasty, devote themselves assiduously to the worship and embellishment of both E-Saggila and E-Zida. In their inscriptions Marduk and Nebo are invoked together and the names of the two temples constantly placed side by side. The symbols of the two gods are similarly combined. On boundary stones and cylinders, when Marduk's symbol—the lance—is depicted, Nebo's symbol—the stylus—is generally found adjacent. The dragon, though of right belonging to Marduk (q.v.), as the conqueror of Tiamat, also becomes the attribute of Nebo, and similarly in other respects the two forms a close partnership. Such is the relation between the two that occasionally, as in the official reports of astrologers and in official letters, Nebo is even mentioned before Marduk without fear of thereby offending the pride of the priests of Marduk.

In Assyria the Nebo cult likewise enjoyed great popularity, and there is a record of one Assyrian ruler who made Nebo his specific deity and called upon his subjects to put their whole trust in him. One may discern, indeed, a tendency in Assyria to take advantage of the almost equal plane on which Nebo stands with Marduk in Babylonia, to play off Nebo as it were against Marduk. The Assyrian king, in this way by glorifying at times Nebo at the expense of Marduk, paid their debt of homage to the south without any risk of lowering the grade of their own chief deity Assur. Marduk was in a measure Assur's rival. This was not the case, however, with Nebo, and they accordingly showed a desire to regard Nebo rather than Marduk as the characteristic representative of the southern pantheon. In the astral-theological system Nebo was identified with the planet Mercury. His consort, known as Tashmit, plays no independent part, and is rarely invoked except in connexion with Nebo.

See also BABYLON, BORSIPPAA BABYLONIAN AND ASSYRIAN RELIGION.

NEBRASKA, a state just N. of the centre of the U.S.A., lying approximately between 40° and 43° N. and between 100° and 108° W., and 25° W. from Washington. It is bounded on the N. by South Dakota, on the E. by Iowa and a corner of Missouri, on the S. by Kansas, on the S. and W. by a corner of Colorado, and on the W. by Wyoming. The Missouri river extends along the eastern half of the north-eastern border. The extreme length of the state is about 430 m., and extreme breadth about 210 m. The area is 77,520 sq. m., of which 712 are water-surface.

Physical Features.—The state lies partly in the physiographic province of the Great Plains (covering more than four-fifths of its area) and partly in that of the Prairie Plains, and slopes gently from the eastern highland to the western lowland. The principal watercourses are as follows: Rulo, in the S.E. corner of the state, 842 ft.; Dakota city, in the N.E., 1102 ft.; Benkelman, in the S.W. in Dundy county, 2056 ft.; Kimball, in the N.W. in Kimball county, 4697 ft.; Harrison, in the N.W. corner, 4590 ft. There are three physiographic sub-divisions: the foot-hills (and Bad Lands), the sand-hills and the plains. Each of these three forms a portion of the three corresponding regions of the Great Plains.

The western portion of the state lies in the foot-hills of the Rocky Mountain system, and is much rougher than western Nebraska. The surface of western Nebraska is characterized by high, barren table-lands, broken by canyons, dotted with buttes, and dominated by some bold and lofty ridges. Pine Ridge, a picturesque escarpment of the Great Plains, cuts across the N.W. corner of Nebraska from the South Dakota and South Dakota counties to the Platte river, precipitous, marked by buttes and deeply cut in places by canyons, is the most striking surface feature of the state. The altitude in this region varies from 3500 ft. to 5000 ft. In the fork of the North and South Platte rivers, the Wild Cat Mountains rise to 5300 ft., in wild White Cat Mountain, long reported as the highest point in the state, attains 5038 ft., Hogback Mountain 5002 ft., and Big Butte, in northeastern Platte county, 5022 ft. The Carlsbad and Green River basins rise to 5500 ft. in the extreme N.W. in the White river and Flat Creek have carved canyons in deep lacustrine deposits, creating huge mesas and buttes of sandstone and gneiss, and highly precipitous, and baked by the sun. The buttes—bary, pyramidal or conical, flat-topped, precipitous hills, and often fantastic, towering rather than grand in their isolation—are never more than 600 to 1000 ft. above the surrounding country. Nature is not grand in any part of Nebraska, but the Bad Lands are imposing, and in the wooded foot-hills there is an abundance of bold and attractive scenery, particularly in Sioux county, and in Cherry county around Valentine and on the canyon of the Snake river. East of the Bad Lands is the sand-hill region, which includes a area of possibly 20,000 sq. m. The sand-hills proper are a portion of the Great Plains, and are marked by the occurrence of prairie fires and the increase of settlement, they have become well grazed over and stable; although sand-draws, and even occasional low-outflows scoured by the winds in the summits or sides of the hills are still characteristic of the prairie. The sand-hills and sand-hill and sand-region are the prairies, which include three-fourths of the state. They are sometimes characteristically flat over wide areas, and are usually gently rolling. The sand-hills form the base of the high plains and the sand-hills are the conspicuous modifying feature of the prairie region; but in general, owing to the gentle slope of the streams and the great breadth of the plains, erosion has been slight; and indeed the streams have broaded their channels and the valleys are deep and narrow. The water-partings are characteristically level uplands, often with shallow depressions, once lakes, and some of them are dotted with shallow lakes of various extent. The valley floor of the North Platte in the foot-hills, the flood-plain of an older river, is in places 700 ft. or more below the bounding tableland, and 10 to 15 m. wide; the present flood-plain being from 1 to 4 m. in width. Hundreds of small tributaries to the greater streams (especially along the Republican and the Logan) complicate and beautify the landscape. No farming country is richer in quiet and diversified scenic charm than the prairies of the eastern half of the state. The Missouri river has long been the fittest boundary which border it almost continuously on at least one side. In the foot-hills there are typical canyons, as along the Platte forks, and in the south part of the state. One of the most striking forms are large, the largest, those of the Bad Lands are the most peculiar; and the Niobrara tributary system is the most developed.

Rivers.—The Missouri skirts the eastern border for perhaps 500 m. It is not navigated, and save at Sioux City and Omaha serves practically no economic purposes, irrigation being unnecessary in the counties on which it borders. Its bluffs, cut for the most part in the loess but at places in the rock, are frequently from 200 to 200 ft. At Vermilion, South Dakota, its alluvial plain, 1131 ft. above the sea, is 330 ft. above the mouth of the Nemaha. The current is always rapid and heavily loaded with sediment, and its axis is shifting constantly. The Missouri, which drains a large area, and from which the Platte river is derived, is deeply incised, and which border it almost continuously on at least one side. In the foot-hills there are typical canyons, as along the Platte forks, and in the south part of the state. One of the most striking forms are large, the largest, those of the Bad Lands are the most peculiar; and the Niobrara tributary system is the most developed.

1 About 62 grains per gallon at low water, 404 at high.
2 The North Platte falls 3700 ft. in 510 m, the South, 7200 ft. in 427 m, above their junction; the latter falling 2602 ft. in 308 m, after leaving its canyon in the Rockies.
surface flow in volume. The Loup system is remarkable for the even drift, and somewhat sandy, which, however, is buried, until the latter banked up its deposits across the mouths of their more sluggish currents. The Republican and South Platte—the former an intermittent system—suffer in their flow from the drain made upon the Colorado. The westward current of the Niobrara above the Keya Paha is in a narrow gorge. Its immediate bluffs and the shores of some of its tributaries, notably the west bank of the Niobrara, are laid bare by cutting away the top clays and some sandy deposit from among Nebraska streams for a number of pretty water-falls. The White river, heading on Pine Ridge, falls 1100 ft. in 20 m. Some streams wholly dry up in the dry seasons, and in the foot-hills and sand-hills, the scanty surface drainage is an important force with the basis of the valleys. The 324 Underground Water.—Swamps and bogs, apart from purely temporary pondage, are confined to a few restricted regions of the Missouri river bottoms and the central part. There the water-table, if cupped or hollowed along the Missouri, and many lakes originate such as are scattered along the Platte, Elkhorn, Big Blue and other rivers. Scores of lakes are scattered about the heads of streams rising in the N.E. to the Colorado river. Some of these lakes are fresh and some alkaline. Springs also are numerous in the sandhills, where they form considerable streams. They often flow with force and are known locally from this peculiarity as artesian springs, or sometimes, from this and their large size, as "mound" springs. The state fish-hatchery is on springs at South Bend; at Long Pine springs of large flow supply the town and railway shops with water for the telegraph wires. Establishments at Chadron, South Dakota, have similar works; and at San Jose, in the Indiana hills, drinking water is available in many parts of the state. At Niobrara, in Knox county, a well 665 ft. deep, drilled in 1896, yielded for a time 2500 gallons per minute at 95-lb pressure (in 1903 1900 gallons at 65 lb.) The Uralla, also near the Missouri, has 383,916, and 54,227 of sand and gravel. The state, however, is particularly rich in good clays, which are probably its greatest mineral resource. Caleite of excellent quality is the commonest mineral. Gravel is of value in most parts, and sand is found in inexhaustible quantities, and is an important article of export. Flint (valuable for railway ballast) occurs in immense quantities in the N.E. regions. The磷酸盐-enriched sands are now promised on the 383,916 of good clays, which are industrially good, where otherwise of excellent quality, and are needed for the production of many of the building stones limestones are the most abundant and important, the best comes from the Benton beds and when "green" can be sawn into blocks. The Dakota formation, though of especial value to industry, are in general coarse or otherwise inferior, yields some of splendid quality. Its clays, which are of all colours, are the most valuable of the state. The finest building stone is a beautiful green quartzite rock of dense, fine texture and lasting quality. It is related to the Ogallala beds and occurs only in small areas. The quarries and clay pits of the state are mainly in the Carboniferous region of the S.E. In the Sand Hills region of the N.E., and peat more widely. The Carboniferous formations carry peat, a commercial coal, never thicker than about 2 ft., and rarely ready available, and they can never be of more small and merely local importance.

Minerals.—Mineral resources are decidedly limited; the total value of the mineral output (excluding coal) in 1907 was $1,383,916, of which $1,352,916 was in coal, 3,724,000 lbs. of salt, and $54,227 of sand and gravel. The state, however, is particularly rich in good clays, which are probably its greatest mineral resource. Caleite of excellent quality is the commonest mineral. Gravel is of value in most parts, and sand is found in inexhaustible quantities, and is an important article of export. Flint (valuable for railway ballast) occurs in immense quantities in the N.E. regions. The phosphate-enriched sands are now promised on the 383,916 of good clays, which are industrially good, where otherwise of excellent quality, and are needed for the production of many of the building stones limestones are the most abundant and important, the best comes from the Benton beds and when "green" can be sawn into blocks. The Dakota formation, though of especial value to industry, are in general coarse or otherwise inferior, yields some of splendid quality. Its clays, which are of all colours, are the most valuable of the state. The finest building stone is a beautiful green quartzite rock of dense, fine texture and lasting quality. It is related to the Ogallala beds and occurs only in small areas. The quarries and clay pits of the state are mainly in the Carboniferous region of the S.E. In the Sand Hills region of the N.E., and peat more widely. The Carboniferous formations carry peat, a commercial coal, never thicker than about 2 ft., and rarely ready available, and they can never be of more small and merely local importance.

Flora. Nebraska lies partly in the arid, or Upper Sonoran, and partly in the humid, or Carolinian, area of the Upper Austral lifezone; the climatic and climatic divisions being placed by the United States Biological Survey in the last-named region. The flora of Nebraska is characterized by its goodly representation of coniferous species to be found in most parts of the Middle West. Native coniferous species include nine pine species (the most important being the juniper), and nine fir or spruce species. The prairies of Nebraska, especially in the S.E. and farther east, are "profoundly" (C. E. Bessey) of the vegetation of the state. There are at least 64 trees and at least 77 shrubs growing native in the state; but of their joint number a considerable number are very rare, and have never been systematically described. The larger trees include the pinons, and the hickory and walnut woods of broad-leaf trees (and red cedars) grow very generally along all the water-courses of the state; and coniferous species grow along the Sandhills and the Wild Cat Mountains, are largely represented in the Sandhills and the Wild Cat Mountains, are largely represented. The barberry, the honeysuckle, the Russian olive, and the Russian mulberry are found in the Sandhills and the Wild Cat Mountains, are largely represented. The prairie dog is a common and widespread species, being one of the best-known groups of the state. There are at least 64 trees and at least 77 shrubs growing native in the state; but of their joint number a considerable number are very rare, and have never been systematically described. The larger trees include the pinons, and the hickory and walnut woods of broad-leaf trees (and red cedars) grow very generally along all the water-courses of the state; and coniferous species grow along the Sandhills and the Wild Cat Mountains, are largely represented in the Sandhills and the Wild Cat Mountains, are largely represented. The barberry, the honeysuckle, the Russian olive, and the Russian mulberry are found in the Sandhills and the Wild Cat Mountains, are largely represented.
wreath, dry of its moisture and so hot that in a day or two it shrivels and turns the crops to ash. Such summers are uncommon, and the belief that Nebraska is often visited by tornadoes is erroneous.

The mean annual temperature of the state is about 48° F, and the normals for the six approximately equal weather sections into which the state is divided by the National Weather Service are respectively about 48°, 50°-52°, 48°-50°, 47°-49°, and 46°-48° F. This is not as uniform as that of the Prairie States. The state is large enough to have a considerable variation in the average temperatures, especially in the central and northeastern districts. But there is a considerable difference in the averages for different months—the normal means of January and July through 30 years being 20° and 74° F, and the means of spring, summer, autumn and winter more or less 72°, 83°, 70°, and 22° F respectively. But for any particular locality a wide range in absolute temperature through the year, which averages for the state probably about 120° F, is not uncommon. Sometimes the temperatures are very high in the higher altitudes, where the nights are almost invariably cool and refreshing after even the hottest day. The number of continuous days with a mean temperature above 90° F, averages probably not more than 15. The length of the snow-fall season is, however, not so great. Temperature is of course lower as one moves to the N. and N.W., the initial planting and harvesting of each crop progressing wave-like across the state in from one to two weeks. Especially in the W. and N.W. there are in some winters occasional anti-cyclical or high-pressure storms known as blizzards—wind-storms preceded or accompanied by snow-fall—which are very severe. These storms are usually accompanied by very low temperature. They are the cause of great loss to the cattle owners. Such storms are, however, rare. In the S.E. portion of the state the winters are characteristically mild and open. The winters are most severe in the southeastern part of the state and the same may be said of temperatures above 95° in summer.

The normal mean annual precipitation for the whole state is about 23". The rainfall and snowfall of the actual yearly fall varying through years between 13-30 and 35-65. The rainfall in Nebraska does not seem inadequate for an agricultural country: moreover, the eastern half of the state is more favored than the western, which becomes, indeed, to the semi-arid Great Plains on which Nebraska belongs. The Service of the United States Government is active. But aridity is a matter of the efficiency rather than of the mere quantity of rainfall, and in this regard Nebraska is very fortunately situated. Rain in Nebraska is the critical moment—a characteristic of the state. Some centimeters of all precipitation falls in the growing season, giving the state, especially in the east, a greater amount at this time than many other states, whose aggregate yearly rainfall is greater; so that Nebraska has not abundance for the safest cultivation. Moreover, nine-tenths of the rainfall is absorbed by the loess and sandy soils, only one-tenth being "run-off." It is a widely spread but unfounded belief in Nebraska that the rainfall has been increasing since the settlement of the state. That its storage has very greatly increased as cultivation has been extended (the prairie sod sheds water like a roof) is true; moreover, the spread of scientific principles of farming has increased the advantages derived from the rainfall. This has increased rainfall has thus been greatly increased. Intermittent streamlets may well become perennial, and many are probably, as reported, in the process of returning to the streams. These may affect the seasonal distribution of precipitation; and that an advantageous alteration has in fact resulted is believed by many.

The climate of Nebraska is exceptionally healthy. Its beneficial qualities are the state's year-round growing season and pure air, constant winds and splendid drainage, to which its even slope and peculiar soil alike contribute. In some people, however, frost-hardiness is indulged. The sandhills, in particular, often have this effect. Autumn is perhaps the finest season; the fields are green into the winter, the air is pure and fresh, though dry and warm, and the long season is delightfully mild and beautiful. The arid climate, as compared with the eastern portion, of the state has alike the advantages and disadvantages of a climate more sharply characterized.

Soil.—Geologically Nebraska is one of the most typical agricultural states of the Union; although in the present distribution of interests agriculture is by no means so predominant as in some southern states. The basis of the soils is sands (coarse, fine or silt); clay beds, though economically important, are in quantity relatively scant. In the eastern half silt, and in the western fine sand, form the bulk of the soil. There are five well-defined soil regions corresponding to the geologic-topographic divisions already indicated of drift areas: 1. Beach or sand; 2. Glacial or moraine; 3. Fluvial or river; 4. Sandy loam with a large percentage of sand or silt, and considerable calcareous matter, and usually a small amount of clay. It contains considerable humic matter, discoloring rapidly in the air (when exposed to the air). The local term for it is "brown," and it is rich in fertility, and its great depth (in Lincoln and Dawson counties bluffs 200 ft. thick are found) is a guarantee of almost inextinguishable reserve. The sand is useful directly from its being of small amount (rare boulders, and some gravel). The superficial soil over most of the state, and everywhere in the E. except rarely where the loess or drift is bare, is a rich, black vegetable mould, 1 or 2 ft. thick, on the gray sandy drift. The loess and drift are not firm fertile; the soil never bakes, is always receptive of moisture,
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absorbing water like a sponge and holding it well. There is a great
amount of fertile valley land, adequately watered. Alfalfa and other
cultivated grasses are encroaching on the whole region, and even the

The
natural arid-land bunch grasses make excellent grazing.
"
"
soil of the W. is a line sandy r nl, characteristically calbutte
careous, derived from the Arikaree. With it also moisture is a great
factor in its productivity. The Bad Lands are by no means infertile
(their name, it should be noted, was originally Mauvaises terres d
but they are almost destitute of ground water, though
traverser)
"
"
where surface water can be
pockets
containing many green
stored.
They contain much clay and marls, non-absorbent and
subject to such excessive wash that vegetation cannot gain a foothold.
In various parts of the west are small tracts of so-called
"
"
gumbo soil; they are due to the Pierre shale, are poorly drained
and characteristically alkaline. Small alkaline areas also occur about
lakes in the sand-hills. Where surface water is adequate the regions
of the Pierre shale make splendid grazing lands; but in general they
are not very useful for agriculture. Salt lands occur about Salt Creek
notably around Lincoln. The stream bottoms of alluvium are modified by loess and humic deposits, and are of course very fertile;
but hardly more so than the loess of the uplands.
Agriculture is not only the chief industry but is
Agriculture.
also the foundation of the commerce and manufactures of the state.
In 1900, of the total area 60-8% was reported as included in farms,
and 37-5% as actually improved. The rank of the state in the
Union was I3th in value of farm property, and loth in value of farm
products. The farm value was $747,950,057, an increase since 1890
an
of 46-1%; while the total product-value was $162,696,386
in the same period. A greater
increase (partly factitious) of 143-4
part of the state was reported improved in 1890 than in 1900; the
change was due to the increase of stock-raising in the West. Simifrom 156-9 acres in 1880
larly, the size of the average farm increased
to 190-1 in 1890, and 246-1 in 1900, although in eastern Nebraska
Under
the
Kincaid law, which
there was a contrary tendency.
permits entire sections instead of quarter sections (160 acres) to be
homesteaded, this movement has been fostered. In the years 1880
1900 the number of farms operated by cash tenants rose from 3-1 to
9-6%; of share tenants from 14-9 to 27-3% of the total. There is
no appreciable tendency toward management for absentee owners.
The census of 1900 showed that not less than two-fifths of the total
net income came from live stock or from hay, grain and forage on
farms representing together 96% of the farm- value of the state
live stock being a trifle more important; dairying was similarly
predominant for 1-6%, and beet-sugar for o-l %. Other crops were
unimportant sources of revenue. Sugar-beet culture has developed
since about 1889; it is localized largely in Lincoln county, near
North Platte, though beets are raised over a large part (especially the
western part) of the state. In 1907 about 11,000 acres were planted
to sugar beets. The principal factory for the slicing of the beets
The dairy
is one built at Grand Island, Hall county, in 1890.
interest is rapidly growing, but is still exceeded in other states.
Omaha is a great dairy market. Nebraska ranks very high in the
production of cattle and hogs. A fourth of all animal products are
represented by milk, butter and cheese, eggs and poultry; the rest
by animals killed on the farm or sold for slaughter, most of them
going to supply the meat-packing industry of South Omaha. Wild,
salt and prairie grasses make up the bulk of the forage acreage, but
the cultivated crops especially millet and Hungarian grasses and
Holt county in the Elkhorn valley,
are more important.
alfalfa
and Sheridan county in the foot-hills, produce more than half the
hay-crop of the state. Alfalfa can be grown with more or less success
in every county of the state, not excepting areas where clay or sand
form the sub-soil but on the uplands of the central part of the state
it is produced with the greatest success and in the greatest quantities.
In 1908, according to the reports of the state Board of Agriculture,
the crop of Custer, Dawson and Buffalo counties was about 15% of
the total crop (1,846,703 tons) of the state. The product was
quintupled between 1899 and 1905, and between 1905 and 1908 the
increase was about 40 %. It has been a great aid to western Nebraska
as to other portions of the Great Plains. Sorghum and kafir corn are
also excellent, and broom-corn fairly good, as drought-resistant
crops; the last, which is of lessening importance, is localized in Cass,
Saunders and Polk counties. Cereals are by far the most important
of farmed land and
crops, representing in 1899 four-fifths
crop
"
off years," but speaking with
values.
Allowing for variations in
as much exactness as is possible, Nebraska has established her
position since about 1900 in the'third, fourth and fifth rank respectively among the states of the Union, in the production of Indian
corn, wheat and oats. Of these, Indian corn is by far the most important, representing normally about two-thirds of the total crop
value; while wheat and oats each represented in 1906 about oneseventh of the total crop, and rye, barley, kafir-corn and buckwheat
make up the small remainder. Indian corn is grown to some extent
all over the state, except in the north-west, but the great bulk of the
crop is produced east of the 99th meridian. It is rarely cut, but is
left to mature and dry on the stalk in the field.
The yearly yield in
the decade 1895-1904, according to the most conservative state
statistics, varied from 298,599,638 to 72,445,227 bushels, and the
average was 178,941,084 bushels, or 190,773,957, omitting the failure
of 1901 the yield per acre being similarly 26-35 or 2 7'9 bushels
;

%

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in 1906 the crop was 249,782.500 bushels, and
(12-4 in 1901)
the average yield per acre 34-1 bushels; in 1907 the crop was
179,328,000 bushels, and the average yield only 24 bushels per acre.
According to the report of the state Board of Agriculture, Custer,
Lancaster and Saunders counties produced the largest amounts
(each more than 5,000,000 bushels) of Indian corn in 1908. Since
1900 Nebraska has become one of the foremost winter wheat states,
second only to Kansas. Little spring wheat is now sown except in
the northern counties, the state being on the northern edge of the
winter wheat belt. From 1880 to 1890 the acreage devoted to wheat
greatly diminished, because the spring variety was not relatively
remunerative, but the acreage trebled in the next decade as autumn
planting increased. The winter varieties have the advantages of
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larger yield, earlier ripening and lesser loss from insects, and afford
protection to the soil. The growth of durum (macaroni) wheat is
also increasing, but is hampered by the uncertainty of market, which
The wheat crops of the decade 1895is for the most part foreign.

1904 averaged 33,208,805 bushels a year; or ranged from a

minimum

of 9-8 to a maximum of 20-9, averaging 15-8 bushels to the acre;
in 1906 the crop was 52,288,692 bushels, and the average yield
22 bushels per acre; and in 1907 the crop was 45.911,000 bushels,
and the average yield 18-1 bushels per acre. In 1908 Clay, Adams
and Hamilton were the principal wheat-growing counties in the
The corresponding figures for oats were: average yield for
state.
the decade, 48,145,185 (range, 28,287,707 in 1901 to 66,810,065 in
1904); range of yield per acre, 17-9 to 34-0, and average 27-6
bushels per acre; in 1906 the crop was 72,275,000 bushels and the
average yield per acre 29.5 bushels; in 1907 the crop was 51,490,000
bushels, and the average yield 20-4 bushels per acre. In the decade
1890-1900 the state did not rise above the loth rank in the Union;
The same is even more markedly true
after 1900 her rise was rapid.
of rye; in 1907 the crop was 1,502,000 bushels (from 88,400 acres), a
yield exceeded in only five states in the country. Apples are raised in
th% N.E. and S.E. sections of the state, and are much the most im-

portant fruit grown.

Peaches are next

in

importance, and horti-

cultural enthusiasts believe that the possibilities ot this crop are very
Other fruits are raised with much success, and in 1904 at
great.
St Louis the horticultural exhibit of the state led those of all other
states in the medals received for excellence; but nevertheless its
relative rank in the Union as a fruit-producing state is still low.
In a period of 30 years (18691898) there were, according to the
state Board of Agriculture, four seasons whose crops could reasonably
"
be classed as failures, three more as short," one as fair, eighteen as
with adjoining states Iowa,
and
four
as
great.
Compared
good,
Minnesota, South Dakota, Kansas, Missouri- none shows a greater,
if indeed any shows sc great an average value per acre in the yield
of Indian corn, wheat, oats, barley and rye; and this despite the
assumed handicap of the western half of the state. In fact the yield
of this section relatively to cultivated acreage is normally fully equal
to that of the eastern section; a result quite consistent with the
The real handicap
scientifically proven fertility of semi-arid lands.
of the western counties would be shown in comparing aggregate yields
inarable. Alfalfa, stock
per given area; for much land is normally
"
"
dry-farming and irrigation are,
raising and dairying, afforestation,
however, proving that the West can maintain prosperity by not
Alfalfa is not easily started,
relying upon ordinary agriculture.
however, on the uplands of the extreme western part of the state;
and dry-farming (the Campbell dust-mulch system) has the expensiveThe above-mentioned
ness in labour of intensive cultivation.
delusion that climate is changing and adapting itself to agriculture,
thus relieving the farmer of accommodating his methods to the
climate, has considerably handicapped him in progress. Systematic
experiments in dry-farming throughout the Great Plains were provided for on a great scale by Congress in 1906. By attention to crop
rotation, soil physics and world-wide search for plants adapted to the
Great Plains (such as the U.S. Department of Agriculture has long
been conducting), a very great deal can be accomplished no one
can say how much; but certainly the Western must long remain at
a great disadvantage in comparison with the Eastern portion of the
state as regards the growth of cereals.
Water for the western part of the state is a resource
Irrigation.

therewith a fundamental
primary importance, and irrigation
Very generally, especially in the butte regions, the country
fends itself to the impounding of surface water. The lakes are of
It is
great importance for the stock ranges of the sand-hills.
commonly believed that of underground water, and generally of
artesian water, even the driest counties have an abundance. This is
great exaggeration. Though both in central and western Nebraska
there are strata that generally yield a considerable flow, the supply is
Up to 1906 dependence
usually limited and the expense is great.
was mainly upon the streams, which it is estimated might furnish
3 or 4 million acre-feet enough to irrigate between 10 and 15%
were all the water available, and the land
of the arid section

of

problem.

1
Data of the State Bureau of Labor and Industrial Statistics,
which are lower than those of the state Board of Agriculture, and
The yearly average given by
(in census years) the Federal Census.
the Board of Agriculture for 1895-1904 is 219,196,000 bushels.
The statistics for 1906 and 1907 are taken from the Year-books of the

Department

of Agriculture.


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Irrigated. As compared with the streams of Colorado, where irrigation is much more advanced, Nebraska has been less favored by the supply-capacities of the Arkansas and Poudre in Colorado, and the Loup and North Platte in Nebraska being about as 1,000, 1,193, 3,347 and 4,532 respectively, according to the last United States Census, the German (1901-1902, vol. iii. p. 144). An irrigation law was first passed by Nebraska in 1885. One of the greatest improvement projects undertaken by the national Reclamation Service is one on the North Platte River, where 97 miles in Wyoming of sufficient capacity to store all the surplus waters of that stream, about 600 m. of canals, and the reclamation of 107,000 acres in Nebraska; it was 74% completed in 1905. The work of the United States Government in the development of Nebraska agriculture was begun in 1862. Some farmers on the uplands between the valleys in western Nebraska irrigate by means of wind-mills, and although the underground water is 175 ft. or more below the surface on wind-mill supplies sufficient water to irrigate ten acres. The extent of irrigated acreage increased about thirteen-fold from 1889 to 1899. In the latter year there were 1701 m. of ditch costing about $75.00 per m., irrigating 448,503 acres, which yielded crops averaging $6 per acre value. The greatest part of the irrigated area is in the valley of the North Platte and the Upper Platte—probably nine-tenths in 1896—in Scotts Bluff, Lincoln, Cheyenne, Dawson, Keith and Deuel counties. There, however, a large district of Platte County—the farthest E. of any large ditch in the country; and though agriculture is normally quite "successful" here without irrigation, nevertheless it is more profitable. In Scotts Bluff County, there was about a quarter of the irrigated acreage lay E. of the section classed as arid.

Manufactures.—The rank of Nebraska among the states of the Union in 1900 in population, in value of agricultural products, and in value of manufactures, was twelfth. Among the leading products are clothing, flour, oats, barley, and meat-packing. In 1900 the value of the manufactures was $2,624,461, compared with $2,024,201 in 1895. Of this the clothing, flour-milling, and meat-packing establishments constitute 92% of the total value of the manufactures. The clothing manufacturers in 1900 were 287, employing 4,282 persons, producing clothing valued at $7,704,130, and yielding nearly one-half the total value of the manufactures of the state ($71,018,339 in 1900; $69,243,468 in 1905). The value of the clothing manufactured in 1900 was $1,433,501, and in 1905 $1,653,788. Nebraska wheat, like that of Kansas, combines for milling the splendid qualities of winter wheat with those characteristic of grain grown on the edge of the semi-arid West; flour and grist-mill products were valued at $7,704,130 in 1900 and at $12,190,303 in 1905. The first creamery in Nebraska was established in 1881. A creamery at Lincoln is said to be the largest in the United States. Many co-operative dairies have persisted since the early days of farmers' granges. The value of cheese, butter and other dairy products was $2,253,593 in 1900 and $3,306,931 in 1905. The relative dependence upon agriculture perhaps the most promising is that of brick and tile products (valued at $289,685 in 1900 and at $1,314,913 in 1905), and the largest is 1905 was the manufacture and repair of steam railway cars (valued at $384,104 in 1900 and $524,294 in 1905). The value of ordinary railway earnings amounted to $4,865,681 in 1905.

Communications.—There is no longer any river navigation. There were 6,101-5 m. of railway in the state at the end of 1907; the great period of railway building was 1870-1890, the mileage in 1870 being 705, in 1880, 1,053, and in 1890, 2,662. There is much better coverage by railways than the western. Six great east and west trunk-lines connecting the Rocky Mountain region and Chicago have 3,175 m. of track (g.e.), and to others, giving rather than an outlet southward, enter the state, so that the cattle paths of the state. In 1896 all but 5 counties out of 90 had railway outlets. A marked tendency toward north and south railway lines is of great importance, especially the eastern side of the state. Omaha and Lincoln are the principal centers of population, and 1,193,214, 1900 16-6% were foreign-born, and 43.3% natives of other states than Nebraska. The latter came mainly from the north-central states. Of the foreigners, Germans, Scandinavians and British (including English Canadians) made up four-fifths of the total. The most numerous individual races were German (55,506), Swedes (44,354), Irish (16,138), Dames (12,313), Irish (11,177), English (9,757), Russians (8,063) and English Canadians (8,010). In 1900 three cities had a population above 25,000—Omaha, 102,555; Lincoln, 40,169; South Omaha, 26,001—and seven others had a population between 5000 and 8000—Beatrice, Grand Island, Nebraska City, Fremont, Hastings, Kearney and York. The population of Nebraska was 28,841 in 1860, 122,993 in 1870, 452,402 in 1880 and 1,062,656 in 1890. The increases of population by decades following 1860 were 326-5, 267-8, 134-1, 0-3, and 11-8%. From 1880-1890 the absolute increase was exceeded in only four states, and was greater than in any state of the Mississippi except the enormous state of Texas; from 1890-1900 it was less than in any state of the Union except Nevada (whose population decreased). In this decade 35 counties out of 98 in the state showed a decrease; the shrinkage was mainly in the first half of the decade, and was due to the cumulative effects of national hard times, a reaction from an enormously inflated land “boom” of the late ’eighties, and a remarkable succession of drought years, and consequent crop failures in the West. Between 1885 and 1893 Kansas and Colorado went through much the same experiences, and a rapid settlement of their arid areas before the conditions of successful agriculture were properly understood. Many homes, and even small settlements in Nebraska—though not to the same extent as in Colorado and Kansas—were abandoned. Urban population (the population in places having 4000 or more inhabitants) also fell, constituting 25-8% in 1890, and in 1900 only 20-9% of the total population of the state.

In the case of some cities that showed a great decrease (e.g., Lincoln 27.2%, and Omaha 27%) notoriously “packed” censuses in 1900 were in part responsible for the bad showing ten years later.

In 1906 there were in the state 345,803 communicants of various religious denominations; of these 100,763 were Roman Catholics, 64,512 Methodists, 59,485 Lutherans, 23,862 Presbyterians, 19,121 Disciples of Christ, 17,939 Baptists and 15,247 Congregationalists. In 1890 there were in the state 2853 untaxed and 3338 taxed Indians, the latter being citizens; in 1900 there were 3,122 altogether, all of them taxed; and in 1908 there were 3720, of whom 1270 were Omaha, 1116 Santee Sioux, 1060 Winnebago, 295 Ponca.

Among the Indians who occupied Nebraska immediately before the advent of the whites and thereafter, the only families of much importance in the state's history were the Caddoan and the Siouan. The Caddoan land was repudiated, there was in 1868 an Indian Removal Advisory Committee; the Siouan family by its Dakota, Tchega, Chwero and Winnebago branches. Included in the Dakota branch were the Santee and Teton tribes, the latter comprising the Brulé, Blackfeet and Oglala Indians; in the Tchega branch were the Omaha and Ponca tribes; and in the Chwero branch, the Iowa, Oto and the Missouri tribes. Other tribes were of less importance; and of these other families—with the exception of the Cheyennes and Arapahoes of the Algonquian family, whose permanent hunting grounds embraced the foot-hill country of the West—were of negligible importance, being only roamers within the borders of the state. The Pawnees contested the plains against the Sioux with undying enmity. Before the Civil War there were no very great troubles between Indians and whites, despite constant frontier difficulties, except the bloody “Pawnee War” of 1859-60, but in 1863-4 the Pawnees rose rather generally along the frontier, and many settlers were killed. In 1890-91 there was another war—with the Sioux—marked by the battle of Wounded Knee, just across the line from Nebraska. The Indians were defeated, and the route of the Peru to the north of the state was substantially abandoned. The only road in Nebraska the usual discernible features of administration. The maltreatment of the Poncas, a fine and peaceful tribe, was peculiarly and inexcusably harsh. Segregation on reservations was generally abolished in 1879, and in 1890 the federal government took over for Omahas and Winnebagos in Thurston county and for the Sioux in Sheridan county, and an agency for the Santees and Poncas near the mouth of the Niobrara; and at Genoa, where the Pawnee agency was located. The Nebraska Indians remained under the Department of the Interior maintained by the United States government with 350 boarding.
pupils. In 1908, however, almost all the tribal lands had been distributed in several ways: the Niobrara Reservation (under the Santee agency) was surrendered to the Omaha School; the Ponca Reservation had only 1,130.7 acres reserved for agency, school and mission purposes; the Ponca Reservation (under the same school) had only 160 acres reserved for agency and school building; the Omaha Reservation (under the Omaha School) had 12,423 acres unallotted; the Sioux Reservation (under the Pine Ridge Agency) for Oglala Sioux had 640 acres; and the Winnebago Reservation (under the Winnebago Agency) was unallotted.

Government.—The present constitution, adopted in 1875, replaced one adopted in 1856. In 1871 a convention framed a constitution that was rejected by the people. It provided for compulsory education, and for the taxation of church property; prohibited the grant by counties or cities of financial aid to railway or other corporations, and enjoined that railways should have an easement only in their right of way. The last two provisions were mainly responsible for the defeat of the constitution. The adoption of 1875 presents a few variations from the normal type, and under it a few interesting problems have arisen. The constitution provides two methods for amendment. A convention for revising or amending the constitution is to be held in case a recommendation to that effect made by the legislature (a three-fifths vote of all the members of each house being required) is accepted by a majority of the electors voting at the next election for members of the legislature, but no amendment agreed upon by the convention is to take effect until approved by a majority of electors voting on it. Without convention, however, if by a majority of members of both houses of the legislature (a three-fifths vote of all the members of each house, adopt an amendment, which is to come into effect only if approved by a majority of electors voting at the next election of senators and representatives—the publication of the proposed amendment in some newspaper in each county once a week for three months before the election being required. This has been interpreted by the courts as requiring a majority of the votes actually cast for senators and representatives. As there is less interest in amendments than in the election of members of the legislature, only two out of a large number of amendments proposed from time to time by three-fifths of the members elected to each house have been adopted. The first of these, increasing the pay per day to the members of the legislature and providing for longer sessions, was declared lost by the official canvassers, but when (1886) the ballots had been recounted by the legislature it was declared adopted. The second (1906), creating a railway commission, was endorsed by a political party in state convention, was printed on the same ballot-paper with the names of the party candidates for office in order to secure it all "straight" party votes, and by this procedure, which was upheld by the state supreme court in 1907, it was adopted. All male persons of the United States who are citizens of the United States or have declared their intention to become such at least thirty days before an election must have the right of suffrage provided they have attained the age of twenty-one years, have resided in the state six months, are not of unsound mind, and have not been convicted of treason or felony. Women who have either children or taxable property may vote on questions relating to schools. The general election of state and local officers is held annually on the first Tuesday succeeding the first Monday in November, but municipal and school officers are elected in other times, as provided by law. The use of the voting machines was authorized in 1890; and the nomination of candidates by primaries was made mandatory in 1907. By a provision unique in 1875, the constitution authorized the legislature to provide that the electors might express their preferences for United States senators; but this was not treated as mandatory on the legislature, and though votes were at times taken (1856, 1894), they were not officially canvassed, nor were any senatorial elections materially affected by them. In 1907, under a direct primary law, the nomination of candidates for United States senator was transferred from the party convention directly to the people; and in 1909 the "Oregon plan" was adopted, whereby each candidate for the legislature must go on record as promising, or not, always to vote for the people's choice. If the legislature takes any action which nullifies the promise of any candidate for the legislature there appears a statement that he "promises," or that he "will not promise," to vote for the "people's choice." In the same year the state enacted a law providing for the non-partisan nomination of all judges, of all superintendents of public instruction and of regents of the state university; nominations are by petition, and there is a separate "official non-partisan ballot" bearing the names and addresses of the nominees and the titles of the office for which they are nominated. The legislature of 1906 also provided for open election primaries and for the framing of state party platforms by convention before the time of the primary.

The governor is the chief executive officer of the state, but quite independent of him are a lieutenant-governor, a secretary of state, an auditor of public accounts, a treasurer, a superintendent of public instruction, an attorney-general and a commissioner of public lands. The governor, lieutenant-governor, secretary of state, auditor of public accounts and treasurer, as well as that of the judges of the supreme and district courts, to $2500 each and that of other important officers (including the secretary of state, the attorney-general and the superintendent of public instruction) to $2000. This economy has somewhat hampered the growing state. Salaries have been too low to attract the ablest men; and as the constitution forbade the fixing of new salaries when the funds were insufficient, the proceeds of sales of state lands could not be secured, resort was had to the creation of additional "secretaries" and of boards constituted of existing state officials or their secretaries.

The legislature consists of a Senate of 33 members and a House of Representatives of 100 members, and meets in regular session on the first Tuesday in January of every odd-numbered year at Lincoln, the capital. Both senators and representatives are apportioned accordingly, with the exception of the drugged districts. Each November of each even-numbered year for a term of two years. The salary of the governor is the rate of five dollars a day during 60 days of a regular session and not exceeding 100 days during their entire term. No bill or joint resolution may be passed on the first day of the regular session after its fourth day, except at the request of the governor. Special legislation of various kinds is expressly prohibited, and in the bill of rights it is declared that "all powers not herein delegate reman granted to the people." This clause would seem to leave the state government with no powers not expressly granted, and to make the rule for interpreting the Nebraska constitution similar to that for interpreting the Federal constitution; but it has been little influenced by it, and it is chiefly of historical interest.

The administration of justice is vested in a supreme court, 15 district courts, county courts and courts of justices of the peace and municipal courts. The supreme court consists of three judges elected for a term of six years, one retiring every two years; each district court consists of one to seven judges elected for a term of four years, and each county court consists of one judge elected for a term of two years. The constitution provides for the condemnation in the probate of wills and the administration of estates, concurrent jurisdiction with the district courts in civil suits for sums not exceeding $1000, and that the constitution may be amended in the present constitution of North Carolina as amended in 1876.

\[1\] The amendment increased the pay of members from three dollars to five dollars a day, making their compensation more. than the bare expenses of the legislature; it provided that a senator should last at least sixty days, and that members should not receive pay "for more than sixty days at any one sitting"; the original constitution had provided that they should not receive pay for more than forty days at any one session and had prescribed no minimum length for a session.

\[2\] An almost identical clause was inserted in the Ohio constitution of 1851, and one in exactly the same language appears in the present (1851) constitution of Alabama; and in the constitutions of 1855, 1858 and 1859 (present), in the Nebraska constitution of 1866, in the North Carolina and South Carolina constitutions adopted in 1876, and in the present constitution of North Carolina as amended in 1876.
relating to appeals; it appears in the bill of rights and reads as follows: "The right to be heard in all civil cases in the court of last resort, by appeal, error or otherwise, shall not be denied." Regardless of this provision, however, the civil code denies the right of an appeal to any person who has been found guilty or, in which the amount claimed does not exceed $20, and the courts have decided that this denial is not in conflict with the constitution; but in at least one case an appeal was allowed here, and the constitutional guaranty, and that guaranty has doubtless had much influence on judicial legislation.

County government exists under both the district-commissioner system and under the county commission system. In the latter, the board of county commissioners is the executive body; in the former, the county government is becoming largely the body of supervisors. The cities are governed in accordance with local ordinance. Except in Omaha there is no great field for social economic legislation; but the record of the state has been normally good in this respect. The constitution, in 1855, declared that in and of itself the position has been a burning political question since 1876, the constitution making it the duty of the legislature to "correct abuses and provide adequate compensation for all illegal exactions and extortions in all charge of express, telegraph and railroad companies" within the state. The influence of the railways has been very great, and a constant drag on just taxation and other legislative reforms. In 1885, 1887 and 1897 the legislature created a Board of Transportation consisting of existing state executive officers or their secretaries, but this could do little except gather statistics, investigate alleged abuses, and advise the legislature, upon which the passage of rates remained mandated.

The Board of Commissioners for the state was held unconstitutional by the state supreme court. In 1893 a maximum freight-rate Act was passed, but the rates thus fixed were declared by the supreme court to be unreasonable. In 1898 the "Equal Amendment," being "unreasonable," The right of the state to fix" reasonable" rates remained unquestioned, but American experience has found such laws to be harmful. In 1906 all political parties endorsed the state's right to regulate railroad rates, passenger and freight; and a constitutional amendment creating a railway commission was adopted in the manner described above. A railway commission was established in 1907 for the regulation of railways. The legislature framed a stringent anti-pass law, reduced passenger fares and express and freight charges, provided for equitable local taxation of railway property, and required railways to pay on the railroad franchise taxes. The constitution makes the railroads responsible for the death or injury of their employes, and gave to the newly-created railway commission complete jurisdiction over all steam-railways in the state, over the street railways, and over the local railway companies, telephone companies and all other common carriers.

In 1909 provision was made for an annual corporation licence tax and for the physical valuation of railways. In the same year, the following the example of Oklahoma, Nebraska passed a law guaranteeing bank deposits from a fund created by an assessment on the basis of total deposits. Useful child-labour and pure-food laws were enacted in 1888, but the institutions heavily embraced in the establishment in the Territory in 1855, but liquor licences were introduced in 1839; in 1909 the licence fee was fixed at $1000. A law enacted in 1907 made it illegal for breweries to own retail liquor houses, and restricted the number of such houses to one in each town or railroad city. In 1909 the legislature made an additional provision for the appointment of county clerks, with the next term of the legislature to be 7 A.M. A homestead law exempts from judgment liens and forced sale a homestead not exceeding $2000 in value and consisting of either 160 acres of land, a substantial dwelling house on lots in a city or village; the exemption, however, does not extend to mechanics', labourers' or vendors' liens upon said homestead or to a mortgage upon that has been signed by both husband and wife or by an unmarried woman and some discriminatory licensing is referred to marriage, except that it becomes liable for payment of debt contracted for necessaries to the family when a judgment against the husband for the payment of the same cannot be satisfied. The rights of dower and courtesy have been abolished, and husband and wife have instead equal rights to inherit property from the other; but the portion of the property of a deceased spouse that descends to the surviving spouse from the intestate's estate is one-half of the property, and each of the children, the grounds for a divorce are adultery, incompetency of the marriage, sentence to imprisonment for a term of three years or more, abandonment without cause, or wanton separation for two years, cruelty, and refusal or neglect of the husband to provide a suitable maintenance for his wife. The period of residence in the state required to secure a divorce was formerly six months, but in 1909 it was made two years.

Finance.—The constitution limited the debt that the state might contract to meet casual deficits to $100,000, unless in time of war, and provided for an interest of 5% on the bonded debt. In the 1890s the floating debt was deposited with the state treasurer; the interest was 3%, and the carrying charge at a rate of 5%.

The provisions were construed to mean not more than $100,000 of debt could be contracted in addition to appropriations made by the legislature. There was from the beginning a constitutional guaranty that the state would not contract any bonded debt. These warrants when issued and presented for payment were paid by the state treasurer, sold to the permanent school fund, and drew 3% interest until cancelled from the general fund. The floating debt which was paid by the state treasurer, sold to the permanent school fund, and drew 4% interest until canceled from the general fund. The floating debt which was paid by the state treasurer, sold to the permanent school fund, and drew 4% interest until canceled from the general fund.

In 1903 the assessed valuation of property was $188,458,479; in 1905, $304,479,951; in 1906, $306,147,627; in 1907, $307,598,987; in 1908, $308,967,578, and in 1909, $310,337,498. The increase was due largely to a new revenue law of 1903 ordering property to be assessed at one-fifth of its actual value. The average effective for the year is about 63 mills in 1905, 1906 and 1907; and in 1908, 68 mills. Education.—The public schools have been endowed by the United States, beginning in 1854, and by the state; in 1909 the permanent educational fund founded by the United States amounted to $8,450,557, invested in state securities, county, school district and municipal bonds. The percentage of illiterate population (i.e. population unable to write) above 10 years of age was in 1880 and 1890 in the state, and it was 2.5% (for native whites, foreign whites and negroes respectively 0.8, 6.8 and 11.8), was smaller than in any other state except Iowa (whose percentage was also 2.5); the percentage for males voting age (2.5%) being the least in the Union. There are four state normal schools—one at Peru (opened 1867), one at Kearney (1893), one at Wayne (originally private; purchased by the state in 1909) and one, provided for by the legislature of 1909, situated in the north-western part of the state. The university of Nebraska at Lincoln was established in 1869 by an act of the state legislature, and was opened in 1871. The university is governed by a board of regents. The board consists of three members appointed by the legislature for three-year terms. In 1907, two members were appointed by the governor for six-year terms. In 1910, two members were appointed by the governor for six-year terms. The university of Nebraska at Lincoln was established in 1869 by an act of the state legislature, and was opened in 1871. The university is governed by a board of regents. The board consists of three members appointed by the legislature for three-year terms. In 1907, two members were appointed by the governor for six-year terms. In 1910, two members were appointed by the governor for six-year terms.
History.—Local pride has prompted some Nebraskans to begin the history of the white race in their state with the march of Coronado, in 1541, across the buffalo plains to “Quivira,” N. of the Arkansas river in Kansas; but the claiming interests of the evidence of the early days is shown by the existence, in the early days, of the Platte from hearsey in 1673; French explorers followed it to the Forks, in 1729; and, after Nebraska passed to the United States in 1803 as part of the Louisiana Purchase, successive American exploring expeditions left traces in its history. Major Stephen H. Long, in particular, followed the Platte and South Platte across the state in 1819, and his desiring of the semi-arid buffalo plains—whence arose the myth of the Great American Desert—finely contrasts with the later history and latter-day optimism of dry-farming and irrigation. Meanwhile, fur traders who drew their goods from the country of the Platte had long been active on the Missouri. Trading posts were probably established in Nebraska in 1795, 1802, 1807 and 1812; the last two near the present towns of Ft. Calhoun (about 20 m. N. by W. from Omaha) and Bellevue. Manuel de Lisa, a noted Cuban trader and plainsman, was probably the first white settler (1807). In 1824 Bellevue became an Indian agency, and in 1849 the first United States post-office in Nebraska. Ft. Atkinson was maintained near the present town of Ft. Calhoun in 1819-1827; in 1825 the government acquired the first Indian lands, and in 1829 the Missouri river route, and the coming interests of the thirty years of the 19th century missionaries began to settle among the tribes; the first Ft. Kearney was maintained where Nebraska City now stands in 1847-1848, and in the latter year was re-established on the Platte, some 175 m. inland from the Missouri. Meanwhile there had begun the passage of the Mormons across the state (1845-1857), marked by important temporary settlements near Omaha (q.v.) and elsewhere, the travel to Oregon, and to California, for which depots of supplies were established at Bellevue, Plattsmouth, Nebraska City and Old Ft. Kearney, or Doby Town. Thus the country was well and favourably known, and the first organized settlement, called by the Mormons, was made in 1854.

 Movements in Congress for the creation of a new Territory on the Platte began in 1844, several attempts at organization failing in the preceding decade. In 1852-1853 Iowans and Missourians along the border of what are now Kansas and Nebraska held elections W. of the Missouri and sent delegates to Congress. A provisional Territorial government formed by Wyandot Indians and licensed white residents on Indian lands in Kansas (q.v.) forced Congress to take action. With what followed, the rivalry of the Platte and Kansas river valleys for the Pacific railroad route, and the coming events, the thirty years of the century missionaries began to settle among the tribes; the first Ft. Kearney was maintained where Nebraska City now stands in 1847-1848, and in the latter year was re-established on the Platte, some 175 m. inland from the Missouri. Meanwhile there had begun the passage of the Mormons across the state (1845-1857), marked by important temporary settlements near Omaha (q.v.) and elsewhere, the travel to Oregon, and to California, for which depots of supplies were established at Bellevue, Plattsmouth, Nebraska City and Old Ft. Kearney, or Doby Town. Thus the country was well and favourably known, and the first organized settlement, called by the Mormons, was made in 1854.

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by a feverish activity in railroad construction (the mileage in the state being increased from 1953 to 5417 m. in the ten years), together an extraordinary rise in land values, urban and rural. Farm-land prices were raised to a basis of maximum productiveness when the best interests, especially of the western section, demanded steady growth based on average crop results under average conditions. The early 'nineties were marked by an economic collapse of false values, and succeeding years by a painful recovery of stable conditions.

The Democratic and Republican parties were first effectively organized in opposition, as parts of national bodies, in the territorial campaigns of 1858. Till then there were practically only Democratic factional rifts. After 1861 the Republicans held the state seat over generally speaking in the People's party.

The governors of Nebraska have been as follows:

<table>
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<th>Period</th>
<th>Governor</th>
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<tr>
<td>1857-1859</td>
<td>William B. Burt</td>
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<td>1859-1861</td>
<td>Thomas H. Cuming</td>
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<tr>
<td>1861-1863</td>
<td>William A. Richardson</td>
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<td>1863-1865</td>
<td>Samuel W. Black</td>
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<td>1865-1867</td>
<td>Alvin Saunders</td>
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<td>1867-1869</td>
<td>Algernon S. Faddock</td>
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Nebraska was one of the states in which the collapse of the cooperative enterprises of the Grange again was particularly severe. The Farmers' Alliance was organized for the state in 1887, became a secret organization in 1889, and, as in other states, was a power by 1890. The membership of Grange, Alliance and Knights of Labor had increased greatly in the previous year.


NEBRASKA CITY, a city and the county-seat of Otoe county, Nebraska, U.S.A., situated on the high W. bank of the Missouri river, about 40 m. below Omaha. Pop. (1880) 4183; (1890) 11,494; (1900) 7380 (882 foreign-born); (1910) 5488. It is served by the Chicago, Burlington & Quincy, and the Missouri Pacific railway systems. A railway and wagon bridge spans the Missouri river at this point. The city was the seat of the state Institute for the Blind (1873), and has three public parks and a public library. The city is a distributing centre for a farming and grazing region, the trade in grain being especially large. In 1900 Nebraska City ranked third among the manufacturing cities of the state, the manufactures including canned fruits and vegetables, packed pork, flour, oatmeal, hominy, grits, meal, starch, cider-vinegar, agricultural implements, windmills, paving bricks, concrete, sewer pipe, beer, overalls and shirts. It is one of the oldest settlements of the state.

The central part of the city was settled by the State of Nebraska in 1854, but the city was incorporated under Nebraska law in 1859. The first Fort Kearney was established on the site of Nebraska City in 1824, and was abandoned in 1848, and the fort was re-established farther W. on the Platte river (see Kearney). Otoe county was organized in 1855, and the original Nebraska City was incorporated and made the county-seat in the same year. This city, together with Kearney City, incorporated in 1855—adjacent to the first "old" Fort Kearney—and South Nebraska City, were consolidated by the legislature into the present Nebraska City in 1858. (Twelve other city "additions" and so-called "towns," all within or closely adjacent to the present city, were in existence in 1871.) Nebraska City was for some years the largest city of the state. In 1858 it became the headquarters of a great freighting-firm that distributed supplies for the United States government among the army posts between the Missouri river and the Rocky Mountains; in seven months in 1859 this one firm employed 602 men, used 517 wagons, 568 oxen, and 75 miles, and shipped 2,782,258 lb. of freight. Nebraska City was the initial point of several roads, parts at one time or another of the "Oregon," "Old California," and "Great Salt Lake" trails. (See Nebraska (State): History.) Nebraska City became a city of the second class in 1871 and a city of the first class in 1893.

The Nebuchadrezzar King of Babylon, the Ñaboukôðôpôpôs of the Greeks. The first and last are nearer to the original name as it is found on the cuneiform monuments, viz. Nabu-kudurri-šušer, "Nebo, defend the landmark." Nebuchadrezzar seems to have been of Chaldean origin. He married Amuha, daughter of the Median king, according to Abydenus, and in 605 B.C. defeated Necho at Carchemish, driving the Egyptians out of Asia and annexing Syria to the Babylonian empire. In the following year he succeeded his father Nabopolassar on the Babylonian throne.
and continued the restoration of Babylon, which he made one of the wonders of the world. His " new palace," the temple that was built in fifteen days; temples were erected to the gods; the great walls of the city were constructed with a moat surrounding them, the Euphrates was lined with brick and a strong fortress erected. Canals were dug throughout the country and a great reservoir excavated near the capital. Only a fragment of his annals has been preserved, recording his campaign against Amasis (Amonis) of Egypt in his thirty-seventh year (396 B.C.) when he defeated the soldiers of "Phut of the Ionians." Tyre revolted in the seventh year of his reign, and was besieged for thirteen years; a contract-table dated in his fortieth year shows that it was still in ruins. When Persia was conquered, the investment of Tyre Nebuchadrezzar marched against Jerusalem, put Jehoiakim to death and placed Jechoniah on the throne. Three months later Jechoniah was deposed and Zedekiah made king in his place. Zedekiah's revolt in 588 B.C. led to another siege of Jerusalem, which was taken and destroyed in 586 B.C. (see JESUS and JERUSALEM). To this period probably belong an inscription of Nebuchadrezzar on the north bank of the Nahr el-Kilb near Beirut, and another in the Wadi Brissa in the Lebanon. From his inscriptions we learn that Nebuchadrezzar was a man of religious character. A younger brother of his is called Nabo-sum-lisir.

See Josephus, Cont. Apion, i. 19; Eusebius, Praep. Evangel. x.

NEBULA (Lat. for "cloud," connected with the Gr. νεφέλη, mist or cloud), in astronomy, the name given to certain luminous cloudy patches in the heavens. They resemble the stars in that they retain the same relative positions, and thus may be distinguished from the comets which appear to wander across the stars. When examined with sufficient telescopic power, a great many of these luminous patches are perceived to be composed of clusters of little stars, which in a smaller telescope are invisible separately, but whose rays of light blend together so as to produce a confused luminous appearance. Others, however, cannot be resolved into individual stars even with the best telescopes, and in many cases the spectroscope gives direct evidence that the nebula has a constitution altogether different from that of a star-cluster. We thus distinguish between the nebulae proper and the star-clusters; but owing to the difficulty of deciding the nature in any particular case, and especially owing to the fact that some of the earlier observers believed it probable that all nebulae would with sufficient telescopic power become resolvable into stars, the term nebula is often used to cover both star-clusters and the true nebulae.

An enumeration of nebulae was made by Charles Messier in Paris in 1771, who recorded 193; Sir William Herschel increased the number known to over 2500; whilst Sir John Herschel between 1825 and 1847 catalogued and described 3926 nebulae (including 1700 observed at the Cape of Good Hope). About 1848 the earl of Ross with his famous six-foot reflector at Parsonstown began his examination of the nebulae, which added greatly to our knowledge of their forms and structure. In more modern times the development of photography has enabled the features of the nebulae to be ascertained and recorded with a certainty, which, unfortunately, the older visual observations and drawings cannot claim to possess. In this connexion the photographic work of Isaac Roberts, A. A. Common, E. E. Barnard and J. E. Keeler in particular must be mentioned. The total number of known nebulae has, too, been enormously increased; Perrin estimates that the number within the power of the Crossley reflector at Lick is not less than half a million.

Nebulae may be conveniently classified according to their telescopic appearance; we enumerate below some of the principal forms that have been recognized, but it must be observed that this classification is rather superficial, and that the differentiation is often one of appearance only and not of real structure. The types are: (1) Irregular nebulae, examples: the great nebula of Orion (M. 42), the "key-hole" nebula near ζ Argus, the "Omega" nebula (M. 17); (2) Annular nebulae, example: M. 37 in Lyra; (3) Double nebulae, example: the dumb-bell nebula (M. 27) in Vulpecula; (4) Planetary nebulae, examples: the "owl" nebula (M. 97) in Ursa Major, M. 1 in Taurus; (5) Elliptical nebulae, example: the great nebula of Andromeda (M. 31); (6) Spiral nebulae, example: M. 51 in Canes Venatici; (7) Nebulous stars; (8) Diffused nebuleis. Most of these names require little explanation. The first class have ill-defined irregular boundaries; their forms often suggest the appearance of curled liquid or wreaths of smoke. The annular nebulae have a ringed appearance, the centre being much darker than the outer parts, though it is filled with faintly luminous matter. Double nebulae belong to the class of condensation. The planetary nebulae are nearly uniformly illuminated compact patches of light generally circular or elliptical in shape; they were so called because they appeared to possess disks like planets. Elliptical nebulae are usually nebulae of some flat type (such as annular or spiral) seen rather edgewise, so that the structure is not readily recognizable. The typical spiral nebulae are in the form of a double spiral, the two branches of which proceed from diametrically opposite points of a bright nucleus and wind round it in the same sense; the whole is generally studied by the aid of a spiral reflector. The structure of spiral nebulae includes the abandoned small nebulae which shine with a white light (in contrast with the blue-green light of the planetary and irregular nebulae—see below Spectra of nebulae), are generally classed as spiral nebulae. The spiral structure has been shown to exist in a few of them, but for the remainder it is only inferred. Nebulous stars are true stars surrounded by an atmosphere or aureole of nebulous light. Diffused nebuleis are very faint nebulae of enormous extent, sometimes forming the background of a whole constellation. We proceed to describe some of the more famous nebulae.

One of the most remarkable nebulae is that which is situated in the sword-handle of Orion and about the multiple star θ Orionis; it is faintly visible to the naked eye. It seems to have been first noticed by Huygens in 1656, who described and figured it in his Systema Saturniwm. It has now been found that nebulous streamers connected with the bright nucleus wind through the whole constellation of Orion. It is well known that all the brighter stars of the constellation except Betelgeuse appear to be related to one another by their similarity both of spectra and of proper motion; it seems probable that they are all situated in the nebula and in some way connected with it.

The only other nebula which can be seen with the naked eye is the elliptical nebula in Andromeda. Modern photographs show very clearly that its structure is spiral. The nucleus is large and appears circular, but the spirals proceeding from it lie in a plane inclined at a rather sharp angle to the line of sight, and this gives to the nebula its elliptical appearance. Two small dense nebulae accompany it, and appear to belong to the system.

The finest example of a ring nebula is M. 57 between β and γ Lyrae. The ring is slightly elliptical, its dimensions being 85" by 64". At the ends of the major axis the ring becomes very faint, so that the form of the bright part may justly be compared to a pair of marks of parenthesis ( ). The centre is marked by a star which appears to be intimately associated with the ring, for the whole space within the ring is filled with a very faint nebulosity. According to Schaeberle, there is evidence of a spiral structure in this nebula also. It must, however, clearly be of an essentially different character from that of any other ordinary spiral nebula. The great majority of the nebula reveals a fundamental difference between the annular and spiral nebulae.

The "dumb-bell" nebula in Vulpecula consists of two almost separated fan-shaped patches of light. It exhibits a close resemblance to the annular nebula; for we have only to assume a continuation of the thinning out along the longest diameter and a slight filling in of the centre of the Lyra nebula to obtain the dumb-bell form.
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Of planetary nebulae, one of the best known is the "owl nebula" in the Great Bear about midway between "the pointers." As seen with Lord Rosse's reflector, it presented a startling appearance, resembling the face of a goblin; two faint stars shone in the centres of the two dark circles which represented the saucer-eyes of the creature. Some change has certainly taken place since then, for the two stars no longer could be supposed to represent the pupils of the eyes; the cause may, however, be merely the proper motion of the stars or of the nebula.

The discovery of great regions having a faint nebulous background is one of the most remarkable results of modern work. Particularly interesting is the fact that, whilst the large telescopes are necessary to reveal the regions, smaller telescopes are able to photograph them, they are revealed by what at first sight seems an abnormally simple apparatus. For the study of the ordinary nebulae large reflecting telescopes (preferably of short focal length) are used, the great light-gathering power being all important; but for photographing these diffused nebulosities portrait lenses of very small aperture and focal length are most successful. Thus the great extension of the Orion nebula was photographed by W. H. Pickering in 1890 with a lens 2-6 in. in aperture and of 8-6 in. focal length; the exposure was rather more than six hours. Other extensive nebulous regions of a similar character have been found by Barnard in the constellations Ophiuchus, Scorpio and Taurus.

Spectra of Nebulae.—Owing to the feebleness of their light the study of the spectra of nebulae is one of particular difficulty. Two varieties of spectra are recognized; the one consists of a few narrow bright lines with sometimes a faint continuous spectrum for a background; the other consists of a continuous spectrum crossed by dark lines and is indistinguishable from that of ordinary stars. The former variety unmistakably shows that the light proceeds from diffuse incandescent vapour; nebulae show that a spectrum is being radiated, and it is possible to form a nebula, annular and planetary nebulae are of this nature. The visual spectrum is marked by three bright lines in the blue and green of wave-lengths 5007, 4959 and 4861. Of these the last is the line H β of the hydrogen series; the other two are of unknown origin, and as they are always found together and have always the same relative intensity, they have both been attributed to the same unknown element, which has been named "nebulium." Usually there are no other conspicuous lines in the visual spectrum, but in the ultra-violet region many can be photographed, including most of the hydrogen series. The yellow line (D2) of helium can be detected in many nebulae. The great majority of the nebulae, however, show the second variety of spectrum, and are thus indistinguishable spectroscopically from irresolvable star-clusters. The great nebula of Andromeda and the spiral nebulae are of this kind. It is not necessary to conclude that they, therefore, are star-clusters whose components are, owing to their remoteness from us, too faint and close together to be separately distinguishable. A gaseous mass only gives a bright line spectrum when it is so rarefied as to be transparent through and through. If the density and thickness are such that a ray of light cannot pass through it the spectrum will, in general, be continuous like that of a solid body.

The inquiry into the physical state and constitution of the nebulae raises problems of great difficulty. In the case of "gaseous" nebulae it is very hard to understand how such extremely tenuous masses are maintained in a state of incandescence. Only one theory has been put forward which at all accounts for this fact, and unfortunately, it is not altogether satisfactory in all respects. This is Sir Norman Lockyer's "Meteoritic Hypothesis," which attributes the light to collisions between numbers of small discrete solid particles, these being vaporized and made luminous owing to the heat developed by their impacts. Formidable difficulties, however, prevent the entire acceptance of this suggestion.

The spiral nebulae are not distributed at random over the sky, nor are they condensed along the galactic plane like the clusters which they spectroscopically resemble. There is a well-marked centre of aggregation of the northern nebulae near the north galactic pole. In the southern hemisphere they are more evenly distributed, but the avoidance of the galactic plane is marked. The remarkable Nebuliclae or Magellanic Clouds in the southern hemisphere, which look like detached portions of the Milky Way, are found on telescopic examination to consist, not of stars alone, like the Milky Way, but of stars and nebulae clustering together. In the greater cloud Sir John Herschel counted 286 nebulae; in the lesser cloud they are rather less numerous:

REMARKS.—The characters of nebulae receive treatment in all textbooks on descriptive astronomy; mention may be made of Miss A. M. Clerke, The System of the Stars (2nd ed., 1905), which contains a full account of these objects, illustrated by many photographs; the same work is replete with references to original papers. Of recent catalogues of nebula, we notice J. L. E. Dreyer, "A new general catalogue of nebula and clusters of stars," Memoirs R.A.S. (1888), published separately in 1890; and "Index Catalogue of Nebulae (1888-1894)." Mem. R.A.S. (1895). Excellent photographs of the more famous nebulae are given in Sir R. Ball's Popular Guide to the Heavens (1905); a more comprehensive collection is given in Isaac Roberts, Photographs of Stars, Star Clusters and Nebulae (2 vols., 1878-1881; in press). A. S. E.

NEBULAR THEORY, a theory advanced to account for the origin of the solar system. It is emphatically a nebular hypothesis; it cannot be demonstrated by observation or established by mathematical calculation. Yet the boldness and the splendour of the nebular theory have always given it a dignity not usually attached to a doctrine which from the very nature of the case can have but little direct evidence in its favour.

There are very remarkable features in the solar system which point unmistakably to some common origin of many of the different bodies which it contains. We may at once put the comets out of view. It does not appear that they bear any testimony on either side of the question. We do not know whether or not they were once satellites of the sun, or whether they may not be merely imported into the system from the depths of space. Even if the comets be indigenous to the system, they may, as many suppose, be merely ejections from the sun. In any case the orbits of comets are exposed to such tremendous perturbations from the planets that it is unsafe from the present orbit of a comet to conjecture what that orbit may have been in remote antiquity. On these grounds we discuss the nebular theory without much reference to comets. But even after the omission of all cometary objects we can still count in the solar system upwards of five thousand bodies, almost every one of which pronounces distinctly, though with varying emphasis, in favour of the nebular theory.

The first great fact to be noticed is that the planets revolve around the sun in the same direction. This is true not only of the major planets Mercury, Venus, the Earth, Mars, Jupiter, Saturn, Uranus and Neptune; it is also true of the host of more than five hundred minor planets. It is also remarkable that all the great planets and many of the small ones have their orbits very nearly in the same plane, and nearly circular in form. Viewed as a question in probabilities, we calculate the chance that five hundred bodies revolving round the sun shall all be moving in the same direction. The improbability of such an arrangement is enormously great. It is represented by the ratio of a number containing about a hundred and sixty figures to unity, and so we are at once forced to the conclusion that this remarkable feature of the planetary motions must have some physical explanation. In a minor degree this conclusion is strengthened by observing the satellites. Discarding those of Uranus, in which the orbits of the satellites are highly inclined to the ecliptic, and in which manifestly some exceptional influence has been at work, we find that the satellites revolve around the primaries also in the same direction;1 while, to make the argument complete, the planets, so far as they can be observed, rotate on their axes in the same manner.

The nebular theory offers an explanation of this most remarkable uniformity. Laplace supposed the existence of a primitive

1 Exceptions are Saturn ix. (Phoebe), Jupiter vii. (?) and viii., and the satellite of Neptune.
nebula which extended so far out as to fill all the space at present occupied by the planets. This gigantic nebulous mass, of which the sun was only the central and somewhat more condensed portion, is supposed to have a movement of rotation on its axis. There is no difficulty in conceiving how a nebula, quite independently of any internal motion of its parts, shall also have had as a whole a movement of rotation. In fact a little consideration of the theory of probabilities will show it to be infinitely probable that such an object should really have some movement of rotation, no matter by what causes the nebula may have originated. As this vast mass cooled it must by the laws of heat have contracted towards the centre, and as it contracted it must, according to a law of dynamics, rotate more rapidly. The time would then come when the centrifugal force on the outer parts of the mass would more than counterbalance the attraction of the centre, and thus we would have the outer parts left as a ring. The inner portion will still continue to contract, the same process will be repeated, and thus a second ring will be formed. We have thus grounds for believing that the original nebula will separate into a series of rings all revolving in the same direction with a central nebulous mass in the interior. The materials of each ring would continue to cool and to contract until they passed from the gaseous to the liquid condition. If the consolidation took place with comparative uniformity we might then anticipate the formation of a vast multitude of small planets such as those we actually do find in the region between the orbit of Mars and that of Jupiter. More usually, however, the ring might be expected not to be uniform, and, therefore, to condense in some parts more rapidly than in others. The effect of such contraction would be to draw the materials of the ring into a single mass, and thus we would have a planet formed, while the satellites of that planet would be developed from the still nascent planet in the same way as the planet itself originated from the sun. In this way we account most simply for the uniformity in the direction in which the planets revolve, and for the mutual proximity of the planes in which their orbits are contained.

Such was the nebular theory as it was originally sketched. At the present day when the nebulae that are spiral in form have been shown to be so numerous, next to the fixed stars themselves, our view of the nebular theory has been somewhat modified. It now seems probable that the spiral nebula is the fittest illustration of the transformation of a diffused nebula into a system of sun and planets. The rotation of the planets on their axes is also explained as a consequence of the nebular theory, for at the time of the first formation of the planet it must have participated in the revolution of the whole nebula, and by the subsequent contraction of the planet the speed with which the rotation was performed must have been accelerated.

There is quite a different method of considering the nebular origin of our system, which leads in a very striking manner to conclusions practically identical with those we have just sketched. We may commence by dealing with the sun as we find it at the present moment, and thence inferring what must have been the progress of events in the earlier epochs of the history of our system.

The supply of heat from the sun at the present time suggests a profound argument in support of the nebular theory. The amount of the sun's heat has been estimated, but we receive on the earth less than one two-thousand-millionth part of the whole radiation. It would seem that the greater part of the rest flows away to be lost in space. Now what supplies this heat? We might at first suppose that the sun was really an intensely heated body radiating out its heat as does white-hot iron, but this explanation cannot be admitted, for there is no historical evidence that the sun is growing colder. We have not the slightest reason to think that the radiation from the sun is measurably weaker now than it was a couple of thousand years ago, yet it can be shown that, if the sun were merely radiating heat as simply a hot body, then it would cool some degrees every year, and must have cooled many thousands of degrees within the time covered by historical records. We, therefore, conclude that the sun has some other source of heat than that due simply to incandescence. It might, for example, be suggested that the heat of the sun was supplied by chemical combination analogous to combustion. It would take 20 tons of coal a day burned on each square foot of the sun's surface to supply the daily radiation. Even if the sun were made of one mass of fuel as efficient as coal, that mass must be entirely expended in a few thousand years if the present rate of radiation was to be sustained. We cannot, therefore, admit that the source of the heat in the sun is to be found in any chemical combination taking place in its mass. Where then can we find an adequate supply of heat? Only one external source can be named: the falling of meteors into the sun must yield some heat just as a shooting star yields some heat to our atmosphere, but the question is whether the quantity of heat obtainable from the shooting stars is at all adequate for the purpose. It can be shown that unless a quantity of meteors in collective mass equal to our moon were to plunge into the sun every year the supply of heat could not be sustained from this source. Now there is no reason to believe that meteors in anything like this quantity can be supplied to the sun, and, therefore, we must reject this source as also inadequate.

The truth about the sun's heat appears to be that the sun is really an incandescent body losing heat, but that the operation of cooling is immensely retarded owing to a curious circumstance due jointly to the enormous mass of the sun and to a remarkable law of heat. It is well known that if energy disappears in one form it reappears in another, and this principle applied to the sun will explain the famous difficulty.

As the sun loses heat it contracts, and every pair of particles in the sun are nearer to each other after the contraction than they were before. The energy due to their separation is thus less in the contracted state than in the original state, and as that energy cannot be lost it must reappear in heat. The sun is thus slowly contracting; but as it contracts it gains heat by the operation of the law just referred to, and thus the further cooling and further contraction of the sun is PROVEN until the additional heat obtained is radiated away. In this way we can reconcile the fact that the sun is certainly losing heat with the fact that the change in temperature has not been large enough to be perceived within historic times.

It has been estimated that the sun is at present contracting so that its diameter diminishes 10 m. every century; there is, however, now reason to think that the rate of contraction is by no means so rapid as this would indicate. This is an inappreciable distance when compared with the diameter of the sun, but if it be a true estimate of our present purpose depends upon the fact that this contraction is always taking place. Assuming the accuracy of the estimate just made, we see that a thousand years ago the sun must have had a diameter 100 m. greater than at present, ten thousand years ago that diameter must have been 1000 m. more than it is now, and so on. We cannot perhaps assert that the same rate is to be continued for very many centuries, but it is plain that the further we look back into the past time the greater must the sun have been.

Dealing then simply with the laws of nature as we know them, we can see no limit to the increasing size of the sun as we look back. We must conceive a time when the sun was swollen to such an extent that it filled up the entire space girdled by the orbit of Mercury. Earlier still the sun must have reached to the earth. Earlier still the sun must have reached to where Neptune now revolves on the confines of our system, but the mass of the sun could not undergo an expansion so prodigious without being made vastly more rarefied than at present, and hence we are led by this mode of reasoning to the conception of the primeval nebula from which our system has originated.

Considering that our sun is but a star, or but one of the millions of stars, it is of interest to see whether any other systems present indication of a nebulous origin analogous to that which Laplace
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proposed for the solar system. In one of his papers, Sir W. Herschel marshals the evidence which can be collected on this point. He arranges a selection from his observations on the nebulae in such a way as to give great plausibility to his view of the gradual transmutation of nebulae into stars. Herschel begins by showing us that there are regions in the heavens where a faint diffused nebulousness is all that can be detected by the telescope. There are other regions in which a nebula can be just discerned, others again in which the nucleus is easily seen, and still others where the nucleus is a brilliant star-like point. The transition from an object of this kind to a nebulous star is very natural, while the nebulous stars pass into the ordinary stars by a few graduated stages. It is thus possible to exhibit a series of objects beginning at one end with the most diffused nebulousness and ending at the other with an ordinary fixed star or group of stars. Each object in the series differs but slightly from the object just before it and the object just after it. It seemed to Herschel that he was thus able to view the actual changes by which masses of phosphorescent or glowing vapour became actually condensed down into stars. The condensation of a nebula could be followed in the same manner as we can study the growth of the trees in the forest, by comparing the trees of various ages which the forest contains at the same time. In attempting to pronounce on the evidence with regard to Herschel’s theory, we must at once admit that the transmutation of a nebula into a star has never been seen. It is indeed very doubtful whether any changes of a nebula have ever been seen which are of the same character as the changes Herschel’s theory would suggest. It seems, however, most likely that the periods of time required for such changes are immense and that the changes accomplished in only a century or two are absolutely inappreciable.

The nebular theory is a noble speculation supported by plausible argument, and the verdict of science on the whole subject cannot be better expressed than in the words of S. Newcomb: “At the present time we can only say that the nebular hypothesis is indicated by the general tendencies of the laws of nature, that it has not been proved to be inconsistent with any fact, that it is almost a necessary consequence of the only theory by which we can account for the origin and conservation of the sun’s heat, but that it rests on the assumption that this conservation is to be explained by the laws of nature as we now see them in operation. Should any one be sceptical as to the sufficiency of these laws to account for the present state of things, science can furnish no evidence strong enough to overthrow his doubts until the sun shall be found growing smaller by actual measurement, or the nebula be actually seen to condense into stars and systems.”

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NECESSITAS (Gr. Ἀρέστα), in Orphic theology, the personification of absolute necessity. She appears as the mother of the Moeræ (Fates), as the wife of Demiurgus (Fashioner of the World) and mother of Hellmarmenē (Destiny). Her power is irresistible, even greater than that of the gods; to her was due the strife (battles with Titans, Giants) that raged amongst them of old, before the rule of love began; the world revolves round the spindle, which she holds in her lap. According to the Egyptian theory, she is one of the four deities present at the birth of every human being, her companions being the Daimon (guardian spirit), Tyche (Fortune) and Eros. On the citadel of Corinth there was a temple sacred to her and Bia (Violence), which none were permitted to enter. The Roman Necessitas is represented in the well-known ode of Horace (i. 33) as the forerunner and companion of Fortuna, holding in her brazen hand huge nails, a clamp and molten lead, symbolical of fixedness and tenacity.

See Plato, Rep. 616 c, Symph. 195 c, 197 b; Macrobios, Saturnalia, i 19; Pausanias ii. 4. 6.

NECESSITY (Lat. necessitas), a term used technically in philosophy for the quality of inevitable happening; for example, hot air necessarily rises. Thus it corresponds in the sphere of action to certainty in the sphere of knowledge. That the sun will rise to-morrow is a necessary event; and men anticipate the rising with certainty. In ordinary language the conception of necessity is rendered meaningless by being referred to the contingent. There are other conditions in which a man can be just discerned, others again in which the nucleus is easily seen, and still others where the nucleus is a brilliant star-like point. The transition from an object of this kind to a nebulous star is very natural, while the nebulous stars pass into the ordinary stars by a few graduated stages. It is thus possible to exhibit a series of objects beginning at one end with the most diffused nebulousness and ending at the other with an ordinary fixed star or group of stars. Each object in the series differs but slightly from the object just before it and the object just after it. It seemed to Herschel that he was thus able to view the actual changes by which masses of phosphorescent or glowing vapour became actually condensed down into stars. The condensation of a nebula could be followed in the same manner as we can study the growth of the trees in the forest, by comparing the trees of various ages which the forest contains at the same time. In attempting to pronounce on the evidence with regard to Herschel’s theory, we must at once admit that the transmutation of a nebula into a star has never been seen. It is indeed very doubtful whether any changes of a nebula have ever been seen which are of the same character as the changes Herschel’s theory would suggest. It seems, however, most likely that the periods of time required for such changes are immense and that the changes accomplished in only a century or two are absolutely inappreciable.

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NECK (O. Eng. necca; the word appears in many Teutonic languages; cf. Dutch nek, Ger. Nacken; in O. E. the common word was wouls; cf. Ger. Hals), that part of the body which connects the head with the trunk (see ANATOMY: Superficial and Artistic). The word is transferred to many objects resembling this part of the body in shape or function; it is thus applied to an isthmus, or to the narrowest portion of a promontory, to the narrow part of a musical stringed instrument connecting the head and body, as in the violin, or to a narrow pass between mountains, which in the Dutch form nek, appears in place-names in South Africa. In architecture, the “neck” is that part of the capital just above the “astragal,” and the term “necking” is applied to the annulet or round, or series of horizontal mouldings, which separates the capital of a column from the plain part or a shaft. In Romanesque work this is sometimes corded.

In Geology, the term “neck” is given to the denuded stump of an extinct volcano. Beneath every volcano there are passages of communication between the volcanic regions and the world above. The volcanic activity has been levelled by denudation there is always a more or less circular pipe which marks the site of the crater. This pipe, which is filled with consolidated ashes or with crystalline lava, is the characteristic of a volcanic neck. Active volcanoes often stand on the sea-bottom and when the eruption comes to an end the volcano is slowly buried under layers of sediment. In tropical seas the coral animals cover the submarine volcanoes which rise nearly to the surface and form great reefs of limestone around them. Should elevation take place after long ages the removal of the overlying strata will bring the volcanic mass to light, and in the normal course of things this will suffuse the region examined with volcanic products. The necks of these are furnished by the geological history of the British Isles. In Carboniferous times, for example, before the Coal-measures were deposited, there were shallow seas over the southern part of Scotland and the north of England. Volcanic activity took place on the seabed-bottom, and many volcanic cones, both small and large, were produced. These have long since been uplifted and the superjacent geology has been worn away. Where the necks have been removed.

In Derbyshire, Fife, the Lothians and the Glasgow district the remains of Carboniferous volcanoes occur in every state of preservation. Some have the conical hills of lavas and ashes well preserved (e.g. Largs, Glasgow); others (e.g. Fintry and Crossford) occur only in a small part of the original volcanic pile (e.g. Arthur’s Seat, Edinburgh; the Binn of Burtston) and of the larger number nothing remains but the neck of the volcano which shows that it was there.

In regions of former volcanic activity necks are the most persistent of all volcanic structures, because the active volcanic magma is located deep within the earth’s crust, and the pipe by which it rises to the surface is of great length and traverses a great thickness of
strata. Many volcanic necks stand on lines of fault. In others there are groups of necks lying in a straight or sinuous line, which may indicate the position of a fracture or at least of a line of least resistance. In many cases their bases are nearly circular in cross section. This pipe was usually vertical, and nearly uniform in diameter for great depths; the material occupying it, when it is extruded, is still, and in a vertical direction, as shown in vertical section (or elevation) in a cliff is a pillar-shaped mass crossing the bedding planes of the strata nearly at right angles. It terminates upwards in the remains of the volcanic cone and downwards in a conical depression, which is usually filled with sediments and is sometimes emplaced, represented in most cases, where it has been exposed, by a large irregular mass (a batholith or boss) of coarsely crystalline igneous rock. The site of such a neck is generally indicated by a low cone, which is a remnant of a hollow or hollows of conical or igneous strata of a different kind. The low cone is generally a point to the greater hardness and strength of the volcanic materials and is not connected with the original shape of the volcano. Such hills are common in some parts of Scotland and well-known examples are Arthur’s Seat and the Castle Rock (Edinburgh), North Berwick Law, the Bass Rock; they occur also in the Peak district of Derbyshire, where the base of the depression is situated, and in a more splendid sugar-loaf cones known as the Pits of St Lucia in the West Indies, rising from the sea with almost vertical sides to a height of nearly 300 ft. These volcanic cones are found in California, Arizona, and many of the western states of North America geologists have observed conical volcanic hills having all the features which belong to necks.

However, the necks are soon and easily disintegrated they may be reduced more rapidly than the strata around them and the position of a neck may be indicated by a cup-shaped hollow; this is the case with some of the diamond-bearing pipes of South Africa, which have been encountered in underground mining operations; in the coal-field of Fife, for instance, the coals are sometimes replaced by a circular mass of volcanic rock, a quarter of an inch thick, which seems to have been formed in a hollow. Better examples are the Kimberley diamond mines. The blue-ground (or serpentine breccia) occupies great pipes or funnels, circular in outline with nearly vertical sides, extending downwards to underground levels, and filled with breccia of a kind of hard rock which is cut from the crater’s walls ultimately filled up the cavity. Nancies occur in Fifeshire and in Shetland, and among the recent volcanoes of the Eiffel there are some which have thrown out more slate and sandstone than consisting of volcanic rock, surrou volca by neck.

In Arran, for example, there is a large neck which contains lumps of Cretaceous rocks nowhere else known to occur on the island; they have fallen down from strata once occupying part of the walls of the crater but now removed by denudation.

The lava which rises and flows out from the crater leaves its trace usually in a vast sheet, but sometimes in a small area along the margin of the crater and surrounded by a rising conical depression, which is composed of solid crystalline rock representing the last part of the magma which ascended from the underground focus and congealed within the crater. In Mount Pelee, for instance, the last stage of the eruptions of 1902 to 1905 was the protrusion of a great column of solidified lava which rose at one time to a height of 900 ft. above the lip of the crater, but has since crumbled down. The Castle Rock of California, a conspicuous feature of the plum of crystalline basalt, is of this kind weather down very slowly and tend to form prominent hills.

After the eruptions terminate gases or hot solutions given out by deep parts of molten rock may find a passage upward through the materials occupying the crater, greatly modifying their mineral nature and laying down fresh deposits. A good example of secondary deposits within a volcanic neck is provided by the Cripple Creek mining district of Colorado. The ore-bearing veins are connected with volcanic rocks and part of these occupy a vertical circular pipe which is a typical volcanic neck. A phylodic breccia, greatly altered, is the principal rock, and is cut by dikes of phylodic dolerite, &c. The country rock is mostly granite and gneiss, and blocks of these are common in the breccia. A large volcano was built up at the same time the granite plateau, and has since been almost entirely removed by denudation. The pipes of crystalline basalt are cut by currents of hot water derived from the volcanic magma and were deposited along cracks and fissures in the materials which occupied the crater, and also in the surrounding rocks (see VOLCANIC NECK). (J. S. F.)

NECKAM, ALEXANDER (1157–1217), English schoolman and man of science, was born at St Albans in September 1157, on the same night as King Richard I. Neckam’s mother nursed the prince with her own son, who thus became Richard’s foster-brother. He was educated at St Albans Abbey school, and began to teach as schoolmaster of Dunstable, dependent on St Albans Abbey. Later he resided several years in Paris, where by 1180 he had become one of the leading men of St. Stephen’s (as it was then called) and was appointed a distinguished lecturer of the university. By 1186 he was head of the school of theology and of the college of the schoolmaster at Dunstable. He is said to have visited Italy with the bishop of Worcester, but this statement has been doubted; the assertion that he was ever prior of St Nicolas, Exeter, seems a mistake: on the other hand, he was certainly much at court during some part of his life. Having become an Augustinian canon, he was appointed abbot of Cirencester in 1213. He died at Kempsey in Worcestershire in 1217, and was buried at Worcester. Besides theology he was interested in the study of grammar and natural history, but his name is chiefly associated with his studies in magnetism: he wrote on De natura rerum and De uteusilbus (the former of which, at any rate, had become well known at the end of the 12th century, and was probably written about 1180) Neckam has preserved as the earliest European notices of the magnet as a guide to seamen—outside China, indeed, these seem to be the earliest notices of this mystery of nature that have survived in any country or civilization. It was probably in Paris, the chief intellectual centre of his time, that Neckam heard how a ship, among its other stores, must have a needle placed above a magnet (the term uteusilbus was that used to designate such a needle, which would revolve until its point looked north, and thus guide sailors in murky weather or on starless nights. It is noteworthy that Neckam has no air of imparting a startling novelty: he merely records what had apparently become the regular practice of at least some seamen of the Catholic world.

See Thomas Wright’s edition of Neckam’s De naturis rerum and De farsibus divinorum sapientiae in the Rolls Series (1863), and of his De uteusilbus in his Volume of Vocabulary. Neckam and his works are included in the Corpus Polygraphiae Protestantiae published by a treatise on grammatical criticism; a translation of Aesop into Latin elegiacs (six fables from this version, as given in a Paris MS., are printed in Robert’s Pales (indiciis); commentaries, still unprinted, on portions of Aristotle, Martianus Capella and Ovid’s Metamorphoses, and other works. Of all these the De natur rerius, a sort of manual of the scientific knowledge of the 12th century, is much the most important; the magnet passage herein is in book ii. of the De variis, p. 183 of Wright’s edition. The corresponding section in the De viusilbus, is on p. 114 of the Vol. of Vocabs.
NECKAR—NECKER

Roger Bacon's reference to Neckam as a grammatical writer (in *multis veris et utilis scriptis: sed... inter auctores non potest... numerati*) may be found in Brewer's (*Rolls Series*) edition of Bacon's *Opera Inedita*, p. 457. See also Thomas Wright, *Biographies Britannica Literaria, Anglo-Norman Period*, pp. 449-459 (1846: some points in this are modified in the 1863 edition of *De nat. rer.*); C. Raymond Beazley, *Dawn of Modern Geography*, iii. 56-60 (C. R. B.).

**NECKAR**

A river, and a right-bank tributary of the Rhine, rises between the Black Forest and the Swabian Alb, near Schwenningen, in Württemberg, at an altitude of 2287 ft. As far as Rottweil only a mountain stream, it here attains the volume of a river, flows N. as far as Horb, thence in a north-easterly direction, and with rapid current it passes Rottenburg and the university town of Tübingen, taking then a generally northerly course. From Esslingen the Neckar becomes broadened, deeply wooded, and is navigable and after passing Cannstatt, from which point it is navigable for small craft, it flows through vine-clad hills by the pleasant village of Marbach, Schiller's birthplace, receives at Besigheim the waters of its most considerable tributary, the Enz, swims down by Laufen, and enters the beautiful vale of Heilbronn. Hence, between hills crowned by frequent feudal castles, it runs by Wimpfen and by Hornberg, where Götz von Berlichingen lived, to Eberbach, where it enters the sandstone formation of the Odenwald. It now takes a tortuous westerly course, and the scenery on its banks becomes more romantic. Windng downward by Neuenstein and Neckargemünd, its wooded heights, it sweeps beneath the Königstuhl (1900 ft.) which, wades the walls of Heidelberg, and now quitting the valley enters the plain of the Rhine and falls into that river from the right at Mannheim. Its length is 247 m., and its drainage area 4790 sq. m. Its most important tributaries are the Enz, Eischach and Glatt (left), and the Fils, Rems, Kocher and Jagst (right). It is navigable for small steamboats up to Heilbronn, for boats up to Cannstatt, and for rafts from Rottweil. It is the principal waterway of Württemberg, and is greatly used for floating down the home produce from Rottweil to Mannheim, which is an important port where every house is surrounded by vineyards. Up to Frankfort it has been deepened and the channel otherwise improved. A committee, chiefly promoted by the Württemberg government and the Stuttgart chamber of commerce, reported in 1901 that it was both desirable and practicable to dredge the river and to canalize it, from Esslingen down to Mannheim, and that the cost would probably be between 2 and 3 million sterling.


**NECKARGEMÜND**, a town and climatic health resort of Germany, in the grand duchy of Baden, situated amid densely wooded hills, on the left bank of the Neckar, 6 m. E. from Heidelberg by the railway to La Würzbourg, and at the junction of a line to Jagstfeld. Pop. (1901) 2500. It has an important trade in wine. The other industries are quarrying, tanning and shipbuilding, and there are electrical works. Neckargemünd, one of the favourite tourist resorts in the Neckar valley, was founded in the 10th century and became a free town in 1286. In 1393 it passed to the elector palatine and, together with the surrounding district, was apportioned to Baden in 1814.

**NECKER, JACQUES** (1732-1804), French statesman, finance minister of Louis XVI, was born at Geneva in Switzerland. His father was a native of Cüstrin in Pomerania, and had, after the publication of some works on international law, been elected as professor of public law at Geneva, of which he became a citizen. Jacques Necker had been sent to Paris in 1747 to become a clerk in the bank of a friend of his father, M. Vernet. He soon afterwards established, with another Genevese, the famous bank of Thelusson & Necker. Thelusson superseded the bank in London (his grandson was made a peer as Lord Rendlesham), while Necker was managing partner in Paris. Both partners became very rich by loans to the treasury and speculations in grain. In 1763 Necker fell in love with Madame de Vermont, but the widow of a French officer. But while en route to Geneva, Madame de Vermont met Suzanne Curchod, the daughter of a pastor near Lausanne, to whom Gibson had been engaged, and brought her back as her companion to Paris in 1764. There Necker, transferring his love from the widow to the poor Swiss girl, married Suzanne before the end of the year. She encouraged her husband to try and make himself a public position. He accordingly became a syndic or director of the French East India Company, and, after showing his financial ability in its management, defended it in an able memoir against the attacks of A. Morelet in 1769. Meanwhile he had made interest with the French government that by a royal edict he was appointed resident at Paris by the republic of Geneva. Madame Necker entertained the chief leaders of the political, financial and literary worlds of Paris, and her Fridays became as greatly frequented as the Mondays of Madame Geoffrin, or the Tuesdays of Madame Helvetius. In 1773 Necker won the prize of the Académie Française for an *éloge* on Colbert, and in 1775 published his *Essai sur la législation et le commerce des grains*, in which he attacked the free-trade policy of Turgot. His wife now believed he could get into office as a great financier, and made him give up his share in the bank, which he transferred to his brother Louis. In October 1776 Necker was made finance minister of France, though with the title only of director of the treasury, which, however, he changed in 1777 for that of director-general of the finances. He did great good in regulating the finances by attempting to divide the taille or poll tax more equally, by abolishing the "vingtième d'industrie," and establishing *monts de piété* (establishments for loaning money on security). But his greatest financial measures were his attempt to fund the French debt and his establishment of annuities under the guarantee of the state. The operation of funding was too difficult to be suddenly accomplished, and Necker rather pointed out the right line to be followed than completed the operation. In all this he treated French finance rather as a banker than as a profound political economist, and thus fell far short of Turgot, who was the very greatest economist of his day. Politically he did not do much to stave off the coming Revolution, and his establishment of provincial assemblies was only a timid application of Turgot's great scheme for the administrative reorganization of France. In 1781 he published his famous *Compte rendu*, in which he drew the balance sheet of France, and was dismissed from his office. Yet his dismissal was not really due to his book, but to the influence of Marie Antoinette, whose schemes for benefitting theduc de Guises he had thwarted. In retirement he occupied himself with literature, and with his only child, his daughter, who in 1786 married the ambassador of Sweden and became Madame de Staël (q.v.). But neither Necker nor his wife cared to remain out of office, and in 1787 Necker was banished by "lettre de cachet" 40 leagues from Paris for attacking Calonne. In 1788 the country, which had at the bidding of the literary guests of Madame Necker come to believe that Necker was the only minister who possessed the heart and soul of the people, as they said, demanded Necker's recall, and in September 1788 he became once more director-general of the finances. Throughout the momentous months which followed the biography of Necker is part of the history of the French Revolution (q.v.). Necker put a stop to the rebellion in Dauphiné by legalizing its assembly, and then set to work to arrange for the summons of the states general. Throughout the early months of 1789 he was regarded as the saviour of France, but his conduct at the meeting of the states general showed that he regarded it merely as an assembly which should grant money, not organize reform. But as he had advised the calling of the call for the national, and the double representation of the third estate, and then permitted the orders to deliberate and vote in common, he was regarded as the cause of the Revolution by the court, and on July 11 was ordered to leave France at once. Necker's dismissal brought about the taking of the Bastille, which induced the king to recall him. He was received with joy in every city he traversed, but at Paris he again proved to be no statesman. Believing that he could save France alone, he refused to act with the National Assembly, and caused the king's acceptance of the suspensive veto, by which he sacrificed his chief prerogative in September, and destroyed all chance of a strong executive
NECROLOGY

NECROLOGY (from Med. Lat. necrologium, Gr. νεκρός, corpse, the termination being formed from λύγης, λέγειν to read, in the sense of list, register; cf. ־ martyrlogio), a register in a monastery or other ecclesiastical establishment of the names of the dead, with the dates of their deaths. The prayers for the dead were said at that hour, but the prayers of the living were not. NECHOMANCY (Gr. νεκρομαντεία, or νεκρομαντία, from νεκρός or νέκας, corpse, and μαντεία, divination), properly divination by communicating with the dead. The Latinized form of the Greek word was corrupted into nigromantia, connecting the word with nigfer, black, and so was applied to the "black art," "black magic," in the sense of witchcraft, sorcery. This corrupted form is common in English to the 17th century (see MAGIC and WITCHCRAFT).

NECROPOLIS, a cemetery (q.v.) or burying-place, literally a "city of the dead" (Gr. νεκρός, corpse, and πόλις, city). Apart from the occasional application of the word to modern cemeteries outside large towns, the term is chiefly used of burial-grounds near the sites of the centres of ancient civilizations.

NECROSIS (Gr. νεκρός, corpse), a term restricted in surgery to death of bone. A severe inflammation, caused by a violent blow, by cold, or by the absorption of various poisons, as mercury and copper, produces a general or local necrosis. The latter part, analogous to the slough in the soft parts, is followed a sequester or exfoliation. At first it is firmly attached to the living bone around; gradually, however, the dead portion is separated from the living tissue. The process of separation is a slow one. New bone is formed around the sequester, which often renders its removal difficult. As a rule the surgeon waits until the dead part is loose, and then cuts down through the new case and removes the sequester. The cavity in which it lay gradually closes, and a useful limb is the result.

NECTAR, in ancient mythology generally coupled with ambrosia, the nourishment of the gods in Homer and in Greek literature generally. Probably the two terms were not originally distinguished; but usually both in Homer and in later writers nectar is the drink and ambrosia the food. On the other hand, in Alcman nectar is the food, and in Sappho and Anaxandrides ambrosia the drink. Each is used in Homer as an unguent (IIiad, xiv. 170; xix. 35). Both are fragrant, and may be used as perfume. According to W. H. Roscher (Nektor und Ambrosia, 1883; see also his article in Roscher's Lexikon der Mythologie) nectar and ambrosia were originally only different forms of the same substance—honey, regarded as a dew, like manna, brought down from heaven, or the honey which was used both as food and drink. (See also AMBROSI)

NEED-FIRE, or WILD-FIRE (Ger. Nofeußer, O. Ger. nodfyr), a term used in folklore to denote a curious superstition which survived in the Highlands of Scotland until a recent date. Like the fire-churning still customary in India for kindling the sacrificial fire, the need- or wild-fire is made by the friction of one piece of wood on another, or of a rope upon a stake. Need-fire is a practice of sheep shepherds to ward off disease from their herds and flocks. It is kindled on occasions by witches, or spirits of the dead, and driven through the town. Its efficacy is believed to depend on all other fires being extinguished. The kindling of the need-fire in a village near Quedlinburg was impeded by a night light burning in the parsonage (Pröhle, Harz-Bilder, Leipzig, 1853). According to one account, in the Highlands of Scotland the rule that all common fires must be previously extinguished applied only to the houses situated between the two nearest running streams (Kelly, Curiosities of Indo-European Tradition and Folklore, p. 53 seq.). In Bulgaria even smoking during need-fire is forbidden. Two naked men produce the fire by rubbing dry branches together in the forest, and with the flame they light two fires, one on each side of a cross-road haunted by wolves. The cattle are then driven between the two fires, from which glowing embers are taken to rekindle the cold hearths in the houses (A. Strausz, Die Bulgaren, p. 198). In Caithness the men who kindled the need-fire had previously to divest themselves of all metal. In some of the Hebrides the men who made the fire had to be eighty-one in number and all married. In the Halberstadt district in Germany, the rope which was wound round the stake, must be pulled by two chaste, virgins; while at Wolfenhüttel, contrary to usual custom, it is said that the need-fire had to be struck out of the cold anvil by the smith. In England the need-fire is said to have been lit at Birley within the last half-century. The superstition had its origin in the early ideas of the purifying nature of flame.


NEEDLE (O. Eng. nedd), the word appears in various forms in Teutonic languages, Ger. Nadel, Dutch naald, the root being ne-, to sew, cf. Ger. nähen, and probably Lat. nāre, to spin, Gr. νιῆσα, spinning), an instrument adapted for passing a thread through fabrics in sewing, consisting of a thin rod of steel, having a pointed end and pierced with a hole or "eye" to carry the thread. The term is also applied to various other objects that more or less resemble a sewing needle in form, though differing in function, such as the magnetized piece of steel that points north and south in the mariner's compass, the pointer or indicator of certain forms of electric telegraph instruments, the small slender tube, which the contents of a hypodermic syringe are injected beneath the skin, a sharp-pointed mountain peak or isolated mass of rock, &c.

Sewing needles have been in use from prehistoric times. Originally they were made of fishbone, bone or ivory, and their first form was probably a rude bodkin having a hook instead of an eye, though bone needles with an eye, sometimes at the end and sometimes in the middle, have been found in cave deposits in Great Britain and France and in the Swiss lakes. Bone
needles continue to be used by uncivilized tribes, but since the discovery of bronze metal needles have been employed in civilized communities. Steel needles were introduced into Europe by the Moors, and it is on record that they were being made at Nuremberg in 1370. In England their manufacture was estab-
lished about 1550. Made in England is also a rival substitute comparatively known as Needlemade. They are made in Warwickshire, with several other small towns in Warwick. Originally the industry was domestic in its character, but is now mainly in factories where mechanical appliances have to a great extent supplanted handwork. Large quantities of needles are also manufactured on the Continent of Europe, Aix-la-Chapelle being an important centre of their production. In the United States ordinary sewing needles are not made, though there is a large output of the special forms used in sewing machines.

The raw material of needle-manufacture consists of Sheffield crucible steel drawn down into wire of suitable gauge. The wire is supplied in coils of definite weight and diameter, and the first operation is to cut the coils into lengths, each sufficient for two needles. These lengths are next straightened. For this purpose a bundle containing several thousand lengths is packed within two strong wooden angles, and the pressure is applied by a pair of heavy wooden rollers. The wire is then placed sideways to the iron rings run over. Over this plate the bundle is worked backward and forward by the pressure of an oblong slightly curved iron tool having two longitudinal slits through which the wire is passed. The rings run on the right hand, lower the rings on the left, and slightly revolving them with his right, was able to point about 100,000 needles a day, the number depending, however, to some extent on the skill of the workman. This process was, however, soon superseded by machinery, which is still more expeditious. The wires are fed out from a hopper to a revolving wheel, on the periphery of which they are held by an India-rubber band. This wheel revolves at right angles to one having a similar action and so each wire is brought up to the stone in rapid succession and pointed at one end, the process being repeated for the other end. The next operations are to stamp the grooves which are to be found at the head of a needle and to polish them by being rubbed between the rings already mentioned. Each wire now forms two needles attached head to head by a broad thin scarf of steel. The operation of separating them is largely performed by machines which pass the double blanks over the face of an emery wheel, but an older method is to split them on two flattened wires, clamp them tightly in a frame, file away the scar and break the blanks in halves, so that two lots of single needles are obtained, each by each step, after the heads have been filed smooth, is to harden and temper the needles, which are heated to redness, plunged into cold oil, and then gently heated by being placed on a continuous band passing over a series of gas flames. After the tempering process the wires are then smoothed and polished so that they will not cut the thread. For this purpose the heads are softened by heating them, and the needles are then formed by a machine which may allow a smooth wire to be bent and the ends be pushed down on the shank, while in another the same end is left free for providing them with a minute latch. Another special class is constituted by the numerous varieties of needles used by surgeons for suturing wounds, &c. (see Surgical Instruments).

NEEDLE-GUN (Zündnadelgewehr), a military breeching-loading rifle, famous as the arm of the Prussians in 1866 and of the Germans in 1870-1871. It was the invention of the gunsmith Johann Nicholas von Dreyse (1787-1867), who, beginning in 1824, had made many experiments, and in 1836 produced the complete needle-gun. From 1841 onwards the new arm was gradually introduced into the Prussian service, and later into the military forces of many other German States. Dreyse was enabled to manufacture at an equipment. The principal details of the arm (pattern 1841) are as follows:

- Breech
- Calibre
- Weight without bayonet
- Charge (black powder)
- Bullet (lead)
- Muzzle velocity
- Sighted to

NEEDLEWORK. This subject may be considered under the two headings of (1) Plain Needlework, used for purely utilitarian purposes, and (2) Art Needlework for decorative purposes. Plain needlework requires no such further explanation as may be given in the case of art needlework, under which title are included (a) embroidery, and (b) other methods of decorative needlework, such as applied or appliqué work, ornamental quilting, patchwork and couching. In these last-mentioned methods the needlework is subservient to the decorative effect, which depends almost wholly upon the materials selected for the purpose; whereas in embroidery the needlework itself constitutes and is the visible decoration. The aim of this article is to indicate briefly different stitches of plain needlework and then to show that these stitches are also used in the domain of art needlework.

The more necessary stitches in plain needlework for making clothes are tacking, running, hemming, feather-stitching or herring-boning (all of which are practically of the same type), and button-holing in which the thread is looped as each stitch is made, and buttonhole is allied to another looped stitch, namely chain-stitching, which though frequently used in embroidery is rarely if ever used in plain needlework. For repairs of clothes and household linen, &c., the principal stitch is darning; grafting, however, is a substitute for it, and varies with the character of the stuff to be repaired, e.g. knitted stockings, damask linen, cloth, &c. Darning is allied to running, and grafting to patchwork. Patchwork as a form of decorative needlework is exemplified in sumptuous canopies and seat covers made several centuries B.C. by Egyptians, and rich hangings made by Italian and Flemish embroiders. Long and short stitches, kindred in principle to the running stitch in plain needlework, are perhaps the most frequent stitches used in embroidery, and are especially appropriate when the blending of tints with a flat even surface is the effect to be aimed at. Much medieval work of this character, as well as that done with chain stitch and its allied split stitch, is regarded as typical of opus anglicanum. Chain stitch produces a comparatively broken surface in decided contrast with the smooth one of long and short stitch, split stitch and satin stitch embroidery. Satin stitch is well adapted to express, with even flat surface in design, for colour effects, each mottled or dotted mass which is to be of one tint. In this respect, therefore, satin stitch serves a purpose in contrast to that of long and short stitch. A characteristic of satin-stitching is the sheen effect produced, on both
NEEMUCH—NEER, VAN DER

sides of the material embroidered, by parallel stitches taken closely together. Buttonhole stitch in relation to art needlework prevails to a great extent in cut linen and drawn-thread work (often called Greek lace), and predominates in the making of needlepoint lace (see Lace). In much of the Persian drawn-thread work, however, it is superseded by whipping or tightly and closely twisting a thread round the undrawn threads of the linen. Whipping has been put to another use in certain 16th-century art needlework for ecclesiastical purposes, where round the gold threads are worked as the ground of a design coloured silks are dexterously whipped, closely and openly, producing gradations of tint suffused with a corresponding variation of golden shimmer. Another important branch of art needlework with gold and silver threads is couching. When the metallic threads, arranged so as to lie closely together, are simply stitched flatly to the foundation material, the work is called flat couching or laying, a kind of treatment more frequent in Chinese and Japanese than in European art needlework. Flat couching is also carried out with floss silks. When a design for couching includes effects in relief, stout strings or cords as required by the design are first fastened to the foundation materials, and over them the metallic threads or in some cases coloured gimps are laid, and so stitched as to have an appearance in miniature of varieties of willow-twisting or basket work. The principle of relief couching is carried much further in certain English art needlework, having cumbersome and grotesque peculiarities, which was done during the reigns of the Stuarts. Crude compositions were wrought in partial relief with padded work, of costumed figures of kings and queens and scriptural persons with a medley of disproportionate animals, insects and trees, &c., in which foliage, wings, &c., were of coloured silk needlepoint lace—the whole being set as often as not in a background of tent or cross-stitch work on canvas. But tent and cross-stitch work (in French point compté) was also used by itself for cushion covers and later for upholstery. In its earlier phases it seems to have come under the medieval classification of opus pulvinarum. The reticulations of the canvas or those apparent in finer material governed the stitching and imparted a stiff formal effect to the designs so carried out, a characteristic equally strong in the lacis work, or darning on square mesh net (see Lace).

Appliqué or applied work belongs as much as patchwork to the medieval category of opus consuimum, or stitching stuffs together according to a decorative design, the greater part of which was cut out of material different in colour, and generally in texture, from that of the ground to which it was applied and stitched. Irish art needlework, called Carrickmacross lace, is the most part of cambric supplied or applied to net.

Quilting is also a branch of art needlework rather than embroidery. Indians and Persians using a short running stitch have excelled in it in past times. Some good quilting was done in England in the 18th century with chain-stitching which lay on the inner side of the stuff, the outer displaying the design in 'short stitches. In the account of his voyage to the East Indies, published in 1655, Edward Terry (1590–1665) writes of the Indians "making excellent quilts of satin lined with taffeta betwixt which they put cotton wool and worked them together with short running or bulky quilting, cords have been used; and elaborate designs for quilted lining of waistcoats were well done in the 18th century, with fine short stitches that held the cords between the inner and outer materials. A large number of names have been given to the many modifications of the limited number of essentially different stitches used in plain and art needlework, and on the whole are fanciful rather than real in technical or practical terms. Much information about them, with an abundance of capital illustrations, is given in the Dictionary of Needlework, by J. F. Caulfield and Emelie Saward (London, 1903).

NEEMUCH, or NEER, a town of Central India, with a British military cantonment, within the state of Gwalior, on the border of Rajputana, with a station on the Rajputana railway, 170 m. N. of Mhow. Pop. (1901) 21,588. In 1857 it was the most southerly place to which the Mutiny extended. The brigade of native troops of the Bengal army, which was stationed there, mutinied and marched to Delhi, the European officers taking refuge in the fort, where they were besieged by a rebel force from Mandasor, and defended themselves gallantly until relieved by the Malwa field force. Since 1895 it has been the headquarters of the political agent in Malwa.

NEENAH, a city of Winnebago county, Wisconsin, U.S.A., on the N.W. shore of Lake Winnebago, 82 m. N. by E. of Milwaukee. Pop. (1890) 9083; (1900) 9524, of whom 1559 were foreign-born; (1905) 6047; (1910) 5734. It is served by the Chicago & North-Western, the Chicago, Milwaukee & St Paul, and the Milwaukee, St Paul & Sault Ste Marie railways, by two interurban electric railways, and by steamboat lines on the lake and on the Fox river, which flows out of Lake Winnebago at this point. Several bridges connect it with Menasha, on the opposite side of the river, and the two cities form one industrial community. Doty Island, at the mouth of the river, belongs partly to Neenah and partly to Menasha. Neenah is a trade centre of the surrounding agricultural region, in which dairying, especially cheese-making, is carried on extensively. The Fox river (with a fall of 12 ft.) furnishes good water-power for the manufactories. There was a trading post at or near the site of Neenah during the French régime in Wisconsin, but there was no actual settlement until well into the 19th century. Neenah was chartered as a city in 1873; its name is derived from an Indian word meaning "running water" or "raptids."

NEER, VAN DER. Aernout and Eglon van der Neer, father and son, were Dutch painters whose lives filled almost the whole of the 17th century.

Aernout van der Neer (1603–1677), commonly called Aert or Artus, was the contemporary of Albert Cuyp and Hobbema, and so far like the latter that he lived and died in comparative obscurity. Aernout was born at Gorkum and died at Amsterdam. Houbraken's statement that Aernout had been a steward to a Dutch nobleman, and an amateur painter, before he settled in Amsterdam and acquired skill with his brush, would account for the absence of any pictures dating from his early years. He died in abject poverty, and his art was so little esteemed that the pictures left by him were valued at about five shillings apiece. Even as early as 1659 he found it necessary to supplement his income by keeping a wine tavern. The earliest pictures in which Aernout coupled his monogram of A. V. and D. N. interlaced with a date are a winter landscape in the Rijks Museum at Amsterdam (dated 1639), and another in the Martins collection at Kiel (1642)—immature works both, of poor quality. Far better is the "Winter Landscape" (1643) in Lady Wantage's collection, and the "Winter Scene on the Dam" in the d'Aguesseau collection in Brussels. In 1652 Aernout witnessed the fire which consumed the old town-hall of Amsterdam. He made this accident the subject for two or three pictures, now in the galleries of Berlin and Copenhagen. Though Amsterdam appears to have been constantly van der Neer's domicile, his pictures tell that he was well acquainted with the canals and woods about Haarlem and Leiden, and with the reaches of the Maes and Rhine. Dort, the home of Albert Cuyp, is sometimes found in his pictures, and substantial evidence exists that there was friendship between the two men. At some period of their lives they laid their hands to the same canvases, on each of which they left their joint mark. On some it was the signature of the name, on others the more convincing signature of style. There are landscapes in the collections of the dukes of Bedford and Westminster, in which Cuyp has represented either the frozen Maes with fishermen packing herring, or the moon reflecting its light on the river's placid waters. These are models after which van der Neer appears to have worked. The same feeling and similar subjects are found in Cuyp and van der Neer, before and after their partnership. But Cuyp was the leading genius. Van der Neer got assistance from him; Cuyp expected nothing from van der Neer. He carefully enlivened his friend's pictures, when asked to do so, with figures and cattle. It is in pictures jointly produced by them that we discover van der Neer's presence at Dort. We are near
Dort in the landscape sunset of the Louvre, in which Cuyp evidently painted the foreground and cows. In the National Gallery picture Cuyp signs his name on the tail of a milkmaid, whose figure and red skirt he has painted with light effectiveness near the edge of van der Neer's landscape. Again, a couple of fishermen with a dog, and a sportsman creeping up to surprise some ducks, are Cuyp's in a capital van der Neer at the Staedel Institute in Frankfort.

Van der Neer's favourite subjects were the rivers and watercourses of his native country either at sunset or after dark. His peculiar skill is shown in realizing transparency which allows objects—even distant—to appear in the darkness with varieties of tone, but without solid masses. The look of his paintings is veiled with frozen water, and his daylight icescapes with golfers, sleighers, and fishermen are as numerous as his moonlights. But he always avoids the impression of frostiness, which is one of his great gifts. His pictures are not scarce. They are less valuable in the market than those of Cuyp or Hobbema; but, possessing a charm peculiarly their own, they are much sought after by collectors. Out of about one hundred and fifty pictures accessible to the public, the choicest selection is in the Hermitage at St Petersburg. In England paintings from his brush are to be found in the National Gallery and Wallace Collection, and, amongst others, in the collections of the marquess of Bute and Colonel Holford.

2. EGLON VAN DER NEER (1643-1703) was born at Amsterdam, and died at Düsseldorf on the 3rd of May 1703. He was first taught by his father, and then took lessons from Jacob van Loo, whose chief business then consisted in painting figures in the landscapes of Wynants and Hobbema. When van Loo went to Paris in 1663 to join the school from which Boucher afterwards emerged, he was accompanied or followed by Eglon. But, leaving Paris about 1666, he settled at Rotterdam, where he dwelt for many years. Later on he took up his residence at Brussels, and finally went to Düsseldorf, where he entered the service of the elector-palatine Johann Wilhelm von der Pfalz. In each of the places where he stopped Eglon married, and having had three wives became the father of twenty-five children. A portrait of the princess of Neuberg led to his appointment as painter to the king of Spain.

Eglon van der Neer has painted landscapes imitating those of his father, of Berchem, and of Adam Elsheimer. He frequently put the figures into the town views of Jan van der Heyden, and sometimes with Berchem and Adrian van der Velde. His best works are portraits, in which he occasionally came near Ter Borch or Metsu in delicacy of touch, de Hooch in effectiveness of lighting, or Mieris in polish of surface. One of his earliest pieces in which the influence of Ter Borch is apparent is the "Lady with the Book," of 1665, which was sold with the Bredel collection in 1875. A young woman in white and red satin at Rotterdam, of 1669, recalls Mieris, whose style also reappears in Eglon's "Cleopatra" at Buckingham Palace. Two landscapes with "Tobit and the Angel," dated 1685 and 1694, in the museums of Berlin and Amsterdam, illustrate his fashion of setting Scripture scenes in Dutch backgrounds. The most important of his sacred compositions is the "Esther and Ahasuerus," of 1666, in the Uffizi at Florence. But Eglon varied his practice also with arrangements of hunting and hawking parties, pastures and fords, and cavalry skirmishes.

The latest of his panels is a mountain landscape of 1703 in the gallery of Augsburg.

NEERWINDEN, a village of Belgium in the province of Liège, five miles E. by S. of Tирelle, which gives its name to two great battles, the first fought in 1693 between the Anglo-Allied army under William III. of England and the French under the duke of Luxemburg, and the second in 1793 between the Austrians under Prince Josias of Coburg and the French under General Dumouriez.

Battle of Neerwinden or Landen, 1693 (see Grand Alliance, War of the).—Luxemburg, having by feints induced William to detach portions of his army, rapidly drew together superior numbers in face of the Allied camps, which lay in a rough semicircle from Elissem on the right to Neerlanden, and thence along the Landen brook on the left (July 18-28, 1693). William had no mind to retire over the Geete river, and entrenched a strong line from Laer through Neerwinden to Neerlanden. On the right section of this line (Laer to Neerwinden) the ground was much intersected and gave plenty of cover for both sides, and this section, being regarded as the key of the position, was strongly garrisoned; in the centre the open ground between Neerwinden and Neerlanden was solidly entrenched, and in front of it Rumsdorp was held as an advanced post. The left at Neerlanden rested upon the Landen brook and was difficult of access. William's right, as his line of retreat lay over the Geete, was his dangerous flank, and Luxemburg was aware that, the front of the Allies being somewhat long for the numbers defending it, the intervention of troops drawn from one wing to reinforce the other would almost certainly be too late. Under these conditions Luxemburg's general plan was to throw the weight of his attack on the Laer-Neerwinden section, and specially on Neerwinden itself, and to economize his forces—as "economy of force" was understood before Napoleon's time—elsewhere, delivering holding attacks or demonstrations as might be necessary, and thus preventing the Allied centre and left from assisting the right. Luxemburg had about 80,000 men to William's 50,000. Opposite the entrenchments of the centre he drew up nearly the whole of his cavalry in six lines, with two lines of infantry intercalated. A corps of infantry and dragoons was held off for the attack of Neerlanden and Rumsdorp, and the troops destined for the main attack, 28,000 of all arms, formed up in heavy masses opposite Neerwinden. This proportion of about one-third of the whole force to be employed in the decisive attack in the event proved insufficient. The troops opposite the Allied centre and left had to act with the greatest energy to fulfil their containing mission, and at Laer-Neerwinden the eventual success of the attack was bought only at the price of the utter exhaustion of the troops.

After a long cannonade the French columns moved to the attack, converging on Neerwinden; a smaller force assaulted Laer. The edge of the villages was carried, but in the interior a murderous struggle began, every foot of ground being contested, and after a time William himself, leading a heavy counter-attack, expelled the assailants from both villages. A second attack, pushed with the same energy, was met with the same determination, and meanwhile the French in other parts of the field had pressed their demonstrations home. Even the six lines of cavalry in the centre, after enduring the fire of the Allies for many hours, trotted over the open and up to the entrenchments to meet with certain defeat, and at Neerlanden and Rumsdorp there was
severe hand to hand fighting. But, meantime, the two intact lines of infantry in the French centre had been moved to their left and formed the nucleus for the last great assault on Neerwinden, which proved too much for the exhausted defenders. They fell back slowly and steadily, defying pursuit, and the British Coldstream Guards even captured a colour. But at this crisis the initiative of a subordinate general, the famous military writer Feuquières (q.v.), converted the hard-won local success into a brilliant victory. William had begun to move troops from his centre and left to the right in order to meet the great assault; but the French and Neerlandish cavalry of the French centre once again straight at the entrencheds. This time the French squadrons, surprising the Allies in the act of manoeuvring, rode over every body of troops they met, and nothing remained for the Allies but a hurried retreat over the Geete. A stubborn rearguard of British troops led by William himself alone saved the Allied army, of which all but the left wing was fought out and in disorder. Luxemburg had won his greatest victory, thanks in a measure to Feuquières' exploit; but had the assaults on Neerwinden been made— as Napoleon would have made them—Neerlandish and Neerwinden were not in the first third of his forces instead of one-third, the victory would have been decisive, and Feuquières would have won his laurels, not in forcing the decision at the cost of using up his cavalry, but in annihilating the remnants of the Allied army in the pursuit. The material results of the battle were twelve thousand Allies (as against eight thousand French) killed, wounded and prisoners, and eighty guns and a great number of standards and colours taken by the French.

The battle of the 18th March 1793 marked the end of Dumouriez's attempt to overthrow the Low Countries, and the beginning of the Allies' invasion of France. The Austrians under Coburg, advancing from Maastricht in the direction of Brussels, encountered the heads of the hurriedly assembling French army at Treilmont on the 13th of May. He was in possession of Utrecht, and Neerwinden and Neerlandish. On the 18th, however, after a little preliminary fighting Coburg drew back a short distance and rearranged his army on a more extended front between Racour and Dormael, thus parrying the enveloping movement begun by the French from Treilmont. Dumouriez was consequently compelled to fight after all on parallel fronts, and though in the villages themselves the individuality and enthusiasm of the French soldier compensated for his inadequate training and indiscipline, the greater part of the front of contact was open ground, where the superiority of the veteran Austrian regulars was unchallengeable. In these conditions an attempt to win a second Jemmapes with numerical odds of 11 to 10 instead of 2 to 1 in favour of the attack was foredoomed to disaster, and the repulse of the Revolutionary Army was the signal for its almost complete dissolution. Neerwinden was a great disaster, but not a great battle. Its loss, however, was the immediate and decisive calamity of the century system with ill-trained troops. The methods by which such troops could compass victory, the way to fight a "sans culotte" battle, were not evolved until later.

NEES VON ESSENBECK, CHRISTIAN GOTTFRIED (1776-1858), German botanist and entomologist, was born at Erbach on the 14th of February 1776, and was educated at Darmstadt and at Jena, where he took the degree of M.D. After spending some time in medical practice he was appointed professor of botany in Erlangen in 1816. Three years later he became professor of natural history in Bonn, and in 1831 he was appointed to the chair of botany in the university of Breslau. In 1848 he entered political life and made himself so obnoxious to the government that in 1837 he was deprived of his professorship, and in consequence the latter years of his life were spent in great poverty. He died in Breslau on the 16th of March 1858.

For about forty years he edited the Nova acta of the "Acad. Leopold-Carolina," in which several of his own papers were published. His earliest memoirs dealt with the ichneumons, and he published a Monographie der Ichneumone in 2 vols. in 1828, and Hymenopterorum Ichneumonidarum Systematisatis; 2 vols. in 1832. In 1835 he published a work on the Anatidae. Of his other separate works include: Die Algen des süßen Wasses nach ihren Entwicklungsstufen dargestellt (1814); Das System der Pflanze und Schimmels (1815); Die Naturgeschichte der europäischen Lehmnose, in 4 vols. (1833-1838); "Agrostologia Brasiliensis," in the Florae Brasiliensis; and a Systema Larinæarum (1836). He also wrote numerous monographs in Flora, in Linneae and in other scientific German magazines, either alone or along with other well-known botanists. His best-known works are those that deal with the Pungi, the Hepaticae and the Glumiferae, in all which groups he made valuable additions to knowledge.

The other Travels in South America of Ludw. NEES VON ESSENBECK (1827-1837), inspector of the botanic gardens at Leiden, and afterwards professor of pharmacy at Bonn, also wrote numerous papers on botanical subjects, dealing more particularly with medicinal plants and their products.

NEEFF, FELIX (1758-1839), Swiss Protestant divine and philanthropist, was born at Geneve on the 8th of October 1758. Originally a sergeant of artillery, he decided in 1819 to devote himself to religious work. He was ordained to the ministry in 1822, and soon afterwards settled in the valley of Freisinyiès, where he laboured in the manner of J. F. Oberlin, being at one and the same time pastor, schoolmaster, engineer and agriculturist. He was so successful that he changed the character of the district and its inhabitants. In 1827, worn out by his labours, he was obliged to return to his native place, where he died two years later.

NEGAPATAM, a seaport of British India, in the Tanjore district of Madras, forming one municipality with Nagore, a town in the N. of the district of the Vettar river. Pop. (1901) 57,190. It carries on a brisk trade with the Straits Settlements and Ceylon, steamers running once a week to Colombo. The chief export is rice. Negapatam is the terminus of a branch of the South Indian railway, and contains large railway workshops. It is also a depot for coffee emigration. Negapatam was one of the earliest settlements of the Protugueses on the Coromandel coast. It was taken by the Dutch in 1666, becoming their chief possession in India, and by the English in 1781. From 1799 to 1845 it was the headquarters of Tanjore district. There was a further connection of Labbios, Mahomedans of mixed Arab descent, who are keen traders. Jesuit and Wesleyan missions are carried on.

NEGATIVE, a city of Marquette county, Michigan, U.S.A., about 12 m. W. by S. of Marquette and 3 m. E. of Ishpeming, in the N. part of the upper peninsula. Pop. (1904) 6707; (1910) 8460. It is served by the Chicago & North-Western, the Duluth, South Shore & Atlantic, and the Lake Superior & Ishpeming railways. It is built on a ridge called Iron Mountain, 1564 ft. above sea-level, and under and near it are some of the most productive iron-ore deposits in the state, the mining of which is the principal industry of the city. The settlement of Negative began about 1870, and the city was chartered in 1873. The name is a Chippewa word meaning "first" or "he goes before," and is said to have been chosen at the request of the Pioneer Iron Company as an equivalent for "Pioneer."

NEGLECT (Lat. negligentia, from negligentere, to neglect, literally "not to pick up"), a ground of civil law liability, and in criminal law an element in several offences, the most conspicuous of which is manslaughter by negligence. In order to establish civil liability on the ground of negligence, three things must be proved—a duty to take care, the absence of due care, and actual damage caused directly by the absence of due care. Mere carelessness gives no right of action unless the person injured can show that there was a legal duty to take care. The duty may be to the public in general, on the ground that any person who does anything which may involve risk to the public is bound to take due care to avoid the risk. For instance, in the words of Lord Blackburn, "those who go personally or bring property where they know that they or it may come into collision with the persons or property of others have by law a duty cast upon them to use reasonable care and skill to avoid such a collision."

Where a special duty to an individual is alleged, the duty must rest on a contract or undertaking or some similar specific ground. Thus, where a surveyor has carelessly given incorrect progress certificates, and a mortgagee who has had no contractual relation with the surveyor has advanced money on the faith of the certificate, the surveyor is not liable to the mortgagee in an action of negligence; because he owed no duty to the mortgagee to be careful. When a duty to take care is established, the degree of care required is now determined by a well-ascertained standard. This standard is the amount of care which would be exercised.
NEGOTIABLE INSTRUMENT—NEGRI TOS

in the circumstances by an "average reasonable man." This objective standard excludes consideration of the capacity or state of mind of the particular individual. It also gets rid of the old distinctions between "gross," "ordinary" and "slight" negligence, though no doubt the degree of care required varies with the circumstances of the case. The application of such a standard is a task for which a jury is a very appropriate tribunal. In fact the decision of the question whether there has been a want of due care is left almost unreservedly to the jury. There is this amount of control, that if the judge is of opinion that the evidence, if believed, could probably be regarded as showing a want of due care, or in technical language that there is "no evidence of negligence," it is his duty to withdraw the case from the jury and give judgment for the defendant. Unless the judge decides that there is no duty to take care, or that there is no evidence of want of care, the question of negligence or no negligence is wholly for the jury.

Ordinarily a man is responsible only for his own negligence and for that of his servants and agents acting within the scope of their authority. For the acts or defaults of the servants of an independent contractor he is not liable. But in certain cases a defendant was imposed on a defendant of premises is under a duty to all persons who go there on business which concerns him to see that the premises are in a reasonably safe condition so far as reasonable care and skill can make them so. Thus he cannot release himself by employing an independent contractor to maintain the premises. The effect of this doctrine is that the occupier may be liable if it can be shown that the independent contractor or his servant has been guilty of a want of due care. A similar obligation has been enforced in the case of a wreck stranded in a navigable river, and the owner was held liable for damage caused by the carelessness of the servant of an independent contractor who had undertaken to light the wreck. So too any person who undertakes a work likely to cause danger if due care is not taken is liable for damage caused by the carelessness of the servant of an independent contractor, so long as the carelessness is not casual or collateral to the servant's employment.

In an action of negligence a familiar defence is "contributory negligence." This is a rather misleading expression. It is not a sufficient defence to show that the plaintiff was negligent, and that his negligence contributed to the harm complained of. The plaintiff's negligence will not disentitle him to recover unless it is such that without it the misfortune would not have happened, nor if the defendant might by the exercise of reasonable care on his part have avoided the consequences of the plaintiff's negligence. The shortest and plainest way of expressing this rule is, that the plaintiff's negligence is no defence unless it was the proximate or decisive cause of the injury. There was an attempt in recent times to extend this doctrine so as to make the contributory negligence of a third person a defence, in cases where the plaintiff, though not negligent himself, was travelling in a vehicle or vessel managed by a negligent servant, or was otherwise under his control. In such circumstances it was said that the plaintiff was "identified" with the third person. (Watte v. North-Eastern Ry. Co., 1858, E. B. & E., 719.) This case, in the Exchequer Chamber, was an action on behalf of an infant by his next friend. The infant, which was five years of age, was with his grandmother, who took a ticket for the child and a ticket for herself to travel by the defendants' line; as they were crossing the railway to be ready for the train the child was injured by a passing train. The jury found that the defendants were negligent, and that the grandmother was guilty of negligence which contributed to the accident, while there was no negligence of the infant plaintiff. A verdict was entered for the plaintiff, but in the Queen's Bench the verdict was entered for the defendants, without calling on them to argue, on the ground that the infant was identified with its grandmother. But the case of the "Bernina," decided in 1888, where a passenger and an engineer on board the "Bushire" were killed in a collision between the "Bernina" and the "Bushire" caused by fault in both ships, but without fault on the part of the deceased, exploded this supposed doctrine, and made it clear that the defence of contributory negligence holds good only when the defendant contends and proves that the plaintiff was injured by his own carelessness.

The American law of negligence is founded on the English common law; but the decisions in different states have occasionally contradicted English decisions, and also one another.


NEGOTIABLE INSTRUMENT, in law, a document or other instrument purporting to represent so much money, and the property in which passes, like money, by mere delivery. Negotiable instruments arise in either of two ways: (1) by statute, (2) by custom of merchants. The most commonly recognized negotiable instruments are bills of exchange, promissory notes, bills of lading, foreign bonds and debentures payable to bearer. Negotiable instruments constitute an exception to the general rule that a man cannot give a better title than he has himself (see BILL OF EXCHANGE).

The NEGRITOS (Span. for "little negroes"), the name originally given by the Spaniards to the aborigines of the Philippine Islands. They are physical weaklings, of low, almost dwarf stature, with very dark skin, closely curling hair, flat noses, thick lips and large clumsy feet. The term has, however, been more generally applied to one of the great ethnic groups into which the population of the East Indies is divided, and to an apparently kindred race in Africa (see NEGRO). A. de Quatrefages suggests that from the parent negroid stem were thrown off two negrito branches to the west and east, the Indo-Oceanie and African, and that the Akkas, Wochuas, Batwas and Bushmen of the Dark Continent are kinsmen of the Andaman Islanders, the Sakais of the Malay Peninsula and the Aetas of the Philippines. The result of Quatrefages's theory would be to place the negro races closest to the primitive human type, a conclusion apparently justified by their physical characteristics. The true negroes are always of little stature (the majority under 5 ft.), have rounded forms and their skull is brachycephalic or subbrachycephalic, that is to say, it is relatively short and broad and of little height. Their skin is dark brown or black, sometimes somewhat yellowish, their hair woolly (scanty on face and body), and they have the flat nose and thick lips and other physical features of the negroes. Among the people undoubtedly negro are those of the Andaman Islands (q.v.), the Malay Peninsula (q.v.) and some of the Philippines (q.v.), the best types being the Sakais (q.v.), Micronesians and Aetas. The question of the so-called negro races of India, the Oraons, Gonds, &c., is in much dispute, Quatrefages believing the Indian aborigines to have been negroats, while other ethnologists find the primitive people of Hindustan in the Dravidian races. Some authorities have placed the Veddahs of Ceylon among the negroats, but their hair and woolly and dolichocephalic skulls are sufficient arguments against their inclusion. The negro is often confounded with the Pigmy; but the latter, though possessing the same woolly hair and being of the same colour, is a large, often muscular man, with a long, high skull.

See A. de Quatrefages, Les Pygmées (Paris, 1887; Eng. trans. 1895); E. H. Man, The Aborigines of the Andaman Islands (London, 1888); Gigiolo, Nuove notizie sui popoli negroidi dell' Asia e specialmente sui Negriti (Florence, 1879); Meyer, Album von Philipps und Typhens (Dresden, 1883); Blumenstritt, Ethnographie der Philippinen (Gotha, 1892); A. B. Meyer, Die Negritos (Dresden, 1899); A. H. Keane, Ethnology; A. C. Haddon in Nature for September 1899.
NEGRO (from Lat. niger, black), in anthroplogy, the designation of the distinctly dark-skinned, as opposed to the fair, yellow, and brown variations of mankind. In its widest sense it embraces all the dark races, whose original home is the intertropical and sub-tropical regions of the eastern hemisphere, stretching roughly from Senegambia, West Africa, to the Fijian Islands in the Pacific, between the extreme parallels of the Philippines and Tasmania. It is most convenient, however, to refer to the dark-skinned inhabitants of this zone by the collective term of Negroes, and to reserve the word Negro for the tribes which are considered to exhibit in the highest degree the characteristics taken as typical of the variety.

These tribes are found in Africa; their home being south of the Sahara and north of a not very well-defined line running roughly from the Gulf of Guinea to a south-easterly trend across the equator to the mouth of the Tana. In this tract are found the true negroes; and their nearest relatives, the Bantu-negroid peoples, are found to the south of the last-mentioned line. The relation of the yellowish-brown Bushman and Hottentot peoples of the southern extremity of Africa to the negro is uncertain; they possess certain negroid characteristics, the tightly curled hair, the broad nose, the tendency towards prognathism; but their colour and a number of psychological and cultural differences would seem to show that the relation is not close. Between the two a certain affinity seems to exist, and the Hottentot is probably the product of an early intermixture of the first Hamito-Bantu immigrants with the Bushman aborigines (see AFRICA: Ethnology). The relation of the negroes of Africa to those of Asia (southern India and Malaysia) and Australasia cannot be discussed with profit owing to the lack of evidence; still less the theories which have been put forward to account for the wide dispersal from what seems to be a single stock. It will be sufficient to say that the two groups have in common a number of well-defined characteristics of which the following are the chief: A dark skin, varying from dark brown, yellowish brown, to nearly black; dark tightly curled hair, flat in transverse section, 1 of the "woolly" or the "frizzly" type; a greater or less tendency to prognathism; eyes dark brown with yellowish cornea; nose more or less broad and flat; and large teeth.

Sharing these characteristics, but distinguished by short stature and brachycephaly, is a group to which the name Negrito (q.v.) has been given; with this exception the tendency among the negroes appears to be towards tall stature and dolichocephaly in proportion as they approach the pure negro type. As between the two a certain affinity seems to exist, and in Africa, the Asiatic and Australasian negroids may be dismissed with this introduction. The negro and negroid population of America, the descendants of the slaves imported from West Africa, and in a less degree, from the Mozambique coast, before the abolition of the slave-trade, are treated separately below.

In Africa three races have intermingled to a certain extent with the negro; the Libyans (Berbers: q.v.) in the Western Sudan; and the Hamitic races (q.v.) and Arabs (q.v.) in the east. The identity of the people who have amalgamated with the negro to form the Bantu-speaking peoples in the southern portion of the continent, and the Hamitic to the north, is not clear; but as the latter appear to approach the Hamites in those characteristics in which they differ from the true negroes, it seems probable that they are infused with a proportion of Hamitic blood. The true negroes show great similarity of physical characteristics; besides those already mentioned they are distinguished by length of arm, especially of fore arm, length of leg, smallness of calf and projection of heel; characteristics which frequently fail to appear to the same degree among the Bantu, who are also as a rule less tall, less prognathous, less platyrhine and less dark. A few tribes in the heart of the negro domain (the Welle district of Belgian Congo) show a tendency to round head, shorter stature and fairer complexion; but it seems reasonable to suppose that the negro has RECEIVED an infusion of Libyan (or less probably Hamitic) or Negro-Negrito blood.

The colour of the skin, which is also distinguished by a velvety surface and a characteristic odour, is due not to the presence of any special pigment, but to the greater abundance of the colouring matter in the Malpighian mucous membrane between the inner or true skin and the epidermis or scar skin. This colouring matter is not distributed equally over the body, and does not reach its fullest development until some weeks after birth; so that new-born babies are a reddish chocolate or copper colour. But excess pigmentation is doubtless confined to the negro skin; the white pigment are often found in some of the internal organs, such as the liver, spleen, &c. Other characteristics appear to be a hypertrophy of the organs of excretion, a more developed venous system, and a less voluminous brain, as compared with the white races.

In certain of the characteristics mentioned above the negro would appear to stand on a lower evolutionary plane than the white man, and to be more closely related to the highest anthropoids. The characteristics are length of arm, prognathism, and by the same time his environment has not been such as would tend to produce in him the restless energy which has led to the progress of the white race; and the easy conditions of tropical life and the fertility of the soil have reduced the struggle for existence to a minimum. But though the mental inferiority of the negro to the white or yellow races is a fact, it has often been exaggerated; the negro is largely the creature of his environment.

1 It is also noteworthy that the dark colour seems to depend neither on geographical position, the isothermal's of greatest heat, nor even altogether on racial purity. The extremes of the chromatic scale are found in juxtaposition throughout the whole negro domain, in Sene-Gambia, in Gabun, and most of the negroes of the Mozambique. In the last region M de Frobrveldt determined the presence of thirty-one different shades from dusky yellow to sooty black. Some of the sub-negroid and mixed races, such as many Abyssinians, Gall, Jolof and Mandingo, are quite as black as the darkest full-blood negro. A general similarity in the outward conditions of soil, atmosphere, climate, food charged with an excess of ox and other undetermined causes have tended to develop a tendency towards dark shades everywhere in the negro domain apart from the basis mainly due to an original stain of black blood. Perhaps the most satisfactory theory explains the excessive pigmentation in the dark-skinned races as a natural protection against the ultra-violet rays in which tropical light is so rich and which are destructive of protoplasm &c. (see E. Woodruff, Tropical Light, London, 1905). The expression "[e Col. Bongo, the coloured races of Africa, &c. Turin, (1864), p. 20."

2 La Raza Negra nel suo stato attuale, &c. (Turin, 1864), p. 20.
and it is not fair to judge of his mental capacity by tests taken directly from the environment of the white man, as for instance tests in mental arithmetic; skill in reckoning is necessary to the white race, and it has cultivated this faculty; but it is not necessary to the negro.

On the other hand negroes far surpass white men in acuteness of vision, hearing, sense of direction and topography. A native who has once visited a particular locality will rarely fail to recognize it again. For the rest, the mental constitution of the negro is very similar to that of a child, normally good-natured and cheerful, but subject to sudden fits of emotion and passion during which he is capable of performing acts of singular atrocity, impudence, and wantonness, and often deceiving and injuring a servant a dog-like fidelity which has stood the supreme test. Given suitable training, the negro is capable of becoming a craftsman of considerable skill, particularly in metal work, carpentry and carving. The bronze castings by the *ciré perdue* process, and the cups and horns of ivory elaborately carved, which were produced by the natives of Guinea after their intercourse with the Portuguese of the 16th century, bear ample witness to this. But the rapid decline and practical evanescence of both industries, when that intercourse was interrupted, shows that the native craftsman was raised for the moment above his normal standards by foreign influences, and is not capable of sustaining the high quality of his work when that inspiration failed.

In speaking of the form or forms of culture found among negro and negroid tribes, the dependence of the native upon his environment must be kept in mind, particularly in Africa, where interchange of customs is continually taking place among neighbours.

Thus the forest regions are distinguished by a particular form of culture which differs from that prevailing in the more open country (see *Africa: Ethnology*). But it may be said generally that the negro is first and foremost an agriculturist. The negroes are on a lower cultural plane; they are nomadic hunters who do no cultivation whatever. Next in importance to agriculture come hunting and fishing and, locally, cattle-keeping. The last is not strictly typical of negro culture at all; nearly all the tribes by whom it is practised are of mixed origin, and their devotion to cattle seems to vary inversely with the purity of race. The most striking exception to this statement is the Dinka of the upper Nile, the whole of whose existence centres round the cattle pen. Of the other tribes where pastoral habits obtain to a greater or lesser degree, the Masai have a large percentage of Hamitic blood, the eastern and southern Bantu-speaking negroids are also of mixed descent, &c.

The social conditions are usually primitive, especially among the negroes proper, being based on the village community ruled by a chief. Where the country is open, or where the forest is not so thick as to present any great obstacle to communication, it has often happened that a chief has extended his rule over several villages and has ultimately built up a kingdom administered by sub-chiefs of various grades, and, has even established a court with a regular hierarchy of officials. Benin and Dahomey are instances of this. But the region where this “empire-building” has reached its greatest proportions lies to the south of the forest belt in the territory of the Bantu negroids, where arose the states of Lunda, Cazembe, &c.

The domestic life of the negro is based upon polygamy, and marriage is almost always by purchase. So vital is polygamy to the native social system that the attempts made by missionaries to abolish plurality of wives would, if successful (a contingency unthinkable under present conditions), result in the most serious social disorder. Not only would an enormous section of the population be deprived of all means of support, but the native wife would be infinitely harder worked; agriculture, the task of the women, would be at a standstill; and infanticide would probably assume dangerous proportions.

Descent in the negro world is on the whole more often reckoned through the female, though many tribes with a patriarchal system are found. Traces of totemism are found sporadically, but are rare.

Of the highest importance socially are the secret societies, which are found in their highest development among the negroes of the west coast, and to a less significant extent among some of the Bantu negroids of the western forest district. In their highest form these societies transcend the tribal divisions, and the tie which binds the individual to the society takes precedence of all others. But the secret society cannot be called a definitely negro institution, since it is found in the west only.

As an agriculturist the negro is principally a vegetarian, but this form of diet is not the result of direct choice; meat is everywhere regarded as a great delicacy, and no opportunity of obtaining it is ever neglected, with one exception—that the cattle-keeping tribes rarely slaughter for food, because cattle are a form of currency. Fish is also an important article of diet in the neighbourhood of large rivers, especially the Nile and Congo. It is worthy of note that the two cultivated plants which form the mainstay of native life, manioc in the west and centre and mealleys in the south and east, are neither of African origin.

Cannibalism is found in its simplest form in Africa. In that continent the majority of cannibal tribes eat human flesh because they like it, and not from any magical motive or from lack of other animal food. In fact it is noticeable that the tribes most commonly classified as cannibals usually live in districts in which meat is most plentiful. Among the true negroes it is confined mainly to the Welle and Ubangi districts, though found sporadically (and due to magical motives) on the west coast, and among the Bantu negroids in the south-western part of Belgian Congo and the Gabun.

With regard to crafts the most important and typical is that of iron smelting and working. No negro tribe has been found of which the culture is typical of the Stone age; or, indeed, which makes any use of stone implements except to crush ore and hammer metals. These use are rough pieces of stone of convenient size, not shaped in any way by chipping or grinding. Doubtless the richness of the African soil in metal ores rendered the Stone age in Africa a period of very short duration (see *Africa: Ethnology*). A good deal of aptitude is shown in the forging of iron, considering the primitive nature of the tools. Considerable skill in carving is also found in the west and among the Bantu negroids, especially of Belgian Congo south of the Congo. Weaving is practiced to a large extent in the west; the true native material being palm-leaf fibre. The cultivation of the west coast, which has brought such fame to West African art, is often combined with an exotic material and has been subjected to foreign influences. Among the Bantu of the Kasai district the art of weaving palm-cloth reaches its highest level, and in the east cotton-weaving is again found. Pottery-making is almost universal, though nowhere has it reached a very advanced stage; the wheel is unknown, though an appliance used on the lower Congo displays the principle in very rudimentary form. The production of fire by means of friction was universal, the method known as “twirling” being in vogue, *i.e.* the rapid rotation between the palms of a piece of hard wood upon a piece of soft wood. The lighting is practised either by direct heating or through the medium of rude forms of currency which vary according to locality. Value is reckoned among the tribes with pastoral tendencies in cattle and goats; among the eastern negroes by hoe-and spear-blades and salt blocks; in the west by cowries, brass rods, and bronze armlets (manillas); in Belgian Congo variously by *olivella* shells, brass rods, salt, goats and fowls, copper ingots and iron spear-blades, &c.

As regards religion, the question of environment is again important; in the western forests where communities are small the negro is a fetishist, though his fetishism is often combined more or less with nature worship. Where communication is easier the nature worship becomes more systematic, and definite supernatural agencies are recognized, presiding over definite spheres of human life. Where feudal kingdoms have been formed, ancestor-worship begins to appear and often assumes paramount

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*The three volumes by Colonel Ellis mentioned in the bibliography form an excellent study of the development of negro religion.*
importance. In fact this form of religion is typical of all the eastern and southern portion of the continent (see Africa: Ethnology). With the negro, as with most primitive peoples, it is the malignant powers which receive attention from man, with a view to propitiation or coercion. Beneficent agencies require no attention, since, from their very nature, they must continue to do good. The negro attitude towards the supernatural is based frankly on fear; gratitude plays no part in it. A characteristic feature of the culture area, among both negro and Bantu negro tribes, is the belief that any form of death except by violence must be due to evil magic exercised by, or through the agency of, some human individual; to discover the guilty party the poison ordeal is freely used. A similar form of ordeal is found in British Central Africa to discover magicians, and the wholesale "smelling-out" of "witches," often practised for political reasons, is a well-known feature of the culture of the Zulu-Xosa tribes. Everywhere magic, both sympathetic and imitative, is practised, both by the ordinary man and by professional magicians, and most magical treatment is based on this, although the magician is usually a herbalist of some skill. Where the rainfall is uncertain, the production of rain by magical means is one of the chief duties of the magician, a duty which becomes paramount in the eastern plains among negroes and Bantu negro tribes alike. But the negroes and Bantu negroes have been considerably influenced by exotic religions, chiefly by Mahomedanism along the whole extent of country bordering the Sahara and in the east. Christianity has made less progress, and the reason is not far to seek. Islam is simple, categorical and easily comprehended; it tends far less to upset the native social system, especially in the matter of polygyny, and at the same time discourages indulgence in strong drink. Moreover the number of native missionaries is considerable. Christianity has none of these advantages, but possesses two great drawbacks as far as the negro is concerned. It is not sufficiently categorical, but leaves too much to the individual, and it discountsenance polygyny. The fact that it is divided into sects, more or less competitive among themselves, is another disadvantage which can hardly be overrated. This division has not, it is true, as yet had much influence upon the negroes of Africa, since the various missions have mostly restricted themselves each to a particular sphere; still, it is a defect in Christianity, as compared with Islam, which will probably make itself felt in Africa as it has in Asia.

As regards language, the Bantu negroes all speak dialects of one tongue (see Bantu Languages). Among the negroes the most extraordinary linguistic confusion prevails, half a dozen neighbouring villages in a small area often speaking each a separate language. All are of the agglutinative order. No absolutely indigenous form of script exists; though the Hausa tongue has been reduced to writing without European assistance.1

Authorities.—J. Deniker, Races of Man (London, 1900); A. H. Keane, Ethnology (London, 1896); Man Past and Present (London, 1900); A. B. Ellis, The Tshi-speaking Peoples (1857); The Ewe-speaking Peoples (1896); The Yoruba-speaking Peoples (1894); B. Arckermann, "Kulturkreise in Afrika," Zeit. f. Eth. (1905), p. 54. See also Africa, § 3, Ethnology. (T. A. J.)

Negroes in the United States.

After the migration of the African-fined races in large numbers to other parts of the earth occupied by people of darker colour, the adjustment of relations between the different races developed a whole series of problems almost unknown to the ancient world or to the life of modern Europe. The wider the diversity of physique and especially of skin colour, the greater the danger of friction. The more serious the effort to secure individual autonomy and co-operation in natural institutions, the graver have become the difficulties. They have been and are perhaps more acute in the United States than elsewhere, because there the lightest and the darkest races have conmingled, because of the theory on which the government of the country nominally rests, that each freeman should be given an equal chance to improve his industrial position and an equal voice in deciding political questions, and because of the almost irreconcilable differences in the public opinion of the two great sections to only one of which do the problems come home as everyday matters. These were not solved by the Civil War and its aftermath, but their settlement has occupied the heads of the other system of slavery nor the governmental theory during the radical reconstruction period that race differences should be ignored has proved workable, and the trend is now towards some modus vivendi between these extremes.

The only definition of negro having any statutory basis in the United States is that given in the legislation of many Southern states prohibiting intermarriage between a white person and "a person who has one-eighth or more of African blood." Census enumerators in their counts of the American people have distinguished the two main races of whites and negroes, but in so doing they have never been given a definition or criterion of race. Consequently they followed the judgment of the community enumerated, which usually classes as negro all persons known or believed to have in their veins any admixture of negro blood. It is probable that this line, the so-called "colour line," which is emphasized in regions where negroes are numerous by many legal, economic and social discriminations between the races, is drawn with substantial accuracy. Far different has been the result of governmental efforts to draw another line within the group of negroes as thus defined, that between the negroes of "pure negro blood" and the mixed of negro and white blood. This distinction has no legal significance, for negroes of pure blood and negroes of mixed blood are subject to the same provisions of law, and at least for the whites it has little social or economic significance.

An attempt to draw it was made at each census between 1850 and 1890 inclusive, and the results, so far as they were published, indicate that between one-sixth and one-ninth of the negroes in the United States have some admixture of white blood. The figures were reached through thousands of census enumerators, nearly all of whom were white. Of recent years an effort has been made on the part of negro investigators to get an answer to the same question by the careful study of communities selected as typical.

The classification of about 39,000 coloured people, most of them in different parts of Georgia, with a study of the other available data and inferences from a somewhat wide observation, led Dr Dubois to the conclusion that "at least one-third of the negroes of the United States have recognizable traces of white blood." Perhaps we may believe with some confidence that the information from white sources understates, and that from negro sources overstates, the true proportion, and that the true proportion of mulattoes in the United States is between one-sixth and onethird of all negroes. To infer that the true proportion in 1850, 1860, 1870 and 1890, the dates to which the census figures relate, was much less than the true proportion in 1895 to 1900, to which the unofficial figures relate, is contrary to the general trend of the evidence. As the law and the social opinion of the Southern whites make little or nothing of this distinction between negroes of pure blood and mulattoes, it is often regarded as less important than it really is. The recognized leaders of the race are almost invariably persons of mixed blood, and the qualities which have made them leaders are derived certainly in part and perhaps mainly from their white ancestry. Wherever large numbers of full-blooded negroes and of persons of mixed central or north European and negro blood have lived in the same community for some generations, there is a strong and growing tendency to establish a social line between them.

The difficulty of ascertaining the number of mulattoes in the United States and the tendency of the testimony to be modified by the opinion or desire of the race from which it comes are typical. There is hardly any important aspect of the subject upon which the testimony of seemingly competent and impartial witnesses is not materially affected by the influence of the race.
NEGRO

to which the witnesses belong. Under these circumstances it
seems necessary to assume that the testimony of the official
documents of the federal government is correct, unless clear
evidence, internal or external, refutes it. The following state-
ments of fact rest mainly on those sources.

The number of negroes living in the (continental) United
States in 1808 was about nine and three-quarter millions, and
if those in Porto Rico and Cuba be included it reached ten
and two-thousand millions. This number is greater than the total
population of the United States, the negroes being nearly as
great as the population of Norway, Sweden and Denmark.

During the colonial period, and down to the changes initiated
by the invention of the cotton gin, negroes were distributed
with some evenness along the Atlantic coast. Between the date
of that invention and the Civil War, and largely as a result of
the changes the cotton gin set in motion, the tendency was to-
ward a concentration of the negroes in the great cotton-growing
area of the country. In 1700, for example, one-ninth of the
population of the colony of New York was negro; in 1900 only
one-seventh of the population of the empire state belonged
to that race. The division line between the Northern and
Southern states adopted by the Census Office in 1850, and em-
ployed since that date in its publications, is Mason and Dixon's
line, or the southern boundary of Pennsylvania, the Ohio river
from Pennsylvania to its mouth and the southern boundary of
Missouri and Kansas. In the states north of that line, the
Northern states, in all of which but Missouri negro slavery either
never existed or else was abolished before the Civil War, the
white population increased tenfold and the negro population
only fourfold between 1790 and 1860. In the states south of
that line, the Southern states, the negro population in the same
period increased sixfold and the white population not so fast.
It was a widespread opinion shortly after the Civil
War that the emancipated slaves would speedily disperse through
the country, and that this process would greatly simplify the
problems arising from the contact of the two races. This expec-
tation has not been entirely falsified by the result. Between
1860 and 1900 the negroes in the Northern states increased
somewhat more rapidly than the northern whites, and those
in the Southern states much less rapidly than the Southern
whites. As a result, one-tenth of the negroes living in 1908 in the
Northern states, a larger proportion than at any
time during the 19th century. But this process of dispersion
is so slow as not materially to affect the prospects for the
immediate future, and it is still almost as true as at any earlier
date that the region in which cotton is a staple crop coincides
in the main with the region in which negroes are more than one-
half of the total population.

This appears if a comparison is made between the northern
boundary of the so-called Antitrirarian zone of plant and animal
life in the United States, that is the zone of the cotton plant,
sugar cane, rice, pecan and peanut, and the northern boundary
of the "black belt" or region in which the negroes are a majority
of the population. The coincidence of the two is very close,
and was much closer in 1900 than in 1860. It appears yet more
clearly by a comparison between a map showing the counties
in which at least 5% of the area was planted to cotton in 1890
and another map showing the "black belt" counties in 1900.
The black belt stretches north through eastern Virginia beyond
the cotton belt, and the cotton belt stretches south-west through
eastern central Texas beyond the black belt, but between these
two extremes there is a close agreement in the boundaries of the
two areas.
The question "Have the American negroes progressed, materi-
ally and morally, since emancipation?" is generally answered
in the affirmative. But even on this question entire unanimity
is lacking. A considerable body of men could still be found
in 1910, mainly among Southern whites, who held that the con-
dition of the race was worse than it was in the days of slavery.
Probably all competent students would admit, however, that
the race has differentiated since 1865, that the distance separating
the highest tenth from the lowest tenth has become wider, that
the highest tenth is far better and far better off than formerly,
and the lowest tenth is worse and perhaps also worse off than
in slavery. Under such circumstances there are no adequate
objective tests of progress. The pessimist points to the alleged
increase of idleness and crime, the melodist to a demonstrated
decrease of illiteracy and to considerable accumulations of
property. The large majority of competent students believe that
the American negroes have progressed, materially and morally,
since emancipation, that the central or average point is higher than in 1865, although such persons differ widely among themselves regarding the amount of that
progress.

It would be generally but not universally held, also, that the
negroes in the United States progressed under slavery, that they
were far better qualified for incorporation as a vital and
contributing element of the country's civilization at the
time of their emancipation than they were on arrival or than
an equal number of their African kindred would have been.
But probably the rate of progress has been more rapid under
freedom than it was under slavery.
The evidence regarding the progress of the American negro may be grouped under the following heads: numbers, birth-rate, health, wealth, education, occupations, morals,
citizenship.

Numbers.—The dictum of Adam Smith, "The most decisive mark
of the prosperity of any country is the increase of the number of its
inhabitants," may perhaps be adapted by the Southern
"decissive" to "obvious," to the negro population of the United
States. The negro population of Africa is probably not increasing
at all. But during the 19th century the negroes in the United States
increased nearly ninefold. They are now much the most thriving
offshoot of the race and the most civilized and progressive group
of negroes in the world. Under a slavery system not permitting
the importation of new supplies a high rate of increase by excess
of births over deaths is an advantage to the master class. During
the slavery period and until about 1880 the increase of southern
whites and of southern negroes proceeded at about the same rate.
But after the last score of years the century increase of negroes
was much less rapid, the rate being only about three-fifths of that
prevailing among southern whites.

Birth-rate.—As the increase of negro population is slackening, as
the immigration and emigration of negroes are insignificant in
amount, and as the death-rate is about stationary, it is reasonable
to infer that the birth-rate is dwindling. This cannot be stated with
certainty, for there are no registration records giving the number
of births for any large and representative group of American
negroes. A good index to the birth-rate, however, may be derived
from the proportion of children under 5 years of age to women 15 to
49 years of age. In the returns negroes are not distinguished from Indians
and Mongolians. To minimize this slight source of error and at the
same time to secure a more representative and homogeneous popu-
lation group, the following figures are confined to the Southern or
former slave states:

<table>
<thead>
<tr>
<th>Date</th>
<th>Negroes</th>
<th>Whites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1850</td>
<td>705</td>
<td>695</td>
</tr>
<tr>
<td>1860</td>
<td>688</td>
<td>682</td>
</tr>
<tr>
<td>1870</td>
<td>661</td>
<td>601</td>
</tr>
<tr>
<td>1880</td>
<td>641</td>
<td>561</td>
</tr>
<tr>
<td>1890</td>
<td>604</td>
<td>580</td>
</tr>
<tr>
<td>1900</td>
<td>577</td>
<td>581</td>
</tr>
</tbody>
</table>

These figures indicate that the proportion of children to child-
bearing women, and hence probably the birth-rate, changed in the
same direction during each decade between 1850 and 1890. Between
1850 and 1860 the proportion of negro children decreased about 6% and
that of white children about 4%. Between 1860 and 1880 the proportion
of negro children increased about 12% and that of white children about
9%; between 1880 and 1890 the proportion of negro children decreased
about 18% and that of white children about 12%; between 1890 and 1900 the
proportion of negro children decreased about 4% and that of white children
remained practically the same. Before the war the proportion of living children to potential mothers
was about the same for the two races. At the South, for the first three
censuses after the war the proportion of negro children was much
greater than that of white children, but by 1900 that proportion was
less, and the movement during the decade suggests that the proportions
may have begun to change in opposite directions.
Some light upon the influences at work may be derived from the comparison between city and country at the south.

<table>
<thead>
<tr>
<th>Date</th>
<th>Cities having at least 25,000 Inhabitants.</th>
<th>Smaller Cities and Country Districts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1890</td>
<td>319</td>
<td>301</td>
</tr>
<tr>
<td>1900</td>
<td>271</td>
<td>374</td>
</tr>
</tbody>
</table>

The noteworthy inference from these figures is that the proportion of Negroes in southern cities was very low and decreasing. In 1890 it was about five-sixths, and in 1900 less than three-fourths of the proportion of children among whites in these cities. The differences in northern cities are equally marked. City life appears to exercise a powerful and increasing influence in reducing the birth rate among the Negroes.

Health.—The prosperity and progress of a population group are indicated, not merely by growth in numbers but also by the longevity of its members. This vitality is roughly measured by the death rate. Other things being equal, a low and sinking death rate is evidence of a high and increasing average duration of life. In the United States, vital statistics are in charge of several states and cities, and are often defective or entirely lacking. In 1890 and 1900 the Federal government compiled what were of importance, and in 1884 an official compilation was made of death-rates of Negroes before the war. The results are worth consideration.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainly between 1816-1863</td>
<td>106,217</td>
<td>35-6</td>
<td>27-0</td>
</tr>
<tr>
<td>1890</td>
<td>25,579</td>
<td>29-9</td>
<td>20-1</td>
</tr>
<tr>
<td>1900</td>
<td>37,029</td>
<td>29-6</td>
<td>17-3</td>
</tr>
</tbody>
</table>

These figures indicate that the death-rate of each race decreased during the half century, but that the Negro among Negroes was much less rapid than among whites. The Negro death-rate at the earliest period exceeded that of the whites by 8-0 per thousand, or three-tenths of the smaller rate. But these figures speak for Negroes living mainly in cities where the proportion of children and elderly persons is small and that of Negroes at the healthy ages is large. After making a proper allowance for these differences in sex and age composition, it is found that the true death-rate of Negroes in the registration area is about twice as high as that of a white population of like sex and age structure. Whether the difference between the two races is due to the greater number of Negroes in the southern cities and the different incidence of diseases in the two regions, and partly by probable differences in the accuracy of diagnosis of disease in the two sections and by physicians attending the two races.

The leading causes of death among Negroes in the registration area are arranged in the order of importance are stated below. The cause of the corresponding death-rate among whites is added, but the differences are affected partly by the greater proportion of Negroes in the southern cities and the different incidence of diseases in the two regions, and partly by probable differences in the accuracy of diagnosis in the two sections and by physicians attending the two races.

**Causes of Death.**

<table>
<thead>
<tr>
<th></th>
<th>Negro Death-rate per 1000.</th>
<th>Ratio to White Death-rate per 1000.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption</td>
<td>4-85</td>
<td>280</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>3-55</td>
<td>192</td>
</tr>
<tr>
<td>Diseases of the nervous system</td>
<td>3-08</td>
<td>144</td>
</tr>
<tr>
<td>Heart disease and dropsy</td>
<td>2-18</td>
<td>106</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>2-14</td>
<td>165</td>
</tr>
<tr>
<td>Diseases of the urinary organs</td>
<td>1-48</td>
<td>157</td>
</tr>
<tr>
<td>Typhoid fever</td>
<td>0-68</td>
<td>204</td>
</tr>
<tr>
<td>Old age</td>
<td>6-76</td>
<td>125</td>
</tr>
<tr>
<td>Malarial fever</td>
<td>6-93</td>
<td>136</td>
</tr>
<tr>
<td>Cancer and Tumour</td>
<td>4-85</td>
<td>204</td>
</tr>
<tr>
<td>Diphtheria and croup</td>
<td>3-32</td>
<td>160</td>
</tr>
<tr>
<td>Influenza</td>
<td>3-32</td>
<td>136</td>
</tr>
<tr>
<td>Whooping cough</td>
<td>2-93</td>
<td>136</td>
</tr>
<tr>
<td>Diseases of the liver</td>
<td>2-93</td>
<td>136</td>
</tr>
<tr>
<td>Measles</td>
<td>1-58</td>
<td>115</td>
</tr>
<tr>
<td>Scarlet fever</td>
<td>0-25</td>
<td>25</td>
</tr>
</tbody>
</table>

These figures bring out in a striking way the very high mortality, absolute, and relative, of the American Negro from consumption.
deserves careful attention. Enumerations of negroes affording comparable results were made in 1880, 1890 and 1904.

<table>
<thead>
<tr>
<th>Date</th>
<th>Negro Prisoners Number per 100,000 Pop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>16,089</td>
</tr>
<tr>
<td>1890</td>
<td>24,727</td>
</tr>
<tr>
<td>1904</td>
<td>26,087</td>
</tr>
</tbody>
</table>

These figures show a rapid increase between 1880 and 1890 in the number and proportion of negro prisoners, and between 1890 and 1904 a slow increase in the number and a notable decrease in the proportion.

But in order to make the figures for 1890 and 1904 comparable, it is necessary to exclude from those for the earlier date 4473 negro prisoners mainly belonging to two classes, persons in confinement prior to sentence and persons of indeterminate age, who by reason of their inability to pay a fine, but all belonging to classes which were excluded from the enumeration for 1904. This gives the following result:

<table>
<thead>
<tr>
<th>Date</th>
<th>Negro Prisoners Number per 100,000 Pop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>16,089</td>
</tr>
<tr>
<td>1890</td>
<td>19,804</td>
</tr>
<tr>
<td>1904</td>
<td>26,087</td>
</tr>
</tbody>
</table>

The proportion of negro prisoners to population increased rapidly between 1880 and 1890 and slightly between 1890 and 1904, the increase for the first period being mostly attributable to the first set of figures and that for the second period by the second set of figures. It is noteworthy also that the proportion of white prisoners to population increased during the same period, but perhaps a more significant comparison is that between the proportion of prisoners of each race to the population of that race in the northern states and the southern states respectively, the distribution of population and the systems of penal legislation and administration being widely different in the two sections. It is impossible to make the correction just referred to except for the United States as a whole, but it must be remembered that the figures for 1890 are not comparable with those for 1904, and that the true figures for that year would be decidedly less.

Number of Prisoners to each 100,000 People.

<table>
<thead>
<tr>
<th>Date</th>
<th>Southern States. Northern States.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1890</td>
<td>157</td>
</tr>
<tr>
<td>1904</td>
<td>221</td>
</tr>
</tbody>
</table>

These figures indicate that in the southern states in 1890 there were about four and a half times as many negro prisoners to population as white prisoners, and in 1904 about five and a half times as many; that in the northern states in 1890 there were about six times as many white prisoners to population as negroes, and in 1904 about nine times as many. They throw no light whatever upon a point they are often quoted as establishing, the comparative criminality of the northern and southern negroes. Those residing in the north include persons of a more adult age, and of a larger population, influences all tending to increase the proportion of prisoners. It seems likely that if the figures for the south in 1890 could be made strictly comparable with those for the same region in 1904 the apparent decrease of 22% in the proportion of negro prisoners to population would about almost but not quite disappear. The evidence regarding crime indicates a continued but slow and slackening increase in the proportion of negro prisoners to negro population in the country as a whole and in its two main sections, an increase in the proportion of white prisoners to white population during the first interval and a decrease during the second, and a growing difference between the two races in the proportion of negro prisoners.

CITIZENSHIP. When the Fourteenth and Fifteenth Amendments to the Federal Constitution were adopted, the former conferring United States citizenship on all native negroes and the latter providing that the right of such citizens to vote should be abridged by any state on account of race, color or previous condition of servitude, it was not the practice in northern states to allow negroes to vote. The northern states were, however, the first to have negroes in the state legislature; the negroes of the southern states were not even regarded as taxable or as voters. Six states in Connecticut, Wisconsin, Minnesota and Colorado, and in each state they were rejected. In all states containing a large proportion of negroes the results of the Federal policy of reconstruction were disastrous, and negroes, perhaps, contributed more than the Civil War itself to estrange the two sections. Since the withdrawal of Federal troops in 1877 the prevailing and persisting jurisdiction of southern whites regarding the laws and the policy to be adopted upon the negro question have been accepted as taking and more weight in determining the action of the states and the Federal government. The number of negroes voting or entitled to vote has been reduced at first by intimidation or fraud, later by legislation or provisions of the state constitutions. If such enactments are not directed against any race but against certain characteristics which may appear mainly in the race, such as illiteracy, inability to pay a fine, or any other act, they are not directed against negroes at all.
NEHEMIAH (Heb. for "Yahweh comforts"), governor of Judaea under Assarhaddons (apparently A. Longinianus, 465-434 B.C.). The book of Nehemiah is really part of the same work with the book of Ezra, though it embodies certain memoirs of Nehemiah in which he writes in the first person. Apart from what is related in this book we possess little information about Nehemiah. The hymn of praise by Ben Sira (Ecclesiasticus xlix. 13) extols his fame for rebuilding the desolate city of Jerusalem and for raising up fresh homes for the downtrodden people. According to other traditions he restored the temple-service and founded a collection of historical documents (2 Mac. i. 18-36, ii. 13). See further Ezra and Nehemiah (Books), J.B. Pusey, History of the Jewish People (2 vols., 1853) and 1857.

NEIGHBOUR (O. Eng. nækegbær, from næka, "nigh," "near") and gebær, "beot," literally "dweller," "husbandman"; cf. Dan. and Swed. nabo, Ger. Nachbar), properly one who lives in a house close to one, hence any one of a number of persons living in the same locality. From Biblical associations (Luke x. 27) the word is used widely of one's fellow-men.

NEILE, RICHARD (1562-1640), English divine, was educated at Westminster school and at St John's College, Cambridge. His first important preferment was as dean of Westminster (1630). In 1631 he held the living of Rochester (1628), Lichfield (1610), Lincoln (1614), Durham (1617) and Winchester (1628), and the archbishopric of York (1631). When at Rochester he appointed William Laud as his chaplain and gave him several valuable preferences. His political activity while bishop of Durham was rewarded with a privy councilship in 1627. Neile sat regularly in the courts of star-chamber and high commission. His correspondence with Laud and with Sir Dudley Carleton and Sir Francis Windebank (Charles I.'s secretaries of state) are valuable sources for the history of the time.

NEILL, JAMES GEORGE SMITH (1810-1857), British soldier, was born near Ayr, Scotland, on the 26th of May 1810, and educated at Glasgow University. Entering the service of the East India Company in 1827, he received his lieutenant's commission a year later. From 1828 to 1832 he was mainly employed in duty with his regiment, the 1st Madras Europeans (of which he wrote a Historical Record), but gained some experience on the general and the personal staffs as D.A.A.G. and as aide-de-camp. In 1830 he received his majority, and two years later set out for the Burmese War. He served throughout the war with distinction, became second-in-command to Cheape, and took part in the minor operations which followed, receiving the brevet of lieutenant-colonel. In June 1834 he was appointed second-in-command to Sir Robert Vivian to organize the Turkish contingent for the Crimean War. Early in 1837 he returned to India. Six weeks after his arrival came the news that all northern India was aflame with revolt. Neill acted promptly; he left Madras with his regiment at a moment's notice, and proceeded to Benares. The day after his arrival he completely and ruthlessly crushed the mutineers (4th June 1857). He next turned his attention to Allahabad, where a handful of Europeans still held out in the fort against the rebels. From the 6th to the 19th of June his men forced their way under conditions of heat and of opposition that would have appalled any but a real leader of men, and the place, "the most precious in India at that moment," as Lord Canning wrote, was saved. Neill received his reward in an army colonelcy and appointment of aide-de-camp to the queen. Allahabad was soon made the concentration of Havelock's column. The officers, through a mutual regard for each other and their respective instructions, disagreed, and when Havelock went on to Cawnpore (where Neill had reoccupied shortly before) he left his subordinate there to command the lines of communication. At Cawnpore, while the traces of the massacre were yet fresh, Neill inflicted the death penalty on all his prisoners with the most merciless rigour. Meanwhile, Havelock, in spite of a succession of victories, had been compelled to fall back for lack of men; and Neill criticized his superior's action with a total want of restraint. A second expedition had the same fate, and Neill himself was now attacked, though by his own exertions and Havelock's victory at Bithor (16th August) the tension on the communications was ended. Havelock's men returned to Cawnpore, and choler broke out there, whereupon Neill again committed himself to criticisms, this time addressed to the commander-in-chief and to Outram, who was on the way with reinforcements. In spite of these very grave acts of insubordination, Havelock gave his rival a brigade command in the final advance. The famous march from Cawnpore to Lucknow began on September 19th; on the 21st there was a sharp fight, on the 22nd incessant rain, on the 23rd intense heat. On the 23rd the fighting opened with the assault on the Allah Bagh, Neill in command in person of the leading European regiment, less recklessly commanded. Neill was hit heavily engaged, and on the 29th he led the great attack on Lucknow itself. The Fury of his assault carried everything before it, and his men were entering the city when a bullet killed their commander. Strict as he was, he was loved not less than feared, and throughout the British dominions he had established a name as a skilful and extraordinarily energetic commander. The rank and precedence of the wife of a K.C.B. was given to his widow, and memorials have been erected in India and at Ayr. See J. W. Kaye, Lives of Indian Officers (1889); and J. C. Marshman, History of the Indian Mutiny (1865).

NEILSON, ADELAIDE (1846-1886), English actress, whose real name was Elizabeth Ann Brown, was born in Leeds, the daughter of an actress, and her childhood and early youth were passed in poverty and menial work. In 1865 she appeared in Margate as Julia in The Hunchback, a character with which her name was long to be associated. For the next few years she played at several London and provincial theatres in various parts, including Rosalind, Amy Robsart and Rebecca (in Ivanhoe), Beatrice, Viola and Isabella (in Measure for Measure). In 1872 she visited America, where her beauty and talent made her a great favourite, and she returned year after year. She died on the 15th of August 1880. Miss Neilson was married to Philip Henry Lee, but was divorced in 1877.

NEISSE, three rivers of Germany. (1) The Glatzer Neisse rises on the Schneegengebirge, at an altitude of 1,400 ft., flows north past Glatz, turns east and pierces the Eulengebirge in the Wartha pass, then continues east as far as the town of Neisse, and after that flows north-east until at an altitude of 453 ft. it joins the Oder between Oppeln and Briesen. Owing to its terrigenous character the greater part of its course is only used for floating down timber. It abounds in fish, and its total length is 212 m. (2) The Lasauritzer or Görlitzer Neisse rises near Reichenberg in Bohemia, on the south side of the Riesengebirge, at an altitude of 1190 ft., flows north west near Reichenberg, Görlitz, Forst and Guben, and enters the Oder above Fürstenberg at an altitude of 105 ft. Its length is 140 m., of which less than 40 m. are navigable. (3) The Wüterende Neisse is a tributary of the Kätzbach.

NEISEN, a town and fortress of Germany, in the province of Prussian Silesia, at the junction of the Neisse and the Biala, 32 m. by rail S.W. of Oppeln. Pop. (1903) 25,734 (mostly Roman Catholics) including a garrison of about 5000. It consists of the town proper, on the right bank of the Neisse, and the Friedrichstadt on the left. The Roman Catholic parish church of St. James (Jakobikirche) dates mainly from the 13th century, but was finished in 1430. The chief secular buildings are the old episcopal residence, the new town hall, the old Rathaus, with a tower 205 ft. in height (1499), the beautiful Renaissance Kämmererei (exchequer) with a high gabled roof ornamented with frescoes, and the theatre. A considerable trade is carried on in agricultural products.

Neise, one of the oldest towns in Silesia, is said to have been founded in the 10th century, and afterwards became the capital of a principality of its own name, which was incorporated with the bishopric of Breslaw about 1200. Its first walls were erected in 1350, and enabled it to repel an attack of the Hussites in 1424. It was thrice besieged during the 'Thirty Years' War. The end of the first Silesian War left Neise in the hands of Frederick the Great, who laid the foundations of its modern fortifications.
The town was taken by the French in 1807. Neisse can, at the will of the garrison, be protected by a system of inundation.


**NEJD**, a central province of Arabia, bounded N. by the Nafud desert, E. by El Hasa, S. by the Dhahe desert and W. by Asir and Hejžá. It lies between 20° and 28° N. and 41° and 48° E., extends nearly 550 m. from north to south, 450 from east to west, and covers approximately 180,000 sq. m. The name Nejd implies an upland, and this is the distinctive character of the province as compared with the adjoining coastal districts of Hejžá and El Hasa. Its general elevation varies from 2,000 ft. on its western border to 2,500 in Kasim in the north-east, and somewhat less in Yemáma in the south-east. In the north the double range of Jebel Shammar, and in the east the ranges of J. Tuwék and J. 'Arid rise about 1,500 ft. above the general level, but on the whole it may be described as an open steppe, sloping very gradually from S.W. to N.E. of which the western and southern portion is desert, or at best pasture land only capable of supporting a nomad population; while in the north and east, owing to greater abundance of water, numerous fertile oases are found with a large settled population. The principal physical features are described in the article ARABIA.

The main divisions of Nejd are the following: Jebel Shammar, Kasim, Sudēr, Wushman, 'Arid, Asfāj, Harf, Yemáma and Wadi Dawsár. J. Shammar is the most northerly: its principal settlements are situated in the valley some 70 m. long, between the two hills which entirely surround it on the north and south. Its western outer flanks. Jauf, Téma and Khairab, though dependencies of the Shammar principality, lie beyond the limits of Nejd. The capital, Hall, has been visited by several Europeans, by W. G. Palgrave in 1862, when Tálāl was emir, and by Mr Willfrid and Lady Anne Blunt, Charles Dougherty, C. Huber, T. Euting and Baron E. Nolde during the reign of Mohammad b. Rashid, who from 1892 till his death in 1897 was emir of all Nejd. Its well ordered and thriving appearance is commented on by all these travellers. The town is surrounded by a wall and dominated by the emir’s palace, a stately, if somewhat gloomy building, the walls of which are quite 25 ft. high, with six towers, the whole giving the idea of an old French or Spanish donjon.

Hall lies at the northern end of the valley, 2 m. S.E. of J. Aja, at an altitude of about 3,000 ft. The highest point of J. Aja, the western and higher of the twin ranges, is according to Huber 4,600 ft. above sea-level. The valley is about 20 m. in width and is intersected with dry ravines and dotted with low ridges generally of volcanic origin. Wells and springs are the only source of water supply, both for drinking and for irrigation. The principal crops are dates, wheat and barley and garden produce; forage and firewood are very abundant, and the total population was estimated by Nolde in 1893 at 10,000 to 15,000.

Among the other settlements of J. Shammar are Jaféfá and Mukák at the northern foot of J. Aja, Kasr and Kafár at its southern foot, Rauda, Mustajidda and Féd at the foot of J. Selma, all large villages of 3,000 to 5,000 inhabitants. 'Akdá is a small valley in the heart of J. Aja, an hour’s ride from Hall; it was the oldest possession of the Ibn Rashid, since 1835 the ruling family of J. Shammar, and is a place of great natural strength. Kasim lies E. of J. Shammar in the valley of the W. Rumma the great wadi of northern Nejd; the chief towns Burēdá and 'Anežá are situated about 70 m. apart, on the north and south sides of the wadi respectively. Doughty described 'Anežá in 1879 as clean and well built with walls of sun-dried brick, with well supplied shops. Many inhabitants live in distant houses in gardens outside the town walls. 'Anežá and Burēdá each contain some 12,000 inhabitants. The dry bed of the Wadi Rumma in lower Kasim is about 2 m. across, fringed in places with palm plantations; water is found at 6 or 8 ft. in the dry season and in winter the wells overflow. The staple of cultivation is the date-palm, the fruit ripening in August or September. Fruit trees and fields of wheat, millet or millet surround the villages, but the extent of cultivation is limited by the necessity of artificial irrigation. Kaháfa, Kusába and Kuwárá are the principal villages of upper Kasim; and 'Anežá and Burēdá, Madnáb, Ayun and Ras of lower Kasim.

Doughty’s and Huber’s explorations did not extend east of Kasim, and for all details regarding eastern and southern Nejd Palgrave is the only authority. According to him, a long desert march leads from Madnab to Zulfā the first settlement in Sūdér, where the land rises steadily to the high calcareous tableland of J. Tuwék. The entire plateau is intersected by a maze of valleys, generally with steep banks, as if artificially cut out of the limestone. In these countless hollows is concentrated the fertility and population of Nejd; gardens and houses, cultivation and villages lie hidden from view among the depths while one journeys over the dry flats, till one comes suddenly on a mass of emerald green beneath.

Sūdér forms the northern end of the plateau, 'Arid the southern, while Wushman appears to lie on its west, and Asfāj and el Harf below it and to the south and south-west respectively. The principal town is Majma the former capital of Sūdér, a walled town situated on an eminence in a broad shallow valley surrounded by luxuriant gardens and trees. Tawém, Jalajil and Hula are also described by Palgrave as considerable towns.

'Arid is entered at Sedūs, on the W. Hanía, a broad valley bottom with precipitous sides, here 2 or 3 m. wide, full of trees and brushwood. Along its course lie the villages of Ayāna, and Deraíya the former Wahhābí capital, destroyed by Ibrahim Paša in 1817; and a few miles farther E. the new capital of the reigning Emir is sited by the emir. They were visited by Palgrave in 1863, and by Pelly two years later. It was then, and still is, a large town of perhaps 20,000 inhabitants with thirty or more mosques, well-stocked bāzārs, and like the towns of Kasim, surrounded by well-watered gardens and palm groves. To the south the valley opens out into the great plains of Yemáma, dotted with groves and villages, among which Manfuha is scarcely inferior in size to Riád itself. Still farther to the south-east lies the district of Harik, with its capital Hauta, the last in that direction of the settled districts of Nejd, and on the borders of the southern desert.

Palgrave visited El Kharfa the chief place of the Alaj district some 80 m. S.W. of Riád. This district seems to be scantily peopled as compared with Sūdér or Yemáma, and a large proportion of the inhabitants are of mixed negro origin. While there, he made inquiries about the adjoining district of W. Dawāsir. Its length was stated to be ten days’ journey or 200 m.; scattered villages consisting of palm-leaf huts lie along the way, which leads in a south or south-westerly direction to the highlands of Asir and Yemen.

The Beduín who occupy the remainder of Nejd consist in the main of the four great tribes of the Shammar, Harb, 'Atēba and Mutēr. The first-named represent that part of the great Shammar tribe which has remained in its ancestral home on the southern edge of the Nafud (the northern branch long ago emigrated to Mesopotamia); many of its members have settled down to town life, but the tribe still retains its Bedouin character, and its late chief, the emir Mahommed Ibn Rashid, the most powerful prince in Nejd, used to live a great part of his year in the desert with his tribesmen. The Harb are probably the largest of the Bedouin tribes in the peninsula; they are divided into a number of sections, several of which have settled in the oases of Hejžá, while others remain nomadic. Their territory is the steppe between Kasim and Medina, and across the pilgrim road between Medina and Mecca, for the protection of which they receive considerable subsidies from the Turks. The 'Atēba circuits extend from the Hejžá border near Mecca along the road leading thence to Kasim. The Mutēr occupy the desert from Kasim northwards towards Kuwēt.

Nejd became nominally a dependency of the Turkish empire in 1871 when Mīhad Pasha established a small garrison in El Hasa, and created a new civil district under the government of Baura, under the title of Nejd, with headquarters at Hofuf. Its real independence was not, however, affected, and the emirs,
Mohammed Ibn Rashid at Hall, and Abdullah Ibn Sa‘ud at Riadh, ruled in western and eastern Nejd respectively, until 1893, when the former by his victory at ‘Anţaza became emir of all Nejd. His successor, Abdul Aziz Ibn Rashid, was, however, unable to hold his position, and in spite of Turkish support sustained a severe defeat in 1905 at the hands of Ibn Sa‘ud which for the time, at any rate, restored the supremacy to Riadh.

No data exist for an accurate estimate of the population; it probably exceeds 1,000,000, of which two-thirds may be settled, and one-third nomad or Bedouin. Palgrave in 1864, perhaps unduly exaggerating the importance of the town population, placed it at nearly double this figure. The revenue of the emir Mohammed Ibn Rashid of Hall, who died in 1897, was estimated by Blunt in 1879 at £60,000, and his expenditure at £57,000 a year. Outside the visited Hall in 1893 after the emir’s conquest of the Wakahabi state, believed that his surplus income then amounted to £60,000 a year, and his accumulated treasure to £1,500,000.

Authorities.—W. G. Palgrave, Central and Eastern Arabia (London, 1865); Lady Anne Blunt, Pilgrimage to Nejd (London, 1881); C. M. Daughtry, Arabia Deserta (Cambridge, 1889); C. Hubes, Journal d’un voyage en Arabie (Paris, 1891); J. Euting, Reise in inner Arabien (Leyden, 1896); E. Nolde, Reise nach inner Arabien (Brunswick, 1895).

NEJEF, or Meshed ‘Ali, a town of Asiatike Turkey, in the pass of Baghdad, 30 m. S. of Kerbelah and 5 or 6 m. W. of the ruins of ancient Ka‘fa, out of the bricks of which it is chiefly built. It stands on the eastern edge of the Syrian desert, on the north-eastern shore of a deep depression, formerly a sea, the Assyrion Stagnum of the old geographers, but in latter years drained and turned into gardens for the town. It is a fairly prosperous city, supplied with admirable water by an underground aqueduct from the Hindeh canal, a few miles to the north, which also serves to water the gardens in the deep dry bed of the former lake. The town is enclosed by nearly square brick walls, flanked by massive round towers, dating from the time of the caliphs, but now falling into decay. Outside the walls, over the sterile sand plateau, stretch great fields of tombs and graves, for Nejef is so holy that he who is buried here will surely enter paradise. In the centre of the town stands Meshed (strictly Meshedh) ‘Ali, the shrine of ‘Ali, containing the reputed tomb of that caliph, which is regarded by the Shi‘ite Moslems as being no less holy than the Ka‘ba itself, although it should be said that it is at least very doubtful whether ‘Ali was actually buried there. The dome of the shrine is plated with gold, and within the walls and roof are covered with polished silver, glass and coloured tiles. The resting-place of ‘Ali is represented by a large square stone, on which small windows are graced with double bars, and a door with a great silver lock. Inside this is a smaller tomb of damascened ironwork. In the court before the dome rise two minarets, plated, like the dome, with finely beaten gold from the height of a man and upward. While the population of Nejef is estimated at from 20,000 to 30,000, there is in addition a very large floating population of pilgrims, who are constantly arriving, bringing corpses in all stages of decomposition and accompanied at times by sick and aged persons, who have come to Nejef to die. At special seasons the number of pilgrims exceeds many thousands. The tomb of ‘Ali is the point of departure from which Persian pilgrims start on the journey to Mecca. No Jews or Christians are allowed to reside there. The accumulated treasures of Meshed ‘Ali were carried off by the Wahhabites early in the 19th century, and in 1843 the town was deprived of many of its former liberties and compelled to submit to Turkish law; but it is again enormously wealthy, for what is given to the shrine may never be sold or used for any outside purpose, but constantly accumulates. Moreover, the hierarchy derives a vast revenue from the fees for burials in the sacred edifices.

See W. K. Loftus, Chaldæa and Susiana (1857); J. P. Peters, Nippur (1897); B. Meissner, Hiruz Huwarq (1901). (J. P. P.)

NELEUS, in Greek legend, son of Poseidon and Tyro, brother of Pelias. The two children were exposed by their mother, who afterwards married Cretheus, king of Iolcus in Thessaly. After the death of Cretheus, the boys, who had been brought up by herdsmen, quarrelled for the possession of Iolcus. Pelias expelled Neleus, who migrated to Messenia, where he became king of Pylos (Apollodorus I. 6; Dion. Sic. IV. 68) and the founder of a royal family called the Neleidae. Thus Neleus may be traced as the old ruling family in some of the Ionian states in Asia Minor. Their presence is explained by the legend, that when the Dorians conquered Peloponnesus, the Neleidae were driven out and took refuge in Attica, whence they led colonies to the eastern shores of the Aegean. By Chloris, daughter of Amphion, Neleus was the father of twelve sons (of whom Nestor was the most famous) and a daughter Pero. Through the contest for his daughter’s hand (see Melampus) he is connected with the legends of the prophetic race of the Melampodidae, who found the mysteries and expatiatory rites of Dionysus in Argolis. According to Pausanius (i. 2. 2, v. 8. 2) Neleus restored the Olympian games and died at Corinth, where he was buried on the isthmus.

NELLORE, a town and district of India, in the Madras presidency. The town is on the right bank of the Penner river, and has a station on the East Coast railway, 109 m. N. of Madras city. Pop. (1901) 32,040. There are United Free Church, American Baptist and Catholic missions.

The District of Nellore has an area of 9761 m. It consists of a large tract of low-lying land extending from the base of the Eastern Ghats to the sea. Its general aspect is forbidding: the coast-line is a fringe of blown sand through which the waves occasionally break, spreading a salt sterility over the fields. Farther inland the country begins to rise, but the soil is not naturally fertile, nor are means of irrigation readily at hand. About one-half of the total area is cultivated; the rest is either rocky waste or is covered with low scrub jungle. The chief rivers are the Pennar, Suvarnamukhi and Gundlakam.

They are not navigable, but are utilized for irrigation purposes, the chief irrigation work being the anicut across the Pennar. Nellore, however, is subject both to droughts and to floods. Copper was discovered in the western hills in 1805, but several attempts by European capitalists to work the ore proved unremunerative, and the enterprise has been abandoned since 1840. Iron ore is smelted by indigenous methods in many places, but the most important mining industry is that of mica. Salt is largely manufactured along the sea-coast. Nellore, with the other districts of the Carnatic, passed under direct British administration in 1801. The population in 1901 was 1,496,687 showing an increase of 2·3% in the decade. In 1904 a portion of the district was transferred to the newly formed district of Guntur, reducing the remaining area to 7965 sq. m., with a population of 1,272,815. The principal crops are millets, rice, other food grains, indigo and oil-seeds. The breed of cattle is celebrated. The East Coast railway, running through the length of the district, was opened throughout for traffic in 1899. The section from Nellore town to Gudur, formerly on the metre gauge, has been converted to the standard gauge. Previously the chief means of communication with Madras was by the Buckingham canal. The sea-borne trade is insignificant.

NELSON, HORATIO NELSON, VISCOUNT (1758-1805), duke of Bronte in Sicily, British admiral, was born in 1758, the son of the wealthy linen-draper house of Burnham Thorpe, in Norfolk, on the 20th of September 1758. His father, Edmund Nelson (1722-1800), who came of a clerical family, was rector of the parish. His mother, whose maiden name was Catherine Suckling (1724-1767), was a grandson of Sir Robert Walpole (1st earl of Orford). This connexion proved of little or no value to the future admiral, who, in a letter to his brother, the Rev. William Nelson, written in 1784, speaks of the Walpoles as “the merest set of cyphers that ever existed—in public affairs I mean.” His introduction to the navy came from his maternal uncle, Captain Maurice Suckling (1725-1778), an officer of some reputation who at his death held the important post of comptroller of the navy. Horatio, who had received a summary, and broken, education at Norwich, Downham and North Walsham, was entered on the “Raisable” when Captain Suckling was appointed to her in 1770 on an alarm
of war with Spain. The dispute was settled, and Captain Suckling was transferred to the "Triumph," the guardship at Chatham, whither he took his nephew. In order that the lad might have more practice than could be obtained on a harbour ship, his uncle sent him to the West Indies in a merchant vessel, and on his return gave him constant employment in boat work on the river. In a brief sketch of his life, which he drew up in 1799, Nelson says that in this way he became a good pilot for small vessels from Chatham to the Tower of London, down the Swin, and the North Foreland; and confident of myself among rocks and sands, which has many times since been of great comfort to me. Between April and October of 1772 he served as Captain Lutwidge in the "Cromer," one of the vessels which went on a not otherwise notable voyage to the Arctic seas with Captain Phips, better known by his Irish title of Baron Mulgrave. On his return from the north he was sent to the East Indies in the "Seahorse," in which vessel he made the acquaintance of his lifelong friend Thomas Troubridge. At the end of two years he was invalided home. In after times he spoke of the depression under which he laboured during the return voyage, till "after a long and gloomy reverie, in which I almost wished myself overboard, a sudden glow of patriotism was kindled in my heart, and presented my king and my country as my patron. My mind exulted in the idea. 'Well then, I exclaimed, 'I will be a hero, and, confiding in Providence, I will brave every danger.' " He spoke to friends of the "radiant orb" which from that hour hung ever before him, and "urged him onward to renown." On his return home he served during a short cruise in the "Worchester" frigate, passed his examination as lieutenant on the 9th April 1777, and was confirmed in the rank next day. He went to the West Indies with Captain Locker in the "Lowestoft" frigate, was transferred to the flagship by the admiral commanding on the station, Sir Peter Parker (1721-1813), and was then by him placed in rank to the command of the "Badger" brig, and the "Hinchinbrook" frigate. By this appointment, which he received in 1779, he was placed in the rank of post captain (from which promotion to flag rank was by seniority), at the very early age of twenty. His connexion with Captain Suckling may, no doubt, have been of use to him, but in the main he owed his rapid rise to his power of winning the affection of all those he met, whether as comrades or superiors. Sir Peter Parker and Lady Parker remained his friends all through his life. In 1780 he saw his first active service in the navy, when, a midshipman in the "San Juan" sloop, he was rendered deadly by the climate. He was brought to death's door by fever, and invalided home once more. In 1781 he was appointed to the "Albemarle" frigate, and after some convoy service in the North Sea and the Sound was sent to Newfoundland and thence to the North American station. "Fair Canada," as he records in one of his letters, gave him the good health he had so far never enjoyed. At Quebec he formed one of those passionate attachments to women which marked his career. He now made the personal acquaintance of Sir Samuel Hood, Lord Hood. In the autobiographical sketch already quoted, he mentions the high opinion formed of him by the admiral who presented him to Prince William, duke of Clarence, afterwards King William IV., as an officer well qualified to instruct him in "naval tactics," by which we must perhaps understand seamanship. Prince William has left a brief but singularly vivid account of their first meeting. He appeared, says the Prince, "to be the merest boy of a captain I ever beheld; and his dress was worthy of attention. He had on a full-fledged uniform; his lack unpowdered hair was tied in a stiff Hessian tail of an extraordinary length; the old-fashioned flaps of his waistcoat added to the general quaintness of his figure, and produced an appearance which particularly attracted my notice; for I had never seen anything like it before, nor could I imagine who he was or what he came about. My doubts were, however, removed when Lord Hood introduced me to him. There was something irresistibly pleasing in his address and conversation; and an enthusiasm, when speaking on professional subjects, that showed he was no common being." The slight oddity of appearance, the power to arouse affection, and the glow indicating the fire within, are noted by all who ever looked Nelson in the face.

In March 1783, at the very end of the American War, he saw his second piece of active service. He was repulsed in an attempt to retake Turk's Island from the French. The peace gave him leisure to pay a visit to France, for which country and all its ways he entertained a dislike and contempt characteristic of his time. In France he formed another attachment, and went so far as to apply to a maternal uncle for an allowance to eke out his half-pay. It came to nothing, presumably by refusal on the lady's part. And now when the navy was cut down to the quick on the peace establishment, and the vast majority of naval officers were condemned to idleness on shore, he had the extraordinary good fortune to be appointed to the command of the "Boreas" frigate, for service in the West Indies. Nelson found in this commission an opportunity for the display of his readiness to assume responsibility. He signalized his arrival in the West Indies by refusing to obey an order of the admiral which required him to acknowledge a half-pay officer acting as commissioner of the dockyard at Antigua as his superior. He insisted on enforcing the Navigation Laws against the Americans, who by the time independent had become foreigners. He called the attention of the government to the corruption prevailing in the dockyard of Antigua. His line was in all cases correct, but it impressed the admiralty as somewhat assuming, and his strong measures against the interfering trade brought on him many lawsuits, which, though he was defended at the expense of the government, caused him much trouble for years. In the West Indies on the 12th of March 1787 he married Frances Nisbet (1761-1831), the widow of a doctor in Nevis, whose favour he first gained by being found romping on all fours with her little boy under the drawing-room table. The marriage was one of affection and respect, rather than of love.

Though Nelson had as yet seen little active service, and that little had not been specially distinguished, he had already gained that reputation within his own service which commonly precedes public recognition. His character had been fully developed, and his capacity proved. His horizon was narrow, being strictly confined to his profession. He had all the convictions of the typical John Bull of his generation. The loyalty of a devoted subject was strong in him. He burned to win affection, admiration, distinction. He was a man to do whatever there was to be done. An instrument of the first excellence. A most magnificent instrument for use in the great Revolutionary struggle now close at hand could not have been forged.

War having broken out, he was appointed captain of the "Agamemnon" (64) on the 30th of November 1793, and joined his ship on the 7th of February. From this date till June 1800, rather more than seven years, he was engaged on continual active service, with the exception of a few months when he was invalided home. This period is the most varied, the busiest, the most glorious and the most debated of a very full career. It subdivides naturally into three sections; (1) From the date of his appointment as captain of the "Agamemnon" till he was disabled by the loss of his arm in the unsuccessful attack on Santa Cruz de Tenerife on the 24th of July 1797 he served as captain, or commodore, under Hood, Itham and Jervis, successive commanders-in-chief in the Mediterranean. (2) After an interval of nine months spent at home in recovering from his wound, and from the effects of a badly performed operation, he returned to the Mediterranean, and was at once sent in pursuit of the great French armament which sailed from Toulon under the command of Napoleon for the conquest of Egypt. His victory of the Nile on the 1st of August 1798 placed him at once in the foremost rank among the warriors of a warlike time, and made him a national hero. With his return to Naples on the 22nd of September the second period ends. (3) From now till he landed at Leghorn on the 26th of July 1800, on his return home across Europe, he was entangled at Naples in political transactions and intrigues, which he was ill prepared to deal with by either nature or training, and was plunged into the absorbing passion,
which did increase his popularity with the mob, but cost him many friends.

The first of these three passages in his life is full of events which must, however, be told briefly. In May he sailed for the Mediterranean with Hood, and was engaged under his orders in the occupation of Toulon by the allied British and Spanish forces. In August 1793 he was despatched to Naples to convoy the troops which the Neapolitan government had undertaken to contribute towards the garrison of Toulon. It was on this occasion that he made the acquaintance of Emma Hamilton (q.v.), the wife of Sir William Hamilton, minister at the Court of Naples. References to Lady Hamilton begin to appear in his letters to his wife, but, as might be expected, they indicate little beyond respectful admiration, and he makes a good deal of her kindness to his stepson, Josiah Nisbet, whom he had taken to sea. Young Nisbet was afterwards promoted to post captain, and was put in command of a frigate at an improperly early age by Nelson's interest. He proved quite unworthy, and in the end died mad.

After the allies had been driven from Toulon by Napoleon, Nelson was employed throughout 1794 in the operations connected with the occupation of Corsica. In April and May he was engaged in the capture of Bastia, and June and July he was employed in Calvi. Both the British squadrons were suffering from a lack of stores, but the naval brigades under Nelson's personal direction were conspicuously active, and their energy was favourably contrasted with the alleged formalities of the troops. During the operations at Calvi, Nelson's right eye was destroyed by gravel driven into it by a cannon shot which struck the ground close to him. From the date of the occupation of Corsica till the island was evacuated, that is to say, from the end of 1794 till the middle of 1795, he was incessantly active. He served under Hotham, who undertook the command when Hood returned to England, and was engaged in the indecisive actions fought by him in the Gulf of Lyons in May 1795. The easy-going ways of the new admiral fretted the eager spirit of Nelson, and Hotham's placid satisfaction with the trifling result of his encounters with the French provoked his subordinate into declaring that, for his part, he would never think that the British fleet had done very well if a single ship of the enemy got off while there was a possibility of taking her. His zeal found more satisfaction when he was detached to the Riviera of Genoa, where, first as captain, and then as commodore, he had an opportunity to prove his qualities for independent command, but harrowing with Jervis, who was connected with the French, and co-operating with the Austrians. In Sir John Jervis, who superseded Hotham, he found a leader after his own heart.

When Spain, after first making peace with France at Basel, declared war on England, and the fleet under Jervis withdrew from the Mediterranean, Nelson was despatched to Elba on a hazardous mission to bring off the small garrison and the naval stores. He sailed in the "Minerve" frigate, having another with him. After a smart action with two Spanish frigates which he took off Carthage on the 20th of December, and a narrow escape from a squadron of Spanish line of battle ships, he fulfilled his mission, and rejoined the flag of Jervis off the eave of the great battle off Cape St Vincent on the 14th of February 1797 (see ST VINCENT, BATTLE OF). The judgment, independence and promptitude he showed in this famous engagement, were rewarded by the conspicuous part he had in the victory, and revealed him to the nation as one of the heroes of the navy. Nelson receiving the swords of the Spanish officers on the deck of the "San Josef" became at once a popular figure.

A few days after the victory he became rear-admiral by seniority. He had already been made a peer under the title of Earl St Vincent. Nelson's own services were recognized by the grant of the knighthood of the Bath. During the trying months in which the fleet was menaced by the sedition then rife in the navy, which came to a head in the mutinies at Spithead and the Nore, he remained with the flag, and in the blockade of Cadiz. In July 1797 he was sent on a desperate mission to Santa Cruz de Tenerife. It was believed that a Spanish Manilla ship carrying treasure had anchored at that place, and Lord St Vincent was desirous of depriving the enemy of this resource. The enterprise was, in fact, rash in the last degree, for the soldiers from the garrisons of Elba and Corsica having gone home, no troops were available for the service, and a fortified town was to be taken by man-of-war boats alone. Nelson's well-established character for daring marked him out for a duty which could only succeed by dash and surprise, if it was to succeed at all. But the Spaniards were on the alert, and the attack, made with the utmost daring on the night of the 24th of July, was repulsed with heavy loss. Some of the boats missed the mole in the dark and were stove in by the surf, others which found the mole were shattered by the fire of the Spaniards. Nelson's right elbow was shot through, and he fell back into the boat from which he was directing the attack. The amputation of his arm was badly performed in the hurry and the dark. He was invalided home, and spent months of extreme pain in London and at Bath. On the 10th of April 1798 he came back to the fleet off Cadiz as rear-admiral, with his flag in the "Vanguard" (74).

He was now one of the most distinguished officers in the navy. Within the next six months he was to raise himself far above the heads of all his contemporaries. It was notorious that a great armament was preparing at Toulon for some unknown destination. To discover its purpose, and to defeat it, the British government resolved to send their naval forces again into the Mediterranean, and Nelson was chosen for the command by Jervis, with whom the immediate decision lay, but also by ministers.

Having joined the flag of Lord St Vincent outside of the straits of Gibraltar on the 30th of April, Nelson was detached on the 2nd of May into the Mediterranean, with three line-of-battle ships and five frigates, to discover the aim of the Toulon armament. Napoleon had, however, enforced rigid secrecy, and Nelson, on obtaining the information that Jervis had been despatched to St Vincent, was directed to return to Toulon for more information. In the meantime the French squadron made its appearance, but Nelson, contrary to the advice of Jervis, insisted on staying in the Mediterranean rather than the British at concealing their plans. Beyond the fact that a powerful combined force was collected in the French port he could learn nothing. On the 20th of May the "Vanguard" was dismasted in a gale. Nelson bore the check in a highly characteristic manner. "I ought not," he wrote, "to call what has happened by the cold name of accident; but I believe firmly that it was the Almighty's goodness to check my consummate vanity." The "Vanguard" was saved from going on shore by the seamanship of the French flagship's captain, and Nelson, who had hitherto been under the impression that he had hitherto a peculiar regard. The "Vanguard" was refitted by the exertions of her own crew under cover of the little island of San Pietro on the southern coast of Sardinia. In the meantime the frigates attached to his command had returned to Gibraltar, in the erroneous belief that the liners would be taken there to make good the damage suffered in the gale. "I thought Hope would have known me better," said Nelson. On the 30th of April he was off Toulon again, only to find that the French were gone, and that he could not learn whither they were steering. Racked by anxiety and deprived of his best ship, he obtained the armament by the disappearance of his frigates, he remained cruising till he was joined, on the 7th of June, by Troubridge with ten sail of the line. And now he started on his fierce pursuit of the enemy, seeking him in the dark, for there were no scouts at hand; exasperated at being left without the eyes of his fleet; half maddened at the thought he might, by no fault of his own, miss the renown towards which his prophetic imagination had seemed to guide him; knowing that St Vincent would be blamed for choosing so young an admiral; but resolved to follow the enemy to the antipodes if necessary. From the coast of Sardinia to Naples, from Naples to Messina, from Messina to Alexandria, from Alexandria, where he found the roadstead empty, back to Sicily, and then when at last a ray of light came to him, back to Alexandria—he swept the central and eastern Mediterranean. At no time in his life were the noble qualities of his nature displayed more entirely free from all alloy. He was an embodied flame of resolution, and as yet he showed no sign of the vulgar bluster which was to appear
later. In the midst of his anxieties his kindness of heart shone forth without a trace of the tendency of sentimental gush so irritatingly obvious in after days. Unlike most admirals of his time, he did not live apart from his captains, but saw much of them, and freely discussed his plans with them. He had his reward in their devotion and perfect comprehension of what he wished them to do. At the same time he acquired an absolute confidence in the efficiency of his squadron, the magnificent force which had been formed by years of successful war, and by the careful training of his predecessors. The captains were the band of brothers he himself had made them.

The great victory of the 1st of August 1796 (see Nile, BATTLE 09) brought Nelson yet another wound. He was struck on the forehead by a largegrid shot, and had for a time to lie below. It is to be lamented in the interest of his fame that the wound was not severe enough to compel him to return home. After providing for the blockade of what remained of the French fleet in Alexandria, he sailed for Naples, and arrived there on the 22nd of September. There was no rear-admiral of any standing in the navy who could not have done what remained to be done in the Mediterranean, under the supervision of St Vincent, as well as he. For him Naples was a pitfall. There awaited him there precisely the influences to folly which he was least able to resist. He loved being loved, and was the man to think the gift a deception, but the advantage and praise of these weaknesses of character which caused Lord Minto, who yet never ceased to regard him with sincere friendship, to say that he was in some respects a "baby," he was disarmed in the presence of the two women who now made a determined attempt to capture him. Emma Hamilton, who could not help endeavouring to conquer every man she met, was naturally eager to dominate one who had filled Europe with his fame. Emma Hamilton was the queen of Naples, Maria Carolina, a woman who had a share of the ability of her mother Maria Theresa without any of her fine moral qualities. Maria Carolina was all her life trying to fight the power of revolutionary France, with no better resources than were afforded her by the insignificant kingdom of Naples, and a husband who was the embodiment of all the faults of the Italian Bourbons. She had made use of the English minister's wife as an instrument of political intrigue, and now she employed her to manage Nelson. We have the repeated assertions of Nelson himself in all his ample correspondence from September 1798 to July of 1800, and indeed later, to prove that he was, in his own tell-tale phrase, persuaded to "Sicily" his conscience—in other words to turn his squadron into an instrument of the rival influence and power of Maria Carolina, the "Dear Queen" of his letters to Emma Hamilton. It is highly probable that he was secretly influenced by acquaintance at the pedantry of the British government, which only gave him a barony for the splendid victory of the Nile, on the ridiculous ground that no higher title could be given to an officer who was not a commander-in-chief. All doubt as to the character of his relations with Lady Hamilton has been laid at rest by the Morrison papers. None ought ever to have existed, for, if Nelson did not love this woman in the fullest possible sense of the word, his conduct would be inexplicable on any other hypothesis than that which commands us to believe that the avowed affection to lead him about "like a bear," and to drag him into gambling, which he naturally hated. For her sake he offended old friends, and quarrelled with his wife in circumstances of vulgar brutality. That he believed she had borne him a child can no longer be disputed, and he carried on with her a correspondence under the name of Thompson which was apparently meant to deceive her husband, but is varied by grotesque explosions which destroy the illusion, such as it was.

In the hands of these two women, and in the intoxication produced on him by flattering, which should not be too copious or gross for his taste, Nelson speedily became a Neapolitan royalist of far greater sincerity than was to be found among the king's subjects except in the ranks of the Lazzaroni. He gratified the headlong queen by egging her torpid husband into an exceedingly foolish attack on the French garrisons then occupying the so-called Roman republic. The collapse of the Neapolitan forces was instant and ignominious. The court fled to Palermo in December, under the protection of the British fleet. At Palermo Nelson was directing the operations of the ships engaged in blockading Malta, then held by the garrison placed in it by Napoleon when he took it on his way to Egypt, and sinking continually deeper into his slavery to Lady Hamilton, till the spring of the following year. He was then aroused by a double call. A royalist army led by the king's vicar-general, Fabrizio Ruffo (q.v.), had succeeded in recovering the greater part of the kingdom of Naples from the government set up by the French, and called, in the pedantic style of the revolutionary epoch, the Parthenopian republic. A French fleet commanded by Admiral Jervis crossed the Mediterranean. News of the appearance of Bruix reached Nelson just as he was about to sail for Naples with the heir apparent to co-operate with Ruffo and his "Christian Army." He immediately took steps to concentrate his ships, which had been reinforced by a small Portuguese squadron, at Marittimo on the western coast of Sicily, where he would be conveniently placed to meet the French, if they came, or to unite with the ships of Lord St Vincent. He was, however, half distraught between his sense of what was required by his duty to his own service and the obligations he had assumed towards the sovereigns of Naples. In the end he resolved to sail for Naples for this time without the crown prince, in order to carry out a mission entrusted to him by the king.

The story of Nelson's visit to Naples in the June of 1799 will probably remain a subject for perpetual discussion. His reputation for humanity and probity is considered to depend on the view we take of his actions there and at this period. It is true that the relative importance of these episodes has been much diminished by the publication of the Morrison Papers, and that it has at all times been exaggerated. From the Morrison Papers we know that, when his passions were concerned, he was not incapable of stratagems to deceive his old friend William Hamilton. It is the less incredible that he should have been willing to use deceit against persons whom he hated so fiercely as he did the Neapolitan Jacobins, in his double quality of English Tory and Neapolitan Royalist. But apart from his laxity in the course of a double adultery, his letters, written to many different people during his stay on the coasts of Naples, contain more than sufficient evidence to show that he was utterly unhinged by excitement, and was unable to estimate the real character of many of his own words and deeds. He considered himself as owing an equal allegiance to Ferdinand of Naples, and his feelings towards the Jacobin subjects of his Italian king are expressed in terms which bear a remarkable likeness to the rhetoric of the Jacobins of France when they were most vigorously engaged in ridding their country of aristocrats. To Troubridge he writes: "Send me word some proper heads are taken off, this alone will comfort me." To St Vincent he reports that "Our friend Troubridge had a present made him the other day of the head of a Jacobin, and makes an apology to me, the weather being very hot, for not sending it here." Some allowance may be made for a rude taste in these reminiscences, but it is not easy to make the scream of fury in Nelson's letters, imitated from the style of Lady Hamilton, who in these things was the syrophant of the queen, a man who allowed his thoughts to dwell in an atmosphere of hysterical ferocity, and was above all a man of action, was well on the way to interpret his words into deeds. It was while he was in this heated state that he was sent to preside over the fall of the Parthenopian republic at the end of June 1799.

King Ferdinand had not been unwilling to offer terms to those of his subjects who had joined with the French to establish the republic, so long as he was under the influence of fear. But when the French had been defeated in northern Italy and had left the Republicans to their own resources, he became more anxious to make an example. In the early parts of June he heard that Ruffo was inclined to clemency, and grew very eager to prevent any such mistake. No more effectual way of
enforcing just could be imagined than to put the control of events entirely in the hands of Nelson, whose sentiments were well known, who was notoriously under the influence of Emma Hamilton, that is to say, of the queen, and who, as a stranger, would have no family or social attachments with the republicans, no changes of fortune nor future revenges to fear. That he asked Nelson to go to Naples, giving him large powers, may be considered certain. A commission in the full sense he could not give without the consent of the king of Great Britain, and that was not even asked for. But Nelson had general instructions from home to support the Neapolitan government, and through the only means he could rely on, an ally and again the common enemy, he understood it in a much wider sense, while he considered himself as being bound to Ferdinand in the relation of subject to sovereign by the grant of the duky of Bronté in Sicily, which he had just received. He therefore sailed to Naples resolved to act in the double capacity of English and Neapolitan admiral, of English opponent of the Jacobins, and of Neapolitan royalist. The general cause of Europe and the particular revenge of the king and queen were of equal importance to him. When he entered the Bay of Naples on 24th July he found that a capitulation had been agreed upon some thirty-six hours earlier, between Ruffo, acting as vicar-general, with the consent of Captain Foote (1767–1833) of the "Seahorse," the senior British naval officer present, on the one side, and the Neapolitan republicans on the other. The republicans had been reduced to the possession of the castles of Uovo and Nuovo, and had been glad to secure terms which allowed them to go into exile in France. Nelson denounced an arrangement which would have precluded all cutting off of heads as "infamous." He ordered the white flag to be hauled down on the "Seahorse," and told Ruffo that he would not allow the capitulation to be carried out. The same warning was given to the republicans in the forts. There is a question whether the capitulation had been in part already carried into effect. Sir William Hamilton, who, together with his wife, had accompanied Nelson from Palermo, asserts that it had, in an official despatch to Lord Grenville dated on the 14th July. But this letter, written only a fortnight after the transaction, contains many inaccuracies, and can be held to prove only that Hamilton would have seen nothing discreditable in violating a capitulation, or that he was in his dotage, and did not know what he was doing. Ruffo refused to be a party to a breach of faith. On the afternoon of the 25th he had an interview with Nelson on board the flagship the "Foudroyant," which was conducted through the Hamiltons and was of a very heated character. Next morning, as Ruffo showed a determination to stand aside and throw on Nelson the responsibility of provoking a renewal of hostilities, messages were sent to him both by the admiral and by Hamilton that there would be no interference with the "armistice." This assurance put a stop to the dispute between them. The republicans came out of the forts and were transferred to feluccas under the guard of British marines, where they were kept till the king's pleasure was known. As a matter of course it was that they should be mostly hanged or shot. Whether Nelson meant to deceive Ruffo into thinking that he had accepted the capitulation when he named the armistice,—whether the vicar-general was deceived, and then misled the garrisons in good faith—or whether he knew perfectly well that the capitulation was not included, and took the opportunity afforded him by these two English gentlemen to deceive his own countrymen, are points much discussed. The republicans in the forts did claim that they were covered by the capitulation, and that it had been violated. It is difficult to see in what way the service of King George was forwarded by Nelson's zeal for King Ferdinand. Such discredit as fell on him would have been avoided if he had kept to his duty as British admiral, and had not thought it incumbent on him to prove himself a good Neapolitan royalist. On the 29th of June Francesco Caracciolo (q.v.), a Neapolitan naval officer who had joined the republicans, was brought to Nelson as a prisoner. Out of his desire to make an example of a proper head, and in the full knowledge that Caracciolo's death would be pleasing to the queen, Nelson, in virtue, seemingly, of his supposed commission as Neapolitan admiral (which he did not possess), ordered a court martial of Italian officers to sit, on an English ship, to try the prisoner. The court could only find him guilty, and Caracciolo was hanged. The sentence was just, but the procedure was indecent, and Nelson's intervention cannot be justified.

At this period of his life it is indeed difficult to represent Nelson's actions in a favourable light. In July he disobeyed the order of Lord Keith to send some of his ships to Minorca, on a rumour that they were needed for the defence of Naples. The influence of the queen, exercised through Emma Hamilton was partly responsible for his willfulness, but a great deal must be put down to his annoyance at finding that Keith, and not he himself, was to succeed St Vincent as commander-in-chief in the Mediterranean. After the victory of the Nile he became, in fact, incapable of acting as a subordinate. Until he left for home in June 1800, except during the short interval when he acted as commander-in-chief in the absence of Keith, he was captious, querulous and avoided leaving Palermo as much as he could, and far more than he ought. When forced out he made his health an excuse for going back. He began a quarrel with Troubridge which ripened into complete estrangement. He wearied out his friends at the Admiralty, and finally extorted leave to return. As Keith would not allow him to take a line ofattleship for his journey home with the Hamiltons, and indeed said plainly that Lady Hamilton had commanded the Mediterranean station long enough, he returned across Europe with his friends. Accounts of the figure they cut, and the sensation they created at Vienna and at Dresden, can be found in the Minto correspondence, and in the reminiscences of Mrs St George, afterwards Mrs Trench (1768–1827). He reached home in November.

In England he was received with the utmost popular enthusiasm, but with coldness by the king, the Admiralty, and by the great official and social world. His erratic and self-willed conduct towards Lord Keith sufficiently explains the distrust shown by My Lords of the Admiralty. Their uneasiness was not diminished by their knowledge that his renown made it quite impossible to lay him aside at a crisis. The king, a man of strict domestic habits and strong religious convictions, was undoubtedly offended by the scandals of Nelson's life at Naples, and he cannot but have been displeased by the admiral's openly avowed readiness to devote himself to King Ferdinand. English society as represented by the First Lord, Lord Spencer, and his wife, may not have shared the moral indignation of the pious king; but their taste was offended, and so was their self-respect, when Nelson insisted on forcing Lady Hamilton on them, and would go nowhere where she was not received. When it was discovered that he insisted on making his wife live in the same house as his mistress, he was considered to have infringed the accepted standard of good manners. After enduring insult at once cruel and cowardly, to the verge of poorness of spirit, Lady Nelson rebelled. A complete separation took place, and husband and wife never met again.

On the 1st of January 1801 Nelson became vice-admiral by seniority. The alliance of the Northern powers of which the Tsar Paul was the inspiring spirit, made it necessary for the British government to take vigorous measures in its own defence. A fleet had to be sent on a very difficult and dangerous mission to the Baltic. The Admiralty would have been unpardonable, and would not have been excused by public opinion if, when it had at its disposal such an admirable weapon as the conqueror of the Nile, it had failed to employ him. Nelson was chosen to go as a matter of course, but unfortunately, it was thought proper to put him under the command of Sir Hyde Parker (q.v.) an officer of no experience, and, as the Admiralty ought to have known, of commonplace, not to say indolent, character. Nelson bore the subordination with many bitter complaints, but on the whole with patience and tact. Sir Hyde Parker began by keeping his formidable second in command at arm's length, but Nelson handled him with considerable diplomacy. Knowing
his superior to be fond of good living he caused a turbot to be caught for him on the Dogger Bank, and sent it to him with a complimentary message. Sir Hyde was insensible to the attention, and thowed notably. We have the good fortune to possess a letter written by Colonel Stewart (1774-1827), a military officer who did duty with Nelson as a marine. Colonel Stewart has put on record many stories of Nelson which have a high biographical value. He saw the hero when his character was displayed in all its strength and its weakness. Nelson was at once burning for honour, ardently desirous to serve his country at a great crisis, and yet longing for rest and for the company of Emma Hamilton. His passion had, if possible, been increased by the birth of the child Horatio, whom he believed to be his own, and his jealousy was excited by fears that Emma would become an object of attention to the Prince of Wales (afterwards George IV.). His health, as Colonel Stewart justly observed, was always affected by anxiety, and during the Baltic campaign he complained incessantly of his sufferings. Nervous irritation provoked him into odd explosions of excitement, as when, for instance, he suddenly interfered with the working of his flagship while the officer of the watch was tacking her on the south coast of England, and so threw her into disorder. When he saw the consequences of his untimely intrusion he sharply appealed to the officer to tell him what was to be done next, and when the embarrassed lieutenant hesitated to recall the battle, exclaimed: "If you do not know, I am sure I don't," and then went into his cabin. His subordinates learnt to take these manifestations as matters of course, knowing that they were wholly without malignity. To them he was always kind, even when they were at fault, taking, as his own phrase has it, a penknife where Lord St Vincent would have taken a hatchet. Colonel Stewart tells how he was wont to invite the midshipmen of the middle watch to breakfast, and romp with them as if he had been the youngest of the party. The playfulness of his nature came out, in combination with his heroism, when he admitted his refusal to obey Sir Hyde's weak order to recall in the middle of the battle, which would have been disastrous if it had been acted on, by putting his telescope to his blind eye and declaring that he could not see the order to retire. At such moments all could see his agitation; but, as the surgeon of the "Elephant," whose bire flag at Copenhagen, says, they could also see that "it was not the agitation of indecision, but of ardent animated patriotism panting for glory." When Sir Hyde Parker was recalled in May, Nelson assumed the command in the Baltic; but the dissolution of the Northern Confederation left the battle of Trafalgar only the last act in the drama of the war. The British ships were dispersed on the northern latitudes, and in June he obtained leave to come home. His services were grudgingly recognized by the title of viscount. During the brief interval before the peace he was put in command of a flotilla to combat Napoleon's futile threat of invasion. In the hope of quieting public anxiety rather than in any serious expectation of success, an attack was made on a French flotilla strongly protected by its position, at Boulogne, which was disastrously repulsed. Nelson was not in command on the spot, and if he had been would in all probability have renewed his experience at Santa Cruz. He could not do the impossible more than once. But in the words in which he acknowledged the fatal stroke, he lingered for a very few hours of anguish in the fetid cockpit of the "Victory," amid the horrors of darkness relieved only by the dim light of lanterns, and surrounded by men groaning, or raving with unbearable pain. The shock of the broadsides made the whole frame of the "Victory" tremble, and extorted a moan from the dying admiral. When Captain Hardy came down to report the progress of the battle, his inherent love for full triumph drew from him the declaration that less than twenty prizes would not satisfy him. He clung to his authority to the end. The suggestion that Collingwood would have to decide on the course to be taken was answered with the eager claim, "Not while I live." But the last recorded words were of affection and of duty. He begged Hardy for a kiss, and he ended with the proud and yet humble claim, "I have done my duty, thank God for that."
NELSON

His body was brought home in his flagship and laid to rest in St Paul’s. He is commemorated in London by the monument in Trafalgar Square, completed in 1849 with a colossal statue by E. H. Baily, and surrounded by Landseer’s bronzed lions, added in 1856.

In the character of Nelson, and his achievements, there are some elements which must be allowed for more fully than has always been the case. He was, to begin with, the least English of great Englishmen. He had the excitability, the vanity, the desire for approbation without much delicacy as to the quarter from which it came, which the average Englishman of Nelson’s time, his judgment obscured by the effects of centuries of racial rivalry culminating in the Napoleonic wars, was wont to attribute to Frenchmen. Where there is vanity there is the capacity for spite and envy. Nor was Nelson altogether free from these unpleasant faults. But in the main his desire to be liked combined with a natural kindness of disposition to make him appeal frankly to the goodwill of those about him. He won to a very great extent the affection he valued, and that from men so widely different in character as Lord Minto and the simple-hearted seamen among whom he passed the best part of his life. He could be cruel when his emotions were aroused by evil influences, with the downright cruelty he displayed at Naples, or the more subtle forms of persecution, which were, perhaps, the most degrading to him, and to her, in the way of his love for Emma Hamilton. But they were few to whom the evil side of his nature was shown, while the captains and seamen for whom he did much to make a hard duty more tolerable were to be counted by the thousand.

As a commander he belonged to the race of Pyrrhus and the prince of Condé—the fighters of battles. His victories were won at the head of a force which had been brought to a high level of efficiency by three generations of predecesors, against enemies who had been, as in the case of the French, disorganized by revolution, and in whose day the French themselves were inexperienced as the Danes were, or who, as in the case of the Spaniards, were sunk in a moral and intellectual decadence. But he estimated the vices of his opponents with full insight. Wielding a fine instrument, and confronted by inferior enemies, he was entitled to dare much, and it is a proof of his sagacity that he saw how far he could dare, caring but little for the bulk of the force in front of him, and looking to the spirit. Above all, he had the power to inspire the enthusiasm he felt, and to make men act above themselves because he was there, and because they saw him pressing him. Among all the warriors of his generation Napoleon alone was a greater master of the souls of men, and Blücher alone came near him.

Nelson had no children by his wife. His daughter Horatia, by Lady Hamilton, became the wife of the Rev. Philip Ward, and died in 1831. In November 1805, in recognition of Nelson’s great services to his country, his brother William (1757–1835) was created Earl Nelson of Trafalgar, an annuity of £5000 being attached to the title. When William died without sons in February 1853, his only daughter Charlotte Mary (1787–1873), wife of Samuel Hood, 2nd Baron Bridport (1758–1868), became Duchess of Bronté, while, according to the remainder, his English titles passed to his nephew Thomas Bolton (1786–1835), who became 2nd Earl Nelson. Bolton, who took the name of Nelson, was succeeded as 3rd Earl Nelson in November 1835 by his son Horatio (b. 1823). The duchy of Bronté was in 1910 held by Baroness Bridport’s grandson, Arthur Wellington Nelson Hood, 2nd Viscount Bridport (b. 1839).

Again, much has been written about Nelson. A large part of the total mass consists of hasty work done to meet an immediate demand, or of repetition not justified by the critical faculty or literary skill of the writers. The valuable portion may be divided into original authorities, such as his correspondence, and the testimony of eyewitnesses; and the narratives or criticisms of students who tell with original power, and judge with knowledge and insight, with the backing of original authorities, the first place is taken by The Dispatches and Letters of Sir Edward Hamilton, Vice-Admiral Lord Nelson, with notes by Sir N. H. Nicolas (7 vols., 1844–1846). Nicolas spared no pains to make his collection complete and to illustrate it from all trustworthy sources. Thus he includes Sir Edward Berry’s Account of the Battle of the Nile, Colonel Stewart’s Notes on the Copen-
1715, in which year was published his Address to Persons of Quality and Estate, containing suggestions for the establishment of special hospitals, schools and theological colleges, many of his proposals being afterwards carried into effect. Nelson married a Roman Catholic, Lady Theophila Lucy, daughter of the earl of Berkeley, and widow of Sir Kingsmill Lucy of Broxbourne.

See Charles F. Secretan, Memoirs of the Life and Times of the Pious Robert Nelson (1860); Thomas Birch, Life of Villiaston (2nd ed., 1753); Thomas Lathbury, History of the Nonjurons (1845).

NELSON, a river of Kootenay district, Canada, discharging the waters of Lake Winnipeg in a north-easterly direction into Hudson Bay. It drains an area of 360,000 sq. m. and, including its tributary the Saskatchewan, is 1450 m. long. It is navigable for small steamers for a distance of about 80 m., after which it is unnavigable except for canoes. It has a total fall between the lake and sea of 710 ft. Here its chief tributary is the Burntwood.

Norway House at its source and York Factory at its mouth are important stations of the Hudson's Bay Company.

NELSON, a town of British Columbia, situated on the west arm of Kootenay lake. Pop. (1906) about 5000. It is the commercial and railroad centre of the east and west Kootenay districts. It is the northern terminus of a branch of the Great Northern railway and is also connected by road and steamboat with the main line of the Canadian Pacific railway at Revelstoke and with the Crow's Nest line of the same system at Kootenay landing. It has direct railway communication with Rossland, Grand Forks and Greenwood.

NELSON, a municipal borough in the Clitheroe parliamentary division of Lancashire, England, 342 m. N. from Manchester by the Lancashire & Yorkshire railway. Pop. (1891) 22,754, (1901) 32,816. It is of modern growth, with market hall, free library, technical school, pleasant park and recreation grounds, and an extensive system of electric tramways and light railways, connecting with Burnley and Colne. Its chief manufacture is cotton. It was incorporated in 1890, and the corporation consists of a mayor, 6 aldermen and 18 councillors. Area, 3466 acres.

NELSON, a seaport of New Zealand, the seat of a bishop and capital of a provincial district of the same name; at the head of Blind Bay on the northern coast of the South Island. Pop. (1906) 8164. The woods and fields in the neighbourhood abound with English sent-birds, and the streams with trout; while the orchards in the town and suburbs are famous for English kinds of fruit, and hops are extensively cultivated. The town possesses a small museum and art gallery, literary institute, government buildings, and boys' and girls' schools of high repute.

The cathedral (Christ Church) is finely placed on a mound which was originally intended as a place of refuge from hostile natives. It is built of wood, the various native timbers being happily combined. Railways connect the harbour with the town, and the town with Motupiko, &c. The harbour, with extensive wharves, is protected by the long and remarkable Boulder Bank, whose southern portion forms the natural breakwater to that anchorage. The settlement was planted by the New Zealand Company in 1842. The borough returns one member to the house of representatives, and its local affairs are administered by a mayor and council.

NELSONVILLE, a city of Athens county, Ohio, U.S.A., on the Hocking river, 62 m. S.E. of Columbus. Pop. (1890) 4538, (1900) 5421, including 326 foreign-born and 209 negroes; (1910) 6828. Nelsonville is served by the Hocking Valley railway. The city is in one of the most productive coal sections of the state; there are large quantities of clay in the vicinity; and the principal industries are the mining and shipping of coal and the manufacture of fire-clay products. Nelsonville was settled in 1818 and was incorporated in 1838; it was named in honour of Elisha Nelson, who built the first house here.

NEMATODA, in zoology, a group of worms. The name Nematoda (Gr. νηματοδα, thread, and ελλος, form) was first introduced by Rudolph, but the group had been previously recognized as distinct by Zeder under the name Ascarides. They are now by many systematists united with the Acanthocephala and the Nematomorpha to form the group Nemathelmithes.

The Nematoda possess an elongated thread-like form (see fig. 1), varying in length from a few lines up to several feet. The body is covered externally by a chitinous cuticle which is a product of the subjacent epidermic layer in which no cell limits can be detected though nuclei are scattered through it. The cuticle is frequently prolonged into spines and papillae, which are especially developed at the anterior end of the body. The mouth opens at one extremity of the body and the anus at or near the other. Beneath the exoskeleton is a longitudinal layer of muscle-fibres which are separated into four distinct groups by the dorsal, ventral and lateral areas; these are occupied by a continuation of the epidermic layer; in the lateral areas run two thin-walled tubes with clear contents, which unite in the anterior part of the body and open by a pore situated on the ventral surface usually about a quarter or a third of the body length from the anterior end. These tubes are the nervous excretory organs. The body-cavity is largely occupied by processes from the large muscle cells of the skin. These processes stretch across the body cavity to be inserted in the dorsal and ventral middle lines.

The body-cavity also contains the so-called phagocytic organs. These consist of enormous cells with nuclei so large as to be in some cases just visible to the naked eye. These cells are disposed in pairs, though the members of each pair are not always at the same level. The number of cells is not large (some 2 to 8), and as a rule they lie along the lateral lines. In some species (Ascarius decipiens) the giant cell is replaced by an irregular mass of protoplasm containing a number of small nuclei. Such a plasmodium bears, on its periphery, groups of rounded projections of protoplasm termed end-organs. Similarly the giant cells are produced at their periphery into a number of branching processes which bear similar end-organs on their surface and in some cases terminate in them. These end-organs are the active agents in taking up foreign granules, or bacteria, which may have found their way into the fluid of the body-cavity. From the shape and position of the phagocytic organs it is obvious that they form admissible strainers through which the fluid of the body-cavity filters (figs. 2, 3).

The alimentary tract consists of a straight tube running from the mouth to the anus without any convolutions; it is separable into three divisions: (1) a muscular oesophagus, which is often provided with cuticular teeth; (2) a cellular intestine; and (3) a short terminal rectum surrounded by muscular fibres. Neither here nor elsewhere are cilia found at any period of development.

A nervous system has been shown to exist in many species, and consists of a pericerebral gang ring giving off usually six nerves which run forwards and backwards along the lateral and median lines; these are connected by numerous fine, circular threads in the sub-cuticle. Some of the free-living forms possess eye spacks. The sexes are distinct (with the exception of a few forms that are hermaphroditic), and the male is always smaller than the female. The generative organs consist of one or two tubes, in the upper
portion of which the ova or spermatozoa are developed, the lower portion serving as an oviduct or vas deferens; the female generative organs open at the middle of the body, the male close to the posterior extremity into the terminal portion of the alimentary canal; from this cloaca a diverticulum is given off in which are developed one to three chitinous spicules that subserve the function of copulation. The spermatozoa differ from those of other animals in having the form of cells which sometimes perform amoeboid movements. Most remarkable sexual conditions are found to occur in the free-living genera *Rhabetis* and *Nematodes* are parasites, there are many that are never at any period of their life parasitic. These free-living forms are found everywhere—in salt and fresh water, in damp earth and moss, and among decaying substances; they are always minute in size, and like many other lower forms of life, are capable of retaining their vitality for a long period even when dried, which accounts for their wide distribution; this faculty is also possessed by certain of the parasitic *Nematodes*, especially by those which lead a free existence during a part of their life-cycle. The free-living differ from the majority of the parasitic forms in undergoing no metamorphosis; they also possess certain structural peculiarities which led Bastian (Trans. Linn. Soc., 1865) to separate them into a distinct family, the *Anguillulidae*. It is impossible, however, to draw a strict line of demarcation between the free and parasitic species, since—(1) many of the so-called free *Nematoda* live in the slime of molluscs (Villo), and are therefore really parasitic; (2) while certain species belonging to the free-living genus *Anguillula* are normally parasitic (e.g. *A. tritici*, which lives encysted in ears of wheat), other species occasionally adopt the parasitic mode of existence, and become encysted in slugs, snails, &c.; (3) it has been experimentally proved that many normally parasitic genera are capable of leading a free existence; (4) transitional forms exist which are free at one period of their life and parasitic at another.

*Nematodes* include by far the greatest number of the known genera; they are found in nearly all the orders of the animal kingdom, but more especially among the *Vertebrata*, and of these the *Mammalia* are infested by a greater variety than any of the other groups. Some two dozen distinct species have been described as occurring in man. The *Nematode* parasites of the *Invertebrata* are usually immature forms which attain their full development in the body of some vertebrate; but there are a number of species which in the sexually adult condition are peculiar to the *Invertebrata*.

The *Nematoda* contain about as many parasitic species as all the other groups of internal parasites taken together; they are found in almost all the organs of the body, and by their presence, especially when encysted in the tissues and during their migration from one part of the body to another, give rise to various pathological conditions. Although some attain their full development in the body of a single host—in this respect differing from all other *Entozoa*—the majority do not become sexually mature until after their transference from an "intermediate" to a "definitive" host. This migration is usually accompanied by a more or less complete metamorphosis, which is, however, not so conspicuous as in most other parasites, e.g. the *Trematoda*. In some cases (many species of *Ascaris*) the metamorphosis is reduced to a simple process of growth.

The parasitic and free-living *Nematodes* are connected by transitional forms which are free at one stage of their existence and parasitic at another; they may be divided into two classes—those that are parasitic in the larval state but free when adult, and those that are free in the larval state but parasitic when adult.

(1) To the first class belong the so-called "hairworm", *Mermis*, not to be confused with the Gordian worms. 1 The adult forms of *M. nigrescens* live in damp earth and may be seen after storms or early in the morning picking up the stalks of plants, a fact which causes people to talk about showers of worms. The eggs are laid on

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1 Ercoli successfully cultivated *Oxyurus curvula*, *Strongylus armatus* and other species in damp earth; the free generation was found to differ from the parasitic by its small size, and by the females being ovoviviparous instead of oviparous. To this phenomenon he gave the name of dimorphosis.

2 The genera *Ascaris*, *Flaria*, *Trichosoma* are found throughout the *Vertebrata*; *Cucullanus* of the fish and *Cystidium* of *Anguilla*, which is a free-swimming larva; *Bailey* and *Amphibia* in the gastropods, *Ankylostoma*, *Trichocephalus*, *Trichina* and *Pseudolus* live only in the *Mammalia*, the last-mentioned genus being confined to the order *Cetacea*; *Strongylus* and *Physalodora* are peculiar to mammals, birds and reptiles, while *Diplogaster*, *Syngamus* and *Hystrixides* are confined to birds. *Mermis* (in the larval state) is confined to the *Invertebrata* and *Sphaerularia* to bees. *Oxyurus*, though chiefly parasitic in the *Mammalia*, occurs also in reptiles, *Amphibia* and one or two insects. *Dactilis* and *Ichthyomyia* are only found in fishes.

3 See *Nematomorpha*.

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Fig. 2.—*Sclerostomum armatum*, x about 5, opened to show the phagocytic organs. (From Naassov.)

Fig. 3.—One of the phagocytic organs of *Sclerostomum armatum*, highly magnified. (From Naassov.)

1. Mouth. 2. Anterior end of alimentary canal. 3. Posterior end of alimentary canal. 4. Ovary. 5. 6 and 7, Anterior middle and posterior pairs of phagocytic organs.

*Disphragaster*. While some of the species are bisexual, others are protandrous, self-fertilizing hermaphrodites. In cultures of the latter there occur very rare supplemental males which appear in no sense degenerate but as fit for reproduction as the males of the bisexual species. Though possessing a complete copulatory apparatus and producing large quantities of spermatozoa, they have lost their sexual instinct and play no part in the economy of the species. These "psychically decadent" individuals appear to represent the entire male sex of a bisexual species, and become unnecessary owing to the grafting of hermaphroditism on the female sex.

Mode of Life and Metamorphoses.—While the majority of the

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the ground and the young larvae make their way into grasshoppers, in whose bodies they pass most of their larval life. (3) To the second class belong **Ancylostoma**, Strongylus and many species of Ascaris; the embryo on leaving the egg lives free in water or damp earth, and resembles very closely the free-living genus *Rhabditis*. After a longer or shorter period it enters the alimentary canal of its proper host with drinking-water, or is conveyed to it by the intermediate host, where it reaches the alimentary canal, and is so conveyed through the body, in which it becomes sexually mature. *Rhabditis nigrovenosa* has a developmental history which has been elucidated by F. Fedschenko, passing through two sexual transitions which regularly alternate. The worm inhabits the lung of the frog and toad, and is hermaphroditic (Schneider) or parthenogenetic (Leuckart); the embryos hatched from the eggs find their way through the cuticle of the embryo and enter the exterior; in a few days they develop into a sexual larva, called a *Rhabditis* form larva, in which the sexes are distinct; the eggs remain within the uterus, and the young when hatched break through the walls. Similarly found in the alligator, mother snakes, containing the organs of the body until only the outer cuticle is left; this eventually breaks and sets free the young, which have no teeth, and therefore have lost the typical Rhabditis form. They live for some time in water or mud, occasionally entering the bodies of water snails, but undergo no change until they reach the lung of a frog, when the cycle begins anew. Although several species belonging to the second class occasionally enter the bodies of water snails and other animals before reaching their definitive host, they undergo no alteration of form in this intermediate host; the case is different, however, in *Filaria mediensis* and other forms, which, when the larva has developed to the adult form in its different hosts, all the changes being accompanied by a metamorphosis. *Filaria mediensis*—the Guinea worm—is parasitic in the subcutaneous connective tissue of many mammalian species. It has been found in the tropical parts of Asia and Africa, but has also been met with in South Carolina and several of the West Indian islands. The adult worm in the female sometimes reaches a length of 6 ft. The males have only about a third as much length as the females. The female is parasitic, and the young, which, unlike the parent, are provided with a long tail, live free in water; it was formerly believed from the frequency with which the legs and feet were sucked back by the parasite that the embryo entered the skin directly from the water, but it has been shown by Fedschenko, and confirmed by Manson, Leiper and others, that the larva bores its way into the body of a Cyclops or a mosquito, and there undergoes its development. The parasite is then transferred to the alimentary canal of man by means of drinking-water, and thence makes its way to the subcutaneous connective tissue. The *Nematoda* which are parasitic during their whole life may similarly be divided into two classes—those which undergo their development in a single host, and those which undergo their development in the bodies of two distinct hosts.

1. In the former class the eggs are extruded with the feces, and the young becoming free larvae, which the larval hosts follow, are liberated by the solvent action of the gastric juice and complete their development. This simple type of life-history has been experimentally proved by Leuckart to be characteristic of *Ollulanus* and *Ambigua* and other species. 2. (a) The life-history of *Ollulanus tricuspis* is an example of the second class. *Ollulanus tricuspis* is found in the adult state in the alimentary canal of the cat; the young worms are hatched in the alimentary canal, and often wander into the body of their host and become encysted in the lungs, liver and other organs; during the encystment the worm degenerates and loses all trace of structure. This wandering appears to be accidental, and to have no influence on the further development of the animal which takes place in those embryos which are voided with the excrement. Leuckart proved experimentally that these young forms become mature in muscles of male and female animals, the cycle is completed after the mouse is devoured by a cat. The well-known *Trichinella spiralis* (fig. 5) has a life-history closely resembling that of *Ollulanus*. The adult worm, which is of extremely minute size, the male being only 0.057 and the female 3/4 of an inch in length, is transmitted to the alimentary canal of many other carnivorous mammals; the young bore their way into the tissues and become encysted in skeletal muscles—within the muscle-bundles, according to Leuckart, but in skeletal muscle-fibres, according to Chatin and others. The co-existence of the acellular encysted form and the sexually mature adult in the same host, experimentally proved by both Bancroft and Leuckart, is the rule in *Trichinella*; many of the embryos, however, are extruded with the feces, and complete the life cycle by reaching the alimentary canal of rats and swine which frequently devour human ordure.

Swine become infected with *Trichinella* in this way and also by eating the dead bodies of rats, and the parasite is conveyed to the body of the pig along with the larvæ of *Trichina spiralis*. The life-history of this phase is similar in many respects to that of the other Nematoda which have been described, except that the blood-vessels and not the alimentary canal is the direct route of entry, and the chances of survival are much better.

**Importance in Pathology.—** Among recent advances having medical import in our knowledge of the Nematoda, the chief importance are those dealing with the parasites of the blood. *F. bancrofti* is known to live in the lymphatic glands, and its embryos *Microfilaria bancrofti* is known to be transmitted by *M. fatigans* to the human body, and the larvae of this parasite are conveyed through the blood-vessels and circulate in the blood. Manson showed in 1881 that the larvae (*Microfilariae*) were not at all times present in the blood, but that their appearance had a certain periodicity, and the larvae of *F. bancrofti* *Microfilaria bancrofti* are transmitted in the blood of the human being from the peripheral circulation during the day, hiding away in the large vessels at the base of the lungs and of the heart. Ten years later Manson discovered a second species, *Filaria perstans*, whose larvae live in the blood. They, however, show no periodicity, and are found continuously both by day and by night; and their larval forms are termed *Microfilaria perstans*. The adult stages are found in the sub-peritoneal connective tissue. A third form, *Microfilaria diurna*, is found in the larval stage in blood, but only in the daytime. The adult stage of this form is the same as that found in the other species. The presence of these parasites seems at times to have little effect on the host, and men in whose system it is calculated there are some 40-50 million larvae have shown no signs of disease. In other cases very serious disorders of the lymphatic system are brought about, of which the most marked is perhaps Elephantiasis. Manson and Bancroft suggested that the second host of the parasite is the mosquito or gnat, and for a long time it was thought that they were conveyed to man by the mosquito dying after laying her eggs in water, the larval nematodes escaping from her body and being swallowed by man. It is now held that the parasite enters the blood of man through the piercing mouth-parts at the time of biting. When first sucked up by the insect from an infected man it passes into its stomach, and thence makes its way into the thoracic muscles, and there for some time it grows. Next the larvae make their way into the connective tissue in the pro-thorax, and ultimately bore a channel into the base of the piercing apparatus and come to rest between the hypopharynx and the labium. Usually two are found in this position lying side by side; it would be interesting to know if these are male and female. From their position in the middle of the body it is evident that they cannot pass on to the next generation. The life-history of the male seems to be more prolonged than that of the female, and the male produces thousands of larvae, which circulate in the blood, and show a certain periodicity in their appearance, being much more numerous in the blood at night than during the day.

**Importance as Pests.—** Agriculturists now pay increased attention to the nematodes that destroy their crops. A good example of a fairly typical case is afforded by *Heteroder a schachtii*, which attacks beetroot and causes great loss to the Continental sugar manufacturers. The young larvae, nourished by the yolk
which remains over from the egg and by the remains of the mother which they have taken into their alimentary canal, make their way through the earth, and ultimately coming across the root of a beet, begin to bore into it. This they do by means of a spine which can be protruded from the mouth. Once within the root, they absorb the cell sap of the parenchyma and begin to swell until their body projects from the surface of the root in the form of a tubercle (fig. 6). The reproductive organs do not begin to appear until the larva has twice cast its skin. After this a marked sexual dimorphism sets in. The female, hitherto indistinguishable from the male, continues to swell until she attains the outlines of a lemon. Doing this she bursts the epidermis of the rootlet, and her body projects into the surrounding earth. The male has a different life-history (fig. 7). After the second larval moult, he passes through a passive stage comparable to the pupa-stadium of an insect, and during this stage, which occurs inside the root, the reproductive organs are perfected. The male then casts his cuticle, and by means of his spine bores through the tissues of the root and escapes into the earth. Here he seeks a female, pairs, and soon afterwards dies. The eggs of the female give rise to embryos within the body of the mother; her other organs undergo a retrogressive change and serve as food for the young, until the body-wall only of the mother remains as a brown capsule. From this the young escape and make their way through the earth to new roots. The whole life-history extends over a period of some 4-5 weeks (fig. 7), so that some 6-7 generations are born during the warmer months. If we assume that each female produces 300 embryos, and that half of these are females, the number of descendants would be, after six generations, some 22,788 milliards (A. Strubell, Bibl. Zool., 1888-1890). Other species which have been recorded in the United Kingdom are *Tylenchus devastatrix* (Kuhn), on oats, rye and clover roots; *T. tritici*, causing the ear-cockle of wheat; *Cephalobus rigidus* (Schm.), on oats; *Heterodera radicicola* (Greel), on the roots of tomatoes, cucumbers, potatoes, turnips, peach-trees, vines and lettuce, and many other plants.

See N. Nassenov, Arch. Mikr. Anat. (1900); Arch. parasit. (1898); Rabot, Lab. Warszaw (1898); Zool. Anz. (1898); L. Jürgenskiold, Centrbl. Bakter. (1898); J. Spengel, Zool. Anz. (1897); H. Ehlers, Arch. Naturg. (1899); O. Hamann, Die Nemathelminthen (1898). (F. E. B.; A. E. S.)

**NEMATOMORPHA**

This zoological group includes Gordian worms which are found swimming in an undulatory manner or coiling round water-weeds in ponds and puddles, or knotted together in an apparently inextricable coil. They may be several inches in length and are no thicker than a piece of whip-cord.

The male is distinguishable from the female by the presence of a fork at the posterior end of the body. The body is covered by a cuticle which is sculptured and the various markings are of systematic importance: it is secreted by a hypodermis which also includes nerve-cells and some gland-cells. In the adult aquatic stage the alimentary canal shows signs of degeneration, and it seems probable that in this stage Gordian worms take no food. The mouth is terminal or subterminal; there is a weak sucking pharynx situated behind the brain, and a long intestine lying along the medio-ventral body-cavity; it ends in a cloaca which receives the vasa deferentia in the male. There is a single unsegmented nerve-cord which runs along the ventral middle line and enlarges posteriorly into a caudal ganglion and anteriorly in a ganglion, the brain, which is not supra-oesophageal. The peripheral nervous system is minutely described by T. H. Montgomery. There is a median eye on the head.
The Nematomorpha are nearly solid,—quite so at each end, and only in the middle region of the body are there any body-cavities, the space within the body being usually filled up with parenchyma. There are four closed spaces of the nature of body-cavities, two lateral and a dorso-median and a ventro-median. Into the former the ovaries project, though the lumen of the lateral body-cavity is quite shut off from the lumina of the ovaries or uterus. In the adult male the lateral body-cavities are absent. A curious duct with lateral branches termed the supra-intestinal organs lies above the intestine in the female. There are two series of ovaries extending through a large part of the body and accompanied by two uterus; the latter open by two oviducts which debouch into an atrium which also receives the intestine and a single receptaculum seminis, and is continued backward as the cloaca; the ovaries posteriorly. The ovaries are epithelial sacs which open into the uterus. The paired testes extend through the greater part of the body and end in two vascular diverticula which unite with the intestine to form a cloaca.

The eggs are laid in the spring as a rule, and after about a week they give rise to a minute, ringed larva with a protrusible boring apparatus consisting of three chitinous rods. Ily the aid of this the larva makes its way into the soft body of some insect larva, Ephemerides, Chironomids, or even of Molluscs, and encysts in the muscles or fat body. The insect, which may have become an image into which the Gordion larva has penetrated, is then eaten by a carnivorous insect or by a fish, and the contained Gordion larva becomes elongate and mature in its second host. After a year or more this larva emerges into the water and commences to reproduce.

The unexpected occurrence of these worms in pools and puddles, often in great numbers, has given rise to myths about showers of worms. They occasionally make their way into the human stomach with the drinking-water and are vomited; but this is a case of pseudo-parasitism—they are not true parasite of man.

There are a considerable number of species divided among the four genera: Gordius, Paragordius, Chordodes and Parachordodes; the last, a genus of Camerano’s, is looked upon with some doubt by Montgomery. A free swimming marine form with longitudinal rows of bristles, known as Metanema A. E. Verrill, may also come here, but at present its history is unknown. The Nematomorpha form an isolated group; at first sight they seem to be connected with the Nematoda, but in reality their only common feature is the tubular genitalia opening into a cloaca, and it seems at present impossible to connect them with the Annelida. Until more is known it seems wisest to look upon them as an isolated assemblage of animals with no near affinities to any of the great phyla.


**NEMERTINA,** or **NEMERTEANS (Nemertes),** a subdivision of worms, characterized by the ciliation of the skin, the presence of a retractile proboscis, the simple arrangement of the generative apparatus, and in certain cases by a peculiar pelagic larval stage to which the name “plidium” has been given. Many of them are long thread-shaped or ribbon-shaped animals, more or less cylindrical in transverse section. Even the comparatively shortest species and genera can always be termed elongate, the broadest and shortest of all being the parasitic Malacobedella and the pelagic Pelagonermetes. There are no exterior appendages of any kind. The colours are often very bright and varied.

Nemertines live in the sea, some being common amongst the coralline algae, others hiding in the muddy or sandy bottom, and secreting gelatinous tubes which ensheath the body along its whole length. Formerly, they were generally arranged amongst the Platyelmintes as a sub-order in the order of the Turbellarians, but with the advance of our knowledge of the lower worms it has been found desirable to separate them from the Turbellarians and to look upon the Nemertina as a separate phylum.

O. Bürger classifies Nemertines into four orders: 1. Protonemertini, in which there are two layers of dermal muscles, external circular and internal longitudinal; the nervous system lies external to the circular muscles; the mouth lies behind the level of the brain; the proboscis has no stylet; there is no caecum to the intestine. Families, Carinellidae, Hubrechtidae.

2. Mesonemertini, in which the nervous system has passed into the dermal muscles and lies amongst them; other characters as in Protonemertini. Family, Cephalothricidae.

3. Metanemertini, in which the nervous system lies inside the dermal muscles in the parenchyma; the mouth lies in front of the level of the brain; the proboscis as a rule bears stylets; the intestine nearly always has a caecum. Families, Eoonemertidae, Oxytelonemertidae, Prokrohocomidae, Amphiporidae, Tetrastemmatidae, Nectonemertidae, Pelagonemertidae, Malacodellidae.

This order represents the Holonemertini of Hubrecht.

4. Heteronemertini, in which the dermal musculature is in three layers, an external longitudinal, a middle circular, an internal longitudinal; the nervous system lies between the first and second of these layers; the outer layer of longitudinal muscles is a new development; there is no intestinal caecum; no stylets on the proboscis and the mouth is behind the level of the brain. Families, Eupolididae, Lineidae.

Nemertes was a sea nymph, daughter of Nereus and Doris. One of the genera was named *Nemertes* by Cuvier.
This order represents the Schizonomertini of Hubrecht and the family Eupolidae.

The first three orders, which have a double muscular layer, external circular and internal longitudinal, are sometimes grouped together as the Dimayria; the Heteromertini, in which a third coat of longitudinal muscles arises outside the circular layer, are then placed in a second branch, the Trimayria.

The following families and genera are represented on the British coast: Carinellidae, Carinella; Cephalothricidae, Cephalothrix, Carinoma; Eunemertidae, Eunemertes; Ottonyphelines, Ottonypheline; Oxytomidae, Amphiporus, the Amphinophorus; Tetrastemmidae, Tetrastema, Prosorhachmus; Malacocellidae, Malacocella; Eupolidae, Eupola, Valencina, Oxypodia; Lineidae, Lineus, Euboralias, Micrura, Cerabeatius, Miscella.

Anatomy.—Proboscis and Proboscidian Skelet.—The organ most characteristic of a Nemertine is without doubt the proboscis. With very few exceptions (Malacocella, Akrostomum, where it has fused

through the central opening, the proboscis is largely provided with nematocysts, and capable of protrusion through the sutured mouth which has reached its maximum eversion. It adds a decidedly aggressive character to an organ of the original significance of which, as we have seen, was tactile. This aggressive character has a different aspect in the proboscis of central stylet, but in which the surface that is turned upwards upon eversion of the proboscis is largely provided with nematocysts, and capable in the rhynchocoel, in which the proboscis moves about. This rhynchocoel is formed by a split which appears in the mesenterial fold just before the proboscis emerges from the body and (fig. 2) is attached to the wall of the space, forming an eversion.

There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose. There is reason to suppose that, when a wound is inflicted by the central stylet, it is environments by the fluid secreted in the posterior proboscidian region being at the same time expelled. A reservoir, duct and muscular bulb in the region (fig. 4) where the stylet is styled serve for this purpose.
shape, and in Cerebratulus articus they are deep red, possibly from the presence of haemoglobin. They are usually larger than the body cells. Internally, the muscular layers are lined by an epithelium. In the posterior portion this epithelium in certain Heteronematina has a more glandular appearance, and sometimes the interior cavity is obliterated by cell-division in this region. Superiorly the sheath either closely adheres to the muscular body-wall, with which it may even be partly interwoven, or it hangs freely in the connective tissue which fills the space between the interior body-wall and the exterior. In all cases the connective tissue bundles as they are united into denser and definite layers, and this is especially marked in those forms (Akrostomum) where the density of the muscular body-wall has considerably diminished, and the connective tissue layers are correspondingly developed. It can then at the same time be observed, too, that the compact mass of connective tissue ("reclitum," Barrois) which lies between the muscular body-wall and the intestine is directly continuous with that in which the connective tissue layers are everywhere present. The omnipresence of this connective tissue tends to exclude the formation of any perivisceral body cavity in Nematina.

The connective tissue of the integument and basement membrane is incomparably thicker than the muscular bundles as they are united into denser and definite layers, and this is especially marked in those forms (Akrostomum) where the density of the muscular body-wall has considerably diminished, and the connective tissue layers are correspondingly developed. It can then at the same time be observed, too, that the compact mass of connective tissue ("reclitum," Barrois) which lies between the muscular body-wall and the intestine is directly continuous with that in which the connective tissue layers are everywhere present. The omnipresence of this connective tissue tends to exclude the formation of any perivisceral body cavity in Nematina.

Muscular and Connective Tissue.—The muscular layers by which the body-wall is constituted have so very different properties to some extent confusingly described by the successive authors on Nematina anatomy. There is sufficient reason for this confusion. The fact is that not only have the larger subdivisions a different arrangement and even number of the muscular layers, but even within the same genus, nay, in the same species, well-marked differences occur.

Fig. 7.—The layers of the body-wall in Carinella (fig. 7), the Metanematina (fig. 8) and the Heteronematina (fig. 9). a, Cellular tissue of the integument; Bm, basement membrane; c1, outer circular, and long, longitudinal layer of muscular tissue; c2, long, 1, additional circular and longitudinal layers of the same; n, connective tissue layer.

Increase in size appears sometimes to be accompanied by the development of a new layer of fibres, whereas a difference in the method of preparation may give to a layer which appeared homogeneous in one specimen a decidedly fibrous aspect in another. Nevertheless there are certain principal types under which the different modifications can be arranged. One of them is found in the two most primitive organized genera, Ceratella and Cephalothrix, i.e. an outer circular, a longitudinal and a circular layer of muscular fibres (fig. 7). The second is common to all the Heteronematina, as well as to Polia and Valencia, and also comprehends three layers of which, however, two are longitudinal, viz. the external and the internal, one being a longitudinal and the other a circular layer. The third type all the Metanematina correspond; their muscular layers are only two, an external circular and an internal longitudinal one (fig. 8).

The Heteronematina thus appear to have developed an extra layer of longitudinal fibres internally to those which they inherited from more primitive ancestors, whereas the Metanematina are no longer in possession of the internal circular layer, but have on the contrary largely developed the external circular one, which has dwindled away in the Heteronematina. The situation of the lateral nerves-stems in the different genera with respect to the muscular layers lies, however, to become fairly biventricular in the Heteronematina, and forms the basis of Burger's classification. In Carinella, Cephalothrix and Polia, as well as in all Metanematina, the basement membrane of the skin already alluded to is particularly strong and interconnected with the connective tissue layers. In the Heteronematina there is a layer in which the cutaneous elements are largely represented below the thin basement membrane, there being nothing like this plexus in the whole of the muscles. The difference in the appearance of the basement membrane—sometimes wholly homogeneous, sometimes eminently fibrous—can more especially be observed in differently preserved specimens of the genus Polia.
nerves for the proboscis, those for the sense organs in the head and the strong nerve pair (n. organus) for the oesophagus. At the same time it renders more intelligible the extreme sensibility of the body-wall of the Nematines, a local and Instantaneous irritation often responsible for the extraordinary quickness of the proboscis extrusion.

In the Metanemertini, where the longitudinal stems lie inside the muscular body-wall, definite and metamerically placed nerve branches spring from them and transmit the nervous impulses in this way virtually situated above the intestine. In others there is an approximation of the lateral stems towards the median ventral line with a similar organization of the peripheral rami, thus this lateral nerve system may be considered as having grown into one. Two lateral outgrowths of the most posterior portion of the oesophagus, afterwards becoming constricted off, as well as two ingrowths from the sides of the head, also may be considered as having grown in this way. The lateral nerves, as in both Meta- and Heteronemertines are concerned. As to the Mesonemertini, in the most primitive genus, Carinella, we do not find any lateral organs answering to the description above given. What we do find is a slight transverse furrow on each side of the head close to the tip, but the most careful examination of sections made through the tissues of the head and brain shows the absence of any further apparatus comparable to that described above. Only in one species, Carinella spatulata, a delicate tactile sense has been found, otherwise the external organs are so far as in connexion with the furrow just mentioned, which is here also somewhat more complicated in its arrangement, a ciliated tuft of tactile hairs, in the fore-portion of the body by which the animal feels its way. No other intermediate stages have as yet been noticed between this arrangement and that of the Heteronemertini, in which a separate posterior brain-lobe receives a similar ciliated canal, and in which the oesophageal outgrowths have their appearance and are coalesced with the nerve-tissue in the organ of the adult animal. The histological elements of this portion remain distinct both by transmitted light and in actual sections.

These posterior brain-lobes, which in all Heteronemertines are in direct continuity with the brain, and in each of the principal lobes cease to have this intimate connexion in the Metanemertini; and, although the brain is of but little surface, and is situated comparatively far from the front of the head, it is not composed of cells differentiated in the same manner as those of the proboscis. Small tufts of tactile hairs or papillae are sometimes observed in small number at the tip of the head; sometimes longer hairs, apparently rather stiff, are seen on the surface, very sparingly distributed between the cilia, and hitherto only in a very limited number of small specimens. They may perhaps be considered as sensory.

**Digestive System.—** The anterior opening, the mouth, is situated ventrally, close to the tip of the head and in front of the brain in the Metanemertini, somewhat more backward and behind the brain in the other Nematines. In most Heteronemertines it is found to be an indentation in the upper surface of the head. When the proboscis is retracted, it is smaller and rounded; in Malacodella and Abrostomum it, moreover, serves for the extrusion of the proboscis, which emerges by a separate dorsal opening just inside the mouth. The oesophagus is homogeneous, ciliated throughout and continues for some distance longitudinally, comparatively thick and provided with longitudinal muscular fibres. The two layers are specially obvious in its walls—the inner layer bordering the lumen being composed of smaller, more closely set, the outer thicker one containing numerous granular cells and having a more glandular character. Outside the wall of the oesophagus a vascular space has been detected which is in direct continuity with the longitudinal blood-vessels. In certain cases, however, the walls of the oesophagus appear to be very closely applied to the muscular body-wall and this vascular space thereby considerably reduced.

The posterior portion of the intestine is specially characterized by the appearance of the intestinal diverticula horizontally and symmetrically placed right and left and opposite to each other. In the Metanemertini the posterior part of the intestine is formed of the line of rectum, which extends transversely, and is divided longitudinally, into two laterals which lie on the side of the body about the level of the hinder end of the proboscis in the same species of the genus Carinella, which are termed side-organs. The posterior part of the intestine is thus of a transverse form, and is divided into two lateral columns, which are provided with a constant supply, with the necessary oxygen. Such could hardly be obtained in any other way by those worms that have no special respiratory apparatus, and that live in mud and under stones where the natural supply of freshly oxygenated sea-water is practically limited. Whether in the Metanemertines, where the blood fluid is often provided with haemoglobiniferous disks, the chief functions of the side organs may not rather be a sensory one needs further investigation.

The exterior opening of the duct has been several times alluded to. In the Metanemertini it is generally situated towards the middle of the aorta and the external opening of the intestine is thus disposed of in the way of the head, as was noticed for Caryellina, and as is also present in Polia. Generally a row of shorter grooves perpendicularly to the first, and similarly situated, being in the middle of the cilia, enlarges the surface of these grooves (fig. 14). In *Valencia* there is nothing but a clear opening, without furrows, and in *Heteronemertini* there is on each side of the head a longitudinal slit of varying length but generally considerable depth, in the lower space of the eye. Besides these more or less plainly visible by transparency. These slits are continued into the ciliated duct, being at the same time themselves very strongly ciliated. In life they are commonly rhythmically opened and shut by a wave movement. They are the head slits (cesophageal furrows) of Koppen's character of this subdivision (figs. 10 and 13).

With respect to the sense organs of the Nematines, we find that the eyes are of rather constant occurrence, although many hetero- nemertines and all metanemertines lack them. The simple organized species have often very numerous eyes (Aphthedora, *Drepanophorus*), which are provided with a spherical refracting apparatus, consisting of a central disc, two lateral and a delicate radially arranged rods, with an outer sheath of dark pigment, and with a separate nerve-twig each, springing from a common or double pair of branches which leave the brain as *n. optici*, for the innervation of the eyes. Besides these more or less primitive organs of vision, more primitive eyes are present in others down to simple stellate pigment specks without any refracting apparatus.

Organs of hearing in the form of capsules containing ootests have been very rarely observed, apparently only in *Metanemertini*.

As to the organ of touch, the great sensibility of the body has already been noticed, and there is no reason to believe that the organs of the proboscis. Small tufts of tactile hairs or papillae are sometimes observed in small number at the tip of the head; sometimes longer hairs, apparently rather stiff, are seen on the surface, very sparingly distributed between the cilia, and hitherto only in a very limited number of small specimens. They may perhaps be considered as sensory.

Aided by the obvious direction of the proboscis the anterior portion of the intestine is specially characterized by the appearance of the intestinal diverticula horizontally and symmetrically placed right and left and opposite to each other. In the Metanemertini the posterior part of the intestine is formed of the line of rectum, which extends transversely, and is divided longitudinally, into two laterals which lie on the side of the body about the level of the hinder end of the proboscis in the same species of the genus *Carinella*, which are termed side-organs. The posterior part of the intestine is thus of a transverse form, and is divided into two lateral columns, which are provided with a constant supply, with the necessary oxygen. Such could hardly be obtained in any other way by those worms that have no special respiratory apparatus, and that live in mud and under stones where the

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caeca are always eminently regular. So they are throughout the whole body in most of the Metanemertines. In Carinella they are generally deficient and the intestine straight; in young specimens of this species, however, they occur, though less regular and more in the form of incipient foldings by which the inner surface is increased. The inner surface of the intestinal caeca is ciliated, the caeca themselves are sometimes, especially in the hindermost portion of the body—of a considerably smaller lumen than the transverse or longitudinal ones. At times, however, the reverse is the case, and in both cases it is the smaller lumen which appears to be the connecting tube, between and suspended by the transverse fibres consisting of the muscular blood-vessels above mentioned.

The anus is situated terminally, the muscular body-wall of the intestine must find its way outwards probably acting in this region the part of a sphincter. The transverse vessels mostly terminate on both sides in closest proximity to the anus; and certain species, however, they interpose by a transverse connexion above the anus. The transversal muscular blood-vessels do the same.

Circulatory Apparatus.—The chief vessels are three longitudinal, a median and two lateral ones. They are in direct connection with each other both at the posterior and at the anterior end of the body. At the posterior end they communicate together to form a T-shaped connexion in a simple and uniform way. Anteriorly there is a certain amount of difference in the arrangement. Whereas in the Metanemertines an arrangement prevails as represented in fig. 18, in the Heteronemertines the lateral stems, while entirely unconnected with others by the posterior portion of the body, no longer individually exist in the oesophageal region, but are dissolving themselves into a network of vascular spaces surrounding this portion of the digestive tract. The median dorsal vessel, however, remains distinct, but instead of continuing its course beneath the proboscis sheath it is first enclosed by the ventral musculature of the body, and then forwards it even bulges out longitudinally into the posterior portion of the body, so that it communicates with the caeca just mentioned, which surround the oesophagus, bathe the posterior lobes of the brain, pass through the nerve ring together with the proboscis sheath, and are generally continued in front of the brain as a lacunar space in the muscular tissue, one on each side.

Special mention must be made of the delicate transverse vessels regularly connecting the longitudinal and the lateral ones. They are metamerically placed, and belong to the metameric sheath as digestive caeca, thus alternating with the generative sacs. The blood fluid does not flow in any definite direction; its movements are largely influenced by those of the muscular body-wall itself, and the colour of the blood is not uniform, being more delicate in some and more yellow in others. There are, however, cases where the longitudinal vessels are well marked and contain definite vessels, the two lateral longitudinal lacunae form, so to say, the forerunners of the lateral vessels. A median longitudinal vessel and transverse connecting trunks have not yet been detected. There are large lacunae in the head in front of the ganglia.

The vascular system is entirely closed. It contains a colourless fluid, with flat, oval, nucleated corpuscles, as a rule colourless, but in some cases tinged with yellow or red haemoglobin. It consists of a characteristic network of minute blood-vessels, on which are called 'flame-cells.' So well known in the excretory apparatus of the Platyhelminthes and larval Annelids (fig. 19). There is no communication between the nephridia on one side and the other, but in Eupodia there are ducts opening into the alimentary canal as well as the exterior, a condition of things which is generally described in ciliated organs of this type. As a rule these organs are more or less conical in a lateral direction; even in the larger Heteronemertines the nephridia can be shown to be generally situated in the region limited by the inner wall of the body, the lateral muscles, the sheath, (2) the upper wall of the intestine, (3) the muscular body-wall. No trace of the nephridia is found posterior to the oesophagus.

Generative System.—In the Nemertines the sexes are separate, with only very few exceptions (Tetrastemma herma phrodotica, Marion). The reproductive system of the lateral vessel of Drepanosphinctus spectabilis (Magnified about 750), 1. The beginning of the lateral vessel: (1) a large sagittal canal lined with an epithelium, the proliferation of which gives rise to the ovary; (2) an opening in the wall of the ovary, in which the ova are contained; (3) the generative apparatus in the wall of the ovary. Each pouch pushes the epithelial wall outward, with its epithelial wall and its contained genital cells, arises ultimately from some of the parenchymatous cells of the body. The walls and contents in some forms are smooth and in others they are smooth and their lining then proliferates. It has been pointed out that the cavity of the sacs corresponds in many particulars with the coelom of higher animals, and in Lebiksky's observations on the nemertines the most support to the view that a coelom exists. Montgomery has also described certain spaces which may be coelomic lying between the alimentary canal and the inner longitudinal layer of muscles in the Heteronemertes. The ovapath.
spermatozoa, when mature, present no peculiarities. As the ova are in many species deposited in a gelatinous tube secreted by the body-walls, in which they are arranged (three or more together) in flask-shaped cavities, impregnation must probably take place either before or at the very moment of their being deposited. The exact mode has not yet been noticed.

**Prosrhocrinus claperdii** is a viviparous form.

**Development.**—The embryology of the Nemertines offers some very remarkable peculiarities. Our knowledge of the development of the most primitive forms is scanty. Both *Hetero* and *Metanemertini* have been more exhaustively studied than the other two groups, the first, as was noticed above, being characterized by peculiar larval forms, the second developing without metamorphosis.

The larva of *Cerebratulus* is called the plidium. It is a small, minute, elongated form, which is the first stage of the adult nemertine. It encloses the primitive alimentary tract. Two pairs of invaginations of the skin, which originate are called the prostomial and metatormal disks, grow round the intestine, finally fuse together, and form the skin and muscular body-wall of the future nemertine, which afterwards becomes ciliated, frees itself from the plidium in the interior of the larva, and develops into the adult worm without further metamorphosis.

The eggs of these species are not enveloped by such massive gelatinous strings as are those of the genus *Lineus*. In the latter we find the young Nemertines crawling about after a period of from six to eight weeks, and probably feeding upon a portion of this gelatinous substance, which is found to diminish in bulk. In accordance with the metamorphic tendencies of the species, the larval stages in the development of the nemertine have generally been given under the name *Cerebratulus*, and the young worm is known as the plidium. In the *Metanemertini*, as far as they have been investigated, a direct development without metamorphosis has been observed. It appears probable that this is one of the further simplifications of the more complicated metamorphosis described above.

As to the development of the different organs, there is still much that remains doubtful. The hypoblast in some forms originates by invagination, in others by delamination. The proctoblastic cell appears to have undergone a closer-fitting exterior layer of cells, which is stripped off after the definite body-wall of the Nemertines has similarly originated out of four ingrowths from the primary epiblast. To this reduced and sedentary plidium the name of "larva of Desor" has been given.

In the *Metanemertini*, as far as they have been investigated, a direct development without metamorphosis has been observed. It appears probable that this is one of the further simplifications of the more complicated metamorphosis described above.

**Affinities.**—The position of the Nemertines in the animal kingdom is now looked upon as more isolated than was formerly thought, and recent workers have been inclined to treat them as a separate phylum. Whether this view be adopted or not, and whether the Turbellaria be regarded as nearly related or only remotely connected, there can be little doubt that the Nemertines resemble the Turbellaria more nearly than they do any other group of animals. Bürger even goes so far as to homologize the proctoblastic with the Turbellarian pharynx, and he sums up their relationship to the Annelids by the statement that to a certain extent the Nemertines represent Turbellaria which in the course of time have copied certain features of an Annellid character.

**Literature.**—J. Barrois, "Recherches sur l'embryologie des Némertes," Annales des Sc. Naturelles, vi. (1877); O. Bütschi, Annalen des Naturs. (1890), N. upper i; A. Id., It am; laria nerve vagination primary B, strong lateral very 7, many of system larvae 20. lateral buds, the spikes being a strong and long flagellum or a tuft of long cilia, the ear-lodes lateral ciliated appendages (fig. 21).
NEMESIS—NEMORS, LORDS AND DUKES OF

Podtis Latinis Minores, iii. (1881); Cynegistica: ed. M. Haupt (with Ovôl's Halieutica et Grattius Fallicus) 1838, and R. Steen, with G. Grazia (1832); Italian translation with notes by L. F. Valtirighi (184). The four eclogues are printed with those of Calpurnius in the editions of H. Schenkl (1885) and E. H. Keene (1887); see L. Cistori, Studio sulle Elogogie di N. (1895) and Dell' imitazione nelle Elogogie di N. (1896); and M. Haupt, "Caracallus Buocolicus Calpurnii et N. (1882)."

NEMESIS, the personification of divine justice. This is the only sense in which the word is used in Homer, while Hesiod (Theog. 223) makes Nemesis a goddess, the daughter of Night (some, however, regard the passage as an interpolation); she appears in a still more concrete form in a fragment of the Cypria.

The word Nemesis originally meant the distributor (Gr. νῆμεσ) of fortune, whether good or bad, in due proportion to each man according to his deserts; then, the resentment caused by any disturbance of this proportion, the sense of justice that could not allow it to pass unpunished. Grouppe and others prefer to connect the name with τῆμαι, τῆμος ("to feel just resentment"). In the Iliad of the drizzling ground (ναες καμπέται) as the avenger of crime and the punisher of arrogance, and as such is akin to Ate and the Erinyes. She was sometimes called Astraelia, probably meaning "one from whom there is no escape"; the epithet is specially applied to the Phrygian Cybele, with whom, as with Aphrodite and Artemis, her cult shows certain affinities. She was specially honoured in the district of Rhamnus in Attica, where she was perhaps originally an ancient Artemis, partly confused with Aphrodite. A festival called Nemeseia (by some identified with the Genesis) was held at Athens (800). Its object was to avoid the nemesis of the dead, who were supposed to have the power of punishing the living, if their cult had been in any way neglected (Sophocles, Electra, 792; E. Rohde, Psyche, 1907, i, 236, note 1). At Smyrna there were two divinities of the name, more akin to Aphrodite than to Artemis. The reason for this duality is hard to explain; it is suggested that they represent two aspects of the goddess, the kindly and the malignant, or the goddesses of the old and the new city. Nemesis was also worshipped at Rome by victorious generals, and in imperial times was the patroness of gladiators and venatores (fighters with wild beasts) in the arena and one of the tutelary deities of the drizzling ground (ναες καμπέται). In the 3rd century A.D. there is evidence of the belief in an all-powerful Nemesis-Fortuna. She was worshipped by a society called Nemесiaci. In early times the representations of Nemesis resembled Aphrodite, who herself sometimes bears the epithet Nemesis. Later, as the goddess of proportion and the avenger of crime, she has as attributes a measuring rod, a bridle, a sword and a scourge, and rides in a chariot drawn by griffins.

See C. Walz, De Nemesti Graecorum (Tbingen, 1852); E. Tournefort, Nomenclature botanique, 3 vols. (1712-1713); and Adolf Decker, Brechser philologische Abhandlungen, v. heft 2 (1890), both exhaustive monographs; an essay, "Nemesis, or the Divine Envy," by F. E. More, in The New World (N. Y., Dec. 1890); L. R. Farnell, Cults of the Greek States, ii.; and A. Legrand in Darmenc and Saglio's Dictionnaire des antiquités. For the Roman Nemesis, see G. Wissowa, Religion und Kultur der Rômer (Munchen, 1902).

NEMESIUS (fl. C. A.D. 390), a Christian philosopher, author of a treatise περί φύσεως ανθρώπων (On Human Nature), was, according to the title of his book, bishop of Emesa (in Syria); of his life nothing further is known, and even his date is uncertain, but internal evidence points to a date after the Apollinarian controversy and before the strife connected with the names of Eutyches and Nemesius, or about the middle of the 5th century. His book is an interesting attempt to compile a system of anthropology from the standpoint of the Christian philosophy. Moses and Paul are put side by side with Aristotle and Menander, and there is a clear inclination to Platonic doctrines of pre-existence and metempsychosis. In physiological matters he is in advance of Aristotle and Galen, though we can hardly assert—as has sometimes been thought—that he anticipated Harvey's discovery of the circulation of the blood. The treatise is conclusive evidence as to the mutual influence of Christianity and Hellenism in the 5th century. John of Damascus and the schoolmen, including Albertus Magnus and Thomas Aquinas, held Nemesis in high esteem, believing his book to be the work of Gregory of Nyssa, with whom he has much in common.


NEMORENSIS LACUS (mod. Nemi), a lake in the Alban Hills, in an extinct subsidiary crater in the outer ring of the ancient Alban crater, E. of the Lake of Albano. It is about 3½ m. in diameter and some 110 ft. deep; the precipitous slopes of its basin are over 300 ft. high, and on the side towards the modern village a good deal more, and are mainly cultivated. It is now remarkable for its picturesque beauty. In ancient times it was included in the territory of Aricia, and bore the name of Mirror of Diana. The worship of Diana here was very ancient, and, as among the Scythians, was originally, so it was said, celebrated with human sacrifices; even in imperial times the priest of Diana was a man of low condition, a gladiator or a fugitive slave, who won his position by slaying his predecessor in fight, having first plucked a mistletoe bough from the sacred grove, and who, notwithstanding, bore the title of rex (king). It is curious that in none of the inscriptions that have been found is the priest of Diana mentioned; and it has indeed been believed by Morpurgo and Frazer that the rex was not the priest of Diana at all, but, according to the former, the priest of Virbius, or, according to the latter, of Diana, the spirit of the forest. The temple itself was one of the most splendid in Latium; Octavian borrowed money from it in 31 B.C., and it is frequently mentioned by ancient writers. Its remains are situated a little above the level of the lake, and to the N.E. of it. They consist of a large platform, the back of which is formed by a wall of concrete faced with opus reticulatum, with niches, resting against the cliffs which form the sides of the crater. Excavations in the 17th and the last quarter of the 19th centuries (now covered in again), and also in 1905, led to the discovery of the temple itself, a rectangular edifice, 48 ft. by 42 ft., and of various inscriptions, a rich frieze in gilt bronze, many statuettes (ex-votos) from the favissae of the temple in terra-cotta and bronze, a large number of coins, &c. None of the objects seem to go back beyond the 4th century B.C. A road descended to it from the Via Appia from the S.W., passing through the modern village of Genzano. The lake is drained by a tunnel of about 2 m. long of Roman date. On the W. side of the lake remains of two ships (really floating palaces moored to the shore) have been found, one belonging to the time of Caligula (as is indicated by an inscription on a lead pipe), and measuring 27 ft. long by 8 ft. wide. The finest is decorated with marbles and mosaics, and with some very fine bronze headbands, with heads of wolves and lions having rings for hawisers in their mouths (and one of a Medusa), now in the Museo delle Terme at Rome, with remains of the woodwork, &c., &c. Various attempts have been made to raise the first ship, from the middle of the 15th century onwards, by which much had a villa constructed there, but destroyed again almost at once as the more it did not remain. See F. Barnabei, Notizia degli scavi (1895), 261, 451; (1896), 188; V. Malfatti, Notizia degli scavi (1895), 471; (1896), 393; Risolta marittima (1896), 379; (1897), 293; J. G. Frazer, The Golden Bough (London, 1900); L. Morpurgo in Monumenti dei Lincei, x. (1903), 197-209.

NEMORS, LORDS AND DUKES OF. In the 12th and 13th centuries the lordship of Nemours, in Gâtinais, France, was in possession of the house of Villeboeuf, a member of which, Gautier, was marshal of France in the middle of the 13th century. The lordship was sold to King Philip III. in 1274 and 1276 by Jean and Philippe de Nemours, and was then made a county and given to Jean de Grailly, capitain de Bouch in 1364. In 1404 Charles VI. of France gave it to Charles III. of Evreux, king of Navarre, and erected it into a duchy in the peerage of France (ducé-pairie). Charles III.'s daughter, Beatrix, brought the
duchy to her husband Jacques de Bourbon, count of La Marche, and by the marriage of their daughter, Eleanor, to Bernard of Armagnac, count of Pardiac, passed to the house of Armagnac. After being co-seated and restored several times, the duchy reverted to the French crown in 1505, after the extinction of the house of Armagnac-Pardiac. In 1507 it was given by Louis XII. to his nephew, Gaston de Foix, who was killed at Ravaeni in 1512. The duchy then returned to the royal domain, and was detached from it successively for Giuliano de Medicis and his wife Philiberta of Savoy in 1515, for Louise of Savoy in 1524, and for Philip of Savoy, count of Genevois, in 1528. The descendants of the last-mentioned duke possessed the duchy until its sale to Louis XIV.

In 1572 Louis gave it to his brother Philippe, duke of Orleans, who resided at the court for a few years, and finally presented it to the House of Bourbon. The title of duc de Nemours was afterwards given to Louis Charles, son of King Louis Philippe, who is dealt with separately.

The following are the most noteworthy of the earlier dukes of Nemours.

**JAMES DE ARMAGNAC**

Duke of Nemours (c. 1433-1477), was the son of Bernard d'Armagnac, count of Pardiac, and Eleanor of Bourbon-La Marche. As comte de Castres, he served under Charles VII. in Normandy in 1444 and 1450, and afterwards in Guienne. In 1503, under Louis XI. the king loaded him with honours, married him to his god-daughter, Louise of Anjou, and recognized his title to the duchy of Nemours in 1462. Sent by Louis to pacify Roussillon, Nemours felt that he had been insufficiently rewarded for the rapid success of this expedition, and joined the League of the Public Weal in 1465. He subsequently became reconciled with Louis, but soon resumed his intrigues. After twice pardoning him, the king's patience became exhausted, and he besieged the duke's château of Carlat and took him prisoner. Nemours was treated with the utmost rigour, being shut up in a cage; and was finally condemned to death by the parliament and beheaded on the 4th of August 1477.


**PHILIP DE SAVOY**

Duke of Nemours (1490-1533), was a son of Philip, duke of Savoy, and brother of Louise of Savoy, mother of Francis I. of France. Originally destined for the priesthood, he was given the bishopric of Geneva at the age of five, but resigned it in 1519, when he was made count of Genevois. He served under Louis XII., with whom he was present at the battle of Agnadello (1509), under the Emperor Charles V. in 1520, and finally under his nephew, Francis I. In 1528 Francis gave him the duchy of Nemours and married him to Charlotte of Orléans-Longueville. He died on the 25th of November 1553.

His son, **JAMES** (1531-1588), became duke of Nemours in 1553. He distinguished himself at the sieges of Lens and Metz (1552-1553), at the battle of Kenty (1554) and in the campaign of Parment (1553). He was a supporter of the Guises, and had to retire for some time into Savoy in consequence of a plot. On his return to France he fought the Huguenots, and signalized himself by his successes in Dauphiné and Lyonnais. In 1567 he induced the court to return from Meaux to Paris, took part in the battle of St. Denis, protested against the peace of Longjumeau, and repulsed the invasion of Wolfgang, count palatine of Zweibrücken. He devoted his last years to letters and art, and died at Annecy on the 15th of June 1585.

By his wife Anne of Este, the widow of Francis, duke of Guise, the duke left a son, Charles Emmanuel (1567-1595), who in his youth was called prince of Genevois. Involved in political intrigues by his relationship with the Guises, he was implicated in the assassinations of Henry IV., duke of Navarre, and his brother the cardinal of Lorraine in 1588, but contrived to escape. He fought at Ivry and Arques, and was governor of Paris when it was besieged by Henry IV. After quarrelling with his half-brother Charles of Lorraine, duke of Mayenne, he withdrew to his government of Lyonnais, where he endeavoured to make himself independent. He was imprisoned, however, in the château of Pierre-Encise by the archbishop of Lyons. After his escape he attacked Lyons, but was defeated owing to the intervention of the constable de Montmorency. He died at Annecy in July 1595.
1838 he held the Tailieries long enough to cover the king's retreat, but refrained from initiating active measures against the mob. He followed his sister-in-law, the duchess of Orléans, and her two sons to the chamber of deputies, but was separated from them by the rioters, and only escaped finally by disguising himself in the uniform of a national guard. He embarked for England, where he settled with his parents at Claremont. His chief aim during his exile, especially after his father's death, was a reconciliation between the two branches of the house of Bourbon, as indispensable to the re-establishment of the French monarchy in any form as those wishes were frustrated on the one hand by the attitude of the comte de Chambord, and on the other by the determination of the duchess of Orléans to maintain the pretensions of the count of Paris. Nemours was prepared to go further than the other princes of his family in accepting the principles of the legitimists, but lengthy negotiations ended in 1837 with a letter, written by Nemours, as he subsequently explained, at the dictation of his brother, François, prince de Joinville, in which he insisted that Chambord should express his adherence to the tricolour flag and to the principles of constitutional government. In 1871 the Orleans princes received the Countess of Castiglione, the destinies of France, in the house of the house, but they were not consulted when the count of Chambord came to Paris in 1873, and their political differences remained until his death in 1883.

Nemours had lived at Bushey House after the death of Queen Marie Amélie in 1866. In 1871 the exile imposed on the French princes was withdrawn, but he only transferred his establishment to Paris after their disabilities were also removed. In March 1872 he was restored to his rank in the army as general of division, and placed in the first section of the general staff. After his retirement from the active list he continued to act as president of the Red Cross Society until 1881, when new decrees against the princes of the blood led to his withdrawal from the Parisian society. During the presidency of Marshal MacMahon, he appeared from time to time at the Élysée. He died at Versailles on the 26th of June 1896, the duchess having died at Claremont on the 10th of November 1837. Their children were Louis Philippe Marie Ferdinand Gaston, comte d’Eu (b. 1842), who married Isabella, eldest daughter of Don Pedro II. of Brazil; Ferdinand Philippe Marie, duc d’Arlon (b. 1844), who married Sophie of Bavaria (1847–1897), sister of the empress Elizabeth of Austria; Margaret (1846–1893), who married Prince Ladislas of Czartoryski; and Blanche (b. 1837).

See R. Bazin, _Le Duc de Nemours_ (1907); Paul Thuere-Dangin, _Histoire de la monarchie de jullet_ (4 vols., 1884, &c.).

**NEMOURS**, a town of northern France, in the department of Seine-et-Marne, on the Loing and its canal, 26 m. S. of Melun, on the Paris-Lyon railway, _Pop._ (1906) 4814. The church, which dates mainly from the 16th century, has a handsome wooden spire, and there is a feudal castle. A statue of the mathematician Bésout (d. 1785), a native of the town, was erected in 1885. In the vicinity is a group of fine sandstone rocks, and sand is extensively quarried. Nemours is supposed to derive its name from the woods (nemora) in the midst of which it formerly stood, and discoveries of Gallo-Roman remains indicate its early origin. It was captured by the English in 1420, but derives its historical importance rather from the lordship (afterwards duchy) to which it gave its name. In 1585 a treaty revoking previous concessions to the Protestants was concluded at Nemours between Catherine de Medici and the Guises.

**NENADOVICH, MATeya** (1777–1854), Servian patriot, was born in 1777. He is generally called Prota Mateja, since as a boy of sixteen he was made a priest, and a few years later became archpriest (Prota) of Valyevo. His father, Alexa Nenadovich, Knez (chief magistrate) of the district of Valyevo, was one of the most popular and respected public men among the Servians at the beginning of the 19th century. When the four leaders of the Janissaries of the Belgrade Pashalic (the so-called Dabias) thought that the only way to prevent a general rising of the Servians was to intimidate them by murdering all their principal men, Alexa Nenadovich was one of the first victims. The policy of the Dahis, instead of preventing, did actually and immediately provoke a general insurrection of the Servians against the Turks. Prota Mateja became the deputy-commander of the insurgents of the Valleyvo district (1804), but did not hold the post for long, as Karageorge sent him in 1805 on a secret mission to St Petersburg, and afterwards employed him almost constantly as Servia’s diplomatic envoy to Russia, Austria, Bucharest and Constantinople. After the fall of Karageorge (1813), the new leader of the Servians, Milosh Obrenovich, sent Prota Mateja as representative of Servia to the Congress of Vienna (1814–1815), where he pleaded the Servian cause indefatigably. During that mission he often saw Lord Castlereagh, and for the first time the Servian national interests were brought to the knowledge of British statesmen.

Prota Mateja’s memoirs are the most valuable authority for the history of the first and second Servian insurrections against the Turks. The best edition of the _Memoiri Profe Mateya Nenadovica_ was published by the Servian Literary Association in Belgrade in 1893.

**NENAGH, a market town of Co. Tipperary, Ireland, finely situated in a rich though hilly country near the river Nenagh, 66½ m. S.W. from Dublin by the Ballyhropy and Limerick line. In 1872 it had 5243 inhabitants, and was extensively worked for iron. In the midst of the town was built the Nenagh Round, dating from the time of King John, there still exists the circular donjon or keep. There are no remains of the hospital founded in 1200 for Austin canons, nor of the Franciscan friary, founded in the reign of Henry III. and one of the richest religious houses in Ireland. The town is governed by an urban district council. It was one of the ancient manors of the Butlers, who received for it the grant of a fair from Henry VIII. In 1539 the town and friary were burned by O’Carroll. In 1649 the town was taken by Owen Roe O’Neill, and shortly afterwards it was recaptured by Lord Inchiquin. It surrendered to Ireton in 1651, and was burned by Sarsfield in 1668.

**NENNIUS (fl. 760), a Welsh writer to whom we owe the _Historia Britonum_, lived and wrote in Brecknock or Radnor. His work is known to us through thirty manuscripts; but the earliest of these cannot be dated much earlier than the year 1000; and all are defaced by interpolations which give to the work so confused a character that critics were long disposed to treat it as an unskilful forgery. A new turn was given to the controversy by Heinrich Zimmer, who, in his _Nennius vindicatus_ (1895), took the view that Nennius compiled the _Mirabilia_ manuscripts with the 11th-century translation of the Irish scholar, Gilla Coemgím (d. 1072), succeeding in stripping off the later accretions from the original nucleus of the _Historia_. Zimmer follows previous critics in rejecting the _Prologus maior_ (§§ 1, 2), the _Capitula_, or table of contents, and part of the _Mirabilia_ which form the concluding section. But he proves that Nennius should be regarded as the compiler of the _Historia_ proper (§§ 7–65). Zimmer’s conclusions are of more interest to literary critics than to historians. The only part of the _Historia_ which deserves to be treated as a historical document is the section known as the _Genalogiae Saxonicum_ (§§ 57–65). This is merely a recursion of a work which was composed about 679 by a Briton of Strathclyde. The author’s name is unknown; but he is, after Gildas, our earliest authority for the facts of the English conquest of England. Nennius himself gives us the oldest legends relating to the victories of King Arthur; the value of the _Historia_ from this point of view is admitted by the severest critics. The chief authorities whom Nennius followed were Gildas’ _De excidio Britonum_, Eusebius, _Vita Patricii_ of Murich Macev Machi, _The Collectanea of Tichern_ and _The Liber ascensionis_ (an Irish work on the settlement of Ireland), the _Liber de exaditus mundi_, the chronicle of Prosper of Aquitaine, the _Liber boati Germani_. The sources from which he derived his notices of King Arthur (§ 56) have not been determined.

NEO-CAESAREA, SYNOD OF, NEOPLATONISM

NEO-CAESAREA, SYNOD OF, a synod held shortly after that of Ancyra, probably about 314 or 315 (although Hefele inclines to put it somewhat later). Its principal work was the adoption of fifteen disciplinary canons, which were subsequently accepted as ecumenical by the Council of Chalcedon, 451, and of which the most important are the following: i. degrading priests who marry after ordination; vii. forbidding a priest to be present at the second marriage of any one; viii. refusing ordination to the husband of an adulteress; xi. fixing thirty years as the age below which a presbyter might not be ordained (because Christ bestowed His public ministry at the age of thirty); xiii. according to city priests the precedence over country priests; xiv. permitting Choripiscopi to celebrate the sacraments; xv. requiring that there be seven deacons in every city.


NEOCOMIAN, in geology, the name given to the lowest stage of the Cretaceous system. It was introduced by J. Thurmann in 1835 on account of the development of these rocks at Neuchâtel (Neocomium), Switzerland. It is divided by some into two sub-stages: one, Barremian, or the lower Cretaceous, comprising the barremian rocks in the Wealden beds of southern England; the other, Aptian, or the upper Cretaceous, comprising the Aptian rocks. The Neocomian includes the barremian and aptian sub-stages; Sir A. Geikie (Text Book of Geology, 4th ed., 1903) regards "Neocomian" as synonymous with Lower Cretaceous, and he, like Renvie, closes this portion of the system at the top of the Lower Greensand (Aptian). Other British geologists (A. J. Jukes-Browne, &c.) restrict the Neocomian to the marine beds of Speeton and Tealby, and their estuarine equivalents, the Weald Clay and Hastings Sands (Wealden). Much confusion would be avoided by dropping the term Neocomian entirely and employing instead, for the type area, the subdivision immediately above, the Barremian, or barremian, and below, the Hauterivian, or Hauterive, sub-stage, so that this becomes the more obvious when it is pointed out that the Barremian type is limited to Dauphine; the Valanginian has not a much wider range; and the Hauterivian does not extend north of the Paris basin.

Characteristic fossils of the Barremian are Hoplitus euthymi, H. octocarinus; of the Valanginian, Naica levilhian, Belenmites pestilentialis; of the Hauterivian, Hoplitus radiatus, Crioceras capricornus, Exogyra Couloni and Tectiros complanatus. The marine equivalents of these rocks in England are the lower Speeton Clays of Yorkshire and the Tealby beds of Lincolnshire. The Wealden beds of southern England represent approximately an estuarine phase of deposit of the same age. The Hils clay of Germany and Wealden of Hanover; the limestone and shales of Teschen; the Aptophyes and Pygopses diphyodes marks of Spain, and the Pitchnormian formation of Russia are equivalents of the Neocomian in its narrower sense.

See Cretaceous, WEALDEN, SPEETON BEDS. (J. A. H.)

NEOCRATE, a rank or dignity granted by the Senate under the Roman Empire to certain cities of Asia, which had built temples for the worship of the emperors or had established cults of members of the imperial family. The Greek word νεώτερος meant literally a temple-sweeper (νεώτερος, temple, κοσμεῖν, to adorn), and was hence used both of a temple attendant and of a priestly holder of high rank who was in charge of a temple.

NEOLITHIC, or LATER STONE AGE (Gr. νεώτερος, new, and ἄλθος, stone), a term employed first by Lord Avebury and since generally accepted, for the period of highly finished and polished stone implements, in contrast with the rude workmanship of those of the earlier Stone Age (Paleolithic). Knowledge of Neolithic times is derived principally from four sources, Tumuli or ancient burial-mounds, the Lake-dwellings of Switzerland, the Kitchen-middens of Denmark and the Bone-Caves. No trace of metal is found, except gold, which seems to have been sometimes used for ornaments. Agriculture, pottery, weaving, the domestication of animals, the burying of the dead in dolmens, and the rearing of megalithic monuments are the typical developments of man during this stage.

See ARCHAEOLOGY; also Lord Avebury, Prehistoric Times (1900); Sir John Evans, Ancient Stone Implements of Great Britain (1897); J. F. Prestwich, Geology (1886-1890).

NEOPHYTE (Gr. νεώτερος, from νεώς, new, φυτόν, a plant, "newly planted"), a word used in the Eleusinian and other mysteries to designate the newly initiated, and in the early church applied to newly baptized persons. These usually wore the white garments which they received at their admission to the church (see BAPTISM) for eight days, from Easter eve till the Sunday after Easter (hence called Dominica in albis), but were subject to strict supervision for some time longer and, on the authority of 1 Tim. iii. 6, were generally held ineligible for election as bishops, a rule to which, however, history shows some notable exceptions, as in the cases of St Ambrose at Milan, 374 and Bishop Nectarius of Cyrene at Ptolemais in 409, who were chosen bishops before they were even baptized. By the council of Nicaea (325) this rule was extended to the priesthood. The ancient discipline is still maintained in the Roman Church, and applies to converts from Christian sects as well as to those from heathenism. The period, however, is determined by circumstances. The term "neophyte" is also sometimes applied in the Roman Church to newly ordained priests, and even—though rarely—to novices of a religious order. In a transferred sense the word is also given to one beginning to learn any new subject.

See Bergier, Dict. de théologie, s. v.; Martigny, Dict. des antiquités, pp. 433-435; Siegel, Christliche Alterthümer, ii. 17 seqq.; Riddle, Christi. Antiquitates, pp. 313, 522; Walcott, Sacred Archaeology, s. v.

NEOPLATONISM, the name given specially to the last school of pagan philosophy, which grew up mainly among the Greeks of Alexandria from the 3rd century onwards. The term has also been applied to the Italian humanists of the Renaissance, and in modern times, somewhat vaguely, to thinkers who have based their speculations on the Platonic metaphysics or on Plotinus, and incorporated with it a tendency towards a mystical explanation of ultimate Systems of Cyrene at Ptolemais in 409.

Historical Position and Significance.—The political history of the ancient world ends with the formation, under Diocletian and Constantine, of a universal state bearing the name of the East as well as the Roman civilization. The history of ancient philosophy ends in like manner with a universal philosophy which assimilated elements of almost all the earlier systems, and worked up the results of Eastern and Western culture. Just as the Later Roman empire was at once the supreme effort of the old world and the outcome of its exhaustion, so Neoplatonism is in one aspect the consummation, in another the collapse, of ancient philosophy. Never before in Greek or in Roman speculation had the consciousness of man's dignity and superiority to nature found such adequate expression; never before had real science and pure knowledge been so undervalued and despised by the leaders of culture as they were by the Neoplatonists. Judged from the standpoint of empirical science, philosophy passed its meridian in Plato and Aristotle, declined in the post-Aristotelian systems, and set in the darkness of Neoplatonism. But, from the religious and moral point of view, it must be admitted that the ethical "mood" which Neoplatonism endeavored to create and maintain is the highest and purest ever reached by antiquity.

It is a proof of the strength of the moral instincts of mankind that the only phase of culture which we can survey in all its stages from beginning to end culminated not in materialism, but in the boldest idealism. This idealism, however, is also in its way a mark of intellectual bankruptcy. Contempt for reason and science leads in the end to barbarism—its necessary consequence being the rudest superstition. As a matter of fact, barbarism did break out after the flower had fallen from Neoplatonism. The philosophers themselves, no doubt, still lived
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on the knowledge they repudiated; but the masses were trained to a superstition with which the Christian church, as the executor of Neoplatonism, had to reckon and contend. By a fortunate coincidence, at the very moment when this bankruptcy of the old culture must have become apparent, the stage of history was occupied by barbaric peoples. This has obscured the fact that the inner history of antiquity, ending as it did in despair of this world, must in any event have seen a recurrence of barbarism. The present world was a thing that men would neither enjoy nor master nor study. A new world was discovered, for the sake of which all previous was discarded. First, it stands in the line of post-Aristotelian systems; it is, in fact, as a subjective philosophy, their logical completion. Secondly, it is founded on scepticism; for it has neither interest in, nor reliance upon, empirical knowledge. Thirdly, it can justly claim the honour of Plato’s name, since it expressly goes back to him for its metaphysics, directly combating those of the Stoics. Yet even on this point it learned something from the Stoics; the Neoplatonic conception of the action of the Deity on the world and of the essence and origin of matter can only be explained by reference to the dynamic pantheism of the Stoics. Fourthly, the study of Aristotle also exercised an influence on Neoplatonism. This appears not only in its philosophical method, but also—though less prominently—in its metaphysics. And, fifthly, Neoplatonism adopted the ethics of Stoicism; although it was found necessary to supplement them by a still higher conception of the functions of the spirit.

Thus, with the exception of Epicureanism—which was always treated by Neoplatonism as its mortal enemy—there is no outstanding earlier system which did not contribute something to the new philosophy. And yet Neoplatonism cannot be described as an eclectic system, in the ordinary sense of the word. First, in the first place, it is dominated by one all-pervading interest—the religious; and in the second place, it introduced a new first principle into philosophy, viz. the supra-rational, that which lies beyond reason and beyond reality. This principle is not to be identified with the “idea” of Plato or with the “form” of Aristotle. Neoplatonism perceived that neither sense perception nor rational cognition is a sufficient basis or justification for religious ethics; consequently it broke away from rationalistic ethics as decidedly as from utilitarian morality. It had therefore to find out a new world and a new spiritual function, in order first to establish the existence of what it desiderated, and then to realize and describe what it had proved to exist. Man, however, cannot transcend his psychological endowment. If he will not allow his thought to be determined by experience, he falls a victim to his imagination. In other words, thought, which will not stop, takes to mythology; and in the place of reason we have superstition. Still, as we cannot allow every fancy of the subjective reason to assert itself, we require some new and potent principle to keep the imagination within bounds. This is found

in the authority of a sound tradition. Such authority must be superhuman, otherwise it can have no claim on our respect; it must, therefore, be divine. The highest sphere of knowledge—the supra-rational—as well as the very possibility of knowledge, must depend on divine communications—that is, on revelations. In short, philosophy as represented by Neoplatonism, its sole interest being a religious interest, and its highest object the supra-rational, must be a philosophy of revelation.

This is not a prominent feature in Plotinus or his immediate disciples, who still exhibit full confidence in the subjective pre
ing of the essences of their philosophy. But the later adherents of the school did not possess that confidence; they based their philosophy on revelations of the Deity, and they found these in the religious traditions and rites of all nations. The Stoics had taught them to overslip the political boundaries of states and nationalities, and rise from the Hellenic to a universal human consciousness. Through all history the spirit of God has breathed; everywhere we discover the traces of His revelation. The older any religious tradition or mode of worship is, the more venerable is it, the richer in divine ideas. Hence the ancient religions of the East had a peculiar interest for the Neoplatonist. In the inter
there of the Stoic myths Neoplatonism found its vehicle, as practised especially by the Stoic philosophers. They interpreted the myths and were done with them; the later Neoplatonists treated them as the proper material and the secure foundation of philosophy. Neoplatonism claimed to be not merely the absolute philosophy, the keystone of all previous systems, but also the absolute religion, reinvigorating and transforming all previous religions. It contemplated a restoration of all the religions of antiquity, by allowing each to retain its traditional forms, and at the same time making each a vehicle for the religious attitude and the religious truth embraced in Neoplatonism; while every form of ritual was to become a stepping-stone to a high morality worthy of mankind. In short, Neoplatonism seizes on the aspiration of the human soul after a higher life, and treats this psychological fact as the key to the interpretation of the universe. Hence the existing religions, after being refined and spiritualized, were made the basis of philosophy.

Neoplatonism thus represents a stage in the history of religion; indeed it is precisely when its historical importance lies in the progress of science and enlightenment it has no positive significance, except as a necessary transition which the race had to make in order to get rid of nature-religion, and that under
valuing of the spiritual life which formed an insuperable obstacle to the advance of human knowledge. Neoplatonism, however, failed as signally in its religious enterprise as it did in its philo
sophical. While seeking to perfect ancient philosophy, it really extinguished it; and in like manner its attempted reconstruction of ancient religions only resulted in their destruction. For in requiring these religions to impart certain prescribed religious truths, and to inculcate the highest moral tone, it burdened them with problems to which they were unequal. And further, by inviting them to loosen, though not exactly to dissolve, their political allegiance—the very thing that gave them stability—it removed the foundation on which they rested. But might it not then have placed them on a broader and firmer foundation? Was not the universal empire of Rome ready at hand, and might not the new religion have stood to it in the same relation of dependence which the earlier religions had held to the smaller nations and states? This was no longer possible. It is true that the political and spiritual histories of the peoples on the Mediter
ranian run in parallel lines, the one leading up to the universal monarchy of Rome, the other leading up to monotheism and universal human morality. But the spiritual development had shot far ahead of the political; even the Stoic occupied a height far beyond the reach of anything in the political sphere. It is also true that Neoplatonism sought to come to an understanding

1 Porphyry wrote a book, περὶ τῆς ἐκ λαὸς ψεύδων, but this was before he became a pupil of Plotinus; as a philosopher he was independent of the λόγον.
with the Byzantine Roman empire; Julian perished in the pursuit of this project. But even before his day the shrewder Neoplatonists had seen that their lofty religious philosophy could not stoop to an alliance with the despotic world-empire, because it could not come in contact with the world at all. To Neoplatonism political affairs are at bottom as indifferent as all other earthly things. The idealism of the new philosophy was too heavenly to be naturalized in the Byzantine empire, which stood more in need of police officials than of philosophers. Important and instructive, therefore, as are the attempts made from time to time by the state and by individual philosophers to unite Neoplatonism and the universal monarchy, their failure was a foregone conclusion.

There is one other question which we are called upon to raise here. Why did not Neoplatonism set up an independent religious community? Why did it not provide for its mixed multitude of divinities by founding a universal church, in which all the gods of all nations might be worshipped along with the one ineffable Deity? The answer to this question involves the answer to another—Why was Neoplatonism defeated by Christianity? Three essentials of a permanent religious foundation were wanting in Neoplatonism; they were an external cult, a visible religion, and a regular system of morals. First, and chiefly, it lacked a religious founder; second, it could not tell how the state of inward peace and blessedness could become permanent; third, it had no means to win those who were not endowed with the speculative faculty. The philosophical discipline which it recommended for the attainment of the highest good was beyond the reach of the masses; and the way by which the masses could attain the highest good was a secret unknown to Neoplatonism. Thus it remained a school for the "wise and prudent"; and when Julian tried to enlist the sympathies of the common rude man for the doctrines and worship of this school, he was met with scorn and ridicule.

It is not as a philosophy, then, nor as a new religion, that Neoplatonism became a decisive factor in history, but, if one may use the expression, as a "mood." The instinctive certainty that there is a supreme good, lying beyond empirical experience, and yet not an intellectual good—this feeling, and the accompanying conviction of the utter vanity of all earthly things, were produced and sustained by Neoplatonism. Only it could not describe the nature of this highest good; and therefore it had to abandon itself to imaginative and aesthetic impressions. It changed thought into an emotional dream; it plunged into the ocean of sentiment; it treated the old world of fable as the reflection of a higher reality, and transformed reality into poetry; and after all these expedients, to borrow a phrase of Augustine's, it only saw afar off the land of its desire.

Yet the influence of Neoplatonism on the history of our ethical culture is immeasurable, above all because it begot the consciousness that the only blessedness which can satisfy the heart must be sought higher even than the sphere of reason. That man shall not live by bread alone, the world had learned before Neoplatonism; but Neoplatonism enforced the deeper truth—a truth which the older philosophy had missed—that man shall not live by knowledge alone. And, besides the prodigious importance which thus belongs to it, another fact has to be taken into account in estimating the influence of Neoplatonism. It is to this day the nursery of that whole type of devotion which affects renunciation of the world, which strives after an ideal, without the strength to rise above aesthetic impressions, and is never able to form a clear conception of the object of its own aspiration.

Origin.—As forerunners of Neoplatonism we may regard, on the one hand, those Stoics who accepted the Platonic distinction between the sensible world and the intelligible, and, on the other hand, the so-called Neopythagoreans and religious philosophers like Plutarch of Chaeronea and especially Numerius of Apamea. But these cannot be considered the actual progenitors of Neoplatonism; their philosophic method is quite elementary as compared with the Neoplatonic, their fundamental principles are uncertain, and unbounded deference is still paid to the authority of Plato. The Jewish and Christian thinkers of the first two centuries approach considerably nearer than Numenius to the later Neoplatonism.1 Here we have Philo, to begin with. Philo, who translated the Old Testament religion into the terms of Hellenic thought, holds as an inference from his theory of revelation that the divine Supreme Being is "superrational," that he can be reached only through "ecstasy," and that the oracles of God supply the material of moral and religious knowledge. The religious ethics of Philo—a compound of Stoic, Platonic and Neopythagorean elements—already showed the peculiar character of the later Neoplatonism. While the system assigns the supremacy to God, it is possible over the national religion of Israel, it exacts from the former, as a sort of tribute to the latter, the recognition of the elevation of God above the province of reason. The claim of positive religion to be something more than the intellectual apprehension of the reason in the universe is thus acknowledged. Religious syncretism is also a feature of Philo's system, but it differs essentially from what we find in later Neoplatonism. For Philo pays no respect to any cultus except the Jewish; and he builds the method of reconciliation of the Gnostics in thinking out the

1 The resemblance would probably be still more apparent if we thoroughly understood the development of Christianity at Alexandria in the 2nd century; but unfortunately we have only very meagre fragments to guide us here.
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The original Being first of all throws out the Nous, which is a perfect image of the One and the archetype of all existing things. It is at the same time the ground of all existence, the source of all being or generation. This Nous is the perfect image of the One and is from all time, for the Nous is the limit of the mode or the perfect image of the One. Thus in Nous we have the beginning of the sensible world and the supreme intelligible Being. All that is and all that is possible is derived from them.

An acquaintance with Judaism and Christianity. But if we search Plotinus for evidence of any actual influence of Jewish and Christian philosophy, we search in vain; and the existence of any such influence is the more unlikely because it is the only later Neoplatonism that offers striking and deep-rooted parallels of the early Christian and Jewish philosophies. Plotinus's Neoplatonic philosophies thus appear to be merely an historical anticipation of the Neoplatonic, without any real connexion. Nor is there anything mysterious in such an anticipation. It simply means that a certain religious and philosophical tendency, which grew up slowly on Greek soil, was already implanted in those who occupied the vantage-ground of a revealed religion of redemption. We have to come down to Iamblichus and his school before we find complete correspondence with the Christian Gnosticism of the 2nd century; that is to say, it is only in the 4th century that Greek philosophy in its further development reaches the stage at which certain Greek philosophers who had embraced Christianity had arrived in the 2nd century. The influence of Christianity—whether Gnostic or Catholic—on Neoplatonism was at no time very considerable, although individual Neoplatonists, after Amelius, used Christian texts as oracles, and put on record their admiration for Christ.

HISTORY AND DOCTRINES. — The founder of the Neoplatonic school in Alexandria is supposed to have been Ammonius Saccas (q.v.). But the Enneads of his pupil Plotinus are the primary and classical document of Neoplatonism. The doctrine of Plotinus is most accurately and liked mysticism its self-contented, and its ramification is divided into two main divisions. The first or theoretical part deals with the high origin of the human soul, and shows how it has departed from its first estate. In the second or practical part the way is pointed out by which the soul may again return to the Eternal and Supreme. Since the soul in its longings reaches back beyond all sensible things, beyond the world of ideas even, it follows that the highest being must be something supra-rational. The system thus embraces three heads—(1) the primeval Being, (2) the ideal world and the soul, (3) the phenomenal world. We may also, however, in accordance with the views of Plotinus, divide thus: (A) the invisible world—(1) the primeval Being, (2) the ideal world, (3) the soul; (B) the phenomenal world.

The primeval Being is, as opposed to the many, the One; as opposed to the finite, the Infinite, the unlimited. It is the source of all life, and therefore absolute causality and the only real existence. It is, moreover, the Good, in so far as all finite things have their purpose in it, and ought to flow back to it. But one cannot attach moral attributes to the original Being itself, any more than to a single point of the infinite. It has an active quality of any kind; it is being without magnitude, without life, without thought; in strict propriety, indeed, we ought not to speak of it as existing; it is "above existence," "above goodness." It is also active force without a substratum; as active force the primeval Being is perpetually producing something else, without alteration, or motion, or diminution of itself. This production is not a physical process, but an emission of force; and, since the product has real existence only in virtue of the original existence working in it, Neoplatonism may be described as a species of dynamic pantheism, either directly or indirectly, equivalence being reached by the "One." In its broadest sense it is as far as they have being, are divine, and God is all in all. Derived existence, however, is not like the original Being itself, but is subject to a law of diminishing completeness. It is indeed an image and reflection of the first Being; but the further the line of successive projections is prolonged the smaller is its share in the true existence. The totality of being may thus be conceived as a series of concentric circles, fading away towards the verge of non-existence, the force of the original Being in the outermost circle being a vanishing quantity. Each lower stage of being is united with the "One" by all the higher stages, and receives its share of reality only by transmission through them. All derived existence, however, has a drift towards, a longing for, the higher, and bends towards it so far as its nature will permit.

The image and product of the motionless nous is the soul, which, according to Plotinus is, like the nous, immaterial. Its relation to the Nous follows from the same hypothesis, and the same kind of relationship. The Nous is the immediate sphere between the nous and the phenomenal world, is permeated and illuminated by the former, but is also in contact with the latter. When they would harmonize, individuation is at an end and remain in the nous, but at the same time it has the power of uniting with the corporeal world and thus being disintegrated. It therefore occupies an intermediate position. As a single soul (world-soul) it represents that universe or harmony of the Nous, which is also embraces innumerable individual souls; and these can either submit to be ruled by the nous, or turn aside to the sensual and lose themselves in the finite.

Then the soul, a moving essence, generates the corporeal or phenomenal world. This world ought to be so pervaded by the soul that its various parts should remain in perfect harmony. Plotinus is no more a Christian Gnostic; he admires the beauty and splendour of the world. So long as idea governs matter, or the soul governs the body, the world is fair and good. It is an image—though a shadowy image—of the upper world, and the degrees of being are placed in a horse in its harmonious development. But in the actual phenomenal world unity and harmony are replaced by strife and discord; the result is a conflict, a becoming and vanishing, an illusive existence. And the reason for this state of things is the presence of the body: the body is the soul's wedge against the fabric of the universe; the Nous is the basework of each (ro Blyra krdwv q 6ba); it is the dark principle, the indeterminate, that which has no qualities, the μη δο. Destitute of form in itself, it is formless, and is matter. The human souls which have descended into corporeality are those which have allowed themselves to be ensnared by sensuality and overpowered by lust. They now seek to cut themselves loose from their true being; and, striving after independence, they assume a false existence. They must turn back from this; and, since they have not lost their freedom, a conversion is still possible.

Here, then, we enter upon the practical philosophy. Along the same line of thought, and which is the same road back to the supreme Good. It must first of all return to itself. This is accomplished by the practice of virtue, which aims at likeness to God, and leads up to God. In the ethics of Plotinus all the several schemes of virtue are taken over and arranged in a graduated series. The lowest stage is that of the civil virtues, then follow the purifying, and last of all the divine virtues. The civil virtues merely adorn the life, without elevating the soul. That is the office of the pure and divine virtues, by which the soul is freed from sensuality and led back to itself, and thence to the Nous. By means of ascetic observances the man is made conscious of his inward, spiritual nature.

But there is still a higher attainment: it is not enough to be "God." This is reached through contemplation of the primeval Being, the One—in other words, through an endless reminder of the One. But the Oneness reaches only to the nous, and is itself a kind of motion. It is only in a state of perfect passivity and repose that the soul can recognize and touch the primeval Being. Hence the soul must first pass through the spiritual stage, and become the Niagara from which the corporeal things in their multiplicity and harmony, it then reverts upon itself and withdraws into the depths of its own being, rising thence to the nous, the world of ideas. But even there it does not find the Highest, the One; it still hears a voice saying, "not we have made ourselves." The last stage is reached when, in the highest tension and concentration, beholding in silence and utter forgetfulness of all things, it is able as it were to lose itself. Then it may see God, the fountain of life, the source of being, the origin of all good, the root of the soul. In that moment it enjoys the highest indescribable bliss: it is as it were swallowed up of divinity, bathed in the light of eternity.

Such is the religious philosophy of Plotinus, and for himself personally it sufficed, without the aid of the popular religion or worship. Nevertheless he sought for points of support in these. God is certainly in the truest sense nothing but the primeval Being; but He reveals Himself in a variety of names and attributes. The idea of God is manifested in the idea of the μονοτρόπον, the μαντηρατον, which are wrapped up in it are gods, the stars are gods, and so on. A rigid monotheism appeared to Plotinus a miserable conception. He gave a meaning to the myths of the popular religions, and he had something to say even for magic, sooth-saying and prayer. In support of image-worship he advanced

1 Porphyry tells us that on four occasions during the six years of their intercourse Plotinus attained to this ecstatic union with God.
arguments which were afterwards adopted by the Christian image-worshippers. Still, as compared with the later Neoplatonists, he is comparatively free from crass superstition and wild fanaticism. He is not to be classed amongst the "deceived deceivers," and the restoration of the worship of the old gods was by no means his chief object.

Amongst his pupils, Ameliaus and Porphyry are the most eminent. Under the direction of the teaching of Plotinus on certain points; and he also put some value on the prologue to the Gospel of John. To Porphyry (q.v.) belongs the credit of having recast and popularized the system of his master Plotinus. He was not an original thinker, but a diligent student, distinguished by great learning, by a turn for historical and philosophical criticism, and by an earnest purpose to uphold false teaching—especially Christianity, to enable men and train them to goodness. The system of Porphyry is more emphatically practical and religious than that of Plotinus. The object of philosophy, according to Porphyry, is the salvation of the soul. The origin and the blame of evil are not in the body, but in the desires of the soul. Hence the strictest asceticism (abstinence from flesh, and wine, and sexual intercourse) is demanded, as well as the knowledge of God. As he advanced in life, Porphyry protested more and more earnestly against the rude faith of the common people and their immoral worship. But, outspoken as he was in his criticism of the popular religions, he had no wish to give them up. He stood up for a pure worship of the many gods, and maintained the cause of every old national religion and the ceremonial duties of its worship. Against the Christians was directed, not against Christ, nor even against what he believed to be Christ's teaching, but against the Christians of his own day and their sacred books, which, according to Porphyry, were the works of deceivers and ignorant people. In his trenchant criticism of the origin of what passed for Christianity in his time, he spoke bitter and severe truths, which have gained for him the reputation of the most rabid and wicked of all the enemies of Christianity. His work was destroyed, but the copious extracts which we find in Lactantius, Augustine, Jerome, Macarius Magnus and others show how profoundly he had studied the Christian writings, and how great was his talent for real historical research.

Porphyry marks the transition to a new phase of Neoplatonism, in which it becomes completely subservient to polytheism, and seeks before everything else to protect the Greek and Oriental religions from the formidable assault of Christianity. In the hands of Iamblichus (q.v.), the pupil of Porphyry, Neoplatonism is changed "from a philosophical theory to a theological doctrine." The distinctive tenets of Iamblichus cannot be accounted for from scientific but only from religious considerations. In order to justify superstition and the ancient forms of worship, philosophy becomes in his hands a theurgy, a knowledge of mysteries, a sort of spiritualism.

To this period also belongs a set of "philosophers," with regard to whom it is impossible to say whether they are dupes or impostors—the "decepti deceptores" of whom Augustine speaks. In this philosophy the mystical properties of numbers are a leading feature; absurd and mechanical notions are glossed over with the sheen of sacramental mystery; myths are explained by pious fancies and fine-sounding pietistic reflections; miracles, even of the most abominable sort, are belied in, and miracles are wrought. The "philosopher" has become a priest of magic and philosophy a method of incantation. Moreover, in the unbridled exercise of speculation, the number of divine beings was increased indefinitely; and these fantastic accessions to Olympus in the system of Iamblichus show that Greek philosophy is returning to mythology, and that nature-religion is still a power in the world. And yet it is undeniable that the very noblest and choicest minds of the 4th century are to be found in the ranks of the Neoplatonists. So great was the general decline that this Neoplatonistic philosophy offered a welcome shelter to many earnest and influential men, in spite of the charlatans and hypocrites who were gathered under the same roof. On certain points of doctrine, too, the dogmatic of Iamblichus indicates a real advance. Thus his emphatic assertion of the truth that the seat of evil is in the will is noteworthy; and so also is his repudiation of Plotinus's theory of the divinity of the soul.

The numerous followers of Iamblichus—Aedesius, Chrysanthus, Eusebius, Priscus, Sopater, Sallust, and, most famous of all, Maximus (q.v.), rendered little service to speculation. Some of them (Themistius in particular) are known as commentators on the older philosophers, and others as the missionaries of mysticism. The work De mysteriis Aegyptiorum is the best sample of the views and aims of these philosophers. Their hopes rose high when Julian ascended the imperial throne (361—363). But the emperor himself lived long enough to see that his romantic policy of restoration was to leave no results; and after his early death all hope of extinguishing Christianity was abandoned.

But undoubtedly the victory of Christianity in the age of Valentinian and Theodosius had a purifying influence on Neoplatonism. During the struggle for supremacy, the philosophers had been driven to make common cause with everything that was hostile to Christianity. But now Neoplatonism was thrust from the great stage of history. The church and church theology, to whose guidance the masses now surrendered themselves, took in along with them their superstition, their polytheism, their magic, their myths, their systems of philosophy, and their machinery. The church made all this settled and established itself—certainly not without opposition—in the church the purer did Neoplatonism become. While maintaining intact its religious attitude and its theory of knowledge, it returned with new zest to scientific studies, especially the study of the old philosophers. If Plato still remains the divine philosopher, yet we can perceive that after the year 400 the writings of Aristotle are increasingly read and valued. In the chief cities of the empire Neoplatonic schools flourished till the beginning of the 5th century; during this period, indeed, they were the training-schools of Christian theologians. At Alexandria the noble Hypatia (q.v.) taught, to whose memory her impassioned disciple Synesius, afterwards a bishop, reared a splendid monument. But after the beginning of the 5th century the fanaticism of the church could no longer endure the presence of "heathenism." The murder of Hypatia was the death of philosophy in Alexandria, although the school there maintained a lingering existence till the middle of the 6th century. But there was one city of the East which, lying apart from the crowded highways of the world, had sunk to a mere provincial town, and yet possessed associations which the church of the 5th century felt itself powerless to eradicate. In Athens a Neoplatonic school still flourished. There, under the monuments of its glorious past, Hellenism found its last retreat. The school of Athens returned to a stricter philosophical method and the cultivation of scholarship. Still holding by a religious philosophy, it undertook to reduce the whole Greek tradition, as seen in the light of Plotinus, to a comprehensive and closely knit system. Hence the philosophy which arose at Athens was what may fairly be termed scholasticism. For every philosophy is scholastic whose subject-matter is imaginative and mystical, and which has itself powerless to eradicate. In Athens a Neoplatonic school still flourished. Out of these they drew the material of their philosophy, which they then proceeded to elaborate with the appliances of dialectic.

The most distinguished teachers at Athens were Plutarch (q.v.), his disciple Syrusian (who did important work as a commentator on Plato and Aristotle, and who deserves more mention for his vigorous defence of the freedom of the will), but above all Proclus (411—485). Proclus is the great schoolman of Neoplatonism. It was he who, combining religious
ardour with formal acuteness, connected the whole mass of traditional lore into a huge system, making good defects, and smoothing away contradictions by means of distinctions and speculations. "It was reserved for Proclus," says Zeller, "to bring the Neoplatonic philosophy to its formal conclusion by the rigorous consistency of his dialectic, and, keeping in view all the modifications which it had undergone in the course of two centuries, to give it that form in which it was transferred to Christianity and Mahometanism in the middle ages." Forty years after the death of Proclus the school of Alexandria (q.v.) had already fulfilled its mission in the work of Proclus. The works of Proclus, as the last testament of Hellenism to the church and the middle ages, exerted an inculcative influence on the next thousand years. They not only formed one of the bridges by which the medieval thinkers got back to Plato and Aristotle; they determined the scientific method of thirty generations, and they partly created and partly nourished the Christian mysticism of the middle ages.

The disciples of Proclus are not eminent (Marinus, Asclepiodotus, Ammonius, Zenodotus, Isidorus, Hegias, Damascius), the highest of them was Damascius (q.v.). When Justinian issued the edict for the suppression of the school, Damascius along with Simplicius (the painstaking commentator on Aristotle) and five other Neoplatonists set out to make a home in Persia. They found the conditions were unfavourable and were allowed to return (see CHOSROES I.).

At the beginning of the 6th century Neoplatonism had ceased to exist in the East as an independent philosophy. Almost at the same time, however—and the coincidence is not accidental—it made new conquests in the church theology through the writings of the pseudo-Dionysius. It began to bear fruit in Christian mysticism, and diffuse a new magical leaven through the worship of the church.

In the West, where philosophical efforts of any kind had been very rare since the 2nd century, and where mystical contemplation did not meet with the necessary conditions, Neoplatonism found a congenial soil only in isolated individuals. C. Marius Victorinus (q.v.) translated certain works of Plotinus, and thus had a decisive influence on the spiritual history of Augustine (Confess. vii. 9, viii. 2). It may be said that Neoplatonism influenced the West only through the medium of the church; for the most part it was a system of expounding, and disputing, Neoplatonism. So Boethius (it may now be considered certain) was a Catholic Christian, although his whole mode of thought was certainly Neoplatonic (see BOETHIUS). His violent death in the year 525 marks the end of independent philosophy in the West. But indeed this last of the Roman philosophers stood quite alone in his century, and the philosophy for which he lived was neither original, nor well-grounded, nor methodically developed.

**Neoplatonism and the Theology of the Church.**—The question as to the influence of Neoplatonism on the development of Christianity is not easily answered, because it is scarcely possible to get a complete view of their mutual relations. The answer will depend, in the first instance, upon how much is included under the term "Neoplatonism." If Neoplatonism is understood in the widest sense, as the highest and finest expression of the religious movements in the Graeco-Roman empire from the 2nd to the 5th century, then it may be regarded as the twin-sister of the church dogmatism, which grew up during the same period; the younger sister was brought up by the elder, then rebelled against her and at last transfigured over her. The Neoplatonists themselves characterized the theologians of the church as intruders, who had appropriated the Greek philosophy and spoiled it by the admixture of strange fables. Thus Porphyry says of Origen (Euseb. H.E. vi. 19), "The outer life of Origen was that of a Christian and contrary to law; but, as far as his views of things and of God are concerned, he thought like the Neoplatonists; he regarded the soul as immortal, and the body as accidental. This verdict of Porphyry's is at all events more just and apt than that of the theologians on the Greek philosophers, when they accused them of having borrowed all their really valuable doctrines from the ancients, and then adding to them so little that the relationship was acknowledged on both sides. Now, in so far as both Neoplatonism and the church dogmatism set out from the felt need of redemption, in so far as both sought to deliver the soul from sensuality and recognized man's inability without divine aid—without a revelation—to attain salvation and a sure knowledge of the truth, they are at once most intimately related and at the same time mutually independent. It must be confessed that when Christianity began to project a theology it was already deeply impregnated by Hellenic influences. But the influence is to be traced not so much to basic Neoplatonism as to the whole set of conditions under which spiritual life was manifested. When Neoplatonism appeared, the Christian church had already laid down enough of a Christian position to make it possible for them out of Neoplatonism—those are not a mere accident—but still independently. It was only by identifying itself with the whole history of Greek philosophy, or by figuring as pure Platonism restrained, that Neoplatonism may be regarded as a development of Alexandria—a plagiarism from itself. These assumptions, however, were fanciful. Although our sources are unfortunately very imperfect, the theology of the church does not appear to have learned much from Neoplatonism; the vein of dogmatism is almost purely Oriental. The latter had not yet reached the form in which its doctrines could be accepted by the church dogmatism, and partly because theology was in the same way a question of faith, partly because it settled firmly on its own territory, to make good her position and clear away old and objectionable opinions. Origen was quite as independent a thinker as Plotinus; only, they both drew on the same tradition. From the 4th century downwards, however, the influence of Neoplatonism on the Oriental theologians was of the utmost importance. The church gradually expressed her most peculiar conceptions, which were formulated by philosophical means, but were irreconcilable with Neoplatonism (the Christological dogmas); and the further this process went the more unrestrainedly did theologians resign themselves to the influence of Neoplatonism on their doctrine. The question is, the doctrinal and the political. The function of the incarnation, the reconstruction of the flesh and the creation of the world in time marked the boundary line between the church's dogmatic and Neoplatonism; in every other respect, theologians and Neoplatonists drew so closely together that many of their most complicated and at first sight so strange considerations are, in reality, almost the same. It is easy to see that the doctrines attributed to Neoplatonism by the church were the conclusions of St. Augustine. If we con- sider the historical position of Neoplatonism finally for some time, we may often discover whether the writer is a Christian or a Neoplatonist. In ethical precepts, in directions for right living (that is, asceticism), the two systems appear more and more closely. But it was here that Neoplatonism finally achieved its greatest triumph. It indoctrinated the church with all its mysticism, its mystic exercises and even its magical cultus as taught by Iamblichus. The works of the pseudo-Dionysius are therefore in part the writings of Iamblichus and Proclus, the church's theology is turned into a scholastic mysticism with directions on matters of practice and ritual. And as these writings were attributed to Dionysius, the disciple of the apostles, the scholastic mysticism which they unfolded was regarded as an apostolic, not to say a divine, science. The influence exercised by these writings, first on the East, and then on the West (or 12th century)—on the West, cannot be overestimated. It is impossible to enlarge upon it here; suffice it to say that the mystical and pietistic devotion of our own day, even in the Protestant churches, is nourished and fed through these works by a series of intermediate links, to the writings of the pseudo-Areopagit.

In the ancient world there was only one Western theologian who came under the influence of the writings of Augustine, the most important of them all. It was through Neoplatonism that Augustine got rid of scepticism and the last dogma, Manichaeism. In the seventh book of his Confessions he has recorded how much he owed to the perusal of Neoplatonic works. On all the cardinal doctrines—God, matter, the relation of God to the world, freedom and evil—Augustine retained the impress of Neoplatonism; at the same time he is the theologian of antiquity who most clearly perceived and most fully stated wherein Neoplatonism and Christianity differ. The best ever written by any church father on this subject is to be found in chaps. xx-xxvi. of the seventh book of the Confessions.

Why Neoplatonism succumbed in the conflict with Christianity is a question which the historians have never satisfactorily answered. As a rule, the problem is not even stated correctly. We have nothing to do with the question of whether it is right to substitute the symbols of grace and justice in the place of the Neoplatonic the doctrine, and what share must be assigned to the organization of the church.

In medieval theology and philosophy mysticism appears as the powerful opponent of rationalistic dogmatism. The empirical science of the Renaissance and the two following centuries was itself a new development of Platonism and Neoplatonism, as opposed to rationalistic and dogmatic rationalism. But astrology and alchemy—all this outgrowth of Neoplatonism—gave the first effective stimulus to the observation of nature, and consequently to natural science, and consequently to finally extinguished barren
rationalism. Thus in the history of science Neoplatonism has played a part and rendered services of which Plotinus or Iamblichus or Proclus never dreamed. So true is it that sober history is often stranger and more capricious than all the marvels of legend and romance.


NEOPLEOMUS (also called PYRHRUS), in Greek legend, the son of Achilles and Deidamia. He was brought up by his grandfather Lycomedes in the island of Scyros, and taken to Troy in the last year of the war by Odyssey, since Helenus had declared that the city could not be captured without the aid of a descendant of Aeneus. Neopolus was famed for his beauty, eloquence and bravery. He was one of the warriors in the wooden horse and slew Priam at the sack of Troy (Odyssey, xi. 508-526; Aeneid, ii. 527). Apart from these Trojan tales, Neopolus is a prominent figure in the legends of Euphras and of Delphi. He was the ancestor of the Molossian kings, who therefore claimed to be of pure Hellenic stock. He was murdered at Delphi, where he was buried, and a festival was held in his honour every eighth year.

NEOPYTHAGOREANISM, a Graeco-Alexandrian school of philosophy, which became prominent in the 1st century A.D. Very little is known about the members of this school, and there has been much discussion as to whether the Pythagorean literature which was widely published at the time in Alexandria was the original work of 1st-century writers or merely reproductions of and commentaries on the older Pythagorean writings. The only well-known members of the school were Apollonius of Tyana and Moderatus of Gades. In the previous century Cicero's learned friend P. Nigidius Figulus (d. 45 B.C.) had made an attempt to revive Pythagorean doctrines, but he cannot be described as a member of the school. Further, it is necessary to distinguish from the Neopythagoreans a number of Eclectic Platonists, who, during the 1st century of our era, maintained views which had a similar tendency (e.g. Apuleius of Madaura, Plutarch of Chaeronea and, later, Numenius of Apamea).

Neopythagoreanism was the first product of an age in which abstract philosophy had begun to pall. The Stoics discovered that their "perfect man" was not to be found in the luxurious, often morbid society of the Graeco-Roman world; that some kind of theosophic and dialectic ethics was needed to reawaken a sense of responsibility. A degenerate society cared nothing for syllogisms grown threadbare by repetition. Neopythagoreanism was an attempt to introduce a religious element into pagan philosophy in place of what had come to be regarded as an absurd formalism. The founders of the school sought to invest their doctrines with the halo of tradition by ascribing them to Pythagoras and Plato, and there is no reason to accuse them of insincerity. They went back to the later period of Plato's thought, the period when Plato endeavoured to combine his doctrine of Ideas with the Pythagorean number-theory, and identified the Good with the One, the source of the duality of the Infinite and the Measured (τό διαμέτρου και περίοδος) with the resultant scale of realities from the One down to the objects of the material world. They emphasized the fundamental distinction between the Soul and the Body. God must be worshipped spiritually by prayer and the will to be good, not in outward action. The soul must be freed from its material surrounding, the "muddy vesture of decay," by an ascetic habit of life. Bodily pleasures and all sensuous impulses must be abandoned as detrimental to the spiritual purity of the soul. God is the principle of good; Matter (όξων) the groundwork of Evil. In this system we distinguish not only the asceticism of Pythagoras and the later mysticism of Plato but also the influence of the Orphic mysteries and of Oriental philosophy. The Ideas of Plato are no longer self-subsistent entities; they are the elements which constitute the content of spiritual activity. The soul is no longer an appanage of oivos, it is oivos itself: the non-material universe is regarded as the sphere of mind or spirit.

Thus Neopythagoreanism is a link in the chain between the old and the new in pagan philosophy. It connects the teaching of Plato with the doctrines of Neoplatonism and brings it into line with the later Stoicism and with the ascetic system of the Essenes. Neopythagoreanism was a thing of the East, and the Neopythagoreans shows a parallel so striking as to warrant the theory that the Essenes were profoundly influenced by Neopythagoreanism. Lastly Neopythagoreanism furnished Neoplatonism with the weapons with which pagan philosophy made its last stand against Christianity.

See PYTHAGORAS, NEOPLATONISM, ESSENES; and Zeller's PHILOSOPHY OF THE GREEKS, where fuller details are to be found. For more references to the history of the school see APOLLONIUS OF TYANA and MODERATUS OF GADES.

NEPAL, NEPAUL or NEPAL, an independent state, situated on the north-eastern frontier of India, lying between 80° 15' and 88° 10' E., and 26° 20' and 30° 10' N.; area, 54,000 sq. m. Its extreme length is about 525 m., and its breadth varies from 90 to 140 m. It is bounded on the N. by Tibet; on the E. by Sikkim; on the S. by Bengal and the United Provinces; and on the W. by Kumaon, from which it is separated by the Kali river. Its population is estimated by the natives at about 5,000,000, the common phrase used by the rulers in speaking of popular opinion being, "but what will the Bāwan (or fifty-two) Lakḥ say to this."

Nepal physically consists of two distinct territories: (1) the tarai, or strip of level, cultivated and forest land lying along the southern frontier; and (2) the hill-country, consisting of the hills (in the lower range) and of the high mountains (in the higher range) running northwards to Tibet. Along the northern frontier stand many of the highest peaks of the Himalayan range, such as Dhaulagiri (26,837 ft.), Māsūrpatra, Garshrīlak and Yāsā (24,000), Gosaín Thān (22,500), Mākhan (21,000), Kangchhenggo (21,500), Kinchinjunga (21,450), and numerous peaks varying from 20,000 to 24,000 ft. In clear weather this magnificent snowy range may be seen in an almost continuous line from the top of some of the higher ranges near Katmandu. South of these are numerous parallel peaks running up, ranging from 16,000 to 6000 ft. in height, which are broken up at intervals by cross ranges, thus forming a series of glens with a few hill-villages interspersed.

These mountain ranges determine the course of the rivers, which are divided by the cross ranges into four groups. The first of these extends from Kumaon eastward as far as Dhaulagiri, and consists of the affluent of the Ganges and Brahmaputra. The second group, known to the Nepalese as the Kālāpūrī or Kang chen gang. The third group consists of two branches, eastward running, the Dāhuālgiri and Gosaín Thān, and unite at Trebeni Ghat to form the Gandak. The third is a group of smaller rivers draining the great valley of Nepal, the valleys of Chitāng, Benepa, and Panouiri, and portions of the tarai around the Churiaitagi range of hills. There are the various branches of the Bara Gandak, the lesser Rapti, the Bagmati and Kumla. East of this again is the fourth group, known to the Nepalese as the Sapt Kosi, rising from the peaks between Gosaín Thān and Kinchinjunga, and uniting to form the Sapt Kosi, which falls into the Ganges.

There is thus a natural division of the country into four portions. The northern consists of the Kālāpūrī or Kangchenjunga range, and contains the towns of Jumla, Doti and Sulliana. The second is the country of the Chaubisi (or twenty-four) rajas, and contains the towns of Malembum, Pulpa, Gorkha and Noakote. The third is the country of the eighteenth of the Bāwan, consisting of the hill capital and many large towns to be mentioned afterwards. The fourth is the eastern portion of Nepal, comprising the country of the Kiratis, and many small towns, such as Dhanokota, Ham and Bijapur.
**Route into Nepal**—The portion of Nepal, exclusive of the tarai, which is the least developed part of the country, is one of the least inhabited parts of the capital of the country, and a few adjacent smaller valleys. There is only one means of access open to Europeans, and this indeed is in general resorted to by the natives, as the other routes are usually impassable during the rainy season. The modern highway, which runs nearly north from Segauli, passing through the tarai and sal forests, to Bhikhkhori; then through the beds of mountain streams, and along the Churighati range, another road runs to Butotam, and a third good road to Bhiphmendi at the foot of the Sisgarhi range of hills. So far the route is practicable for carts and baggage animals, but from this point onward it leads through the forests, which until the Chitlong valley and the Chandragiri range. The distance from Segauli to Katmandu is 90 m.

The valley in extreme length from east to west is about 26 m., and in breadth from north to south, about 10 m. The surface of the hills vary in height from 600 to 9720 ft., the level of the valley being about 4500 ft. above the sea. Tradition has it that Nepal was once lake-like, and appearances are in favor of this view. It is crossed from east to west by a low limestone range, through which the rivers have gradually forced a passage, and in like manner the collected rivers have escaped at the south-eastern corner of the valley.

There are three principal streams, the Bagmati, the Vishnumati, and Manohara, besides many small tributaries of these. All the rivers rise within the valley, except the Bagmati, which springs from the northern part of the tarai; the remainder of the tarai is broken up into ravine at the north-eastern corner. They all unite and pass through a long narrow gorge in the limestone range, already mentioned, at Chisopani, near the frontier of the Kothal."}

**Climate**—In and around the Nepal valley, as in India, the year may be divided into three seasons. The rains fall in June and last till October, but the fall is not so heavy or constant as in the higher Himalayan districts. The second season, from the middle of October to the middle of April. During these months the climate is delicious. Heat-frost and thin ice are common in the mornings, and the thermometer sometimes falls as low as 25° Fahr., and is bright and clear. From Christmas to the end of February there are occasional showers of rain; and snow falls on the surrounding low ranges, but is very rarely seen in the valley itself. In April, the rains are over, but the thermometer seldom reaches 85° in the shade. The result of observations extending over many years gives an average mean temperature of 60° Fahr., and an annual rainfall of about 60 in. Violent thunderstorms are common, and occasionally severe earthquakes occur, as in 1833 and 1866.

**Flora and Fauna.**—In a country possessing such a range of altitudes the flora and fauna are of course very varied. For descriptive purposes, Nepal may again be divided into three zones. These are—(1) the tarai and lower ranges of hills up to 4000 ft. in height; (2) the central ranges and high-lying valleys, up to 10,000 ft.; and (3) the alpine region, from 10,000 to 20,000 ft. in height. Each zone is clearly sharply defined, as the climate varies according to the latitude, the height of intermediate ranges, and the depth of the valleys; so that tropical plants and animals are sometimes found near the summits, and alpine species descend nearly along the loftier spurs into the southern zones.

The low alluvial land of the tarai is well adapted for cultivation, and is, so to speak, the granary of Nepal; but owing to scantiness of water and the absence of water-trees, large swamps and lakes are not found. There are, however, numerous small swamps, jungles and forests. Considerable stretches of land are, however, being reclaimed from year to year. The productions here are those of British India—cotton, rice, wheat, pulse, sugar-cane, tobacco, opium, indigo, and the fruits and vegetables familiar in the plains of India. The forests yield a magnificent supply of sal, sidi, and other valuable forest trees; and the jungles abound with acacias, mimosa, cotton tree (Bombax), dák (Rhus Jacquemontiana), large bamboos, rattans, palms, and numerous ferns and orchids. On the Churighati range the common Pinus longifolia grows freely. Tea can be grown at a height of from 2000 to 4000 ft. The middle range supports several species of rhododendrons, and the lower slopes are covered with potatoes, Cucurbitaceae, pineapples, and many varieties of European fruits, vegetables and flowers. The forests contain tree rhododendrons, Pinus longifolia, and more shrubs, nuts, walnuts, maples, hickory, bamboo, wild cherry, pear, allies of the Himalayan plum, peach (Daphne), roses, and many other inhabitants of temperate climes, with various orchids, ferns and wild flowers. In the alpine zone evergreen conifers, such as the spruce, fir, box, hollies, birch, dwarf rhododendrons and the usual alpine flora.

The wild animals follow a similar distribution, and the following typical species may be mentioned. In the lowest zone are found the tiger, leopard, sambar, wild cat, and wild bear; in the middle zone, the elephant and rhinoceros, the gaur (Gaurus gaurus), gyal (Gaurus frontalis), wild buffalo or auro, many species of deer, and the black bear (Ursus labiatus). Among the birds are the eagle, vulture (Gyps philocetus), the jungle fowl, and the smaller vultures, &c. In the middle zone there are also the leopard, the Himalayan black bear (Ursus tibetanus), the wild dog, cats of many sorts, squirrels, hares, porcupines, the pangolin, and some species of deer and antelope. Among the birds are the larger vultures and eagles, pheasants (Gallus philocetus), chukor, hill partridges, &c., the eagle the true red and golden eagle (Aquila chrysaetos), &c. Among the birds are the eagle- vulture (Gyps philocetus), the blood pheasant (Pheasant philocetus), snow pheasant (Tetragallus himalaicus), and the blue pheasant (Cortinnis sanya), crestless pheasant (Coturnix walli), &c. Geese, ducks, waders of all sorts, and other migratory birds are found in abundance, among the two most common being the teal and the drake.

Minerals.—The lowest zone in some directions abounds in fossils; and deposits of lignite, and even of true coal, are met with, the latter notably at a spot south of Palpa. The middle zone is rich in limestone and marble. They rest also on minerals, such as iron, copper, zinc, lead and sulphur. Copper is found near the surface in many places, and there are remains of mines both at Markhu and in the great valley of Nepal. Mineral springs, both hot and cold, are of frequent occurrence in this zone. The races of silver, and also of gold, have been found in the alpine zone.

**People.**—The races occupying Nepal are of mixed Mongol appearance, being generally short and robust, and having flat or oblique eyes, yellow complexes, black hair, and comparatively hairless faces. The Newars, according to the Vamcavali or native history, trace their descent from the races of southern India, but this is rendered more than doubtful by both their appearance and language. The Gurkhas (Gurkhas) or Gurkhas are descendants of the Brahmans and Rajputs who were driven out of Hindostan by the Moslems, and took refuge in the western hilly lands, where they ultimately became dominant, and where they have become much mixed with the other races by intermarriage.

**Religion.**—The Bhutias, Newars, Limbus, Keratis, and Lepchas are all Buddhists, but their religion has become so mixed up with Hindutism that it is now hardly recognizable. The Newars have entirely abandoned the monastic institutions of Buddhism, and in the measurement of time they often make 24 hours equal to a day, this is particularly the case in the higher and more northern districts, known as Kamhas, Tharsus, Manjus, &c., but generally classed together by the Nepalese as Aoulias, or dwellers in the malarious or aul districts. These are probable descendants of immigrants from the lower castes of Hindus, occupying the borderlands of the tarai. Among the forests of the lower eastern region are also to be found some small savage tribes, known as Chepangs and Kusundas.

All the races except the Aoulias are of a decidedly Mongolian appearance, being generally short and robust, and having flat or oblique eyes, yellow complexes, black hair, and comparatively hairless faces. The Newars, according to the Vamcavali or native history, trace their descent from the races of southern India, but this is rendered more than doubtful by both their appearance and language. The Gurkhas (Gurkhas) or Gurkhas are descendants of the Brahmans and Rajputs who were driven out of Hindostan by the Moslems, and took refuge in the western hilly lands, where they ultimately became dominant, and where they have become much mixed with the other races by intermarriage.

**Education.**—There is a central educational institution at Katmandu with sixteen branches, or schools, over the valley of Nepal. This central institution has three departments, English, Sanskrit and Persian—or more correctly perhaps Urdu. Education is provided
free by the state, and is encouraged by grants of scholarships and prizes. Boys passing out well are sent at government expense to the schools of the west, and there is a free education for the poor, education, and some have lately been sent to Japan. The evil effects of higher education, as taught in the Indian colleges, on the youth of Bengal, &c., has, however, been strongly denounced. It is not unlikely that education in Nepal may receive a set-back in consequence. Some of the upper classes speak English fluently, but the bulk of the labouring classes is quite illiterate.

Katmandu is a perfect storehouse of ancient Sanskrit literature, and some of the oldest MSS. in that language as yet known to scholars have been found there. There is also a fair English library.

Calendar.—There are three principal eras in Nepal. The Samvat of Vikramaditya begins fifty-seven years before the Christian era. That of the Bhadra, which is the date of the Nepalese era, and the Nepalese Samvat dates from October A.D. 880. The Sri-Harsha and Kaliagata eras are also sometimes used. Day is considered to begin when the tiles on a house can be counted, or when one can read in the sky against the sun. Sixty bispals = 1 pala; 60 pala = 1 ghari or 24 minutes; 60 ghari = 1 day of 24 hours.

Health.—All families of good position have at least one badi, or medical man, in constant attendance, and there are also many general practitioners. There is a large central hospital at Katmandu, and some thirteen other smaller hospitals are distributed over the country, with similar physicians and surgical officers. There is also a small hospital attached to the British Residency.

The disease most prevalent in the country are rheumatism, chronic dyspepsia, skin diseases, syphilis, gout, smallpox, cholera and leprosy. The prevailing diseases are malaria, typhus fever, and diarrhea, and dysentery are met with. Fever of a severe typhoid type is common in the crowded lanes and dirty villages. Vaccination is not extensively practised.

The health of the inhabitants of the principal cities in the valley has greatly improved since the introduction of fresh water, which has been brought in by pipes from mountain springs.

Trade.—There are three large towns in the Nepal valley, Katmandu, the capital, said to contain approximately 50,000 inhabitants, Patan and Bhatagaon about 30,000 each. The houses are from two to four storeys in height, built of brick and tile. The windows and balconies are numerous and sometimes beautifully carved. There are numerous handsome temples in all the towns, the majority of which are pagoda-shaped and built of brick, with roofs of copper, which is sometimes gilt. The streets are narrow, and they, as well as the squares, are all paved with brick or stone. In front of the temples generally stand monoliths surmounted by figures of Garuda, or of the founder, made of brass gilt, or sometimes of black stone. Besides these three large towns, there are at least twenty smaller towns and numerous villages in the valley, all of which possess temples. Some of these, as for instance those of Pashupati, Bhaktapur and Bhaktapur, near Katha, are considered of great sanctity. Many thousands of pilgrims travel annually to the shrines of Pashupati, Pashupati, and it is there that the dying are brought to be immersed in the Bagmati, and the dead are burned on its banks.

The Gurkhas are noted for their military abilities, and the agriculture of the valley is carried on by the Newars. The soil is varied in character, from light micaceous sand to dense ferruginous clay. The whole valley is cultivated and irrigated by the numerous streams which slope down from the mountains so that there is little grazing ground, and few sheep or cattle are kept. There are some milch cows and buffaloes, which are either slain or reared for consumption and sacrifice are all imported, and are consumed as fast as they are brought in. In the cold season the Bhutias bring large flocks of sheep and goats laden with bags of borax, salt and salt petre. These are sold for consumption, except a few that are retained to carry back the bags. These droves are generally accompanied by ponies and some of the large Tibetan dogs; the latter are very cheerful, fierce, shaggy animals, about the size of a small Newfoundland. There are also hawks, hares and some game such as pheasants and ducks, the eggs of which are in great demand even among the orthodox Hindus. The crops grown in the valley consist of rice, both the transplanted and the dry-sown or ghaiya varieties, wheat, pulse, murwah, maize, buckwheat, chillies, radishes, mustard, garlic, onions, ginger, turmeric, sugar-cane, potatoes, ground nuts, many species of cucumbers and pumpkins, &c. Nothing but artichokes, radishes and some vegetables are grown. Large cardamoms are extensively grown in the eastern hills, and form an important article of trade with India. The hemp plant (Cannabis indica) grows wild, and is used both for manufacturing purposes and for producing the resinous extract and other ingredients which are used for making opium. Some opium is planted and grown, but timber, such as madder or manjist, are grown in some places; and drugs, such as chirata, are collected and exported. The better class of soils yields a return of about Rs. 180 per khat, and the poorest about Rs. 90 per khat. From some of the finer soils as many as three crops of various sorts are obtained annually. The land measures in use are different in different parts of the country. Thus a small plot of nearly 2 acres in Kathmandu district is worth Rs. 120, while in the western tarai it is only 15x15 yds. In the hills the unit of land measurement is called rupni, which is about twice the size of an English acre. The area of Nepal is approximately 116,000 square miles.

Land Taxes.—The tarai lands pay from two to nine rupees (British) per Nepali bigha according to quality of land. In the hills taxes range from one to ten rupees per Nepali bigha. There is also a stall-fed tax, payable by all owners of stall-fed, bullock, one bullock without plough about 10 annas; one sapat 63 annas. These taxes are termed Hol, Patay and Kodaley.

Agriculture.—The Newars are the principal agriculturists. Many European fruits, flowers and vegetables have been introduced and grow freely. The country is famed for its oranges and pineapples. Flowers are grown and sold for religious purposes, and even wild flowers are collected and distributed by the Newar women in adornning their hair, as well as for offerings at the shrines. Many wild fruits are collected and sold in the markets. Apples and pears, English stock, thrive well; apricots and plums are good; peaches and grapes grow freely and are of large size, but they seldom ripen before the rains begin, when they rot.

Manufactures.—All the trade and manufactures of the country are in the hands of the Newars, and a few Kashmiris and natives of Hindustan. The trade in European goods is chiefly carried on by the latter, whilst the Newars deal in corn, oil, salt, tobacco and articles of daily consumption. The Newars are noted for their shoddy and coarse textiles. The white sari, which are woven on cotton looms, are the same as those of the Sikhs. They are manufactured in the villages, and the women are generally engaged in the work. The manufacture of incense is a peculiar trade of the Newars, who are also celebrated for the manufacture of silk and worsted goods. Some small quantities of cotton, hemp, and jute are manufactured. The Newars are also noted for the manufacture of woolen cloths, and are the principal manufacturers of woollen cloth for export to British India. The Newars are also noted for the manufacture of paper, and the making of armorials, and ornaments of silver.

Manufactures.—The Newars are skillful workmen. Their bricks are excellent, and so also is their pottery, which certain towns are famous, such as Themi and Nokote. As carpenters they excel, though the use of the large saw is still unknown, and planks are cut with chisel and mallet. Some of the wood carvings on the temples and large houses are most artistic in design and bold in execution, though unfortunately they are sometimes of a most obscene character. The manufactures are few, consisting chiefly of coarse cotton cloths, paper made of the inner bark of the paper-plants (Dioon), cloths, bags and burlaps, worsteds, wools, and ornaments of gold and silver.

Coinage.—At one time Nepal supplied Tibet with its silver coinage, but this was abandoned on account of the adulterations introduced by the Nepalese. The ancient coins, specimens of which are still to be met with, were made by hand. The modern coinage is struck by machinery, a regular mint having been established by Sir Jung Bahadur Rana after his return from London in 1859.

Government.—The Nepalese have relations with China, and occasionally send an embassy with presents to Peking. The British too have considerable influence with the government in regard to their foreign relations, and a British resident is stationed at Katmandu. But in all matters of domestic policy the Nepalese brook no interference, and they are most jealous of anything that has a tendency to encroach on their independence. Theoretically the government of Nepal is a pure despotism, and the maharajah is paramount. Practically, all
real power has long been in the hands of the prime minister, and much of the modern history of the country consists of accounts of the struggles of one faction or another to gain ascendancy. Under the prime minister there is a council, consisting of the relations of the king, the raj guru, the generals, and a few other officials known as kajis and sirdars and bhardars, which is consulted on all important business, and which forms a court of appeal for disputed cases from the courts of law. There are separate civil and criminal courts, but the distinction is not always observed, as difficult cases are often transferred from one to the other.

Law and Justice.—The old savage code with its ordinances by fire and water, and its punishments by mutilation and torture was abandoned by Sir Henry Yule and his colleagues in 1851. Treason, rebellion and desertion in war-time are punished by death. Bribery and peculation by public servants are punished by dismissal from office, and a fine and imprisonment, the latter of which can be compounded by payments at various rates, according to the nature of the offence. Murder and the killing of cows are capital offences. Manslaughter and maiming cows are punished by imprisonment for life and other offenses against the person or property by imprisonment or fine. Brahmanas and women are exempted from capital punishment. Offences against caste are heavily punished by fine and imprisonment. In some cases indeed all the members of a caste are punished, and in such cases, as the land can be sold as slaves. Bankruptcy laws have been recently introduced. The marriage laws are somewhat peculiar. Among the Gurkhas the laws resemble those of other Hindus as regards the marriage of widows and remarriage of those of the same rank. An every girl who is not married with ceremony to a boi fruit, which is then thrown into some sacred stream. As the fate of the fruit is unknown, the parents are considered to be atoning for a wanton age of puberty a husband is selected, but the woman can at any moment divorce herself by placing a betel-nut under her husband's pillow and taking her departure. Adultery is punished by the imprisonment of both the adulteress and her paramour. Sati has been abolished in Nepal by law.

Goals.—There are three large prisons in the Nepal valley, one for males and two for females; there are also a considerable number of jails in the country. The convicts are kept in them, and employed in public works of various sorts. They are allowed six pice a day for subsistence at the capital, and five pice in other places. Their relatives are allowed to minister to their creature comforts.

Slavery is an institution of the country, and all families of rank possess many slaves, who are employed in domestic and field work. They are generally treated well, and are carefully protected by law. The price of slaves ranges from Rs. 100 to Rs. 200. Revenues.—The revenue of Nepal is about one hundred and fifty lakhs of rupees, i.e. £1,000,000. The chief sources of it are the land revenue and the customs duties. About 10% of the total lands, and 20% of the hill lands, are private property. Some lands were assigned by the Gurkha kings to Brahmanas, some to the Thakurs, and others to the Bhandars. Where these are not the gifts of the old Newar kings, pay from 4 to 8 annas per bigha. All such grants of land, however, are subject to a heavy fine on the coronation of a new raja. Land which does not produce rice is lightly rated, but in the valley of Nepal, and wherever there are rice crops, the government tax or rent is one half of the produce of the land. Waste lands, when brought into cultivation, are rent free for ten years, after which for five years the tax is only 4 annas per bigha, and the cultivator receives one-tenth of the cleared land rent free for his life. A considerable revenue in the shape of royalty is obtained from mines of copper, iron, &c. The taxes on merchandise amount to from 12 to 14% on the value of the goods carried to and from British India, and from 5 to 6% on goods exported to Tibet.

Army.—Much attention is devoted by the Gurkhas to military matters, and the bulk of that race may be said to be soldiers. The standing army consists of about 50,000 men, in a fair state of efficiency. Besides this force there is a reserve, consisting of men who have served for a few years and taken their discharge, but in case of necessity can be called on again to enter the ranks. These would probably raise the strength to between 70,000 and 80,000 men. The regiments are formed on the European system, and similarly divided into companies, and supplied with supplies of gunpowder and military stores. There are workshops where cannon are cast, and rifles and ammunition of all sorts turned out in large quantities, but only for the use of the army.

In addition to its own army, Nepal supplies to the British army in India a large force of splendid soldiers, who were raised under the following circumstances. In 1815 the British enlisted three battalions of Gurkhas from amongst the soldiers of that race who were thrown out of employment, owing to the termination of the first phase of the war with Nepal. These regiments were styled the 1st, 2nd and 3rd Gurkhas, and were soon employed on active service. The 1st and 2nd behaved with much gallantry at the siege and storming of Bharatpur, and in the First Sikh War, while the 2nd and 3rd won a great name for loyalty and courage during the Mutiny of 1857—58, especially at the siege of Delhi. This induced the British to 1856 two more battalions, which they numbered the 4th and 5th, and the whole Gurkha force has since proved its usefulness and loyalty on many occasions, particularly during the Afghan War of 1878—80, and on many frontier expeditions. Batallions have been sent on service to Burma, Egypt, China and Tibet. The Gurkhas in the British service now consist of ten regiments of riflemen of two battalions each, and number about 20,000 men.

History.—Nepal and the somewhat similar country of Kashmir are peculiar among the Hindu states of India in possessing an historical literature. The Nepalese Vamśavālī professes to start from a very early period in the Satya Yuga, when the present valley was still a lake. The earlier portion of it is devoted to the Satya and Treta Yugas, and contains mythological tales and traditions having reference to various sacred localities in the country. During these two Yugas, and also the Dwapur and Kali, the Vamśavālī deals in round numbers of thousands of years.

In the beginning of the Kali Yuga, the Gupta dynasty is said to have been founded by Ne-Muni, from whom the country takes its name of Nepal. Lists are then given of the various dynasties, with the lengths of the reigns of the rajas. The dynasties mentioned are the Gupta, Ahir, Kirāti, Somavanshi, Suryavanshi, Thakuri or first Rajput, Vaishya Thakuri, second Rajput and Karnakati dynasties. The country was then invaded by Mukundasena, and after his expulsion various Vaishya Thakur dynasties are said to have held the throne for a period of 225 years. The chronology of the Vamśavālī up to this period is very confused and inaccurate; and, though the accounts of the various invasions and internal struggles, mixed up as they are with grotesque legends and tales, may be interesting and amusing, they can hardly be considered authentic. Some of the names of the rajas, and the dates of their reigns, have been determined by coins, the colophons of old MSS., and certain inscriptions on the temples and ancient buildings. For instance, Ançuvarma, of the Thakuri dynasty, reigned about A.D. 633, as he is mentioned by the Chinese traveller Hsuan Tsang, who visited Nepal. His name too is found in the chronology of the country in a manuscript. In this manner it is ascertained from MSS. that Rudra-deva-Varma was reigning in 1068; Lakshmikama-deva from 1015 to 1040; Padma-deva, of the Vaishya Thakuri dynasty, in 1065; Mana-deva, of the second Rajput dynasty, in 1139; Ananta-Malla, 1286-1302; Harisinha-deva, 1324; Jayastithi-Malla, 1385-1391. Much information as to the chronology of the various dynasties can be obtained from the catalogue of the Cambridge MSS. compiled by Cecil Bendall, and also from his papers on the ancient coins of the country. Inscriptions too have been edited by Professor Bühler in the Indian Antiquary, vol. iv. Detailed lists of the rajas are to be found in Kirkpatrick's Account of Nepal, in Hodgson's Essays, Prinsep's papers in the Asiatic Society's Journal and Wright's History of Nepal.

The records begin to be more accurate from the time of the invasion and conquest of the country by Harisinha-deva, the raja of Simraun, 1324. This raja was driven from Simraun by Tughlah Shah of Delhi, but seems to have found little difficulty in the conquest of Nepal. There were only four rajas of this Ayodhya dynasty, and then the throne was occupied by Jaya-bhadrā-Malla, a descendant of Ahbha-yā-Malla, who reigned practically until the 13th century. There were eight rajas of this dynasty. The seventh, Jayastiti-Malla, who reigned for forty-three years (1386—1429), has appeared to have done much in forming codes of laws, and introducing caste and its rules among the Newars. In the reign of the eighth raja, Yakesha-Malla, the kingdom was divided into four separate states—namely, Banega, Bhatgaon or Bhaktapur, Kantipur or Katmandu, and Lalitapur or Patan. There was only one raja of Banega, who died without issue. The Malla dynasty in the other
three branches continued in power up to the conquest of the country by the Gurkhas in 1768.

The Gurkhas claim descent from the Rajputs of Chitor, in Rajputana. They were driven out of their own country by the victorious Mughals, and took refuge in the hilly districts about Kumaon, whence they gradually pushed their way eastwards to Lamjung, Gurkha, Noakot and ultimately to the valley of Nepal, which under Raja Prithwi Narayan they finally captured. In the struggle which took place at Bhatgaon, Jaya-prakasa (the raja of Katmandu) was wounded, and shortly afterwards he died at Pashupati. Ranjit-Malla, the aged raja of Bhatgaon, was allowed to retire to Benares, where he ended his days. Tej Narasinha, the raja of Patan, was kept in confinement till his death. During the latter years of the war Jaya-prakasa applied to the British for assistance, and a small force, under Captain Kinloch, was sent into the tarai in 1765, but it was repulsed by the Gurkhas.

Prithwi Narayana died in 1774. He left two sons, Pratap-sinha Sah and Bahadur Sah. The former succeeded his father, but died in 1777, leaving an infant son, Rana Bahadur Sah. On the death of Pratap-sinha, his brother, who had been in exile, returned to Nepal and became regent. The mother of the infant king, however, was opposed to him, and he had again to flee to Betta, in British territory, where he remained till the death of the rani, when he again became regent, and continued in possession of the throne. During this time the Gurkhas were busily annexing all the neighboring petty states, so that in 1790 their territories extended from Bhutan to the Sutlej river, and from Tibet to the British provinces. At length, in 1790, they invaded Tibet, and were at first successful; but they were thus brought into contact with the Chinese, who in 1791 sent a large force to invade Nepal. In 1792 the Chinese advanced as far as Noakot, and there dictated terms to the Nepalese.

In 1791 the Gurkhas had entered into a commercial treaty with Britain. When driven hard pressed, they applied for assistance against the Chinese to Lord Cornwallis. In consequence of this Kirkpatrick was despatched to Nepal, and reached Noakot in the spring of 1792, but not till after peace had been concluded. One result of this embassy was the ratification of another commercial treaty on the 1st of March 1792. In 1795 Rana Bahadur removed his uncle, Bahadur Sah, from the regency, and two years subsequently put him to death. From this time up to 1799 the king, who seems to have been insane, perpetrated the most barbarous outrages, till at length his conduct became so intolerable that he was forced to abdicate in favour of his son, Girvan-yuddha Vikrama Sah, who was still an infant. Rana Bahadur once again recovered the throne in 1804, but was assassinated in 1805.

In October 1801 another treaty was signed by the British and Nepalese authorities, and a British resident was sent to the Nepalese court, but was withdrawn in 1805, owing to the conduct of the Nepalese. From this time the Nepalese carried on a system of encroachment and outrage on the frontier, which led to a declaration of war by the British in November 1814. At first the British attacks were directed against the western portion of the Nepalese territory, and under Generals Marly, Wood and Gillespie several disasters were met with. General Gillespie himself was killed while leading an assault on a small fort called Kalunga. General Ochterlony was more successful, and the Gurkhas were driven eastward beyond the Kali river, and began to negotiate for peace. Arms, however, were soon taken up again, and Ochterlony, who was put in command, in January 1816, advanced directly on the capital in the line of the route that is now in use. He soon fetched his way as far as Mukwanpur, and the Nepalese sued for peace. A treaty was concluded in March, by which the Nepalese relinquished much of their newly acquired territory, and agreed to allow a British residency to be established at Katmandu. In November the raja died, and was succeeded by his infant son, Surendra Bikran Sah, the reins of government being held by General Bhimsena Thapa.

From this time the records for many years furnish little of interest except a history of struggles for office between the Thapa and Pandy factions, and futile attempts at forming combinations with other states in Hindustan against the British.

In 1839 Bhimsena's enemies succeeded in driving him from power, and he committed suicide, or was murdered, in prison. The Kala Pandy faction then came into power, and there were frequent grave disputes with the British. War, however, was averted by the exertions of the resident, Mr Brian Hodgson.

In 1843 Matabar Singh, the nephew of Bhimsena, returned from exile, soon got into favour at court, and speedily effected the destruction of his old enemies the Kala Pandyrs, who were seized and executed in May 1843. At this time mention begins to be made of a nephew of Matabar Singh, Jung Bahadur, the eldest of a band of seven brothers, sons of a kaji or state official. He rose rapidly in the army and in favour at the court, especially with one of the rani, who was of a most intriguing disposition. In 1844 he was a colonel, and on the 18th of May 1845 killed his uncle, and immediately, with the aid of the rani, took a prominent part in the government. After a short but turbulent interval of intrigue, he got rid of his enemies at one fell swoop, by what is known as the Kot massacre, on the 15th of September 1846. From that time till the day of his death Jung Bahadur was in reality the ruler of Nepal. His old friend, the rani, was banished, and all posts of any consequence in the state were filled by Jung, his brothers and other relatives. In 1850, finding himself securely seated in power, Jung Bahadur paid a visit to England, which made a great impression on his acute intellect, and ever after he professed and proved himself to be a stanch friend of the British. On his return in 1851 he at once devoted himself to reforming the administration of the country, and, whatever may have been the means by which he gained power, it must be allowed that he exercised it so as to prove himself the greatest benefactor his country has ever possessed. In 1853 a treaty for the extradition of criminals was proposed, but it was not ratified till February 1855. In 1854 the Nepalese entered into a war with Bhutan, a war which lasted with varying success nearly forty years, and it was not till the end of 1859 that they were finally swept out of the country. The Nana was said to have died of fever in the tarai, and it is probable that this was the case. His wives and a few attendants resided for many years near Katmandu.

In return for the aid afforded to the British, Jung Bahadur was well rewarded. He was created a G.C.B., and in 1853 a G.C.S.I., honours of which he was not a little proud. The troops employed received food and pay from the day of leaving Katmandu; handsome donations were given to those severely wounded, and to the relatives of the killed; great quantities of muskets and rifles were presented to the Nepalese government; and, to crown all, a large portion of the tarai was restored to Nepal. This ground contains most valuable sal and sisu forests, and yields a revenue of several lakhs of rupees yearly.

From the termination of the mutiny Nepalese history has been uneventful. The country has been prosperous, and the relations with the British have continued to be most friendly. Nevertheless the restrictions on commerce, and the prohibitions against Europeans entering the country, or travelling beyond certain narrow limits, are as rigidly enforced as they were a hundred years ago. Sir Jung Bahadur died suddenly in the tarai in 1877. In spite of all the exertions he had made to bring about a better state of things, three of his wives were allowed to immolate themselves on his funeral pyre. His brother, Sir Ranadip Singh Bahadur, G.C.S.I., succeeded him as prime minister. Shortly after his accession to power a plot was formed against him, but nearly forty of the conspirators were seized and executed, while
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others escaped into exile. He was, however, murdered in 1883 and was succeeded by his nephew Sir Shamsher Jung, G.C.S.I., who died in 1901 and was succeeded by his brother Deb Shamsher Jung. But in June of that year a palace revolution placed another brother, Chandra Shamsher Jung, in power, whilst Deb Shamsher fled to India. Maharajah Chandra Shamsher has ruled Nepal with much ability. He gave effective aid to the British during the Tibet war of 1904, and the relations with the government of India became more cordial after his accession to power. In 1906 Chandra Shamsher was created a G.C.S.I., and in 1908 he visited England as a guest of the government, when he was invested with the G.C.B. by King Edward VII. He was also made a major-general in the British army, and honorary colonel of the 4th Gurkha Rifles.

For authorities see Dr. Daniel Wright, History of Nepal (1877); Colonel Kirkpatrick, Account of Nepal; British Houghton Hodgeson’s essays; Dr. H. A. Oldfield’s sketches; Sir C. M. Aitchison, Treatises and Essays; Sir Joseph Hooker’s writings; and Sir Richard Temple, Hydrobad and Nepal (1887). (D. Wr.; H. Wy.)

Nephelinites (Gr. νηφέλης, χ. φάρμακον, a drug that takes away grief, from νηθ- privative, and χέω, 'grief'), an Egyptian drug spoken of by Homer in the Odyssey (iv. 221). Others held that "nephelinite" is the name given to any drug having a like property, and also occasionally to herb or plant from which such a drug is produced. It is also applied to a special genus of plants, chiefly East Indian, known as the "pitcher-plants," on account of the formation of the leaves.

Nepheline, a rock-forming mineral consisting of sodium, potassium and aluminium silicate, Na₆K₆Al₂Si₆O₁₈. Its crystals belong to the hexagonal system, and usually have the form of a short six-sided prism terminated by the basal plane. The unsymmetrical etched figures produced artificially on the prism faces indicate, however, that the crystals are hemimorphic and tetraedrical, the only element of symmetry being a polar hexad axis. The hardness is 5½. The specific gravity (2-6), the low index of refraction and the feeble double refraction are nearly the same as in quartz; but since in nepheline the sign of the double refraction is negative, whilst in quartz it is positive, the two minerals are readily distinguished under the microscope.

An important determinative character of nepheline is the ease with which it is decomposed by hydrochloric acid, with separation of gelatinous silica (which may be readily stained by colouring matters) and cubes of salt. A clear crystal of nepheline which has been decomposed in this way is found to contain, as the name nepheline, proposed by R. B. Hailly in 1801, from Gr. νηφέλης, a cloud.

Although in naturally occurring nepheline sodium and potassium are always present in approximately the atomic ratio 3:1, artificially prepared crystals have the composition NaAlSi₆O₁₈; the corresponding potassium compound, KAl₂Si₆O₁₈, which is the mineral kaliophilithe, has also been prepared artificially. It has therefore been suggested that the orthosilicate formula, (NaK)Al₂Si₆O₁₈, represents the true composition of nepheline.

The mineral is one specially liable to alteration and in the laboratory various substitution products of nepheline have been prepared. In nature it is frequently altered to zeolites (especially natrolite), sodalite, kaolin, or compact muscovite. Giesekite and lihenerite are pseudomorphs.

Two varieties of nepheline are distinguished, differing in their external appearance and in their mode of occurrence, being analogous in these respects to sanidine or glassy orthoclase and common orthoclase respectively. "Glassy nepheline" has the form of small, colourless, transparent crystals and grains with a vitreous lustre. It is characteristic of the later volcanic rocks like phonolite and trachyte; hornblende-basalt, &c., and also of certain dikes-rocks, such as tinguita. The best crystals are those which occur with mica, sanidine, garnet, &c., in the crystal-lined cavities of the ejected blocks of Monte Somma, Vesuvius.

The other variety, known as eucolite, occurs as large, rough crystals, or more often as irregular masses, which have a greasy lustre and are opaque, or at most translucent, with a reddish, greenish, brownish or grey colour. It forms an essential constituent of certain alkaline plutonic rocks of the nepheline-syenite series, which are typically developed in southern Norway.

The colour and grey lustre of eucolite (a name given by M. H. Klaproth in 1809, from Gr. χελαινος, oil, and μονος, stone; Ger. Pettitstein) are due to the presence of numerous microscopic enclosures of other minerals, possibly augite or hornblende. These enclosures sometimes give rise to a chatoyant effect like that of cat’s-eye and cymophane; and eucolite when of a good green or red colour and showing a distinct band of light is sometimes cut as a gem-stone with a convex surface.

Closely allied to nepheline, and occurring with it in some nepheline-syenites, is the species crenanite, which has the composition H₄Na₆Ca(Na₄CO₃)₂Al₆(SiO₆)₆. It is frequently of a bright yellow colour, and has sometimes been cut as a gemstone.

Nepheline-Syenite, or Elaolitite-Syenite, a holocrystalline plutonic rock which consists largely of nepheline and alkali felspar. The rocks are mostly pale coloured, grey or pink, and in general appearance they are not unlike granites, but dark grey varieties are also known. They do not contain micas as that mineral and nepheline are mutually exclusive. From ordinary syenites they are distinguished not only by the presence of nepheline but also by the occurrence of many other minerals rich in alkalis or in rare earths. Orthoclase and albite are the principal felspar; usually they are intergrown to form perthite. In some rocks the potash felspar, in others the soda felspar predominates. Soda-lime felspars such as oligoclase and andesine are rare or entirely absent. Fresh clear microcline is very characteristic of some types of nepheline-syenite. Sodalite, colourless and transparent in the slides, but frequently pale blue in thin specimens, is the principal felspathoid mineral in addition to nepheline. As a rule these two crystalize before felspar, but they may occur in perthitic intergrowth with it. The commonest ferro-magnesian mineral is pale green augite, which may be surrounded by rims of dark-green, pleochroic soda-augite (aegirine). The latter forms long flat prisms or bundles of radiating needles. A dark reddish-brown biotite is very common in some of these rocks and a white mica, probably not muscovite but lepidolite, is occasionally present. The hornblende may be brown, brownish-green, blue or blue-black, belonging as a rule to the blue hornblende, which occurs with the pyroxene or enclosed in it. The dark-brown triclinic hornblende aenigmatite occurs also in these rocks. Olivine is rare, but may be found in some basic forms of nepheline-syenite.

The commonest accessaries are sapphire, zircon, iron ores and apatite. Crenanite occurs in several nepheline-syenites; in others there is fluor-spar or melanie garnet. A great number of interesting and rare minerals have been recorded from nepheline-syenites and the pegmatitic veins which intersect them. Among these we may mention cudialyte, eukolite, mesandrite, rinkite, johnstrapite, laevnite, biotelite, parakolomphylie and lamprophyllite. Many of these contain fluorine and the rare earths.

Nepheline-syenites are rare rocks; there is only one occurrence in Great Britain and one in France and Portugal. They are known also in Bohemia and in several places in Norway, Sweden and Finland. In America these rocks have been found in Texas, Arkansas and Massachusetts, also in Ontario, British Columbia and Brazil. South Africa, Madagascar, India, Tasmania, Timor and Turkestan are other localities for the rocks of this series. They exhibit also a remarkable individuality as each occurrence has its own special features moreover a variety of types characterizes each occurrence, as these rocks are very variable. For these reasons, together with the numerous rare minerals they contain, they have attracted a great deal of attention from petrographers.

Many types of nepheline-syenite have received designations derived from the localities in which they were discovered. The laurdalites (from Lardal in Norway) are grey or pinkish, and in many ways closely resemble the lauvrjolithes of southern Norway with which they occur. They contain anorthoclase felspars of lozenge-shaped forms, biotite or greenish augite, much apatite and sometimes olivine. Some of these rocks are porphyritic. The
Nephelinites—Nepheleites

Nephelinites include the greater number of known nepheline-syenites and are called after Foya in the Serra de Monchique (southwestern Portugal), from which they were first described. They are grey, green, or reddish, and mostly of massive structure with preponderantly interstitial nepheline. In some cases (variable amounts of feldspar) one finds altered nepheline (often in blackish foyaites) or felspars in nepheline-syenites, and in some aegirine as the abundant mineral. The foyaites have been described from the basaltic rocks of the Azores, Cape Verde Islands, and Fernando Noronha. In Germany they are represented among the Tertiary eruptive rocks of the Rhine district and Thuringia, at the extinct craters of the Eifel and at the Kaiserstuhl. In central Bohemia there are many occurrences of nepheline-terphites, basanites and basalts which though fine grained contain all their minerals in excellent preservation. The nepheline of Katanzschuleck in the Odenwald is well known. Contrasted with the nepheline and leucophytes these rocks are scarce in Italy and the Mediterranean province, but leucite-bearing nepheline-terphites occur at Monte Vulture and nepheline-basalts in Southern Spain, Madagascar, and the U.S.A. In the Southern Hemisphere they are found in the Transvaal, Madagascar, and the Cape Province. The English Eifel, at the Kaiserstuhl, contains a variety known as the Eifel nepheline-syenite.

The nephelinites are a group of effusive rocks which contains nepheline with plagioclase felspar as a constituent and, in some cases, aegirine as the constituent. The nephelinites are generally fine-grained with an abundance of feldspar and aegirine. They occur in the North Atlantic and in the eastern Pacific Ocean. The nepheline-syenites are a group of rocks which contains nepheline with plagioclase felspar as a constituent and, in some cases, aegirine as the constituent. The nepheline-syenites are generally fine-grained with an abundance of feldspar and aegirine. They occur in the North Atlantic and in the eastern Pacific Ocean.

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Laurdite

Ditroite

Litchfeldite

Lujaurite

Nephelinites

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deflections.S. Elia, founded about A.D. 1000, with frescoes of the period. It contains a pulpit of the time of Pope Gregory IV. (827–844), the sculptures of which are scattered about the church (F. Mazzanti in Nuovo Bollettino d’Archeologia Cristiana, 1896, 34).

Nepet had become Roman before 386 B.C., when Livy speaks of it and Strutium as the keys of Etruria. In that year it was surrendered to the Etruscans and recovered by the Romans, who beheaded the authors of its surrender. It became a colony in 283 B.C. It was among the twelve Latin colonies that refused further submission to Rome (1879), mainly, it is believed, because of a municipium. It is hardly mentioned in imperial times, except, as a station on the road (Via Amerina) which diverged from the Via Cassia near the modern Settevane and ran to Amelia and Tuder. In the 8th century A.D. it was for a short while the seat of a dukedom.

See G. Dennis, Cities and Cemeteries of Etruria (London, 1883, i. 85) and T. As.

NEPOMUK (or Pomuk), JOHN OF, the national saint of Bohemia. It is necessary to distinguish between the John of Nepomuk of history and the legendary one. In 1303 a dispute arose between King Wenceslaus IV. of Bohemia and the archbishop of Prague, John of Jenzenstcin. Wenceslaus, wishing to found a new bishopric in south-western Bohemia, determined to seize the revenues of the abbey of Kladrub as soon as the aged abbot Raček should die. The archbishop opposed this plan, and, by his orders his vicar-general, John of Pomuk—son of a German named Wälél, a citizen of Pomuk—advised the monks to select a new abbot immediately after Raček’s death. This greatly increased the king, who summoned the abbot and some of his clergy—among whom was Pomuk—to appear before him. He ordered them to be immediately arrested, and though the archbishop escaped his four companions—among them Pomuk—were seized and subjected to cruel tortures. They were ordered to abandon the archbishop. Three of them consented, but Pomuk, who refused to submit and was already on the point of death, was carried to the bridge of Prague and thrown into the Vltava. It is difficult to connect this historical event with the legend of St John of Nepomuk, who was canonized by the church of Rome in 1729, mainly, by the influence of John von Nepomuk, who hoped that this new cult would obliterate the memory of Hus. The Austrian chronicler Thomas Ebendorffer of Haselbach, who lived two generations later, first states that it was reported that King Wenceslaus had ordered that the confessor of his queen—an office that John of Pomuk never held—should be thrown into the Vltava because he would not reveal the secret of confession. The story is afterwards told in greater detail by the untrustworthy Bohemian historian Wenceslas Hajek. It appears certain that the person canonized in 1729 was not the historical John of Pomuk or Nepomuk.

See A. H. Wratilaslaw, Life, Legend and Canonisation of St John Nepomuk (1873), a valuable work founded on the best Bohemian authorities; also A. Frid, Der geschichtliche Heilige Johann von Nepomuk (1861); O. Abel, Die Legende vom heiligen Johann von Nepomuk (1855); and particularly vol. iii. of W. W. Tomek’s History of the Town of Prague (Czech) (12 vols., Prague, 1885-1901).

NEPOMUS, CORNELIUS (c. 99–24 B.C.), Roman historian, friend of Catullus, Cicero and Atticus, was born in Upper Italy (perhaps at Verona or Ticinum). He wrote: Chronicus, an epitome of universal history; Exempla, a collection of anecdotes after the style of Valerius Maximus; letters to Cicero; lives of Catol the elder and Cicero; and De viris illustribus, parallel lives of distinguished Romans and foreigners, in sixteen books. One section of this voluminous work (De excellentiis ducibus exterorum gentium, more commonly known as Vitae excellentium imperatorum) and the biographies of Cato and Atticus from another (De Latinis historicis) have been preserved. Erotic poems and a geographical treatise are also attributed to him. Nepos is not altogether happy in the subjects of his biographies, and he writes rather as a panegyrist than as a biographer, although he can rebuke his own countrymen on occasion. The Liber contains many errors (especially in chronology), but supply information not found elsewhere. The language is as rule simple and easy. The lives were formerly attributed to Aurelius Probus of the 4th century A.D.; but the view maintained by Lambinus (in his famous edition, 1560)—that they are all the work of Nepos—is now generally accepted. A dedicatory epigram written by Probus to the emperor Theodosius and inserted after the life of Hannibal, was the origin of the mistake. This dedication, if genuine, would only prove that Probus copied (and perhaps modified and abridged) the work. In modern times G. F. Unger (Der sogenannnte C. N., 1881) has attempted to prove that the author was Hyginus, but his theory has not been favourably received. Evidence to show that the Liber (especially selections) are extremely unreliable—text by E. O. Winstedt (Oxford, 1904), C. L. Roth (1881), C. G. Cobet (1881), C. Halm and A. Fleckesen (1889), with lexicon for school; with notes, O. Browning and W. R. Inge (1888), J. C. Rolfe (U.S. 1904), A. Weidner and J. Schmidt (1905), C. Erbe (1892), C. Nipperley and B. Lupus (ed. maj., 1879, school ed., 1895), J. Siebelis and O. Stange (1897).

NEPOS, JULIUS, the last but one of the Roman emperors of the West (474–475). He was a nephew of Marcellinus, prince of Dalmatia, whom he succeeded in his principality. After the death of Olybrius the throne of the West remained vacant for some months, during which Italy was abandoned to barbarians. Being connected by marriage with Leo I, emperor of the East, he was selected by him to succeed Olybrius on the Western throne, and proclaimed at Ravenna. After capturing his rival Glycerius, who had been nominated by the army in 473, at the mouth of the Tiber, he was recognized as emperor in Rome, Italy and Gaul. The only event of the reign of Nepos was the inglorious cession to the Visigoths of the province of Auvergne. In 475 Orestes, father of Augustus, afterwards the last emperor of the West, raised the standard of revolt and marched against Nepos at Ravenna. The emperor fled into Dalmatia, and continued to reside at Salona until his assassination by two of his own officers in 480, possibly at the instigation of Glycerius, who had been compelled to enter the church and had been appointed bishop of Salona.

See Tillemont, Hist. des emperors, vi.; Gibbon, Decline and Fall, ch. 36.

NEPTUNE (Lat. NEPTUNUS), an Italian god, of unknown origin and meaning, paired with Salacia, possibly the goddess of the salt water. At an early date (590 B.C.) he was identified with the Greek Poseidon (g.v.), when the Sibylline books ordered a lecisternium in his honour (Livy v. 13). His festival, Nepturnalia, at which tents were made from the branches of trees, was celebrated on the 23rd of July, and his temple, containing a famous marine group by Scopas, stood near the Circus Flaminius. In earlier times it was the god Fortunus who was thanked for naval victories. Sextus Propertius called himself son of Neptune, and Agrippa dedicated to Neptune a temple (Basilica Neptuni) in the Campus Martius in honour of the naval victory of Actium.

NEPTUNE, in astronomy, the outermost known planet of our solar system; its symbol is Ψ. Its distance from the sun is a little more than 30 astronomical units, i.e. 30 times the mean distance of the earth from the sun, or about 2,796,000,000 m. It deviates greatly from Bode’s law, which would give a distance of nearly 30. Its orbit is more nearly circular than that of any other major planet, Venus excepted. Its time of revolution is 16.6 years. The 8th satellite, of the 8th magnitude it is invisible to the naked eye. In a small telescope it cannot be distinguished from a fixed star, but in a large one it is seen to have a disk about 2-3” in diameter, of a pale bluish hue. No features and no change of appearance can be detected upon it, so that observation can give no indication of its rotation. Both its optical aspect and the study of its spectrum seem to show that it resembles Uranus. Its spectrum shows marked absorption-bands in the red and yellow, indicating an atmosphere of great depth of which hydrogen would seem to be a constituent. (See PLANET.) Only a single satellite of Neptune is yet known. This was discovered by William Le Verrier soon after the discovery of the planet. Its period of revolution is 5d. 21 h. Its motion is retrograde, in a plane making an angle of about 35° with the orbit of the planet. This was the first case of retrograde motion found in any of the

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planets or satellites of the solar system. The most noteworthy feature connected with the satellite is a secular change which is going on in the position of its orbital plane. Were the planet spherical in form, no such change could occur, except an extremely slow one produced by the action of the sun. The change is therefore attributed to a considerable ellipticity of the planet, which is thus inferred to be in rapid rotation. It will ultimately be possible to determine from this motion the position of the axis of rotation of Neptune with much greater precision than it could possibly be directly observed. The elements of the satellite were determined by H. Struve from all the observations available up to 1892.

### Varying Elements of Neptune's Satellite.

- Inclination to earth's equator: \( 119.35^\circ = 10^h 16^m 3^s (1-1860) \)
- R.A. of node on earth's equator: \( 185.15^\circ + 0^h 14^m 8^s (1-1860) \)
- Distance from node to epoch: \( 234.42 \)
- Mean daily motion: \( 61.5754^\circ \)
- Mean distance at \( \log \Delta = 1.47814 \): \( 16.271^\circ \)
- Epoch, 1890, Jan. 0, Greenwich mean noon

The eccentricity, if any, is too small to be certainly determined. From the above mean distance is derived as the mass of Neptune to be \( 1.2 \). The motion of Uranus gives a mass \( 1.5\times 10^{-3} \).

### Discovery of Neptune.

The detection of Neptune through its action upon Uranus before its existence had been made known by observation is a striking example of the precision reached by the theory of the celestial motions. So many agencies were concerned in the final discovery that the whole forms one of the most extraordinary chapters in the history of astronomy. The planet was, before its actual discovery by Sir William Herschel in 1781, had been observed as a fixed star on at least 17 other occasions, beginning with Flamsteed in 1690. In 1820 Alexis Bouvard of Paris constructed tables of the motion of Jupiter, Saturn and Uranus, based on a discussion of observations up to that year. Using the mutual perturbations of these planets as developed by Laplace in the Mécanique Céleste, he was enabled satisfactorily to represent the observed positions of Jupiter and Saturn; but the case was entirely different with Uranus. It was found impossible to represent all the observations within admissible limits of error, the outstanding differences between theory and observation exceeding \( 1^\circ \). In these circumstances one of two courses had to be adopted, either to obtain the best general representation of all the observations, which would result in the tables being certainly erroneous, or to reject the older observations which might be affected with errors, and base the tables only on those made since the discovery by Herschel. A few years of observation showed that Uranus was deviating from the new tables to an extent greater than could be attributed to legitimate errors of theory of observation, and the question of the cause became of growing interest. Among the investigators of the question was F. W. Bessel, who tried to reconcile the difficulty by an increase of the mass of Saturn, but found that he could do so only by assigning a mass not otherwise admissible. Although the idea that the deviations were probably due to the action of an ultra-Uranian planet was entertained by Bouvard, Bessel and doubtless others, it would seem that the first clear statement of a conviction that such was the case, and that it was advisable to reach some conclusion as to the position of the disturbing body, was expressed by the Rev. T. J. Hussey, an English amateur astronomer, in a letter to Sir John Herschel in February 1841. Airy's views of the subject, and offered to search for the planet with his own equatorial if the required estimate of its position could be supplied. Airy expressed himself as not fully satisfied that the deviation might not arise from errors in the perturbations. He therefore was not certain of any extraneous action; but even if there was, he doubted the possibility of determining the place of a planet which might produce it. In 1837 Bouvard, in conjunction with his nephew Eugène, was again working on the problem; but it does not seem that they went farther than to collect observations and to compare the results with Bouvard's tables.

In 1835 F. B. G. Nicolai, director of the observatory at Mannheim, in discussing the motion of Halley's comet, considered the possibility that it was acted upon by an ultra-

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3. Ibid. xv. § 217.

NERAC

The longitude of the actual planet was 32° 57' on 3rd of October 1846.

The close agreement of these elements led Airy to suggest to Challis, on the 5th of July 1846, a search for the planet with the Northumberland telescope. He proposed an examination of a part of the heavens 30° long in the direction of the ecliptic and 10° broad, and estimated the number of hours' work likely to be employed in this sweep. The proposed sweeps were commenced by Challis on the 29th of July. The plan required each region to be swept through twice, and the positions of all the known stars found to be compared, in order that the position of each sweep might be verified. On the 7th of August Leverrier's concluding paper was presented to the French Academy, and on the 18th of September he wrote to John G. Galle (1812-1910), then chief assistant at the Berlin observatory, suggesting that he should search for the computed planet, with the hope of detecting it by its disk, which was probably more than 3' in diameter. This letter, probably received on the 23rd of September, was communicated to J. F. Encke, the director of the observatory, who approved of the search. H. L. d'Arrest, a student living at the observatory, expressed a wish to assist. In the first instance it was intended that it would be given to the planet; but this proved impossible to detect any planet by its disk. Star charts were at the time being prepared at the observatory under the auspices of the Berlin Academy of Sciences. It was suggested by d'Arrest that this region might be covered by one of the charts. Referring to the chart, which was lying in a drawer, it was found that such was the case. Comparing the stars on the chart one by one with the heavens it was found that an eighth magnitude star now visible was not on the chart. This object was observed until after midnight, but no certain motion was detected. On the following evening the object was again looked for, and found to have actually moved. "The effect of the planet was at last established. It was afterwards found that Challis in his sweeps had observed the planet on the 4th of August, but, not having compared his observations with those made subsequently, had failed to detect it.

The question whether Leverrier should receive the sole credit of the discovery was warmly discussed. Arago took the extreme ground that actual publication alone should be considered, rejecting Adams' communications to Airy and Challis as quite unworthy of consideration. He also suggested that the name of Leverrier should be given to the planet; but this proposal was received with so little favour outside of France that he speedily withdrew it, proposing that of Neptune instead.

The observations at the first opposition showed that the planet was moving in a nearly circular orbit, and was at a mean distance from the sun much less than that set by Leverrier as the smallest possible. The latter had in fact committed the error of determining the limits by considering the variations of the elements one at a time, assuming in the case of each that while it varied the others remained constant. But a simultaneous variation of all the elements would have shown that the representation of the observations of Uranus would be improved by a simultaneous diminution of both the eccentricity and the mean distance, the orbit becoming more nearly circular and the planet being brought nearer to the sun. But this was not at first clearly seen, and Benjamin Peirce of Harvard University went so far as to maintain that there was a discontinuity between the solution of Adams and Leverrier and the solution offered by the planet itself, and that the coincidence in direction of the actual and computed planet was an accident. But this view was not well founded, and the only explanation needed was to be found in Leverrier's faulty method of determining the limits within which the planet must be situated. As a matter of fact the actual motion of the planet during the century preceding, as derived from Leverrier's elements, was much nearer the truth than the elements themselves were. This arose from the fact that his very elliptic orbit, by its large eccentricity, brought the planet near to the sun, and therefore near to its true position, during the period from 1780 to 1845, when the action on Uranus was at its greatest.

The observations of the first opposition enabled Sears Cook Walker of the National Observatory, Washington, in February 1847 to compute the past positions of the planet and identify it with a star observed by Lalande at Paris in May 1795. This being communicated to the Paris observatory, an examination of Lalande's manuscript showed that he had made two observations of the planet, on the 8th and 10th of May, and finding them discordant had rejected one as probably in error, and marked the other as questionable. A mere re-examination of the region to see which observation was in error would have led him to the discovery of the planet more than half a century earlier and actually recognized. The identity of Lalande's star with Neptune was independently demonstrated by the observers of Altona, before any word of Walker's work had reached him.

BIBLIOGRAPHY.—The principal sources for the history of the discovery of Neptune are the Astronomische Nachrichten, vols. xxv., xxvi., xxvii., and xxxiv. 1846; and E. Le Verrier's paper in the Ergänzungshefte to this publication, pp. 1-31 (Altona, 1845). In the Memoirs of the Royal Astronomical Society, vol. xvi. Airy gave a detailed history of the circumstances connected with the discovery, so far as he was cognizant of them. Documents pertaining to the subject are found in the Monthly Notices of the Royal Astronomical Society, vol. iv. 1847; Report to the Smithsonian Institution on the History of the Discovery of Neptune, published by the Smithsonian Institution (Washington, 1848); the most complete and detailed history of all the circumstances connected with the discovery, and negotiations on the orbit of the planet, that has been published. Leverrier's investigation was published in extenso as an addition to the Connaissance des Temps, as an Appendix to the Almanac of 1851. Peirce's discussions, so far as published at all, are found in the Proceedings of the American Academy of Arts and Sciences. The first computations of the orbit after the discovery were made by Sears Cook Walker, and published by the Smithsonian Institution (1845-1856). General tables of the motion of Neptune are in Kowalski's Tables du mouvement de la planète Neptune; Newcomb's Tables of the motion of Neptune, Washington, Smithsonian Institution (1856); Leverrier's Annuaire de l'Observatoire de Paris, Memoirs, vol. xiv. (1877), and lastly Newcomb's "Tables" in Astron. Papers of the American Ephemeris, vol. vii., part iv. Tables of the planet are found in Newcomb, The Uranian Systems; appendix to the Washington observations of 1873.

NERAC, a town of south-western France, capital of an arrondissement in the department of Lot-et-Garonne, 16 m. W.S.W. of Agen by road. Pop. (1906) town, 4018; commune, 6318. The town, once the capital of the dukes of Albret, is divided by the Baise into two parts, Grand-Nérac on the left bank and Petit-Nérac on the right. The river rises near the town, amid the ruins of the 16th century, called the Pont Vieux, and by the Pont Neuf, of modern construction. Narrow winding streets often bordered by old houses ascend from the narrow quays on both banks. From the left bank a staircase leads to the Rue Henri Quatre, where stands a wing of the castle in which Henry IV. lived. A statue of the king stands in one of the squares. The former palace of the Chambre des Comptes is now occupied by the tribunal of commerce, the library and the museum. The church of Grand-Nérac of the 18th century and the church of Petit-Nérac of the 13th century offer no remarkable features. On the left bank of the Baise, above Grand-Nérac, market gardens have taken the place of the old gardens of the Sires d'Albret, but remains of the Palais des Mariannes and of the Pavillon des Bains du Roi de Navarre, both of Renaissance architecture, are left. The famous promenade de La Garenne laid out by Antoine de Bourbon, king of Navarre, stretches for more than a mile along the opposite bank of the river. The remains of a Roman villa, including a fragment of mosaic, have been found there. A road leads from the south end of La Garenne to the ruins of the feudal castle of Nazareth. The river Baise is navigable to the town which is within a short distance of Nérac. The town has a sub-prefecture, and the industries include brewing and cork-working.

Nérac appears at the beginning of the 11th century as a possession of the monks of St. Pierre de Condom. The lords of Albret gradually deprived them of their authority over the town, and at the beginning of the 14th century founded a castle on the left bank of the Baise. In the 16th century the castle was the residence of Henry IV. during much of his youth and of
NERBUDA—NERGAL

Marguerite de Valois, sister of Francis I., of Jeanne d’Albret, and of the second Marguerite de Valois, wife of Henry IV., who held a brilliant court there. Néerac, the inhabitants of which had adopted the Reformed religion, was seized by the Catholics in 1568, 1578, and 1588, but restored to the protestants by the Edict of Nantes in 1587.

NERBUDA, or NARBADA, a river of India. It is traditionally regarded as the boundary between Hindustan proper and the Deccan. It rises on the summit of Amarkantak hill in Rewa state, and for the first 200 m. of its course winds among the Mandla hills, which form the head of the Satpura range; then at Jubbulpore, passing through the “Marble Rocks,” it enters its proper valley between the Vindhyan and Satpura ranges, and pursues a direct westerly course to the Gulf of Cambay. Its total course through the Central Provinces and Gujarat amounts to 683 m. above sea level, and it falls into the sea in the Borne district of Broach. It receives the drainage of the northern slopes of the Satpuras, but not that of the Vindhyan tableland, the streams from which flow into the Ganges and Jumna. After leaving the Central Provinces, the river widens out in the fertile district of Broach, with an average breadth of 1/2 m. to 1 m. Below Broach city it forms an estuary which is 13 m. broad where it enters the Gulf of Cambay. The Nerbuda is nowhere utilized for irrigation, and navigation is confined to the lower section. In the rainy season boats of considerable size sail about 60 m. above Broach city. Sea-going vessels of about 70 tons frequent the port of Broach, but they are entirely dependent on the tide. In sanctity the Nerbuda ranks only second to the Ganges among the rivers of India, and along its whole course are special places of pilgrimage. The most meritorious act that a pilgrim can perform is to walk from the sea to the source of the river and back along the opposite bank. This pilgrimage takes from one to two years to accomplish.

The Nerbuda has given its name to a division of the Central Provinces, comprising the five districts of Narsinghpur, Hanshagad, Nimar, Betul and Chhindwara. Area, 18,382 sq. m.; pop. 1,001,071.

NERCHINSK, a town of Eastern Siberia, in the government of Transbaikal, 183 m. by rail E. of Chita, on the left bank of the Nercha, 2/4 m. above its confluence with the Shilka. Pop. (1897) 6713. It is badly built of wood, and its lower parts frequently suffer from inundations. It has a small museum. The inhabitants support themselves mainly by agriculture, tobacco-growing and cattle-breeding; a few merchants trade in furs and cattle, in brick-tee from China, and manufactured wares from Russia.

The fort of Nerkhinsk dates from 1654, and the town was founded in 1658 by Pashkov, who in that year opened direct communication between the Russian settlements in Transbaikal and those on the Amur which had been founded by Cossacks and fur-traders coming from the Yakutsk region. In 1689 was signed between Russia and China the treaty of Nerkhinsk, which stopped for two centuries the farther advance of the Russians into the basin of the Amur. After that Nerkhinsk became the chief centre for the trade with China. The opening of the western route through Mongolia, by Urga, and the establishment of a custom-house at Khalkha in 1728 diverted this trade into a new channel. But Nerkhinsk acquired fresh importance from the influx of immigrants, mostly exiles, into Eastern Transbaikal, the discovery of rich mines and the arrival of great numbers of convicts, and ultimately it became the chief town of Transbaikal. In 1821 it was transferred from the banks of the Shilka to its present site, on account of the floods. Since the foundation, in 1851, of Chita, the present capital of Transbaikal, Nerkhinsk has been falling into decay.

NERCHINSK (in full NERCHINSKII ZAVOD), a town and silver-mine of East Siberia, in the government of Transbaikal, 150 m. E.S.E. of another Nerkhinsk (q.v.) (with which it is often confused), on a small affluent of the Argun. Pop. (1897) 3000. It lies in a narrow valley between barren mountains, and is much better built than any of the district towns of East Siberia. It has a chemical laboratory for mining purposes, and a meteorological observatory (31° 18' N., 119° 37' E., 2200 ft. above sea-level), where meteorological and magnetic observations have been made every hour since 1842. The average yearly temperature is 25° F., with extremes of 97° and -52°.

Nerchinsk Mining District extends over an area of 1,450 sq. m., and includes all the silver-mines and gold-fields between the Shilka and the Argun, together with a few on the left bank of the Shilka. It is traversed by several parallel chains of mountains which rise to 4500 ft., and are intersected by a complicated system of deep, narrow valleys, densely wooded, with a few expansions along the larger rivers, where the inhabitants with difficulty raise some rye and wheat. The population (75,625 in 1897) consists of Russians, Buryats and Tunguses. Included in this number were some 2300 convicts. The mountains, so far as they have been geologically explored, consist of crystalline rocks, with quartzites and slate, deeply intersected with veins of silver intermixed with granite, syenite and diorite; they contain rich ores of silver, lead, tin and iron, while the diluvial and alluvial valley formations contain productive auriferous sands.

The Nerchinsk silver mines began to be worked in 1704, and during the first half of the 18th century their yearly production did not exceed 800 oz., and the total amount for the first 150 years (1704-1854) amounted to 11,540,000 oz. The lead was mostly neglected on account of the difficulties of transport, but its production is at present on the increase. Gold was first discovered in 1850, and between 1853 and 1855 260,000 oz. of gold dust were obtained. In 1864 a large number of auriferous deposits were discovered. Until 1863 all the labour was performed by serfs, the property of the emperor, and by convicts, numbering usually nearly four thousand.

NEREUS, in Greek mythology, the eldest son of Pontus and Gaea, and father of the fifty Nereids. He is a beneficent and venerable old man of the sea, full of wisdom and skilled in prophecy, but, like Proteus, he will only reveal what he knows under compulsion. Thus Hermes seized him when asleep, and, although he attempted to escape by assuming various forms, compelled him to reveal the whereabouts of the apples of the Hesperides (Apollodorus ii. 5). His favourite dwelling-place is a cave beneath the depths of the ocean (Athenaeus iii. 149, 218). The Nereids, the Nereids, are personifications of the smiling, quiet sea. Of these, Thetis and Amphitrite rule the sea according to the legend of different localities; Galatea is a Sicilian figure, who plays with and deludes her rustic lover of the shore, Polyphemus. Nereus is represented with the sceptre and trident; the Nereids are depicted as graceful maidens, lightly clad or naked, riding on tritons and dolphins. The name has nothing to do with the modern Greek νερό (really νεάρον, "fresh" [water]): it is probably a short form of νηρός.

NERGAL, the name of a solar deity in Babylonia, the main seat of whose cult was the city of Nergal or Nergal, represented by the mound of Tell- Ibrahim. The importance of Nergal as a religious and at one time also as a political centre led to his surviving the tendency to concentrate the various sun-cults of Babylonia in Shamash (q.v.). He becomes, however, the representative of a certain phase only of the sun and not of the sun as a whole. Portrayed in hymns and myths as a god of war and pestilence, there can be little doubt that Nergal represents the sun of noon-time and of the summer solstice which brings destruction to mankind. It is a logical consequence that Nergal is pictured also as the deity who presides over the probably Upper-Sumerian, and stands at the head of the special pantheon assigned to the government of the dead, who are supposed to be gathered in a large subterranean cave known as Aralu or Ikalla. In this capacity there is associated with him a goddess Allatu, though there are indications that at one time Allatu was regarded as the sole mistress of Aralu, ruling...
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in her own person. Ordinarily the consort of Nergal is Laz. Nergal was pictured as a lion and on boundary-stone monuments his symbol is a mace surmounted by the head of a lion.

As in the case of Ninib, Nergal appears to have absorbed a number of minor solar deities, which accounts for the various names or designations under which he appears, such as Lugaligira, Sharrapu ("the burner," perhaps a mere epithet), Ira, Gibil (though this name more properly belongs to Nusku, q.v.) and Sibitti. A certain confusion exists in cuneiform literature between Ninib and Nergal, perhaps due to the traces of two different conceptions regarding these two solar deities. Nergal is called the "raging king," the "furious one," and the "Lion," and by a play upon his name—separated into three elements Ne-uru-gal ("lord of the great dwelling")—his position at the heart of the nether-world pantheon is indicated. In the astral-theological system he is the planet Mars, while in ecclesiastical art the great lion-headed colossal serving as guardians to the temples and palaces seem to be a symbol of Nergal, just as the bull-headed colossal are probably intended to typify Ninib.

The name of his chief temple at Kutha was E-shid-lam, from which the god receives the designation of Shidlamtia, "the one whose weapon is Eshid-lam." At this temple the temple of Ninib does not appear to have been as widespread as that of Ninib. He is frequently invoked in hymns and in votive and other inscriptions of Babylonian and Assyrian rulers, but we do not learn of many temples to him outside of Kutha. Sennacherib speaks of one at Taribusi to the north of Nineveh, but it is significant that although Nebuchadrezzar II. (606-566 B.C.), the great temple-builder of the neo-Babylonian monarchy, alludes to his operations at E-shid-lam in Kutha, he makes no mention of a sanctuary to Nergal in Babylon. Local associations with his original seat—Kutha—and the conception formed of him as a god of the dead in act of making him feared rather than actively worshipped.

(M. JA.)

NERI, PHILIP (FILIPPO DE) (1515-1555), Italian churchman, was born at Florence on the 21st of July 1515. He was the youngest child of Francesco Neri, a lawyer of that city, and his wife Lucrezia Soldi, a woman of noble birth, whose family had long served the state. He was carefully brought up, and received his early teaching from the friars at San Marco, the famous Dominican monastery in Florence. He was accustomed in after life to ascribe most of his progress to the teaching of two amongst them, Zenobio de' Medici and Servanzio Mini. When he was about sixteen years old, a fire destroyed nearly all his father's property. Philip was sent to his father's childless brother Romolo, a merchant at San Germano, a Neapolitan town near the base of Monte Cassino, to assist him in his business, and with the hope that he might inherit his possessions. So far as gaining Romolo's confidence and affection, the plan was entirely successful, but it was thwarted by Philip's own resolve to take holy orders. In 1533 he left San Germano, and went to Rome, where he became tutor in the house of a Florentine gentleman named Galeotto Caccia. Here he was able to pursue his own studies under the guidance of the Augustinians, and to begin those labours amongst the sick and poor which gained him in later life the title of "Apostle of Rome," besides paying nightly visits for prayer and meditations to the churches of the city and the catacombs. In 1538 he entered on that course of home mission work which was the distinguishing characteristic of his life; somewhat in the manner of Socrates he traversed the city, seizing opportunities of entering into conversation with persons of all ranks, and of leading them on, with patient irony, with searching questions, with words of wise and kindly counsel, to consider the topics he desired to set before them.

In 1548 he founded the celebrated confraternity of the Santissima Trinità de' Pellegrini e de' Convalescenti, whose primary object is to minister to the needs of the thousands of poor pilgrims who flock to Rome, especially in years of jubilee, and also to relieve the patients discharged from hospitals, but still too weak for labour. In 1551 he passed through all the minor orders, and was ordained deacon, and finally priest on the 23rd of May. He had some thought of going to India as a missionary, but was dissuaded by his friends who saw that there was abundant work to be done in Rome, and that he was the man to do it. Accordingly he settled down, with some companions, at the hospital of San Girolamo della Carità, and while there tentatively began, in 1556, the institute with which his name is more especially connected, that of the Oratory. The scheme at first was no more than a series of evening meetings in a hall (the Oratory), at which there were prayers, hymns, readings from Scripture, from the fathers, and from the Martyrology, followed by a lecture, or by discussion of some religious question proposed by the individual who presided (as a rule a canon of the church). These gatherings (from sacred history) were called oratorias. The scheme was developed, and the members of the society undertook various kinds of mission work throughout Rome, notably the preaching of sermons in different churches every evening, a wholly novel agency at that time. In 1564 the Florentines requested him to leave San Girolamo, and to take the oversight of their church in Rome, San Giovanni de' Fiorentini, then newly built. He was at first reluctant, but by consent of Pius IV. he accepted, while retaining the charge of San Girolamo, where the exercises were resumed in the same style. At this time the new society included amongst its members Caesar Baronius, the ecclesiastical historian, Francesco Maria Tarugi, afterwards archbishop of Avignon, and Paravicini, all three subsequently cardinals, and also Gallonius, author of a well-known work on the Sufferings of the Martyrs, Ancina, Bordoni, and other men of ability and distinction.

The Florentines, however, built in 1574 a large oratory or mission-room for the society contiguous to San Giovanni, in order to save them the fatigue of the daily journey to and from San Girolamo, and to provide a more convenient place for assembly, and the headquarters were transferred thither. As the community grew, and its mission work extended, the need of having a church entirely its own, and not subject to other claims, as were San Girolamo and San Giovanni, made itself felt, and the offer of the small parish church of Santa Maria in Vallicella, conveniently situated in the middle of Rome, was made and accepted. The building, however, as not large enough for their purpose, was pulled down, and a splendid church erected on the site. It was immediately after taking possession of their new quarters that Neri formally organized, under permission of a bull dated July 25, 1575, the Congregation of the Oratory, and the headquarters were transferred thither. As the community grew, and its mission work extended, the need of having a church entirely its own, and not subject to other claims, as were San Girolamo and San Giovanni, made itself felt, and the offer of the small parish church of Santa Maria in Vallicella, conveniently situated in the middle of Rome, was made and accepted. The building, however, as not large enough for their purpose, was pulled down, and a splendid church erected on the site.
timely and political intervention. Neri continued in the government of the Oratory until his death, which took place on the 26th of May 1595 at Rome. He was succeeded by Baronius.

There are many anecdotes told of him which attest his possession of a playful humor, united with a shrill mother-wit. He considered a cheerful temper to be more Christian than a melancholy one, and carried this spirit into his whole life. This is the true secret of his popularity and of his place in the folklore of the Roman poor. Many miracles were attributed to him alive and dead, and it is said that when his body was dissected it was found that two of his ribs had been broken by the constant pressure of his heart's desire, which was very fervent in the catacombs about the year 1545. This phenomenon is in the same category as the stigmata of St Francis of Assisi. Neri was beatified by Paul V, in 1600, and canonized by Gregory XV. in 1622.

"Practical commonplaceness," says Frederick William Faber in his panegyric of Neri, was the special mark which distinguishes his form of ascetic piety from the types accredited before his day.

"He looked like other men... he was emphatically a modern gentleman, of scrupulous courtesy, sportive gaiety, acquainted with what was going on in the world, taking a real interest in it, and getting into it, managing it. He had a strong sense of that society has always 1.1. to him, in a modern room with modern furniture, plain, it is true, but with no marks of poverty about it—in a word, with all the ease, the graceful, the polish of a modern great man. His elevation of character was certainly out of all proportion to his birth. He was the active promoter of vernacular services, frequent and popular grace, devotional prayer, and unsanctioned, albeit fervent, private devotion.

Neri was not a reformer, save in the sense that in the active discharge of pastoral work he laboured to reform individuals. He had no one of the tricks of the trade of the character in being in truth an ardent Ultramontanist in doctrine, as was all but inevitable in his time and circumstances, and his great merit was the instinctive tact which showed him that the system of monasticism could never be the leaven of secular life, but that something more homely, simple, and everyday in character was needed for the new time.

Accordingly, the congregation he founded is of the least conventional nature, rather resembling a residential clerical club than a monastery of the older type, and its rules (never written by Neri, but approved by Paul V, in 1612) would have appeared incredibly lax to the other members of the religious order. Harding, Francis or Dominic. It admits only priests aged at least thirty-six, or ecclesiastics who have completed their studies and are ready for ordination. The members live in community, and each pays his own expenses during the time of his probation. This was a startling innovation on the monastic vow of poverty. They have indeed a common table, but it is kept up precisely as a regimental mess. The contributions from every member are divided by the society except the bare lodging, and the fees of a visiting physician. Everything else—clothing, books, furniture, medicines—must be defrayed at the private charges of each member.

There are no vows, and every member of the society is at liberty to withdraw when he pleases, and to take his property with him. The government, strikingly unlike the Jesuit autocracy, is of a republican form; and the superior, though first in honour, has to take his turn in discharging all the duties which come to each priest of the society in the order of his seniority, including that of watching at table, which is not entrusted to the Oratory to lay brothers, according to the practice in most other communities. Four deputies assist the superior in the government, and all public acts are decided by a majority of votes of the whole congregation, in which the superior himself has also casting voice. To be chosen superior, fifteen years of membership are requisite as a qualification, and the office is tenable, as all the others, for but three years at a time. No one can vote till he has been three years in the society; the deliberative vote of the superior is of course the deciding factor. The elections of the classes of members—novices, triennials and decennials. Each house can call its superior to account, can depose, and can restore him, without appeal to any external authority, although the bishop of the diocese in which the house of the Oratory is established has ordinary and immediate superior, though without power to interfere with the rule. Their churches are non-parochial, and they can perform private offices, but no public, except, on the death of the parish priest, who is entitled to receive all fees due in respect of these ministrations. The Oratory chiefly spread in Italy and in France, where in 1760 there were 38 houses all under the government of a superior-general. Malebranche, Thomassin, Mascaron and Masillon were members of the famous branch established in Paris in 1611 by Bérulle (after cardinal), which had a great success and a distinguished history. It fell in the crash of the Revolution, but was re-established by the Oratory of St Peter in 1825. They are the "Oratory of Jesus and the Immaculate Mary"; the Church of the Oratory near the Louvre belongs to the Reformed Church. An English house, founded in 1847 at Birmingham, is celebrated as the home of converts (at least pamphlet converts) of the "New Religion"; never though a few houses have been founded there, in Munich and Vienna.

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NERO (35–68), Roman emperor 54–68, was born at Antium on the 17th of December 35. He was the son of Gnaeus Domitius Ahenobarbus and Agrippina the younger, and his name was originally L. Domitius Ahenobarbus. His father died when Nero was scarcely three years old. In the previous year (39) his mother had been banished by order of her brother Caligula (Gaius) the emperor, who detested her. In 41 Nero had become emperor of his own age, his father having been deprived of both parents, found shelter in the house of his aunt Domitia, where two slaves, a barber and a dancer, began his training. The emperor Claudius recalled Agrippina, who spent the next thirteen years in the determined struggle to win for Nero the throne which had been predicted for him. Her first decisive success was gained in 48 by the disgrace and execution of Messalina (g.n.), wife of Claudius. In 49 followed her own marriage with Claudius, and her recognition as his consort in the government. The Roman populace already looked with favour on Nero, as the grandson of Germanicus, but in 50 his claims obtained formal recognition from Claudius, who adopted him under the title of Nero Claudius Caesar Drusus Germanicus. Agrippina’s next step was to provide a suitable training for her son. The scholar L. Annaeus Seneca was recalled from exile and appointed his tutor. On the 17th of December 51 Nero completed his fourteenth year, and Agrippina, in view of Claudius’s failing health, determined to delay no longer his adoption of the toga virilis. The occasion was celebrated in a manner which seemed to place Nero’s prospects of succession beyond doubt. He was introduced to the senate by Claudius himself on a charge of treasurability, and the title of princeps juven- tatis was conferred upon him. He was specially admitted as an extraordinary member of the great priestly colleges; his name was included by the Arval Brethren in their prayers for the safety of the emperor and his house; at the games in the circus his appearance in triumphal dress contrasted significantly with the simple toga praetexta worn by Britannicus. During the next two years Agrippina followed this up with energy. Britannicus’s leading partisans were banished or put to death, and the all-important command of the praetorian guard was transferred from him to Burrus, who had been the trusted agent first of Livia and then of Tiberius and Claudius. Nero himself was put prominently forward. The petitions addressed to the senate by the town of Bononia and by the communities of Rhodes and Ilium were gracefully supported by him in Latin and Greek speeches, and during Claudius’s absence in 52 at the Latin festival it was Nero who, as prefect of the city, administered justice in the forum. Early in 53 his marriage with 1 Tac. Ann. xii. 26, 36; see also Schiller, Nero, 67.

2 Tac. Ann. xii. 26; Zonaras xi. 10.

3 Tac. Ann. xii. 41.
Claudius's daughter Octavia drew still closer the ties which connected him with the imperial house. Agrippina determined to hasten the death of Claudius, and the absence, through illness, of the emperor's trusted freedman Narcissus, favoured her schemes. On the 13th of October 54 Claudius died, poisoned, as all our authorities declare, by her orders, and Nero was presented to the soldiers on guard as their new sovereign. From the steps of the palace he proceeded to the praetorian camp to receive the salutations of the troops, and thence to the senate-house, where he was promptly invested with all the honours, titles and powers of emperor.

Agrippina's bold stroke had been completely successful. Only a few voices were raised for Britannicus; nor is there any doubt that Rome was prepared to welcome the new emperor with genuine enthusiasm. His prestige and his good qualities, carefully fostered by Seneca, made him popular, while his childish vanity, unGovernable selfishness and savage temper were as yet unsuspected. His first acts confirmed this favourable impression. He modestly declined the title of *pater patriae*; the memory of Claudius, and that of his own father Domitius were duly honoured. The senate listened with delight to his promises to rule according to the maxims of Augustus, and to avoid the errors which had rendered unpopularity the rule of his predecessor, while his unfailing clemency, liberality and affability were the talk of Rome. Much no doubt of the credit of all this is due to Seneca and Burrus. Seneca had seen from the first that the real danger with Nero lay in the savage vehemence of his passions, and he made it his chief aim to stave off by every means in his power the dreaded outbreak. The policy of indulging his tastes and helping him to enjoy the sweets of popularity without the actual burdens of government succeeded for the time. During the first five years of his reign, the golden *quinquennium Neronis*, little occurred to damp the popular enthusiasm. Nero's easy-going and undemanding nature, his impetuosity and his want of patience in the pursuit of objects, were fully fulfilled, and the senate found itself free to discuss and even to decide important administrative questions. Abuses were remedied, the provincials protected from oppression, and the burdens of taxation lightened. On the frontiers, thanks chiefly to Corbulo's energy and skill, no disaster occurred serious enough to shake the general confidence, and even the murder of Britannicus seems to have been accepted as a necessary measure of self-defence. But Seneca's fear lest Nero's sleeping passions should once be roused were fully verified, and he seems to have seen all along that the danger which had rendered his predecessor unpopular would continue to exist, and that his own influence was not likely to be sufficient to avert the danger. He, therefore, with Seneca's advice, and in the name of the senate and the people, consulted the legions, who rose against Nero, adopted Burrus as their chief, and divorced, confirmed, and annexed the new title of Caesar, which was translated into the Roman tongue as emperor. The legions and the praetorian guard, who had been disfrocked by Claudius with the utmost rigor, were restored to their ancient positions and privileges.

In the court of the year 61 Rome was startled by the news of a disaster in Britain. At the time of the Claudian invasion of Britain in A.D. 43 Prasutagus, the king of the Iceni, had concluded a treaty with Claudius, by which, without recognizing the sovereignty of Rome, he was himself enrolled among "the allies and friends of the Roman people." The alliance was of value to Claudius, for the territory of the Iceni (Norfolk, Suffolk, and Cambridgeshire) lay immediately north of the new province and its capital Colchester, and Prasutagus had loyally kept faith with Rome. But in A.D. 61 he died, leaving no male heir. His kingdom therefore lapsed to the legions. By a stroke of good fortune, the kingdom was divided in an orderly way, divided his accumulated wealth between his two daughters and the emperor. His plan failed, for the local Roman officials acted as though the kingdom had been conquered and annexed; they seized on the property of the late king and his chief allies and insulted his family. Fearing that worse might follow when the kingdom should be annexed, and encouraged by the absence of the legate and his legions, the Iceni, led by Prasutagus's daughter Boudicca (Boadicea) rose in revolt and were joined by the Trinovantes in Essex, who had been long subject to Rome and had their own grievances to redress. Colchester, since A.D. 50 a Roman colony, was sacked. The ninth legion which had hurried from Lincoln was cut to pieces, and the insurgents prepared to march on London. The news of the outbreak found the legate Suetonius Paulinus engaged in attacking Anglesey. His resolution was at once taken. He left his garrison on the island and made haste along the Watling Street, leaving orders for the legions to follow. Though the tribes along the road were rising, Suetonius succeeded in reaching London, only however to find himself too late to hold the city. He marched back along the road by which he had come. London first, and then Verulamium, were abandoned to the Britons. At last at some undefined point on the Watling Street his legions joined him. Thus reinforced he turned to face the enemy. The engagement was severe but the Roman victory was decisive, and Roman authority was restored throughout central and southern Britain.

The profound impression produced in Rome by the "British disaster" was not confined two years later in A.D. 65 by the partial destruction of Pompeii by an earthquake, and the news of the evacuation of Armenia by the Roman legions. A far deeper and more lasting impression was produced by the great fire in Rome.

The fire broke out on the night of the 18th of July, 64, among the wooden booths at the south-east end of the Circus Maximus. Thence in one direction it rapidly spread over the Palatine and
Nero

Velia up to the low cliffs of the Esquiline, and in another it laid waste the Aventine, the Forum Boarium and Velabrum till it reached the Tiber and the solid barrier of the Servian wall. After burning five thousand houses, many of which were the first discovery of a fire, he then destroyed the buildings in the north-eastern quarter of the city and desolated the regions of the Circus Flaminius and the Via Lata, and by the time that it was finally quenched only four of the fourteen regions remained untouched; three had been utterly destroyed and seven reduced to ruins. The conflagration is said by all authorities later than Tacitus to have been deliberately caused by Nero himself.1 But Tacitus, though he mentions the rumours, declares that its origin was uncertain, and in spite of such works as Profumo's Le fonti ed i tempi dell'incendio Neroniano (1963), there is no proof of guilt.2 3

Nero's command replaced the Caudo Matronia were utilized to give shelter to the homeless. Crowns, provisions were brought from Ostia and the price of corn lowered. In rebuilding the city every precaution was taken against the recurrence of such a calamity. 

Regular streets replaced the narrow winding alleys. The new houses were limited in height, partly built on hard stone and protected by open spaces and colonnades. The water-supply, lastly, was carefully regulated.

There is, however, no doubt that this great disaster told against Nero in the popular mind. It was regarded as a direct manifestation of the wrath of the gods, even by those who did not suspect the emperor. This impression no religious ceremonies nor even the execution of a number of Christians, as convenient scapegoats, could altogether dispel. But Nero proceeded with the congenial work of repairing the damage. In addition to the rebuilding of the streets, he erected a splendid palace, the "golden house,"4 for himself. The wonders of his Domus aurea were remembered and talked of long after its partial demolition by Vesuvius. It stretched from the Palatine across the low ground, afterwards occupied by the Colosseum, to the Esquiline. Gold was lavished on the Greek workmen, and Greek art was admirably reproduced in the most marvellous of all the grounds in which it stood, with their meadows and lakes, their shady woods and their distant views. To defray the enormous cost, Italy and the provinces, says Tacitus, were ransacked, and in Asia and Africa also the imperial treasures were recalled. The days of Mummium and of Sulla.5 It was the first occasion on which the provincials had suffered from Nero's rule, and the discontent it caused helped to weaken his hold over them at the very moment when the growing dissatisfaction in Rome was gathering to a head. Early in 65 Nero was panic-stricken by the discovery of a formidable conspiracy involving such men as Faenius Rufus, Tigitellinus's colleague in the prefecture of the praetorian guards, Plautius Lateranus, one of the consuls elect, the poet Lucan, and, lastly, not a few of the tribunes and centurions of the praetorian guard itself. Their chosen leader, whom they destined to succeed Nero, was C. Calpurnius Piso (q.v.), a handsome, wealthy and popular noble, and a boon companion of Nero himself. The plan to murder Nero was frustrated by a freedman, Milichus, who, in the hope of a large reward, disclosed the whole plot. Piso, Faenius Rufus, Lucan and many of their less prominent accomplices, and even Seneca himself (though there seems to have been no evidence of his complicity) were executed.

But, though largesses and thanksgivings celebrated the suppression of the conspiracy, and the round of games and shows was renewed with even increased splendour, the effects of the shock were visible in the long list of victims who during the next few months were sacrificed to his restless fears and resentment. Consipuous among them was Paetus Thrasea, who, by the rendering virtue had long made him distasteful to Nero, and who was now suspected, possibly with reason, of sympathy with the conspirators. The death of Poppaea in the autumn of 65 was probably not lamented by any one but her husband, but the general gloom was deepened by a pestilence, caused, it seems, by the overcrowding at the time of the fire. The emperor now appears to have passed some time in the country where, according to Tacitus, he visited the Parthian prince Tiridates. This event was a conspicuous tribute to the ability both as soldier and statesman of Cn. Domitius Corbulo. As long ago as 54 the news reached Rome that the Parthian king Vologaeses had expelled the king recognized by Rome from Armenia and installed in his place his own brother Tiridates. Orders were at once issued to concentrate all available forces on the Cappadocian frontier under Corbulo, the first soldier of his day. After some time spent in making his army efficient, Corbulo invaded Armenia and swept victorious through the country. Armenia was rescued and Corbulo proposed that Tiridates should become king of Armenia on condition of his receiving his crown as a gift from Nero. But the government in Rome had a plan of its own, and a certain Tigranes, long resident in Rome but a stranger to the Armenians, was sent out, and Corbulo was obliged reluctantly to seat him on the Armenian throne. Tigranes's position, always insecure, soon became untenable, and it became necessary for Rome to intervene once more. A Roman force under Caesennius Paetus was sent to restore Tigranes and re-establish Roman predominance. Paetus, however, was defeated, and Corbulo, nowlegate of Syria, was obliged to come to his assistance. The result was the final triumph of Corbulo's policy. Tiridates agreed to accept the crown of Armenia from the hands of Nero. In royal state he travelled to Italy, and the ceremony of investiture was performed at Rome with the utmost splendour. Delighted with this tribute to his greatness, Nero for a moment dreamt of rivalling Alexander. Expeditions were talked of to the Caspian Sea and Ethiopia, but Nero was no soldier and quickly turned to a more congenial field. He had already, in 64, appeared on the stage before the half-Greek public of Naples. But his mind was less interested in the glory of the empire than in the arts, and he was a hearty admirer of the beauties of the ancient home of art. Towards the end of 66 he arrived in Greece with a retinue of soldiers, courtiers, musicians and dancers. The spectacle presented by Nero's visit was unique.6 He went professedly as an enthusiastic worshipper of Greek art and a humble candidate for the suffrages of Greek judges. At each of the great festivals, which to please him were for once crowded into a single year, he entered in regular form for the various competitions, scrupulously conforming to the tradition and rules of the arena, and awaited in nervous suspense the verdict of the umpires. The more the Greeks humoured him to the top of his bent. Everywhere the imperial competitor was victorious, and crowded audiences importuned him to display his talents. The emperor protested that only the Greeks were fit to hear him, and rewarded them when he left by the bestowal of immunity from the land tax on the whole province, and by the gift of the Roman franchise; he also planned and actually commenced the cutting of a canal through the Isthmus of Corinth. If we may believe report, Nero found time in the intervals of his artistic triumphs for more vicious excesses. The stories of his mock marriage with Sophas, his execution of wealthy Greeks for the sake of their money, and his wholesale plundering of the temples were evidently part of the accepted tradition about him in the time of Suetonius, and are at least credible. Far more certainly true is his ungrateful treatment of Domitius Corbulo, who, when he landed at Cenchrea, fresh from his successes in Armenia, was met by an order for his instant execution and at once put an end to his life.

Meanwhile the general dissatisfaction was coming to a head, as we may infer from the urgency with which the imperial freedman Helius insisted upon Nero's return to Italy. More serious was the dissatisfaction which now showed itself in the rich and warlike provinces of the west. In northern Gaul, early in 68, the standard of revolt was raised by Julius Vindex, governor of Gallia Lugdunensis, and himself the head of an ancient and noble Celtic family. South of the Pyrenees, P. Sulpicius Galba, governor of Hispania Tarraconensis, and Poppaea's former

1 Tac. Ann. xv. 38; Suet. Nero, 38; Dio Cass. Ixii. 16; Pliny, N.H. xvii. 5.
2 This work is a reply to C. Pascal's L' Incendio di Roma e i primi Calamitari (Milan, 1900), which throws the guilt on the Christians.
5 Sumptuous and splendid
6 This is an inquiry into the matter of the fire, and the steps taken by the emperor to repair the damage.
husband, Marcus Salvius Otho, governor of Lusitania, followed Vindex's example. At first, however, fortune seemed to favour Nero. It is very probable that Vindex had other aims in view than the deposition of Nero and the substitution of a fresh emperor in his place, and that the liberation of northern Gaul from Roman rule was part of his plan. If this was so, it is easy to understand both the enthusiasm with which the chiefs of northern Gaul rallied to the standard of a leader belonging to their own race, and the opposition which Vindex encountered from the Roman colony of Lugdunum and the legions on the Rhine. For it is certain that the latter at any rate were not animated by loyalty to Nero. Though they defeated Vindex and his Celtic levies at Vesontio (Besançon), their next step was to break the statues of Nero and offer the imperial purple to their own commander Virginius Rufus. He declined their offer, but appealed to them to declare for the senate and people of Rome. Meanwhile in Spain Galba had been saluted emperor by his legions, had accepted the title, and was already on his march towards Italy. On the road the news met him that Vindex had been crushed by the army of the Rhine, and for the moment he resolved to abandon his attempt. Meanwhile, Nero had reluctantly left Greece, but returned to Italy only to renew his realms. When on the 19th of March the news reached him at Naples of the rising in Gaul, he allowed a week to elapse before he could tear himself away from his pleasures, and then contented himself with proscribing Vindex, and setting a price on his head. The revolts in Spain and Germany terrified him a century later. The belief that he had not really died, but would return again to confound his foes, was long prevalent, not only in the remoter provinces, but even in Rome itself, and more than one pretender was able to collect a following by assuming the name of the last of the race of Augustus. More lasting still was the imachable hatred of those who had suffered from his cruelties. Roman literature, faithfully reflecting the sentiments of the aristocratic salons of the capital, while it almost canonized those who had been his victims, fully avenged their wrongs by painting Nero as a monster of wickedness. In Christian tradition he even appears as the mystic Antichrist, who was destined to come once again to trouble the saloons. Even in the middle ages, Nero was still the very incarnation of splendid iniquity, while the belief lingered obstinately that he had only disappeared for a time, and as late as the 17th century his restless spirit was supposed to haunt the slopes of the Pincian Hill.

The chief ancient authorities for Nero's life and reign are Tacitus (Annals, xiii.-xvi., ed. Furneaux), Suetonius, Dio Cassius (Epit. li., lii., liii.), and Zonaras (Ann. xxi.). The most important modern work is the Life and Passions of the Emperor Nero (London, 1903); see an important notice in Class. Rev. vol. xviii. p. 57), which contains complete bibliography of ancient and modern writers; see also H. Schiller's Nero, and Gellius, Kaisers; Lehmann, Claudius und Nero; Treasures of Rome in general. (H. F. P.)

NERVA, MARCUS COCEIUS, Roman emperor from the 18th of September 96 to the 25th of January 68, was born at Narina in Umbria on the 8th of November, probably in the 3rd. He belonged to a senatorial family, which had attained considerable distinction under the emperors, his father and grandfather having been well-known jurists. A single inscription (C.I.L. vi. 31997) gives the name of his mother as Sergia Plautilla, daughter of Laenas. In his early manhood he had been on friendly terms with Nero, by whom he was decorated in 65 (Tacitus, Annals, xv. 72) with the triumphal insignia after the suppression of the Pisonian conspiracy (further valuable information as to his career is given in an inscription from Sassoferato, C.I.L. xi. 5743).

He was praetor (66) and twice consul, in 71 with the emperor Vespasian for colleague, and again in 90 with Domitian. Towards the close of the latter's reign (93) he is said to have excited suspicion and to have been banished to Tarentum on a charge of conspiracy (Dio Cass. lxvii. 15; Philostr. Apoll. Tyan. vii. 8). On the murder of Domitian in September 96 Nerva was declared emperor by the people and the soldiers. He is described as a quiet, kindly, dignified man, honest of purpose, but unfitted by his advanced age and temperament, as well as by feeble health, to bear the weight of empire. Nevertheless, his selection, in spite of occasional exhibitions of weakness, was probably the best choice. His accession brought a welcome relief from the terrible storm of the last few years. The new emperor recalled those who had been exiled by Domitian; what remained of their confiscated property was restored to them, and a stop was put to the vexatious prosecutions which Domitian had encouraged. But the popular feeling demanded more than this. The countless informers of all classes who had thriven under the previous régime now found themselves swept away, to borrow Pliny's metaphor (Pliny, Paneg. 35), by a hurricane of revengful fury, which threatened to become as dangerous in its indiscriminate ravages as the system it attacked. It was finally checked by Nerva, who was stung into action by the sarcasticremark of the consul Titus Caesius Caesar Fronto that, "bad as it was to have an emperor who allowed no one to do anything, it was worse to have one who allowed everyone to do everything" (Dio Cass. lxviii. 1).

Nerva seems to have followed the custom of announcing the general lines of his future policy. Domitian had been arbitrary and high-handed, and had heaped favours on the soldiery while humiliating the senate; Nerva showed himself anxious to restore the traditional privileges of the senate, and such maxims of constitutional government as still survived. He appears, however, to have set himself honestly to carry out reforms. The economical condition of Italy evidently excited his alarm and sympathy. The last mention of a lex agraria in Roman history is connected with his name, though how far the measure was strictly speaking a law is uncertain. Under the provisions of this lex, large tracts of land were bought up and allotted to poor citizens. The cost was defrayed partly from the imperial treasury, but partly also from Nero's private resources, and the execution of the scheme was entrusted to commissioners (Dig. xlvi. 21, 3; Dio Cass. lxvii. 2; Pliny, Ep. vii. 31; Corp. Inscrip. Lat. vi. 1548). He also founded or restored colonies at Verulam, Scylacium and Sitis in Mauretania. The agrarian
law was probably as short-lived in its effects as preceding ones had been, but a more lasting reform was the maintenance at the public cost of the children of poor parents in the towns of Italy (Aur. Vict. Ep. 24), the provision being presumably secured by a yearly charge on state and municipal lands. Private individuals were also encouraged to follow the imperial example. In the hands of Trajan, Hadrian and the Antonines, Nerva's example bore fruit in the institution of the alimentaiones, the most genuinely charitable institution of the pagan world. These measures Nerva supplemented by others which aimed at lightening the financial burdens on the declining industry of Italy. The burden of maintaining the imperial household was transferred to the foedus; from the same source apparently money was found for repairing the public roads and aqueducts; and, lastly, the lucrative but unpopular tax of 5% on all legacies or inheritances (vicesima hereditatium), was so readjusted as to remove the grosser abuses connected with it (Pliny, Paneg. 37). At the same time Nerva did his best to reduce the overgrown expenditure of the state (Pliny, Ep. ii. 1). A commission was appointed to consider the best modes of retrenchment, and the outlay on shows and games was cut down to the lowest possible point. Nerva seems nevertheless to have soon wearied of the unceasing task of settling disputes, and, finding that the dignity of the office was endangered by the execution of Domitian's murderers, the chamberlain, Iain Parthenius and Petronius Secundus, Aelianus's colleague, Nerva vainly strove to save, even at the risk of his own life, the men who had raised him to power, but the soldiers brutally murdered the unfortunate men, and forced him to propose a vote of thanks for the deed (Dio Cass. Epit. lxviii. 4; Aur. Vict. Ep. 24). This humiliation convinced Nerva of the necessity of placing the government in stronger hands than his own. Following the precedent set by Augustus, Galba and Vespasian, he resolved to adopt as his colleague and destined successor, M. Ulpius Trajanus, a distinguished soldier, at the time in command of the legions on the Rhine. In October 97, in the temple of Jupiter on the Capitol, Trajan was formally adopted as his son and declared his colleague in the government of the empire (Pliny, Paneg. 8). For three months Nerva ruled jointly with Trajan (Aur. Vict. Ep. 24); but on the 25th (according to others, the 27th) of January 98 he died somewhat suddenly. He was buried in the sepulchre of Augustus, and divine honours were paid him by his successors. The verdict of history upon his reign is best expressed in his own words— "I have done nothing which should prevent me from laying down my power, and living in safety as a private man." The history of Nerva is of a character to serve the ruined temple in the Via Alessandrina (il Colonacce) which marks the site of the former seat of Domitian, but which Nerva completed and dedicated (Suet. Dom. 5; Aur. Vict. 12).

AUTHORITIES.—Dio Cass. lxviii. 1-4; Aurelius Victor 12, and Epit. 24; Zonaras xl. 20; compare also Pliny, Epistolae and Panegyricus; Tillemon, Histoire des empereurs romains, v. 4; Mervale, History of the Romans under the Empire, ch. 63; H. Schiller, Geschichte der römischen Kaiserzeit, i. pt. 2 (1883), p. 538; J. Asbich, Römisches Kaiserthal und Verfassung bis auf Trajan (Cologne, 1853); Barine, Révolution dans l'Empire romain (s.s. Cocceins, 16); J. B. Bury, The Student's Roman Empire, ch. 23 (1893).

NERVAL, GÉRARD DE (1808-1859), the adopted name of Gérard Labrunie, French man of letters, born in Paris on the 22nd of May 1808. His father was an army doctor, and the child was left with an uncle in the country, while Mme Labrunie accompanied her husband in his campaigns. She died in Silesia. In 1811 his father returned, and beside Greek and Latin taught the boy modern languages and the elements of Arabic and Persian. Gérard found his favourite reading in old books on mysticism and the occult sciences. He distinguished himself by his successes at the Collège Charlemagne, however, and his first work, La France guerrière, élégies nationales, was published while he was still a student. In 1828 he published a translation of Goethe's Faust, the choruses of which were afterwards used by Berlioz for his legend-symphony, The Damnation of Faust. A number of poetical pieces and three comedies combined to acquire for him, at the age of twenty-one, a considerable literary reputation, and led to his being associated with Théophile Gautier. The first of these little comedies was Le Jeune Pasteur, the first of the series of feuilletons for the Presse. He conceived a violent passion for the actress Jessica Colon, in whom he thought he recognized a certain Adrienne, who had fired his childish imagination. Her marriage and her death in 1842 were blows from which his nervous temperament never really recovered. He travelled in Germany with Alexandre Dumas, and alone in various parts of Europe, leading a very irregular and eccentric life. In 1843 he visited Constantinople and Syria, where, among other adventures, he nearly married the daughter of a Druse sheik. He contributed accounts of his travels to the Colon, the Revue des Deux Mondes and other periodicals. After his return to Paris in 1844 he resolved for a short time his feuilleton for the Presse, but his eccentricities increased and he committed suicide by hanging, on the 25th of January 1855. The literary style of Gérard is simple and unaffected, and he has a peculiar faculty of giving to his imaginative creations an air of naturalness and reality. In a series of novelettes, afterwards published under the name of Les Illuminés, ou les précurseurs du socialisme (1852), containing studies on Rétif de la Bretonne, Cagliostro and others, he gave a sort of analysis of the feelings which followed his third attack of insanity. Among his other works the principal are Les Filles du feu (1854), which contains his masterpiece, the semi-autobiographical romance of La Promesse; Scènes de la vie orientale (1848-1850); Contes et folies (1852); La Bohème galante (1856); and L'Alchimiste, a drama in five acts, the joint composition of Gérard and Alexandre Dumas. His Poésies completes were published in 1877.

There are many accounts of Gérard de Nerval's unhappy life. Among them may be mentioned notices by his friend Théophile Gautier and by Arène Housaye, prefixed to the posthumous Le Rêve et la vie (1855); Maurice Tourneux's sketch in his Age du romantisme (1887); and a sympathetic study of temperament in the Nervés (1896) of Mme Arvède Barine. See also G. Ferrières, Gérard de Nerval (1906).

NERVE (Lat. nervus, Gr. ἁρδέος, a bowstring, originally a sinew or tendon (and still so used in the phrase "to strain every nerve"), but now a term practically confined to the fibres of the nervous system in anatomy, though consequently employed as a general psychical term in the sense of courage or firmness, and sometimes (but more usually "nervousness") in the opposite sense. In the present article the anatomy of the nerves is dealt with; see also Nervous System, Muscle and Nerve, Neuropathology, &c.

I. CRANIAL

The cranial nerves are those which arise directly from the brain, and for the most part are concerned with the supply of the head. With one exception they all contain medullated fibres (see Nervous System). Twelve pairs of these nerves are recognized, and they are spoken of as often by their numbers as by their names. The following is a list:

1. (1) Olfactory; (2) Optic; (3) Oculo-motor or Motor ocul.; (4) Trochlearis or Patheticus; (5) Trigeminal or Trifacial; (6) Abducens; (7) Facial; (8) Auditory; (9) Glossato-phyngeal; (10) Vagus or Pneumogastric; (11) Spinal accessory; (12) Hypoglossal.

The first, or olfactory nerve, consists of the olfactory bulb and tract, which are a modified lobe of the brain and lie beneath the sulus rectus on the frontal lobe of the brain (see fig. 1). At its posterior end the tract divides to become continuous with the two extremities of the limbic lobe (see Basal), while at its anterior end it is the tab from which some twenty small non-medullated nerves pass through the cribiform plate of the ethmoid to supply the sensory organs in the olfactory mucous membrane (see Olfactory Organ).
The second or optic nerve consists of the optic tract, the optic commissure or chiasma, and the optic nerve proper. The optic tract begins at the lower visual centres or internal and external geniculate bodies, the superior quadrigenral body and the pulvinar (see fig. 1), but these again are connected with the higher visual centre in the occipital lobe by the optic radiations (see fig. 2). In the chiasma some of the fibres cross and some do not, so that the right optic tract forms the right half of both the right and left optic nerves. In addition to this the fibres coming from the internal geniculate body of one side cross in the chiasma to the same body of the opposite side, forming Gowers's commissure. The optic nerve passes through the optic foramen in the skull into the orbit, where it is penetrated by the central artery of the retina, and eventually pierces the sclerotic just internal to the posterior pole of the eyeball. Its final distribution is treated in the article Eye.

The third or oculomotor nerve arises from a nucleus in the floor of the aqueduct of Sylvius (see Brain, fig. 8), and comes to the surface pass into a small compartment of the dura mater, in front of the apex of the petrous bone, known as Meckel's cave; here the large crescentic Gasserian ganglion is formed upon the sensory root, and from this the three branches commonly named the ophthalmic, maxillary and mandibular nerves arise. The first of these divisions is the opthalmic, the second the maxillary, and the third the mandibular, while the motor root of the oculomotor leaves the pons as the third root of trigeminal. The first three branches combine in the foramen rotundum, and then runs across the roof of the sphenoidal fossa and divides into sphenopalatine or Meckel's ganglion, which lies in the outer part of the orbit, and through which, as well as through its own long ciliary branches, it supplies the muscles of the pupil with sensation. It leaves the orbit through the anterior ethmoid canal, and lies for a short distance on the cribriform plate of the ethmoid; then it enters the nasal cavity and becomes the naso-lacrimal duct of the posterior ethmoid, and finally disappears, the lacrimal duct of the nasal fossa.

The fourth or trigeminal nerve consists of the mandibular, maxillary and ophthalmic divisions, which arise from the trigeminal ganglion, one of the sensory ganglia of the cranial nerves. The maxillary and ophthalmic divisions together form the first division of the trigeminal, which is the general sensory nerve of the head, supplying all the structures of the face below the eyes and the nose, and the mucous and skin covering of the head and neck. The mandibular division of the trigeminal is the motor nerve of the masticatory muscles, and is supplied to the muscles of the face, neck and teeth.

The fifth or trigeminal nerve consists of motor and sensory roots. The motor root rises from a nucleus in the upper lateral part of the floor of the fourth ventricle, as well as from a descending (mesencephalic) tract from the neighbourhood of the Sylvian aqueduct (see fig. 3). The large sensory root goes to a sensory nucleus a little external to the motor one, and also, by a spinal or descending root, to the substantia gelatinosa Rolandi as low as the second spinal nerve (see fig. 3). The superficial origin of the fifth nerve is from the side of the pons (see fig. 1), and the two roots at once

From D. J. Cunningham, in Cunningham's Text-book of Anatomy.

Fig. 1.—View of the Under Surface of the Brain, with the lower portion of the temporal and occipital lobes, and the cerebellum on the left side removed, to show the origins of the cranial nerves.

in a groove on the inner side of the crus cerebri (fig. 1); it soon pierces the dura mater, and lies in the outer wall of the cavernous sinus, where it divides into an upper and lower branch. Both these enter the orbit through the sphenoidal fissure, the upper branch supplying the superior rectus and levator palpebrae superioris muscles, the lower the inferior and internal rectus and the inferior oblique, as to that it supplies five of the seven orbital muscles.

The fourth or trigeminal nerve is very small, and comes from a nucleus a little lower than that of the third nerve. It is specially remarkable that it crosses to the opposite side in the substance of the valve of Viesseens of the fourth ventricle, after which it winds round the outer side of the crus cerebri (fig. 1) and enters the outer wall of the cavernous sinus to reach the orbit through the sphenoidal fissure. Here it enters the superior oblique muscle on its orbital surface.

The fifth or trigeminal nerve consists of motor and sensory roots. The motor root rises from a nucleus in the upper lateral part of the floor of the fourth ventricle, as well as from a descending (mesencephalic) tract from the neighbourhood of the Sylvian aqueduct (see fig. 3). The large sensory root goes to a sensory nucleus a little external to the motor one, and also, by a spinal or descending root, to the substantia gelatinosa Rolandi as low as the second spinal nerve (see fig. 3). The superficial origin of the fifth nerve is from the side of the pons (see fig. 1), and the two roots at once motor branch to the mylohyoid and posterior belly of the digastic muscles, and then enters a canal in the lower jaw, where it gives off twigs to all the lower teeth. A motor branch also runs through the mental foramen to supply the skin of the chin. The auriculo-temporal nerve rises by two roots, which embrace the middle meningeal artery, and runs backward and then upward close to the lower jaw joint to supply the parotid gland, the outer side of the ear, and the side of the scalp. At its beginning it communicates with the otic ganglion, which lies just internal to it below the foramen ovale, and also receives a communication from the nerve to the internal pterygoid muscle.

The sixth or abducens nerve rises from a nucleus in the floor of the fourth ventricle deep to the eminentia teres (see fig. 3). It appears in the lower part of the infratemporal fossa, and runs to the middle line (see fig. 1), soon after which it pierces the dura mater and runs in the floor of the cavernous sinus to the sphenoidal fissure. Entering the orbit through this, it quickly supplies the external rectus and inferior oblique.

The seventh or facial nerve begins in a nucleus which is about the same level as that for the sixth, but much deeper from the floor of the fourth ventricle as well as from the roof of the cranial fossa (fig. 3). The fibres of the facial loop round the nucleus of the sixth, and then emerge in the triangular interval between the medulla, pons and cerebellum, close to the eighth nerve, and having the paras
intermedia between (see fig. 1). Entering the internal auditory meatus with these structures the facial nerve soon passes into a canal in the petrous bone known as the aquaductus Fallopian, and in this it makes a sudden bend and forms the geniculate ganglion, from which the great superficial petrosal branch to Meckel's ganglion is given off. The canal of the stylo-mastoid foramen on the base of the skull, and from the nerve enters the parotid gland, in which it forms a plexus called the plexus tympanicum. From this, branches pass to all the muscles of the face except those of mastication. In the aquaduct the pars intermedia joins the seventh, and beyond the geniculate ganglion, leaves it as the chorda tympani, which runs through the tympanum (see ear) to join the lingual branch of the fifth. It is probable that the pars intermedia, geniculate ganglion and chorda tympani, represent the sensory root of the facial nerve. Just outside the stylo-mastoid foramen the facial nerve gives off the posterior auricular branch to the occipitalis and posterior auricular muscles, as well as a branch to the stylohyoid and posterior belly of the digastric muscles.

The eighth or auditory nerve is in two bundles, cochlear and vestibular. The former comes from the cochlear nuclei which lie deep to the acoustic tubercle in the floor of the fourth ventricle (fig. 3), while the latter rises from the dorsal nucleus, nucleus of Deiters and the nucleus of the descending root, which are more deeply placed. The nucleus of Deiters is connected with the cerebellum, and is concerned in maintaining the equilibrium (p.n.) of the body, while, as is pointed out in the article COCHLEA, the cochlear nuclei are connected with the inferior quadrigeminal body by the lateral fillet as well as with the internal geniculate body, while this body again is connected with the higher auditory centre in the grey cortex of the temporo-sphenoidal lobe by the auditory radiations. The vestibular root passes in front of the restiform body (fig. 3), and the cochlear behind that body. Together they enter the internal auditory meatus, and, at the end of it, pierce the lamina cribrosa, the vestibular nerve supplying the utricle and superior and external semicircular canals, the cochlear nerve the posterior canal, the saccule and the cochlea (see Ear).

The ninth or glossopharyngeal nerve is chiefly, if not entirely, sensory, and its deep termination in the brain is the solitary bundle (see fig. 2, and Brain, fig. 4). It appears on the surface between the olive and restiform body (see fig. 1), and leaves the skull through the posterior lacerated foramen; as it does so two ganglia, the jugular and petrosus, are formed on it, after which it runs downward and forward, between the internal and external carotid arteries, and eventually reaches the back of the tongue (see Tongue). On its way it supplies the tympanum, the stylopharyngeus muscle, though there is grave doubt as to whether these fibres are not really derived from the facial nerve. The contributions to the pharyngeal plexus, the tonsil and part of the epiglottis.

The tenth or vagus has sensory and motor fibres; the former go to the solitary bundle mentioned in the description of the glossopharyngeal nerve (see fig. 3). While the latter come from the dorsal nucleus and nucleus ambiguus, both of which are found deep to the lower half of the fourth ventricle. The nerve appears on the superior surface of the brain, then passes through the olive and restiform body and just below the ninth (see fig. 1). It leaves the skull through the posterior lacerated foramen, and, like the glossopharyngeal, has two ganglia developed on it; the upper of these is the ganglion of the root, and the lower the ganglion of the trunk (see fig. 4). From the former the auricular branch or Arnold's nerve (see Ear) comes off, while from the latter are given off the pharyngeal branches to the pharyngeal plexus (fig. 4, Ph.) and the superior laryngeal branch which is the sensory nerve of the larynx (fig. 4, S.L.). Between the two ganglia the accessory part of the eleventh nerve joins the tenth, and it is from this communication that the motor twigs to the pharynx, larynx, alimentary and respiratory tracts are derived, as well as the inhibitory fibres of the heart. In the neck the vagus accompanies the carotid artery and internal jugular vein, and here it gives off superior and inferior cardiac branches. The left inferior cardiac branch passes to the superficial, while the three others go to the deep cardiac plexus. The nerve now enters the thorax, passing between the subclavian artery and vein. On the right side its recurrent laryngeal branch loops under the subclavian artery (fig. 4, R.), and runs up to supply all the muscles of the larynx except one (see Respiratory System). In the thorax the left vagus passes in front of the arch of the aorta, under which the left recurrent laryngeal loops, and on both sides a thoracic cardiac branch is given to the deep cardiac plexus. Both vagi pass behind the root of their own lung, and break up to form the posterior pulmonary plexus after giving off some branches for the much smaller anterior pulmonary plexus; they then reach the oesophagus, where they again break up into an oesophageal plexus or plexus gulae. As the diaphragm is approached the two nerves become distinct again, but the left one now lies in front and the right behind the food tube, so that, when the stomach is reached, the left vagus supplies the front of the organ and communicates with the hepatic plexus, while the right goes to the back and communicates with the coeliac, splenic and renal plexuses.

The eleventh or spinal accessory nerve is entirely motor, and consists of a spinal and an accessory part. The former rises from the upper cervical nerves, and is distributed to the muscles of the back and neck; the accessory part arises from the first and second cervical nerves, and to the sternomastoid muscle and runs obliquely downward.
NERVE

From A. M. Paterson, in Cunningham's Text-Book of Anatomy.

Fig. 4.—The Distribution of the Pneumogastric Nerve.

III. Spinal

The spinal nerves are those which arise from each side of the spinal cord and are distributed to the trunk and limbs, though some of the upper ones supply the lower parts of the head and face. As is shown in the article Nervous System, the division between cranial and spinal nerves is rather one of convenience than of real scientific difference. There are generally thirty-one pairs of these nerves, which are subdivided according to the part of the vertebral column through which they pass out; thus there are eight cervical (abbreviated C.), twelve thoracic (Th.)—formerly called dorsal,—five lumbar (L.), five sacral (S.) and one coccygeal (Coc.). As the thoracic nerves are the simplest and most generalized in their arrangement, a typical one of these, say the fourth or fifth, will be first described.

The nerve is attached to the spinal cord by two roots, of which the ventral is purely efferent or motor and the dorsal purely afferent or sensory. On the dorsal root is a fusiform ganglion which lies in the foramen between the vertebrae through which the nerve passes. The two roots then join together to form a mixed nerve (see fig. 5), but very soon divide once more into anterior (ventral) and posterior (dorsal) primary divisions. These, however, each contain sensory and motor fibres. Just before it divides in this way the mixed nerve gives and receives its rami communicantes with the sympathetic (see Nervous System).

The anterior primary division runs round the trunk, between the ribs, forming an intercostal nerve and giving off a lateral cutaneous branch, when the side of the body is reached, which divides into anterior and posterior secondary branches. The rest of the division runs forward, supplying the intercostal muscles, as far as the edge of the sternum, when it ends in an anterior cutaneous branch to the front of the chest. The dorsal primary division divides into an external (lateral) and internal

and backward across the posterior triangle of the neck to enter the trapezius; both these muscles are in part supplied by the nerve.

The twelfth or hypoglossal nerve is motor, and rises from a nucleus in the mesencephalon, floor of the fourth ventricle dorsal to the trigonum hypoglossi (see Brain, fig. 3). It emerges from the brain between the anterior pyramid and the olive (see fig. 1), and leaves the skull in two bundles through the anterior condylar foramen. Soon after this it is closely bound to the vagus, and, in front of the atlas, receives an important contribution from the loop between the first and second cervical nerves. The nerve then passes downward until it reaches the origin of the occipital artery, round which it loops, and then runs forward on the surface of the hypo-glossus to the muscles of the tongue. As it bends round the occipital artery it gives off its descendens hypoglossi branch, which derives its fibres from the communications with the first cervical already mentioned. This branch runs down and forms a loop with the communicantes cervicis branch from the second and third cervical nerves, and from this loop (ansa hypoglossi) many of the depressor muscles of the hyoid bone and larynx are supplied. Farther forward special branches are given off to the thyro-hyoid and genio-hyoid muscles, and these, like the descendens hypoglossi, are derived from the first and second cervical loop, thus leaving all the true muscles of the tongue to be supplied by the medullary part of the nerve.

For the embryology and comparative anatomy of the cranial nerves, see Nervous System.

From A. M. Paterson, in Cunningham's Text-Book of Anatomy.

Fig. 5.—Scheme of the Distribution of a Typical Spinal Nerve.
nerve. Its anterior primary division joins those of the second, third and fourth cervical nerves to form the cervical plexus, from which the skin of the side of the neck and lower part of the head and face are supplied by means of the small occipital, great auricular, superficial cervical, suprasternal, supraventricular and supracleavicular nerves (see fig. 7), as well as those muscles of the neck which are not supplied by the cranial nerves. The phrenic nerve, which comes chiefly from the fourth cervical, deserves special notice because it runs down, through the thorax, to supply the greater part of the diaphragm. The explanation of this long course (see Diagram) is that the diaphragm is formed in the neck region of the embryo. The posterior primary division of the second cervical nerve is very large, and its inner (mesial) branch is called the great occipital and supplies most of the back of the scalp (fig. 7). The fifth, sixth, seventh and eighth anterior primary divisions of the cervical nerves as well as a large part of that of the first thoracic are prolonged into the arm, and in the lower part of the neck and arm it communicates with one another to form the brachial plexus. As a general rule underlies the composition of the limb plexuses it will be worth while to study the structure and distribution of this one with some care. It will be seen from the accompanying diagram (fig. 8) that each component nerve with the exception of the first thoracic divides into an anterior (ventral) and a posterior (dorsal) division which are best spoken of as secondary divisions in order to prevent any confusion with the anterior and posterior primary divisions which all the spinal nerves undergo. In the diagram the anterior secondary divisions are white, while the posterior are shaded. It has been suggested by A. M. Paterson that the posterior secondary branches correspond with the lateral branches of the thoracic nerves already mentioned, but there are still certain difficulties to be explained before altogether accepting this. Later on in the plexus three cords are formed of which the posterior is altogether made up of the posterior secondary divisions, while the anterior secondary divisions of the fifth, sixth and seventh cervical nerves form the external cord, and those of the eighth cervical and first thoracic the inner. As a general rule the nerves which rise from the ventral secondary divisions of the limb plexuses run only to that surface of the limb which was ventral in the embryo, while the dorsal secondary divisions are confined to the original dorsal area, but, in order to apply this to the human adult, it must be realized that the limbs
are at one time flattened buds coming off at right angles from the side of the body and having dorsal and ventral surfaces, one (pre-axial) border toward the head of the embryo, and one (postaxial) toward the tail. If a person lies prone upon the floor with the arms outstretched and the palms downward the embryological position of the forelimb is to some extent restored, and it will now be easily understood that the more preaxial part of the limb will be supplied by those nerves which enter it from nearer the head, while the postaxial part draws its nerve supply from lower down the spinal cord. To use Herringham's words (10) (A) of two spots on the skin, that nearer the preaxial border tends to be supplied by the higher nerve. (B) Of two spots in the preaxial area the lower tends to be supplied by the lower nerve, and of two spots in the postaxial area the lower tends to be supplied by the higher nerve. Other points of general importance in regard to cutaneous nerve supply are, firstly, that the area of skin supplied by one spinal nerve is not sharply marked off from that of the next, but the two are separated.

From A. M. Paterson, in Cunningham's Text-book of Anatomy.

FIG. 7.—The Triangles of the Neck (Nerves).

by an overlapping region; and, secondly, that the area supplied by any one spinal nerve is liable to variation in different individuals within moderate limits. This variation may affect the whole plexus, and the term 'prefixed plexus' has been devised by C. S. Sherrington to indicate one in which the spinal nerves entering into its formation are rather higher than usual, while, when the opposite is the case, the plexus is spoken of as 'postfixed.'

With regard to the muscular supply of a limb the general rule is that each muscle is supplied by fibres derived from more than one spinal nerve; this, of course, is made possible by the redistribution of fibres in the plexuses. Moreover, the muscular supply does not necessarily correspond to that of the overlying skin, because (see Muscular System) some of the primitive muscles have been suppressed, others have fused together, while others have shifted their position to a considerable distance. Bearing the foregoing facts in mind, the main distribution of the nerves of the brachial plexus may be surveyed, though the exact details must be sought in the human anatomy textbooks. The outer cord of the plexus gives off the external anterior thoracic nerve (C. 5? 6, 7) to the pectoralis major, the brachial nerve (C. 5 6, 7) to the muscles of the front of the arm, and to the skin of the outer side of the forearm and the posterior thoracic nerve (C. 5 6, 7) supplies most of the flexor muscles of the hand. The median nerve (C. 5 6, 7, 8) supplies the skin of the outer side of the palm including the outer three digits and half the fourth. From the inner cord come the inner head of the median just mentioned, the ulnar nerve (C. 8, Th. 1) which supplies the flexor carpi ulnarsi, the hypoglossal (C. 5, 6, 7, 8) which runs to the anterior and descending hypoglossal nerves (C. 5 6, 7, 8) which supplies the deltoid and teres minor muscles, and the skin over the lower part of the deltoid, and the musculo-spiral nerve (C. 5, 6, 7, 8) which is the largest branch of the brachial plexus and gives off cutaneous twigs to the outer side and back of the arm, and to the forearm as well as the inner digital and a half on the palm and digital aspects. Other branches of the inner cord are the internal cutaneous (C. 8, Th. 1) supplying the inner side of the forearm, the lesser ulnar cutaneous (C. 7, Th. 1) which comes from junction of external and internal cutaneous nerves, and the intercosto-humeral (C. 5, 6, 7, 8) supplies the skin on the inner side of the upper arm, and the internal anterior thoracic nerve (C. 8, Th. 1) to the pectoralis minor and major.
**NERVI—NERVOUS SYSTEM**

From A.M. Paterson, in Cunningham's Text-Book of Anatomy.

**FIG. 8.—The Nerves of the Brachial Plexus.**

Sy, Sympathetic ganglionic cord.
Phr, Phrenic nerve.
C.4, S. 5, 6, 7, 8, T.1, 2, 3, 4, Anterior primary divisions of the lower cervical and upper thoracic nerves.
M1, M2, Muscular branches to axial muscles.
P.T, Long thoracic nerve.
Rk, Nerve to rhomboids (posterior scapular).
Sbr. Nerve to subclavius muscle.
Int, Intercostal nerves.
S.Sc, Supra-scapular nerve. The intercostal nerve of the first thoracic nerve is omitted.
Outer Cord.
E.A.T, External anterior thoracic nerve.
M.C, Muscular-cutaneous nerve.
Side of the thigh, through its middle and internal cutaneous branches, and the skin of the inner side of the leg and foot through the internal saphenous branch. At first sight it is difficult to understand how the anterior cutaneous nerve, which supplies the skin of the front of the thigh, is a posterior secondary division of the lumbar plexus, but the explanation is that the front of the human thigh was originally the dorsal surface of the limb bud, and the distribution of the nerve is quite easily understood if the position of the hind limb of a lizard or crocodile is glanced at. The fourth lumbar nerve is sometimes called the nervus furcalis, because, dividing, it partly goes to the lumbar, and partly to the sacral plexus (fig. 8), though, when the plexus is prefixed, the third lumbar may be the nervus furcalis, or, when it is postfixed, the fifth lumbar. Under ordinary conditions the descending branch of the fourth lumbar nerve joins the fifth, and together they make the lumbo-sacral cord, which, with the first three sacral nerves, forms the sacral plexus. This plexus, like the others, contains anterior and posterior secondary divisions of its spinal nerves, and it resembles the brachial plexus in that the lowest nerve to enter it contributes no dorsal secondary division.

All the constituent nerves of the plexus run into one huge nerve, the great sciatic, which runs down the back of the thigh and, before reaching the knee, divides into external and internal popliteal nerves. These two nerves are sometimes separate from their first formation in the plexus, and may always be separated easily by the handle of a scalpel, since they are only bound together by loose connective tissue to form the great sciatic nerve. When they are separated in this way it is seen that the external popliteal is made up entirely of posterior (dorsal) secondary divisions (see fig. 9), and is derived from the fourth and fifth lumbar and first and second sacral nerves, while the internal popliteal is formed by the anterior (ventral) secondary divisions of the fourth and fifth lumbar and first, second, and third sacral nerves. The external popliteal nerve supplies the short head of the biceps femoris (see Muscular System), and, just below the knee, divides into anterior tibial and musculo-cutaneous branches, which both supply the dorsal surface of the leg and foot. The anterior tibial nerve is chiefly muscular, innervating the muscles in front of the tibia and fibula as well as the extensor brevis digitorum pedis on the dorsum of the foot, though it gives one small cutaneous branch to the cleft between the first and second toes. The musculo-cutaneous nerve supplies the peroneus longus and brevis muscles, and the rest of the skin of the dorsum, of the foot, and lower part of the leg, while the skin of the upper part of the dorsum of the leg, below the knee, is supplied by the external popliteal before its division. The internal popliteal nerve, after supplying the hamstring, is continued into the calf of the leg as the posterior tibial and innervates all the muscles of the calf, the plantar surface. Behind the inner ankle it divides into the external and internal plantar nerves, from which the muscles and skin of the sole are supplied. A little above this the posterior tibial nerve gives off a contribution to help form the external or short saphenous nerve. That from the internal popliteal is called the cutaneous saphenous nerve, while that from the external popliteal is the communicans plantaris. These join about the middle of the back of the leg, and the short saphenous nerve runs down behind the outer ankle to supply the outer side of the foot. Sometimes it encroaches on the dorsum of the foot, replacing part of the musculo-cutaneous, though, when this is the case, its dorsal contribution from the external popliteal (communicans plantaris) is always more than usual.

To return to the sacral plexus: branches are given off from the anterior secondary divisions to the short external rectus muscles (see Muscular System), the small saphenous nerve (S.1, 2, 3) is partly dorsal and partly ventral in its origin and distribution; it supplies the skin of the perineum, buttock and the back of the thigh. The pudic nerve (S.2, 3, 4) helps to supply the skin and muscles of the perineum and genital organs.

The visceral branches form the pelvic stream of white rami communicantes (see Nervous System); they run from the second and third and fourth sacral to the pelvic plexuses of the superior, middle, and inferior hemorrhoidal nerves.

The sciatic nerve (S.2, 3) pierces the great sacro-sciatic ligament and supplies the skin over the lower internal part of the buttock. The muscular branches (S.3, 4) supply the external sphincter, levator ani and coccygeus.

The sacro-coccygeal nerve (S.4, 5, Coc.1) runs down on each side of the coccyx to supply the adventitious skin, and represents the ventral-lateral nerve of the tail of lower mammals.

NERVI, a coast town of Liguria, Italy, in the province of Genoa, from which it is 7½ m. S.E. by rail (also electric tramway), 82 ft. above sea-level. Pop. (1901) 3480 (town); 6317 (community). It is much frequented as a health resort for invalids, invalids, otolaryngologists, and lepers, and its villas have beautiful gardens. It is moister and less dusty than the western Riviera, and is especially in favour with those who suffer from lung complaints. At Quarto, 2½ m. N.W., 1000 Garibaldians (1 mile) embarked for Marsala in 1860.

NERVOUS SYSTEM. The nervous system forms an extremely complicated set of links between different parts of the body, and is divided into (A) the central nervous system, composed of (1) the brain, and (2) spinal cord; (B) the peripheral nervous system, consisting of (1) the cranial nerves, (2) the spinal nerves, (3) the various sense organs such as the eye, ear, olfactory organ, taste organ and tactile organs, and (4) the motor end plates; (C) the sympathetic system. The anatomy and physiology of many of these parts are treated in separate articles (see Brain, Spinal Cord, Nerve, Eye, Ear, Olfactory Organ, Taste, Touch, Muscle and Nerve, Sympathetic Nervous System). The object here is to deal with anatomical points which are
common to the whole system, or for which a place does not conveniently occur elsewhere.

Histology of the Nervous System.

Three kinds of tissue are found in the nervous system, nerve fibres, nerve cells, and a supporting tissue called neuroglia. Nerve fibres may be myelinated or non-myelinated, but, whichever they are, they consist of the long process or axon of a nerve cell; in a non-myelinated nerve this process is either naked or enclosed in a delicate membrane called the primitive sheath or neurilemma, but in a myelinated nerve the process or axis cylinder is ensheathed by a white fatty substance called myelin, and so the term "myelinated" is often used instead of "medullated" for these nerves (see fig. 1). Outside this white sheath the neurilemma is present in most nerves, but is lost when they are massed to form the white matter of the central nervous system and in the optic nerve. At regular intervals the myelin is interrupted by some substance which stains deeply with silver nitrate, and these breaks are known as nodes of Ranvier. They do not, however, affect the axis cylinder. In a large nerve, such as the median, the nerve fibres are collected into small bundles called fasciculi, ensheathed in a connective tissue sheath, the perineurium, and separated from it by a lymph space. From this sheath delicate processes penetrate among the fibres, and these are known as the endoneurium. The fasciculi are collected into bundles called funiculi, and the whole nerve consists of a variable number of fasciculi surrounded by a dense fibrous sheath, the epineurium. The various bundles do not remain distinct, but break up and rearrange themselves, so that following them up with the scalpel is a difficult and tedious work. The nerve fibres, however, never join one another and are often several feet in length.

Nerve cells are unipolar, bipolar or multipolar. Unipolar cells are found in the ganglia on the posterior roots of the spinal nerves, and only give off an axon or axis cylinder process; this, however, soon divides in a T-shaped manner, and all these cells were originally bipolar, though the cell has grown away from its two axons (or, as they are often regarded, axon and dendrite), leaving a stalk joining it to them at right angles. Bipolar cells are found as an embryonic stage of unipolar, though in fish they persist in the spinal ganglia throughout life. They are also sometimes found in the sympathetic ganglia. Multipolar cells are found in the brain and cord, and are best studied in the anterior horns of the grey matter of the latter, where they are nearly whole in the naked eye (see fig. 2). Of their many processes only one is an axon, and it becomes the axis cylinder of a motor spinal nerve. The other processes are called dendrites, and break up into delicate branches some of which surround, but, it is generally believed, are not actually continuous with, neighbouring cells or their processes. It is known that the axons are made up of delicate fibrils, and it is thought by some observers that there is actual continuity between some of these and those of an adjacent neuron, as the combination of a nerve cell, its axon and dendrites, is called. The cells of Purkinje in the cerebellum show a particularly rich arborization of dendrites (see Brain, fig. 7). Nerve cells have generally a large clear nucleus.

The Neuroglia is the delicate connective tissue which supports and binds together the nervous elements of the central nervous system. One part of it, which lines the central canal of the cord and vessels of the brain, is formed of columnar cells, and is called ependyma, while the rest consists of small cells with numerous processes which sometimes branch and sometimes do not. These fibres interlace with one another to form a delicate felt-work which is unimixed with nervous elements on the surface of the grey matter of the brain (see Brain, figs. 7 and 15), though elsewhere it is interwoven with them.

Nerve Endings.—Sensory nerves end by breaking up into filiform or by various tactile organs. In the former case the minute fibrils, of which it has been shown that the axons or nerve fibres consist, separate and end among epithelial cells of the mucous membrane or skin. In the latter case the nerve fibres lose their coating of myelin and end in one of the seven following organs:

1. End bulbs of Krause (fig. 3, A), oval bulbs composed of elongated cells among which the nerve fibrils end in knobs or coils; each is surrounded by a sheath of neurilemma, and the organs are found in the lips, tongue, conjunctiva, epineurium of nerves, synovial membranes of joints, and in the glans penis et clitoritis, where they have a mulberry-like appearance.

2. Pacini corpuscles (fig. 3, B) are large enough to be seen by the naked eye, and are oval bodies made up of a series of concentric capsules of connective tissue rather resembling the structure of an onion; in the centre of this is a structureless core, at the distal extremity of which the nerve fibre ends in one or more knobs. These bodies are found in the palm and sole, in the mesentery, the genital organs and in joints.

3. Tactile corpuscles of Meissner and Wagner (fig. 3, C) are oval bodies found in certain of the skin papillae and mucous membrane, especially of very sensitive parts like the hand and foot, lips, tongue and nipple. They are oval and made of a connective tissue capsule composed of a wall which septa enter the interior. The nerve fibre generally takes a spiral course through them, loses its myelin sheath, and ends by breaking up into its fibrils, which eventually become bulbous.

4. Tactile corpuscles of Gravely are found in the skin of those parts devoid of hair, and consist of a capsule containing two or more large cells, between which the nerve fibre ends in the so-called tactile discs.

5. Ruffini's endings are flattened oval bodies with a thick connective tissue capsule, in which the nerve fibre divides into many
branches which have a varicose appearance, form a rich plexus, and end in knobs. These organs are found between the true skin and subcutaneous tissue of the fingers.

6. Organs of Gaits are found in tendons. Nerve fibres penetrate the tendon bundles and divide in a tree-like manner to end in little disks and varicosities.

7. Neuro-muscular spindles are small fusiform bundles of embryonic muscle fibres among which the nerve fibres end by encircling them and forming flattened disks. These are sensory endings, and must not be confused with the motor end plates. They are found in most of the striated muscles of the body.

Motor nerves end in striped muscle by motor end plates. These are formed by a nerve fibre approaching a muscle fibre and suddenly losing its myelin sheath while its neurilemma becomes continuous with the sarcolemma of the muscle fibre. The axis cylinder divides, and its ramifications are surrounded by a disk of granular matter containing many clear nuclei. In very long muscle fibres more than one of these end plates are sometimes found. Involuntary motor endings are usually found in sympathetic nerves going to unstripped muscle. The fibres form minute plexuses, as of union of which small triangular ganglion cells are found. After this the separate fibrils of the nerve divide, and each ends opposite the nucleus of an unstripped muscle cell.

The Sympathetic System

This system is made up of two gangulated cords running down one on each side of the vertebral column and ending below in the median vertebral. In addition to these cords there are numerous ganglia and plexuses through which the sympathetic nerves pass on their way to or from the viscera and blood-vessels.

A typical ganglion of the sympathetic chain is connected with its corresponding spinal nerve by two branches called rami communicantes, one of which is grey and the other white (see fig. 4). The white consist of medullated fibres belonging to the central nervous system, and these are splanchnic afferent or centripetal and efferent or centrifugal. The efferent fibres lie in the anterior ramus of the spinal nerves, and, like all the fibres there, are either motor or secretory cells with an axon and motor paths for the unstripped muscle of the vessels and viscera, and the secretory paths for the cells of the viscera.

In the course of each fibre from the nerve cell in the spinal cord, of which it is an axon, to the vessel or viscus it supplies, there is always a break where it arborises round a ganglion cell, and this may be in its own ganglion of the sympathetic chain, in a neighbouring ganglion above or below, or in one of the so-called collateral ganglia interposed between the sympathetic chain and the viscera. In addition to these there are a certain number of vasodilator and visceroinhibitory fibres, which run without any central connexions from the spinal or cranial nerves to the viscera. The splanchnic afferent or centripetal fibres are the sensory nerves from the viscera, and have no cell connexions until they reach the spinal ganglia on the posterior roots of the spinal nerves, which they do by traversing the ganglial cord of the sympathetic. The fibres of the white rami communicantes are remarkable for their small diameter, and the efferent fibres, at all events, are found only in two regions, one of which is called the thoraco-lumbar stream and extends from the first or second thoracic to the second or third lumbar nerve, while the pelvic stream is found from the second to the fourth sacral nerves.

The grey rami communicantes are found in connexion with all the spinal nerves, though they are irregular in the paths by which they reach the sympathetic ganglia from the cells of which they come or their fibres are mainly non-medullated, and pass in both roots of the spinal nerves and also into the anterior and posterior primary divisions of those nerves. In this way they reach the body wall and limbs, and are somatic vaso-motor, secretory and pilo-motor nerves, supplying the vessels, glands and hair muscles of the skin and its glands. The sympathetic ganglia, from which these nerves come, contain multipolar nerve cells, with long axons and several dendrites as well as a number of medullated fibres passing through, and much connective tissue.

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Fig. 4.—Scheme of the Constitution and Connexions of the Gangulated Cord of the Sympathetic. The gangulated cord is indicated on the right, with the arrangement of the fibres arising from the ganglion cells. On the left the roots and trunks of spinal nerves are shown, with the arrangement of the white ramus communicans above and of the gray ramus below.

coccygeal ganglion (g. impar). In the neck the cords lie in front of the anterior tubercles of the transverse processes of the cervical vertebrae, in the thorax, in front of the heads of the ribs, while in the abdomen they lie in front of the sides of the bodies of the

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NERVOUS SYSTEM

Some of the axons of these cells pass in the connectives to ganglia above and below, while others pass with the splanchnic efferent nerves to the viscera.

The above sketch will give the general scheme of the sympathetic system, but its exact topographical details in man must be sought in the modern text-books such as those of Gray, Quain or Cunningham. Here only the larger and more important details can be given. In the ganglionic chain there is a ganglion corresponding to nearly each spinal nerve, except in the neck, where only three are found; of these the superior cervical ganglion is more than an inch long, and is connected with the first four spinal nerves as well as (ansa Vieuusseni) joining it to the middle cervical ganglion in front of that vessel. It communicates with the seventh and eighth spinal nerves, and gives branches of distribution to the heart and to the subclavian artery and the vertebral vessels. The last and lowest thoracic part of the sympathetic cord has usually eleven ganglia, which receive both white and grey rami communicantes from the spinal nerves (fig. 6) of the former the upper ones run up in the vertebral canal in the form of a plexus, and the lower ones form the three abdominal splanchnics which pass through the diaphragm (q.v.) and join the abdominal plexuses.

The great splanchnic (fig. 6, SL) comes from the sixth to the ninth ganglia, and ends in the semi-lunar ganglion of the solar plexus (fig. 6, SL). The small splanchnic (fig. 6, S2) comes from the ninth and tenth, or tenth and eleventh ganglia, and ends in the aortico-renale plexus. The second smallest splanchnic (fig. 6, S3) comes from the last thoracic ganglion, whether it be the tenth or eleventh, and ends in the renal plexus.

In the lumbar region the gangliated cord is very irregular; there may be four or more ganglia, and these are often fused. Grey rami communicantes are given to all the lumbar spinal nerves, and white ones are received from the first two. Most of the branches of distribution pass to the aortic plexus. The sacral ganglial cord runs down just internal to the anterior sacral foramina; it usually has four small ganglia, and the two cords end by joining the coccygeal ganglion or ganglion impar, though the two-fourth sacral ganglia are united by transverse communicating fibres. The intermammary rami communicantes, already mentioned as the pelvic stream, from the second to the fourth sacral spinal nerves, do not enter the ganglia but pass directly to the pelvic plexuses (fig. 6, V).

Sympathetic Plexuses.—The branches from the thoracic nerves are the thoracic splanchnics, from the last thoracic to the first lumbar nerves, the lumbar splanchnics, and the sacral splanchnics. The thoracic splanchnics communicate with the renal nerve and ganglion. The lumbar splanchnic nerves communicate with both the aorta and the inferior mesenteric ganglion, while the sacral splanchnics communicate with the sympathetic ganglion of the abdomen.

In the abdomen the solar plexus is by far the most important. It lies behind the stomach and surrounds the superior mesentric artery, and is situated the semi-lunar, aortico-renal and superior mesentric ganglia, and from it are prolonged subsidiary plexuses along the main arteries, so that the sympathetic ganglia, paravertebral, renal, splanchnic, superior mesentric, anterior, posterior, and inferior mesentric plexuses, as these are named, are recognized. The hypogastric plexus is the continuation downward of the aortic, and lies just below the bifurcation of the aorta (see fig. 6, IH); it divides into two branches, which communicate the internal iliac arteries and are joined by the pelvic stream of white rami communicantes from the sacral spinal nerves and some twigs from the ganglia of the sacral sympathetic to form the pelvic plexuses. These are prolonged to the mesentery. The anterior branch of the internal iliac artery, so that haemorrhoidal, vesical, prostatic, vaginal and uterine plexuses are found. By the side of the neck of the uterus in the last-named plexus several small ganglia are seen.

(Estration of the sympathetic system, see Quain’s Anatomy, London, 1895.)

EMBRYOLOGY OF NERVOUS SYSTEM

The development of the brain, spinal cord and organs of special sense (ear, tongue) will be found in articles on that of the cranial and spinal nerves and the sympathetic system is dealt with. The thoracic spinal nerves are the most typical, and one of them is the best way to begin with. In fig. 7, A the ganglion on the dorsal root (DR) is seen growing out from the neural crest, and the cells or neuroblasts of which it is composed become fusiform and grow in two directions as the ganglion recedes from the cord. Those which run toward the spinal cord are the axons, while those growing into the mesoderm are probably the efferent fibres. The ventral roots (VR) rise as the axons of the large cells in the ventral horn of the grey matter, and meet the fibres of the dorsal root on the distal side of the ganglion (fig. 7. A). As the two roots join each other fibres enter an anterior (ventral) and a posterior (dorsal) primary division (fig. 7, D), the latter growing into the dorsal segment of its muscle plate and the skin of the back. The anterior primary division grows down to the right of the cardinal vein and finally forms a rootlet into a somatic branch to the body wall (fig. 7, C, So), and a splanchic or visceral branch (fig. 7, C, VY) which joins the sympathetic and forms the white ramus communicantes. The motor fibres grow to this rootlet and give off branches (fig. 7, E). In the limb regions the anterior primary divisions of the nerves divide into anterior and posterior secondary divisions, which probably correspond to the anterior and posterior roots of the thoracolumbar plexus (fig. 7, F). These unite with neighbouring nerves to form plexuses, and divide again, but the anterior nerves keep to the ventral side of the limb and the posterior to the dorsal.

The cranial nerves are developed in the same way as the spinal, so far as concerns the facts that the motor fibres are the axons of cells situated in the basal lamina of the mesencephalon and
rhombencephalon (see Brain), and the sensory are the axons and dendrites of cells situated in ganglia which have budded off from the brain. The evidence of comparative anatomy, however, shows that there are two ventral roots to one dorsal. In the fishes and higher vertebrates the dorsal and ventral roots unite, though in saurichians and echinoderms (shark) embryos the development of the brain and spinal cord is similar. The posterior B. supplied the dorsal root to the developed trunk. In Amphioxus, the cranial nerves are formed of at least five components: (1) Ventral motor, (2) Lateral motor, (3) Somatic sensory, (4) Visceral sensory, (5) Lateral line nerves.

The cranial nerves are only represented by two pairs in Amphioxus. In the Cyclostomata, fishes and Amphibia, ten pairs of nerves are found, which in their distribution do not always agree with those of man. In the Amniota or reptiles, birds and mammals, the seventh and twelfth nerves have been added. The researches of W. H. Gaskell and J. M. Strong have shown that the cranial nerves are formed of at least five components: (1) Ventral motor, (2) Lateral motor, (3) Somatic sensory, (4) Visceral sensory, (5) Lateral line nerves.

The cranial nerves are formed of at least five components: (1) Ventral motor, (2) Lateral motor, (3) Somatic sensory, (4) Visceral sensory, (5) Lateral line nerves.

From A. M. Paterson, in Cunningham's Text-book of Anatomy.

**FIG. 7.—Development of the Spinal Nerves.**

A. Formation of nerve roots.

B. Formation of nerve trunk (N).

D.F. Dorsal root.

C. Formation of nerves.

D. E. Formation of subordinate branches.

D.G. Dorsal ganglion.

L.A. Sympathetic cord.

D.W. Wolfnian duct.

D.R. Visceral branch.

V. Cardinal vein.

M.P. Muscle plate.

F. Formation of nerve trunks in relation to the limb; dorsal and ventral trunks corresponding to lateral and anterior trunks in D and E.

the cranial nerves cannot be directly homologized with the spinal, nor can the fact of there being twelve of them justify us in assuming that the head contains the rudiments of twelve fused or unsegmented somites. To this we will return later. The case of the optic nerve is different to that of any of the others. A. Robinson (Journ. Anat. and Phys., vol. 30, p. 319) has shown that most of its fibres are the axons of ganglion cells in the retina, and, as the retina is part of the optic vesicle and an outgrowth from the brain, the so-called optic nerve is only comparable to a tract of fibres within the brain.

The twelfth or hypoglossal nerve is regarded as a fusion of the motor roots of three spinal nerves, and embryology bears this out, for Froiep has described a small and transitory ganglion corresponding to the posterior root ganglion of this nerve. Another link in the chain of reasoning is that the first spinal or sub-occipital nerve often has its posterior root suppressed.

The sympathetic system is developed from the posterior root ganglia of the spinal nerves, by cells which in man migrate a few at a time. A. M. Paterson, however, believes that the sympathetic is developed, independently of the cerebro-splanic system, in the mesoderm (Phil. Trans. clxxxii. pt. B. p. 139). In embryos of 14.5 mm. there are found masses of cells on each side of the abdominal aorta, permeated with blood vessels, and having the same structure as the carotid and coccgeal bodies. They are known as the organs of Zuckerkandl, and disappear soon after birth.

**Comparative Anatomy**

The comparative anatomy of the brain and spinal cord is dealt with in the separate articles devoted to them.

**Splanic Nerves.**—In Amphioxus the dorsal and ventral roots do not unite with one another but alternate, a dorsal root on one side being opposite a ventral on the other. The dorsal roots are both sensory and motor, the ventral only motor. In the Cyclostomata (Petromyzon) the arrangement is nearly the same, but in some regions as well as in the lobus trigemini and lobus vagi (fig. 8, Nuc. X.). They are formed in the fifth, seventh, ninth, tenth and eleventh nerves, and supply visceral surfaces. In mammals the lingual and palatine


**FIG. 8.—Brain (A) and Choroid Plexuses (B) of Lamprey.**

branches of the fifth, the chorda tympani and great superficial petrosal (8) of the seventh, and all the sensory fibres of the ninth and tenth except Arnold's nerve, represent these. In fishes and Amphibians the palate is supplied by the seventh nerve instead of

**NERVOUS SYSTEM**
the fifth, but the explanation given for this difference is that in these lower forms the Gasserian and geniculate ganglia are not distinct, and so fibres from the compound ganglion may pass into either nerve. These sensory components of the cranial nerves evidently correspond to the branches which have already been mentioned as the splanchnic afferent fibres of the sympathetic.

The system of the lateral line or acustico-lateralis component is sometimes regarded merely as a subdivision of the somatic sensory. It is best developed in the fish, and may be divided into pre- and post-auditory, and auditory. The pre-auditory part comprises the pit and canal end organs supplied by the seventh, and also probably the olfactory organ supplied by the first nerve. The auditory apparatus, supplied by the eighth nerve, is, according to modern opinion, undoubtedly a part of this system, while the tenth nerve sends a large branch along the lateral line supplying the special end organs of the post-auditory part. All these components of the lateral line pass to the tuberculum acusticum in the fourth ventricle, as well as to the cerebellum, which J. B. Johnston (Zool. Bull. 1, 5, p. 221, Boston) regards as a derivative of the rostral (anterior) end of the acusticum. In mammals no doubt the olfactory and auditory apparatus and nerves have the same morphological significance as in fishes, but the seventh does not supply any cutaneous sense organs on the head or face, and the only vestige of the post-auditory supply of the tenth nerve to the lateral line is the small auricular branch of the vague, often called Arnold's nerve.

The following table, slightly modified from the one drawn up by J. McMurrich, gives a fair idea of the present state of our knowledge of the nerve components of the Mammalia.

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<th>Nerve</th>
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1 A tract of the brain.

For further details and literature of the nervous system see Quain's *Anatomy* (latest edition); R. Wiedenheims *Comp. Anat. of Vertebrates* (Lond. 1907); Bronn's *Classes and Ordnungen des Thierreichs*; C. S. Minot's *Human Embryology* (1897); J. McMurrich's *Development of the Human Body* (London, 1906). For the theory of nerve components see Onéra Merritt, *Journ. Anat. and Phys.*, vol. 39, p. 199. And for the anatomy and morphology of limb plexuses will be found in Miss C. W. Saberton's paper on the "Nerve Plexuses of Troglohydes Niger" *Studies in Anatomy*, University of Manchester, vol. iii. (1906), p. 165. She refers to most of the literature on the subject, but the papers of H. Braus, Jena Zeitschr. v. 31 (1898), p. 239 on fish, of M. Davidoff, *Morph. Jabr.* v. 5 (1879), p. 450 on the pelvic plexuses of fish, and of M. Fürbringer, *Gegenb. Zeitschr.* v. 3 (1897), on the spino-occipital nerves and brachial plexus of fish, are also very important.

NESFIELD, WILLIAM EDEN (1835-1888), British architect, one of the leaders of the Gothic revival in England, was born in Bath on the 2nd of April 1835. His father, Major William Andrew Nesfield, a well-known landscape gardener, laid out Regent's Park and St James's Park, and remodelled Kew. Educated at Eton, Nesfield was articled first to Mr Burn, a classicist, and then to his uncle, Anthony Salvin, who took the Gothic side in "the battle of the styles." Nesfield travelled for study in France, Italy and Greece, afterwards publishing a volume, *Sketches from France and Italy* (London, 1862), which became one of the text-books of the Gothic revival. In 1859 Nesfield settled down in London. His first important commission was to build a new wing to Combe Abbey for Lord Craven. In 1862 began a nominal partnership with Norman Shaw, the fruits of which have been exaggerated; they shared rooms in Argyle Street for some years, but never collaborated. It was in Argyle Street that the principal work of Nesfield's life was conceived—Combe Abbey, Cloversley Hall and Kinnell Park. Here he showed a mastery of planning and construction, a conscientious regard for detail, an eye for the picturesque, an unfailing regard for dignity, which make his achievements landmarks in the history of his art. He built the lodge in Regent's Park (1864) and that in Kew Gardens (1866). Combe Abbey and Cloverley are somewhat "early French" in style, but as Nesfield developed he adopted a purely English manner, and presented his newer ideas in Loughton Hall and Kimmel Park. The gate lodge at Kimmel Park, Abergale, is entirely "English Renaissance"; Cloverley Hall (1864), planned when he was twenty-nine, with its great hall, fine approaches to the staircase, and the staircase itself, is already half English, and Eastlake, in his *History of Gothic Revival*, praises it on that very ground. The full development of the revived classic taste in Nesfield came with his addition to Kimmel Park—red brick, stone dressings, grey-green slated roofs—which elevated that originally unpertinient 15th-century building into a small Renaissance palace. For contrast in style, harmonious as they are in artistic expression, Cloverley and Kimball are the typical examples of the artist's style. Other works are Farnham Royal House near Slough, Lea Wood, Loughton Hall and Westcombe Park. His more notable urban works are the bank at Saffron Walden (1873), and the Rose and Crown, Hotel; the latter was another contrast, the former being medieval and the latter what is called "Queen Anne." Though he built no new important church, Nesfield rebuilt the Early Decorated St Mary's, Farnham Royal, near Slough, mainly on the old lines. He restored King's Walden church, Herts (1868), and Radwinter church, Essex (1871), and Cord church near Whitchurch, Salop; but no great public building came from him. Nesfield's career was a comparatively short one. On the 3rd of September 1883 he married Mary Annette, eldest daughter of John Sebastian Guild and granddaughter of Joseph Guild, and he retired from practice some years before his death at Brighton on the 27th of March 1888. He left behind him a valuable series of sketches and measured drawings, most of which are now in the library of the Royal Institute of British Architects. (J. M. By.)

NESLE, the name of a place in France (dep. of Somme), which gave its name to an old feudal family. This family became extinct at the beginning of the 13th century, and the heiress brought the lordship to the family of Clermont in Beauvaisis. Simon de Clermont, seigneur de Nesle, was regent of the kingdom of France during the second crusade of St Louis. Raoul de Nesle, his grandson, was the child of the grand next gout (d. 1352) de Clermont, both marshals of France, were members of the family. The lordship of Nesle was erected into a countship for Charles de Sainte-Maure in 1497 and into a marquisate for Louis de Sainte-Maure in 1546. It was acquired in 1666 by Louis Charles de Mailly. His grandson, Louis de Mailly, had five daughters, of whom four (the countess of Mailly, the duchess of Lauragais, the countess of Vintimille, and the marquise de la Tourne, afterwards duchess of Chateauroux) were successively, or simultaneously, mistresses of Louis XV.

NESSELRODE, KARL ROBERT, Count (1780-1862), Russian diplomatist and statesman, was born on the 14th of December 1780 at Lisbon, where his father (d. 1810) was Russian ambassador. In deference to his mother's Protestantism he was baptized in the chapel of the Russian embassy, thus becoming a member of the Church of England. The Nesselrodes were of Westphalian origin, but had long been settled in Livonia. Nesselrode's German origin was emphasized by his education in a Berlin gymnasia, his father having been appointed ambassador to the Prussian court about 1787. When he was sixteen he entered the Russian navy, and his father's influence procured for him the position of naval aide-de-camp to the emperor Paul. He presently exchanged into the army, obtained a further court appointment, and entered the diplomatic service. Nesselrode was attached to the Russian embassy at Berlin, and transferred thence to the Hague. In August 1806 he received a commission to travel in South Germany to report on the French troops; he was then attached as diplomatic secretary to Generals Kamenski, Buxhoeveden and Bennigsen in succession. He was present at the battle of Eylau in January 1807, and assisted at the negotiation of the peace of Tilsit. Immediately afterwards
NESTOR

he was sent to Paris to join the embassy of Count Peter Tolstoy, whom he accompanied in the spring of the next year to the meeting of the two emperors at Erfurt. After his return to Paris he strengthened the understanding between Alexander I. and Talleyrand consequent on the Erfurt meeting, and acted as intermediary between the two. On the appointment of a successor to Count Tolstoy he retired to St Petersburg, but returned to Paris early in 1810 charged with a commission from Speranski to Talleyrand and the marquis de Caulaincourt, formerly ambassador in St Petersburg, both of whom were hostile to Napoleon's policy of aggression, and the breach of diplomatic relations with Russia in 1811, Nesselrode returned to St Petersburg by way of Vienna in order to exchange views with Metternich. He sought to persuade Alexander to open negotiations with Napoleon, if only to throw the onus of breaking the peace entirely on the French side. He joined the tsar's headquarters at Vilna in March 1812 and, though Rumiantzov was still foreign minister, it was Nesselrode who directed the foreign policy of Russia from this time forward. He was present at the battle of Leipzig, and accompanied the invading army to Paris. He remained at the capital throughout the lifetime of Mortier at Clechy, and signed the treaty of Chaumont on the 1st of March 1814. His former relations with Talleyrand facilitated negotiations in Paris, and his great influence with the emperor was used in favour of the restoration of the Bourbons, and, after Waterloo, against the imposition of a ruinous war indemnity on France. At the congress of Vienna he was associated with Count Capo d'Istria, and when, in August 1816, Alexander made him secretary of state for foreign affairs in succession to Rumiantzov, it was again in conjunction with the Greek statesman, Nesselrode, the contemporary of Talleyrand, both of whom had opposed Napoleon's policy of aggression. The emperor Alexander I., however, was apt to keep the direction of affairs in his own hands and so long as Alexander inclined to Liberalism Capo d'Istria was the interpreter of his will, but as the emperor veered towards Metternich's system Nesselrode became his mouthpiece. After Alexander's final "conversion" to reactionary principles, Capo d'Istria was dismissed (1822) and Nesselrode definitely took his place. He had consistently advocated Alexander's project of a "universal union," symbolized by the Holy Alliance, in contradistinction to the narrower system of the alliance of the great powers; and, when the Greek insurrection broke out, he did much to determine the tsar to sacrifice his sympathy with the Orthodox Greeks to his dream of the European confederation (see Alexander I., emperor of Russia).

After Alexander's death in 1825 Nesselrode retained office under Nicholas I. He was responsible for the change of policy of Russia towards the Ottoman empire after 1829, viz. that of abandoning the traditional idea of conquering Constantinople in favour of keeping the Ottoman power weak and dependent on the tsar. This was his policy during the revolt of Mehmet Ali (q.v.), and it was Nesselrode who inspired the terms of the famous treaty of Unkiar Skessi (1833). Nicholas I. was, however, even less inclined than his brother to place himself in the hands of a minister; and Nesselrode showed himself amenable, though when his views differed from those of the emperor he stated them with great frankness. He conducted the negotiations which led to the shelving of the treaty of Unkiar Skessi and to the alliance between Russia and Great Britain which, issuing ultimately in the Straits Convention of 1841—40 to which France also was a party—sealed the breach which had so long divided the powers of eastern and western Europe.

In 1849 it was Nesselrode who suggested the intervention of Russia in Hungary in favour of the Austrian government, although he restrained the tsar from active intervention in France then as in 1830. During the crisis of 1853 he prolonged negotiation in the hope of averting war. The last of his important political acts, the signing of the treaty of Paris in 1856, undid the results of his patient efforts to establish Russian preponderance in the Balkan peninsula. He then retired from the foreign office, retaining the chancellorship, which he had held since 1844. He died at St Petersburg on the 23rd of March 1862.

See Lettres et papiers du chancelier comte de Nesselrode 1760-1850, the first volume of which was issued by his grandson Count Anatole Nesselrode at Paris in 1904. This work includes letters of the chancellor's father, Count William, Nesselrode's correspondences, and important state papers. In vol. ii. is a fragment of an autobiography (to 1814), which Count Nesselrode did not live to complete. See also Correspondance diplomatique du comte Pozzo di Borgo et du comte de Nesselrode, edited by Charles Pozzo di Borgo (Paris, 2 vols., 1890—1897).

NESTOR, the place where a bird lays its eggs, hatches them out, and shelters them until they are fledged. The word is used by analogy of other animals than birds, insects, &c. It appears in much the same form in Teutonic languages; related to it are Irish nesad, and Lat. nidus, whence Fr. nid. It has been referred to the Gr. νηστος, return home, but it is now established that it represents a form nida- for nista- from nida- down; cf. "nether," and sed-, to sit. Sanskrit has nīda. The Lat. nidus has given the scientific term for nest-building, nidification (q.v.).

NESTOR, in Greek legend, son of Neleus and Chloris, king of Pylos in Messenia. When all his brothers were slain by Heracles, in consequence of the refusal of Neleus to purify him for the murder of Iphitus, Nester alone escaped, being absent at Gerenia—hence his epithet Gerenios in Homer (Apollodorus i. 9). He is the old warrior of the Iliad and the wise counsellor of the Greeks before Troy. After the fall of the city he returned to Pylos, where Telemachus visited him to obtain news of his father. In his earlier years he took part in the battle of the Centaurs and Lapithae, the Calydonian boar hunt, and the Argonautic expedition. The name is used in modern times for any old man of ripe experience, or the oldest member of a class or corporation.

NESTOR (c. 1050—1114), the reputed author of the earliest Russian chronicle, was a monk of the Pechersky cloister of Kiev from 1073. The only other fact of his life is that he was commissioned with two other monks to find the relics of St Theodore as a means of assertion of the right to rule in Russia. The chronicle begins with the deluge, as those of most chroniclers of the time did. The compiler appears to have been acquainted with the Byzantine historians; he makes use especially of John Malalas and George Hamartolus. He also had in all probability other Slavonic chronicles to compile from, which are now lost. Many legends are mixed up with Nester's Chronicle; the style is occasionally so poetical that perhaps he incorporated bilini which are now lost. The early part is rich in these stories, among which are the arrival of the three Varangian brothers, the founding of Kiev, the murder of Askold and Dir, the death of Oleg which was kept secret by Rostislav, the murder of his father. In his earlier years he took part in the battle of the Centaurs and Lapithae, the Calydonian boar hunt, and the Argonautic expedition. The name is used in modern times for any old man of ripe experience, or the oldest member of a class or corporation.

The latest theory about Nestor is that the Chronicle is a patchwork of many fragments of chronicles, and that the name of Nestor was attached to it because he wrote the greater part or perhaps because he put the fragments together. The name of a certain Sylvestre, an iugen, is affixed to several of the manuscripts as the author. The Chronicle has come down to us in several manuscripts, but unless this was in the number which sent the north of Russia, Pechora, and other places, and Jan, a man ninety years of age, who died in 1106, and was son of Vishata the voivode of Yaroslavl and grandson of Ostomir the Posadnik, for whom the Codex was written. Many of the ethnological details given by Nestor of the various races of the Slavs are of the highest value.
has had many additions made to it from previous and contemporary chronicles, such as those of Volinias and Novgorod. Soloviev, the Russian historian, remarks that Nestor is called the ‘first Russian chronicler,’ but he is the first writer who took a national point of view in his history, the others being merely local writers. The language of his work, as shown in the earliest manuscripts just mentioned, is undeniably Russian, though doubtless it is not without its homely echoes of the lives of Boris and Gleb, the martyrs, and of the life of St Theodosius, because they contradict many passages in the Chronicle. The work is of primary importance for early Russian history, and, although deprived of literary merit, is not without its amusing episodes of an Herodotean character. The reputed body of the ancient chronicler may be seen among the relics preserved in the Pechersky monastery at Kiev. See also Hegel’s Chronique dite de Nestor (Paris, 1884); Bestuzhev Riumin, On the Composition of the Russian Chronicles till the end of the 14th century (in Russian), (St. Petersburg, 1860).

W. R. M.

NESTOR, the name of a small but remarkable group of parrots peculiar to the New Zealand sub-region of which it forms part, is the Ptilocrus meridionalis of Gmelin, founded on a species described by J. Latham (Gen. Synopsis i. 264), and subsequently termed by him P. nestor, in allusion to its hoary head, but now usually known as Nestor meridionalis, the “Kaka” of the Maories and English settlers in New Zealand, in some parts of which it was very abundant, though its nesting is not frequent. Forster, who accompanied Cook in his second voyage; described it in his MSS. in 1773, naming it P. hypopolius, and found it in both the principal islands. The general colour of the head and neck is not unlike that of the ear-coverts in being purplish-brown, and the rump and abdomen a more or less deep crimson-red; but much variation is presented in the extent and tinge of the last colour, which often becomes orange and sometimes bright yellow. The kaka is about the size of a crow, but a larger species, generally resembling it, though with plumage mostly dull olive-green, the Nestor notabilis of J. Gould, was discovered in 1836 by Walter Mantell, in the higher mountain ranges of the Middle Island. This is the “Kee” of the Maories, and incurred the enmity of colonists by developing the extraordinary habit of assaulting sheep, picking holes with its powerful beak in their side, wounding the intestines, and so causing death. The bird is admittedly an eater of carrion in addition to its ordinary food, which, like that of the kaka, consists of fruits, seeds and the grubs of wood-destroying insects, the last being obtained by stripping the bark from trees infested by them. The amount of injury the kea inflicts on flock-masters has doubtless been much exaggerated, for Dr Menzies states that on one visit, “where the loss was unusually large, the proportion of sheep attacked was about one in three hundred, and that those pasturing below the elevation of 2000 ft. are seldom disturbed.

On the discovery of Norfolk Island (October 10 1774) a parrot, thought by Forster to be specifically identical with the kahā (as he wrote the name) of New Zealand—though his son (Voyage, ii. 446) remarked that it was “infinitely brighter coloured”—was found in its hitherto un trodden woods. Among the drawings of Bauer, the artist who accompanied Robert Brown and Flinders, is one of a Nestor marked “Nestoric Isl. 19 Jan. 1803,” on which Herr von Pelseln in 1860 founded his t. norfolkislandensis. Meanwhile Latham in 1835 had described, as distinct species, two specimens evidently of the genus Nestor, one said, but doubtless erroneously, to inhabit New South Wales, and the other from Norfolk Island. In 1836 Gould described an example, without any locality, in the museum of the Zoological Society, as Platychoerus productus, and in 1838 some time after he was in Australia, he found that the home of this species, which he then recognized as a Nestor, was Phillip Island, a very small adjunct of Norfolk Island, and not more than 5 m. distant from it. Whether the birds of the two islands were specifically distinct, or not we shall perhaps never know, since they are all extinct, and no specimen undoubtedly from Norfolk Island seems to have been preserved. The Phillip-Island Nestor may be distinguished from both of the New-Zealand species by its somewhat smaller size, orange throat, straw-coloured breast, and the generally lighter shade of its tints.

The position of the genus Nestor in the order Psittacae must be regarded as uncertain, but it is now usually placed in the sub-family Nestoridae of the Psittacidae (see PARROT). Further knowledge of this very interesting form may be facilitated by the following references to the Transactions and Proceedings of the New Zealand Institute, ii. 64, 65, 387; iii. 45-52, 81-90, v. 207, vi. 114, 120, ix. 340, x. 192, xi. 317; and to Sir W. Buller’s Bird-life of New Zealand (A. N. Z. J. 1893).

NESTORIANS. § 1. The Early Nestorians.—Among those who had been present at Ephesus in support of Nestorius (q.v.) was Tba., presbyter and head of the theological school of Edessa. In 435 he became bishop of Edessa and under his influence the Nestorian teaching made considerable progress. On the accusation of the orthodox he was deposed by the “Robber Synod” of Ephesus, but at Chalcedon in 451 was pardoned on condition of renouncing Nestorius and Eutyches and acknowledging the Tome of Leo. He had not, however, changed his views, and this was generally recognized. Meanwhile one of his pupils, Barsumas, had settled at Nisibis in Persian territory where he became bishop in 453 and established a Nestorian school. And when the emperor suppressed the school of Edessa ("the Athen of Syria") in 489, and expelled its members, they travelled far afield as eager and successful missionaries of the Gospel. In Persia their numbers and their zeal stimulated the old churches into vigour and led to the founding of new ones. And as they succeeded in converting the Nestorians of Western Asia, the Byzantine Church the Persian government welcomed them as a political ally, though the religious opposition of the Magi was still largely retained. In their new environment the Nestorians abandoned some of the rigour of Catholic asceticism, and at a synod held in 499 abolished clerical celibacy even for bishops and went so far as to permit repeated marriages, in striking contrast not only to orthodox custom but to the practice of Aphraates at Edessa who had advocated celibacy as a condition of baptism. The liberty here granted to bishops was enjoyed as late as the 12th century, but since then the Nestorian Church in Persia was divided into two separate Chelsea: from the diocese of Edessa to the Greek Church. That the ascetic ideal was by no means wholly extinct is evident from the Book of Governors written by Thomas, bishop of Marga, in 840 which bears witness to a Syrian monasticism founded by one Awin of Egyptian descent, who settled in Nisibis about 350, and lasting uninterruptedly until the time of Thomas, though it had long been absorbed in the great Nestorian movement that had annexed the church in Mesopotamia.

The Nestorian Church in Eastern Syria and Persia was under the jurisdiction of an archbishop (catholothos), who in 498 assumed the title of Patriarch of the East, and in 516 another called Cresiphon, a fast field and a fitting centre for the great area over which the evangelizing activity of the Nestorians now extended. The church traced its doctrines to Theodore of Mopsuestia rather than to Nestorius, whose name at first they repudiated, not regarding themselves as having been proselytized to any new teaching.

§ 2. The Later Nestorians.—In 608 Migail influence was so strong in Persia that the Christians were persecuted and the office of catholothos was vacant for 20 years, being filled again by Iau-Jabu, during whose patriarchate the Mahomedan invasion overran Persia. The patriarch was able to secure from the caliph permission for the Christians to practice their religion in return for tribute money and this was afterwards remitted. Ibn Ali Talib, anxious to perpetuate their severed from the orthodox church and the Byzantine empire, confirmed these privileges by charter and in 762 the patriarchate was removed to Bagdad. For five centuries the Nestorians were a recognized institution within the territory of Islam, though their treatment varied from kindly to harsh. Birūnī, a Mahomedan writer, who lived at Khiva c. A.D. 1000, speaks of them as comprising the bulk of the population of Syria, Irak and Khorasun, and as superior to the orthodox in intellectual ability.
NESTORIANS

They agreed with Byzantines in observing Lent, Christmas and Epiphany, but differed from them in the observance of all other feasts and fasts. The Latin church tried in vain during the Crusades to secure their adhesion to Rome. The barbaric invasions of the 13th and 14th centuries fell with crushing force on the Nestorians. In 1258-60, and eventook Baghdad, and about 1400 Timur again seized and sacked the city. Though the Nestorians were numerous, their moral influence and their church life had greatly deteriorated. Those who escaped capture by Timur fled to the mountains of Kurdistan, and the community that had played so large a part in Mesopotamian history for a thousand years was thus shattered. In 1532 they were further weakened by a large secession known as “the Chaldeans” arising out of a dispute about the succession to the patriarchate. The discontented appealed to Rome, and the pope (Julius III.) consecrated the Chaldean catholicks. The Chaldeans are now chiefly found in rural districts east of the Tigris. They have a see at Bagdad, a monastery (Rabban Hormuz) at Elkoosh, and are called by those Syrian Christians who have resisted the papal overtures, Maghlabin (“the conquered”). Other attempts during the 16th century to promote union between the Nestorians and Rome proved fruitless, but the Roman Church has never ceased in its efforts to absorb this ancient community. The history of the Jacobites or Syrian Monophysites who, like the Nestorians, diverged from the Byzantine Church, but in an exactly opposite direction, is treated in a separate section (see Jacobites, CHURCH, &c.). Like the Nestorians they were great missionaries, and up to the 7th century, and again in the 12th and 13th, produced the bulk of Syriac literature (q.v.). The chief Nestorian authors were (a) in the 7th, 8th and 9th centuries, Babbayi the elder and Isho-yabith of Gedhala, commentators; Sahdona, who wrote on the monastic life; Abraham the Lame, a devotional and penitential writer; Dionysius of Tell Mahre (see Dionysius Telmaharenesis), whose Annals are important; and Thomas (q.v.) of Marga; (b) in the 14th century, Abd-isho bar Berika (d. 1343), the author of a theological treatise Marganiya (“the Pearl”), 1346, and the Paradise of Eden, a collection of 50 theological poems.

§ 3. The Nestorian Missionary Enterprise.—The combined hostility of the orthodox church and the Byzantine empire drove the Nestorians into exile, but they went much further than was needed simply to secure immunity from persecution. They showed a zeal for evangelization which resulted in the establishment of their influence throughout Asia, as is seen from the bishops founded not only in Syria, Armenia, Arabia and Persia, but also in the East Indies. Media, Merv in Khorasan, Herat, Tabriz, Bukhara, Bokhara, Khokand, Samarkand, Bulbul, Kish, Kasis, Kandahar, Chagri, (Pekin) and Singan fu Hsien fu in China, and Kaljana and Khangareh in India. In 1265 they numbered 25 Asiatic provinces and over 70 dioceses. Mongolian invasions and Mahomedan tyranny have, of course, long since swept away all traces of many of these. The 400,000 Syrian Christians (“Christians of St Thomas,” see Thomas, 67) who live in Malabar do not owe their origin to Nestorian missionaries, the stories of the evangelization of India by the Apostles Thomas and Bartholomew having no real historical foundation, and the Indian state of the Syrian church is a matter of doctrine, not history, for the period of its history on which it is based, the early Church, was not evangelized. They were not Nestorians, in whatever part of India it may have been exercised. The theology of the Indian Syrian Christians is of a Nestorian type, and Cosmas Indicopleustes (6th century) puts us on the right track when he says that the Christians whom he found in Ceylon and Malabar had come from Persia (probably as refugees from persecution, like the Huguenots in England and the Pilgrim Fathers in America). Pahlavi inscriptions found on crosses at St Thomas’s Mount near Madras and at Kottayam in Travancore afford evidence both of the antiquity of Christianity in these places (7th or 8th century), and for the semi-patri-passionism (the apparent identification of all three persons of the Trinity in the sufferer on the cross) which marked the Nestorian teaching. In 745 Thomas of Kana brought a new

1 “In punishment by the cross (was) the suffering of this One; He who is the true Christ, and God alone, and Guide ever pure.”

band of emigrants from Bagdad and Nineveh, and possibly the name “Christians of St Thomas” arose from confusion between this man and the apostle. Other reinforcements came from Persia in 822, but the Malabar church never developed any intellectual vigour or missionary zeal. They had their own kings, lived in the favour and protection of the sultans of Malabar, in caste regulations of food and avoidance of pollution. In 1330 Pope John XXII. issued a bull appointing Jordanus, a French Dominican, bishop of Quilon, and inviting the Nestorians to enter “the Christian Church.” The invitation was declined, but in the 16th century the Syrian Christians sought the help of the Portuguese settlers against Musulman oppression, only to find that before long they were subjected to the fiercer perils of Jesuit antagonism and the Inquisition. The Syriacs submitted to Rome at the synod of Dampier in 1599, but it was a forced submission, and in 1632 when the Portuguese arrested the new bishop just sent out by the catholics of Babylon, the rebellion broke out. The renunciation was not quite thorough, one party adhering to the Roman Church as Romo-Syrians, the others reverting wholly to Syrian usages and forming 10-day about three-fourths of the whole community. In 1665 a curious thing happened. Gregory, the Jacobite metropolitan of Jerusalem, visited Malabar, and, as the people had no consecrated bishop at the time, he consecrated Mar Thomas, who had been filling the office at the people’s request, and remained in the country jointly ordering with the Roman Church, which he had been converted to. Thus the Nestorian Church in India, voluntarily and with perfect indifference to theological dogmas, passed under Jacobite rule, and when early in the 18th century, Mar Gabriel, a Nestorian bishop, came to Malabar, he had a cool reception, and could only detach a small following of Syrians whom he brought back to the old Nestorianism. The approaches of the Anglican Church through the Church Missionary Society in the first part of the 19th century were politely repelled. On the death of the bishop Mar Athanasius Matthew in 1871, litigation began as to his successor, but lastly the occupation of the Church by Thomas, who came from Judea in 636. For two generations the little cause prospered, and again after persecutions in 699 and 813. Later on a second mission arrived, many churches were built and several emperors patronized the faith. This evidence is confirmed by (a) the canon of Theodore of Edessa (800) allowing metropolitans of China, India and other distant lands to send their reports to the catholicks every six years; (b) the edict of Wu Tsang destroying Buddhist monasteries and ordering 300 foreign priests to return to the secular life that the customs of the church were not to be spoken of; (c) the decree of the Chinese, one of whom, Ibn Wahhab, discussed the contents of the Bible with the emperor; (d) the discovery in 1725 of a Syrian MS. containing hymns and a portion of the Old Testament.

In the 10th century the Nestorians introduced Christianity into Tartary proper; in 1274 Marco Polo saw two of their churches. The legend of Prester John is based on the idea of the conversion of a Mongol tribe, the Karith, whose chieftain Uung Khan at baptism received the title Malek Juchana (King John). And there has lately come to light a MS. of the 9th or 10th century in Sogdianese, an Indo-Iranian language spoken in the north-east of Asia, which shows that the Nestorians had translated the New Testament into that tongue and had taught the natives the alphabet and the doctrine. Their activity may well be said to have covered the continent. Their campaign was one of deliberate conquest, one of the greatest ever planned by
Christian missionaries. Marco Polo is witness that there were Nestorian churches all along the trade routes from Bagdad to Pekin. (A. J. G.)

§ 4. The Modern Nestorians.—The Nestorians or East Syrians (Suryoyi) of Turkey and Persia now inhabit a district bounded by Lake Urmia, or Urumbia, on the east, stretching westwards into Kurdistan, to Mosul on the south, and nearly as far as Van on the north. They are divided into the Persian Nestorians of the plain of Azerbaijan, and the Turkish Nestorians, inhabiting chiefly the sanjak of Hakkari in the vilayet of Van, who are subdivided into the Euchearist, or Assyrian, and the Syrian or Persian. The latter being semi-independent in their mountain fastnesses. Forming at once a church and a nation, they now hold allegiance to their hereditary patriarch, Mar Shimun, Catholicos of the East, who resides at Qudshias, a village about 7000 ft. above the sea-level, near the Kurdish town of Julamerk. It is only of late years, under the influence of the different missions, that education, ruined by centuries of persecution, has revived amongst the Nestorians; and even now the mountainers, cut off from the outer world, are as a rule destitute of learning, and greatly resemble the Jews of the Persia of the time of Alexander the Great. They are, however, extraordinarily tenacious of their ancient customs, and, almost totally isolated from the rest of Christendom since the 5th century, they afford an interesting study to the ecclesiastical student. Their churches are rude buildings, dimly lighted and destitute of pictures or images, save that of the Cross, which is treated with the deepest veneration. The qankh, or sanctuary, is divided from the nave, by a solid wall, pierced by a single doorway; it contains the altar, or madhib kha (literary, the sacrificing place), and may be entered only by persons in holy orders who are fasting. Here is celebrated the Eucharist (Qurbana, or the offering; cf. “Corban”), by the priest (gasha), attended by his deacon (shamashka). Vestments are only worn at the ministration of the sacraments; incense is used invariably at the Eucharist and at other ceremonies. There are three liturgies—of the Holy Apostles, of Theodore and of Nestorius. The first is quite free from Nestorian influence, dates from some remote period, perhaps prior to 431, and is certainly the most ancient of those now in use in Christendom; the other two, though early, are undoubtedly of later date. The Nestorian canon of Scripture seems never to have been fully determined, the wildest and most fantastic mental system rigidly defined. Nestorian writers, however, generally reckon the mysteries as seven, i.e. Priesthood, Oyl of Unction, the offering of the Body and Blood of Christ, Absolution, The Holy Vealens, the Signation of the life-giving Cross. The “Holy Vealens” is regarded as the original blessing of the first Eucharist, brought by Addai and Mari and maintained ever since in the Church; it is used in the consecration of the Eucharistic wafers, which are rather thicker than those used in the Western Church. Communion is given in both kinds, as throughout the East; likewise, confirmation is administered directly after baptism. The sacramental confession is enjoined, but has recently become obsolete; prayers for the departed and invocation of saints form part of the service. The bishops are always celibates and are chosen from episcopal families. The service-books were wholly in MS., until the press of the archbishop of Canterbury’s mission at Urmia issued the Tekhtha (containing the liturgies, baptismal office, &c.) and several other liturgical texts.

The Nestorians commemorate Nestorius as a saint, and invoke his aid and that of his companions. They reject the Third Ecumenical Council, and though showing the greatest devotion to the Blessed Virgin, deny her the title of Theotokos, i.e. the mother or bearer of God. Their theological teaching is mystic and perplexing; their earliest writings contain no error, and the hymns of their great St Ephrem, still sung in their services, are positively antagonistic to “Nestorianism”; their theology dating from the schism is not so satisfactory. They attribute two Kian, two Qumni and one Parsa in

\[1\] The legendary founders of the Syrian Church. Addai was supposed to be one of the Seventy of Luke x. 1, and Mari his disciple.

Christ to (see J. F. Bethune-Baker's Nestorius and his Teaching). To say that the modern Nestorians are not definitely and firmly orthodox is perhaps fairer than to charge them with being distinctly heretical.

§ 5. Missions amongst the Nestorians.—The peculiar circumstances, both ecclesiastical and temporal, of the Nestorians have attracted much attention in western Christendom, and various missionary enterprises amongst them have resulted.

1. The Monastery of Bethunia, or Hor Monastery, at Bitlis, is the monastery of the Catholicos of the Oriental Church, who holds the title of Catholicos of all the Orient (see under Chaldeans). It is the seat of the metropolitans of the Nestorian Church, and is situated on a height, 1750 ft. above the sea-level, near the Kur river, about 3 miles from the town of Bitlis.

2. The Eastern Missionary Society, established in 1834-1835 by the Rev. Richard D. Brown, and supported by the Church of England, has been in operation ever since. The object of the society is to advance the knowledge of the Nestorians, and from its foundation has spent in the work of instruction and charity more than $125,000. The society has two classes of missionaries: the first, the educational, constitutes a society in itself. It seeks the foundation of schools and the training of Nestorian clergy, and is under the care of the Rev. Richard D. Brown, D.D. The second, the medical, consists of English medical men, whose residence is in the town of Bitlis. The society has a station in London, and is supported by the Society for the Propagation of the Gospel, the Royal Asiatic Society, the Asiatic Society, and private subscribers. The society has been very successful, and has already founded a college at Bethunia, and a seminary at Bitlis.

3. The Nestorians are a separate and distinct Church, divided into two provinces, the upper and lower. The upper province is divided into two sub-provinces, the upper and lower, and is governed by a Catholicos, who is also the head of the Church of the East. The lower province is divided into two sub-provinces, the upper and lower, and is governed by a Catholicos, who is also the head of the Church of the East.

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said to have been his first patriarchal sermon, Nestorius exorted the emperor in the famous words—"Purge me, O Caesar, the earth of heretics, and I in return will give thee heaven. Stand by me in putting down the heretics and I will stand by thee in putting down the Persians." In the spirit of this utterance, steps were taken within a few days by the new prelate to suppress the assemblies of the Arians; these, by a bold stroke of policy, anticipated his action by themselves setting fire to their meeting-house. Nestorius being with him nicknamed "the incendiary." The Novatians and the Quarto-decimans were the next objects of his authority. In his legal views, the decisions of the councils were not infrequently nullified by the decisions of the emperor; and in his teaching, Dorylaeum, which was attributed to Jesus. In the school of Antioch the importunity of the expression had long before been pointed out, by Theodore of Mopsuestia, among others, in terms precisely similar to those afterwards attributed to Nestorius. From Antioch Nestorius had brought along with him to Constantinople a co-presbyter named Anastasius, who enjoyed his confidence and is called by Theophanes his "syneculus." This Anastasius, in a pulpit oration which the patriarch himself is said to have prepared for him, caused great scandal to the partisans of the Marian cultus then beginning by saying, "Let no one call Mary the mother of God, for Mary was a human being; and that God should be born of a human being is impossible." The opposition, which was led by one Eusebius, a "scholasticus" or pleader who afterwards became bishop of Dorylaeum, chose to construe this utterance as a denial of the divinity of Christ, and the sentence which it became to pronounce it necessary to silence the remonstrants by force. The situation went from bad to worse, and the dispute not only grew in intensity but reached the outer world. Matters were soon ripe for foreign intervention, and the new situation in Constantinople and the antagonism between the Alexandrian and Antiochene schools of theology, as well as the jealousy between the patriarchate of St Mark and that of Constantinople, found a determined and unscrupulous exponent, did not fail to make use of the opportunity. He stirred up his own clergy, he wrote to encourage the dissidents at Constantinople, he addressed himself to the sister and wife of the emperor (Theodosius himself being known to be still favour- able to Nestorius), and he begged the clergy of his own diocese to find bribes for the officials of the court. He also sent to Rome a careful selection of Nestorius's sayings and sermons. Nestorius himself, on the other hand, having occasion to write to Pope Celestine I. about the Pelagians (whom he was not inclined to regard as heretical), gave from his own point of view an account of the disputes which had recently arisen within his patriarchate. While ordinarily Rome might have been expected to hold the balance between the contrasted schools of thought, as Leo was able later to do, it is not surprising that this implied appeal proved unsuccessful, for Celestine naturally resented any questioning of the Roman decision concerning the Pelagians and was jealous of the growing power of Alexandria, in whom the Romish Church of the East. He was not slow to use the opportunity of gaining what was at once an official triumph and a personal satisfaction. In a synod which met in 430, he decided in favour of the epithet Ἐστάρκος, and had Nestorius retract his erroneous teaching, on pain of instant excommunication, at the same time entrusting the execution of this decision to the patriarch of Alexandria. On hearing from Rome, Cyril at once held a synod and drew up a doctrinal formula for Nestorius to sign, and also twelve anathemas covering the various points of the Nestorian dogmatism. Nestorius, instead of yielding to the combined pressure of his two great rivals, merely replied by a counter excommunication. In this situation of affairs the demand for a general council became irresistible, and accordingly Theodosius and Valentinian II. addressed letters to the metropolitans of the church to meet at Ephesus at Whitsuntide 431, each bringing with him someable suffragans. Nestorius, with sixteen bishops and a large following of armed men, was among the first to arrive; soon afterwards came Cyril with fifty bishops. Juvenal of Jerusalem and Flavian of Thessalonica were some days late. It was then announced that John of Antioch had been delayed on his journey and could not appear for some days; he, however, is stated to have written politely requesting that the opening of the synod should not be delayed on his account. Cyril and his friends accordingly assembled in the church of the Theotokos in Chalcedon, and at last yielding to the sense of the enormous majority, he gave a decision in favour of the "orthodox," and the council of Ephesus was dissolved. Maximian, one of the Constantinopolitan clergy, a native of Rome, was promoted to the vacant see, and Nestorius was henceforward represented in the city of his former patriarchate only by one small congregation, which also a short time afterwards became extinct. The commotion which had been thus raised did not so easily subside in the more eastern section of the church; the Antiochenes continued to maintain for a considerable time an attitude.
of antagonism towards Cyril and his creed, and were not pacified until an understanding was reached in 433 on the basis of a new formula involving some material concessions by him. The union even then met with resistance from a number of bishops, who rather than accede to it, submitted to deposition and expulsion from their sees; and it was not until these had all died out that, as the result of stringent imperial edicts, Nestorianism may be said to have become extinct throughout the Roman empire. The Nestorians themselves, however, continued to exist in private life in their old monastries of Euprepios, Antioch, until 435, when the emperor ordered his banishment to Petra in Arabia. A second decree, it would seem, sent him to Oasiss, probably the city of the Great Oasis, in Upper Egypt, where he was still living in 459, at the time when Socrates wrote his Church History. He was taken prisoner by the Blemmyes, a nomad tribe that gave much trouble to the empire in Africa, and when they set him free in the Thebaid near Panopolis (Akhmim) c. 450, they exposed him to further persecution from Shenute the great hero of the Egyptian monks. There is some evidence that he was summoned to the Council of Chalcedon, though he could not attend it, and the concluding portion of his book known as The Bassaor of Heracleides not only gives a full account of the “Rober Synod” of Ephesus 449, but knows that Theodosius is dead (July 450) and seems aware of the proceedings of Chalcedon and the flight of Dioscurus the unscrupulous successor of Cyril at Alexandria. Nestorius was already old and ailing and must have died very soon after.

The Nestorian Heresy.—What is technically and accurately meant in dogmatic theology by “the Nestorian heresy” must now be noticed. As Eutychianism is the doctrine that the God-man has only one nature, so Nestorianism is the doctrine that He has two concurrent natures. For this reason many of the Nestorians have been called Eutychian. This accords quite well with the modern theory that in the two hypostases or natures approaches Eutychianism. It must be remembered that Nestorius was as orthodox at all events as a Christian. Even the definition of Arianism and Apollinarism, and was perfectly correct in his assertion that the Godhead can neither be born nor suffer; all that he can allege against him is that “the fear of the communicatio idiomatum, instead of the communicatio substantiarum, that was raised by Nestorius was not one as to the communicatio idiomatum, but simply as to the proprieties of language. I cannot speak of God,” he said, “as being two or three months old,” a remark which was much cited by the Aviarmenians.” He did not mean that Mary was the mother of Christ, but that he thought it improper to speak of her as the mother of God, and Leo in the Letter to Flavian which was endorsed at Chalcedon uses the term “Mother of the Lord” which was exactly what Nestorius wished. And there is at least this to be said for him that even the most zealous desire to frustrate the Arian had never made it a part of orthodoxy to speak of David as thebêthvew or of James as thebêthivon. The secret of the enthusiasm of the masses for the analogical expression Theokotos is to be sought not so much in the Nicene doctrine of the incarnation as in the recent growth of the cult of the Virgin, rather than to the theology of the Virgin, which were entirely unheard of (except in heretical circles) for nearly three centuries of the Christian era. That the Virgin should be given a title that was quasi-divine mattered little. The danger was that under cover of such a title an unhistorical conception of the facts of the Gospel should grow up, and a false doctrine of the relations between the human and the Divine be encouraged, as the doctrine of a human soul in Christ was destined to be. Hence, even though they happened to be against me personally,” His aim, he tells us, had been to maintain the distinct continuance of the two persons, not only in Christ, but in the whole of creation. “In the Person the nature’s use their properties mutually. The manhood is the person of the Godhead and the Godhead is the person of the manhood.” The ultimate union of these two natures, he said, is not a fusion of soul and body, but rather will and mind in the union of the natures, so that both should will or not will exactly the same things. The natures have, moreover, a

1 Coptic Life of Dioscurus (Rev. Égyptologique, 1880-1883).
2 J. F. Bede-Henon, Nestorius and his Teaching, ch. vi.
3 Syriac, išgērāt, lit. “merchandise.” The Greek word may have been iστρόφων. Nothing is certainly known of any such Heracledes.
mutual will, since the person of this is the person of that, and the person of that the person of this." The manner in which this union is realized is thus stated by Nestorius: "The Word also passed, through Blessed Mary inasmuch as He did not receive a beginning by birth from her, as is the case with the body which was born of her. For this reason I said that God the Word passed and was not born. For He did not receive a beginning from her. But the two natures being united are one Christ. And He who was born of the Father as to the Divinity, and from the Holy Virgin as to the humanity is and is styled one; for of the two natures there was a union." It may truly be said that the ideas for which Nestorius and the Antiochene school strove "won the day as regards the doctrinal definitions of the church. The manhood of Christ was safeguarded, as distinct from the Godhead: the union was left an mystery.


NESZLER, VICTOR (1841-1890), German musical composer, was born on the 28th of January 1841 at Baldenheim, near Schletstadt. At Strassburg he began his university career with the study of theology, but he concluded it with the production of a light opera entitled Fleurette (1864). To complete his knowledge of composition he went to study under Humann, his opera Der Trompeter von Säckingen, based on Scheffel's poem, was composed and performed in 1884. Besides a number of other operas, Neszler wrote many songs and choral works; but it is with the Trompeter von Säckingen that his name is associated. He died at Strassburg on the 28th of May 1890.

In 1895 a monument to him by Marzolf was erected there.

NET, a fabric of thread, cord, or wire, the intersections of which are knotted so as to form a mesh. The art of netting is most widely related to weaving, knitting, plaiting, and lace-making, from all of which, however, it is distinguished by the knotting of the intersections of the cord. It is one of the most ancient and universal of arts, having been practised among the most primitive tribes, to whom the net is of great importance in hunting and fishing.

Net-making, as a modern industry, is principally concerned with the manufacture of the numerous forms of net used in fisheries, but netting is also largely employed for many other purposes, as for catching birds, for the temporary division of fields and gardens, for screening a variety of other furniture purposes, for ladies' hair, bags, appliances used in various games, &c. Since the early part of the 19th century numerous machines have been invented for netting, and several of these have attained commercial success. Fishing nets were formerly made principally from hemp fibre—technically called "twine"; but since the adaptation of machinery to net-making cotton has been increasingly used, such nets being more flexible and lighter, and more easily handled and stowed.

The forms of fishing nets vary according to the manner in which they are intended to act. This is either by entangling the fish in their complicated folds, as in the trammel; receiving them into pockets, as in the trawl; suspending them by the body in the meshes, as in the mackerel-net; imprisoning them within their labyrinth-like chambers, as in the stake-net; or drawing them to shore, as in the seine. The parts of a net are the head or upper margin, along which the cords are strung upon a rope called the head-ropé; the foot is the opposite or lower margin, which carries the foot-ropé, on which in many cases leaden plummetts are made fast. The meshes are the squares composing the net, the length of a net is measured in chains, e.g. a day-net is three fathoms long and one over or wide. The lever is the first row of a net. There are also accurrs, false meshes or quarterings, which are loops inserted in any given row, by which the number of meshes is increased. To breathe a net is to make a net. Dead netting is a piece without either accrues or stole (stolen) meshes, which last means that a mesh is taken away by netting into two meshes of the preceding row at once.

Hand-Netting.—The tools used in hand-netting are the needle, an instrument for holding and netting the material; it is made with an eye E, a tongue T, and a fork F (fig. 1). The twine is wound on it by being passed alternately between the fork and round the tongue, so that the turns of the string lie parallel to the length of the needle, and are kept by the tongue and fork. A spool or mesh-pin is a piece of round or flat wood on which the loops are formed, the perimeter of the spool determining the size of the loops. Each loop contains two sides of the square mesh; therefore, supposing that it be required to make a mesh 1 in. square—that is, measuring 1 in. from knot to knot, an spool 2 in. in circumference must be used. Large meshes may be made, but two or more rounds turn the spool, as occasion may require; or the spool may be made flat, and of a sufficient width. The method of making the hand-knot in nets known as the fisherman's knot is more easily acquired by example than described in writing. Fig. 2 shows the course of the twine in forming a single knot. From the last moved knot the twine passes over the front of the mesh-pin B, and is caught behind by the little finger of the left hand, forming the loop 4, thence it passes to the front and is caught at d by the left thumb, then through the loops and as in fig. 3, where a pin is released by the thumb and the knot is drawn "taut" or tight. Fig. 3 is a bend knot used for uniting two ends of a net.

Machine-Netting.—In 1778 a netting-machine was patented by William Horten, William Ross, Thomas Davies and John Golby. In 1802 the French government offered a prize of 10,000 francs to the person who should invent an automatic machine for net-making. Jacquard submitted a model of a machine which was brought under the notice of Napoleon I. and Carnot, and he was summoned to Paris by the emperor who asked—"Are you the man who pretends to do what God Almighty cannot—tie a knot in a stretched string?" Jacquard's model, which is incomplete, was deposited in the Conservatoire des Arts et Métiers; it was awarded a prize of 1000 francs for an appointment in the Conservatoire, where he perfected his famous attachment to the com- mon loom. In the Kingdom of the Netherlands, the first to succeed in inventing an efficient machine and in establishing the industry of machine net-making was James Paterson of Musselburgh. Paterson, originally a cooper, served the army during the Peninsular War, and was discharged after the battle of Waterloo. He established a net factory in Musselburgh about 1820; but the early form of machine was imperfect, the knots it formed slipped readily, and, there being much prejudice against machine nets, the demand was small. Walter Ritchie, native of Musselburgh, devised a method for forming the ordinary hand-knot on the machine nets, and the machine, patented in July 1835, became the foundation of an extensive and flourishing industry. The Paterson machine is very complex. It consists of an arrangement of hooks, needles and sinkers, one of each being required for every mesh in the breadth being made. The needles hold the meshes, while the hooks, by the means of each and twist it into a loop. Through the series of loops so formed a steel wire is shot, carrying with it twine for the next range of loops. This twine the sinkers successfully catch and depress sufficiently to form the two sides and loop of the next mesh to be formed. The knot formed by threading the loops is now tightened up, the last formed mesh is freed from the sinkers and transferred to the hooks, and the process of threading the loops is repeated.

Another form of net-loom, working on a principle distinct from that of Paterson, was invented and patented in France by Onésiphore Pecqueur in 1840, and again in France and in the United Kingdom in 1849. This machine was improved by many subsequent

1 This is a common Teut. word, of which the origin is unknown; it is not to be connected with "knit" or "knot." The term "net," i.e. remaining after all deductions, charges, &c., have been made, as in "net profit," is a variant of "neat," tidy, clean, Lat. nitidus, shining.
The geographical features of the countries formerly known collectively as the Netherlands or Low Countries are dealt with under the modern English names of HOLLAND and BELGIUM. Here we are concerned only with their earlier history, which is put for convenience under this heading in order to separate the account of the period when they formed practically a single area for historical purposes from that of the time when Holland and Belgium became distinct administrative units.

The sources of our knowledge of the country down to the 5th century are Caesar’s De Bello Gallico, the history of Velleius Paterculus, ii. 105, the works of Tacitus, the Historia Francorum (i.iii) of Gregory of Tours, the Frédegar’s Chronica (for the last two of which see D. Bouquet’s Recueil des historiens des Gaules et de la France, 1738-1870). The Netherlands first became known to the Romans through the campaigns of Julius Caesar. He found the country peopled partly by tribes of Gallo-Celtic, partly by tribes of Germanic stock, the river Rhine forming roughly the line of demarcation between the races. Several of the tribes along the borderland, however, were undoubtedly of mixed blood. The Gallo-Celtic tribes bore the general appellation of Belgae, and among these the Nervii, inhabiting the district between the Scheldt and the Sambre were at the date of Caesar’s invasion, 57 B.C., the most warlike and important. To the north of the Meuse, and more especially in the low-lying ground enclosed between the Waal and the Rhine (insula Batavorum) lived the Batavi, a clan of the great Germanic tribe, the Chatti. Beyond these were found the Frisians (q.v.), a people of German origin, who gave their name to the territory between the Rhine and the Ems. Of the other tribes the best known are the Caninefates, Chauci, Usipetes, Scambri, Eburones, Menapii, Morini and Aduatuci.

Julius Caesar, after a severe struggle with the Nervii and their confederates, was successful in bringing the Belgic tribes into submission to Rome. Under Augustus, 15 B.C., the conquered territory was formed into an imperial province, Gallia Belgica, and the frontier line, the Rhine, was strongly held by a series of fortified camps.

With regard to the region north of the Rhine we first obtain information from the accounts of the campaigns of Nero, Claudius, Drusus and Tiberius. The Batavians were first brought under Roman rule in the governorship of Drusus, a.d. 13. They were not incorporated in the empire, but were ranked as allies, socii or auxilia. Their land became a recruiting ground for the Roman armies, and a base for expeditions across the Rhine. The Batavians served with fidelity and distinction in all parts of the empire, and from the days of Augustus onwards formed a considerable part of the Praetorian guard. The Frisians struggled against Roman over-lordship somewhat longer, and it was not until a.d. 47 that they finally submitted to the victorious arms of Domitius Corbulo. The Frisian auxiliaries were likewise regarded as excellent troops.

In the confusion of the disputed succession to the imperial throne after the death of Nero, the Batavians (a.d. 60-70) under the influence of a great leader, known only by his Roman name, Claudius Civilis, rose in revolt. Civilis had seen much service in the Roman armies, and was a man of statesmanlike ability. In revenge for his own imprisonment, and the death of his brother by order of Nero, he took advantage of the disorder in the empire not only in the province but in the fellow-countrymen of his independence, but to persuade a large number of German and Belgic tribes to join forces with them. A narrative of the revolt is given in detail by Tacitus. At first success attended Civilis and the Romans were driven out of the greater part of the Belgic province. Even the great fortress of Castra Vetera (Xanten) was starved into submission and the garrison massacred. But dissensions arose between the German and Celtic elements of Civilis’s following. The Romans, under an able general, Cerialis, took advantage of this, and Civilis, beaten in fight, retired to the island of the Batavians. But both sides were exhausted, and it was arranged that Cerialis and Civilis should meet on a broken bridge over the Nabelia (Yssel) to discuss terms of peace. At this point the narrative of Tacitus breaks off, but it would appear that easy conditions were offered, for the Batavians returned to their position of socii, and were henceforth faithful in their steady allegiance to Rome. The insula Batavorum, lined with forts, became for a long period the bulwark of the empire against the inroads of the Germans from the north.

Of this period scarcely any record remains, but when at the end of the 3rd century the Franks (q.v.) began to swarm over the Rhineland into the Roman lands the name of the old tribes had disappeared. The peoples within the frontier had been transformed into Romanized provincials; outside, the various tribes had become merged in the common appellation of Frisians. The branch of the Franks—\(\text{The Franks.}\) who were a confederacy, not a people—which gradually over spread Gallia Belgica, bore the name of the Salian Franks. Nominaly they were taken under the protection of the empire, in reality they were its masters and defenders. In the days of their great king Hodwig or Clovis (451-511) they were in possession of the whole of the southern and central Netherlands. The strip of coast from the mouth of the Scheldt to that of the Ems remained, however, in the hands of the free Frisians (q.v.), in alliance with whom against the Franks were the Saxons (q.v.), who, pressing forward from the east, had occupied a portion of the districts known later as Gelderland, Overysel and Drente. Saxo

Saxon was at this period the common title of all the north German tribes; there was but little difference between Frisians and Saxons either in race or language, and they were closely united for some four centuries in common resistance to the encroachments of the Frankish tribes. The conversion of Clovis and his rude followers to Christianity tended gradually to civilize the Franks, and to facilitate the fusion which soon took place between them and the Gallo-Roman population. It tended also to accentuate the enmity to the Franks of the heathen Frisians and Saxons. In the south (of the Netherlands) Christianity was spread by the labours of devoted missionaries, foremost amongst whom were St Amandus, St Bavon and St Eligius, and bishoprics were set up at Cambrai, Tournai, Arras, Thérouanne and Liége. In the north progress was much slower, and...
though a church was erected at Utrecht by Dagobert I. about A.D. 630, it was destroyed by the Frisians, who remained obstinately heathen. The first successful attempt to convert them was made, under the powerful protection of Pippin of Heristal, by Wilhtboord, a Northumbrian monk, who became, A.D. 695, the first bishop of Utrecht (see Utrech). His labours were continued with even more striking results by another Englishman, Winfrid, better known as St Boniface, the Apostle of the Germans. Winfrid's missionary labours were the prelude of a new, widespread movement of religious influence which, for the next three centuries, was to affect the whole of the subsequent history of the Low Countries. It was a part of this mighty movement that led to the conversion of the Frisians. The conversion of the Frisians was a part of the same movement that led to the conversion of the Frisians. The complete conversion, however, in the end due rather to the arms of the Carolingian kings than to the unaided efforts of the missionaries. Towards the end of the century, Charlemagne, himself a Netherlander by descent and ancestral possessions, after a severe struggle, thoroughly subdued the Frisians and Saxons, and compelled them to embrace Christianity.

In the triple partition of the Carolingian empire at Verdun in 843, the central portion was assigned to the emperor Lothaire, separating the kingdoms of East Francia (the later Germany) from West Francia (the later France). This middle kingdom formed a long strip stretching across Europe from the North Sea to Naples, and embraced the whole of the later Netherlands with the exception of the portion on the left bank of the Scheldt, which river was made the boundary of West Francia. On the death of the emperor, his son Lothaire II. received the northern part of his father's domain, known as Lothari or Hlutharil Regnum, corrupted later into Lotharingia or Lorraine. Lothaire had no heir, and in 870 by the treaty of Meersen his territory was divided between the kings of East and West Francia. In 875 the duchy of East Francia acquired the whole; from 912 to 924 it formed part of West Francia. Finally in 924 Lorraine passed in the reign of Henry the Fowler under German (East Frankish) overlordship. Henry's son, Otto the Great, owing to the disordered state of the country, placed it in 953 in the hands of his able brother, Bruno, archbishop of Cologne, for pacification. Bruno, who kept for himself the title of archduke, divided the territory into the two duchies of Upper and Lower Lorraine. Godfrey of Verdun was invested by him with the government of Lower Lorraine (Nieder-Löthringen). The history of the Netherlands from this time forward—with the exception of Flanders, which continued to be a fief of the French kings—is the history of the various feudal states into which the duchy of Lower Lorraine was gradually broken up.

It is a melancholy history, telling of the invasion of the Northmen, and of the dynastic struggles between the petty feudal sovereigns who carved out counties and lordships for themselves during the dark centuries which followed the fall of the Carolingian empire. It was a time of oppression too, for many of the people, in the agitation, during which the country remained chiefly swamp and tangled woodland, with little communication save up and down the rivers and along the old Roman roads. Its remoteness from the control of the authority of the German and French kings, together with its inaccessibility, gave special facilities in Lower Lorraine to the growth of a number of practically independent feudal states forming a group or system apart. Chief among these states were the duchy of Brabant, the counties of Flanders, Hainault, Holland, Gelderland, Limburg and Luxembourg, and the bishoprics of Utrecht and Liége. For their separate local histories and their dynasties and political relations with one another and with neighbouring countries, reference must be made to the separate articles Flanders, Holland, Brabant, Gelderland, Limburg, Luxembourg, Utrecht, Liége.

During the 9th and 10th centuries the Netherlands suffered cruelly from the attacks of the Northmen, who ravaged the shores and at times penetrated far inland. In 834 Utrecht and Dorestad were sacked, and a few years later, Utrecht and Friesland was in their hands. Year after year the raiders went on under a succession of leaders—Herald, Roruk, Rolf, Godfrey—and far and wide there was pillaging, burning, murder and slavery. In 873 Rolf seized Walcheren, and became the scourge of the surrounding districts. In 880 the invaders took Nijmegen, erected a permanent camp at Elsloo and pushed on to the Rhine. Liége, Aix-la-Chapelle, Cologne and Bonn fell into their hands. The emperor, Charles the Fat, was roused to collect a large army, with which he surrounded the main body of the Northmen under their leader Godfrey in the camp at Elsloo. But Charles pre- ferred to pay the tribute demanded by the Northmen. Godfrey received a large sum of money, was confirmed in the possession of Friesland, and on being converted to Christianity in 882, received in marriage Gisela, daughter of Lothaire II. Three years later, however, Godfrey was murdered, and although the raids of the Northmen did not entirely cease for upwards of another century, no further attempt was made to establish a permanent dynasty in the land.

At the close of the 11th century the system of feudal states had been firmly established in the Netherlands under stable dynasties—hereditary or episcopal, and, despite the continual wars between them, civilization had begun to develop, orderly government to be carried on, and the general condition of the people to be less hopeless and miserable. It was at this time that the voice of Peter the Hermit roused the whole of western Europe to enthusiasm by his preaching of the first crusade. Nowhere was the call responded to with greater zeal than in the Netherlands, and nowhere had the spirit of adventure and the stimulus to enterprise, which was one of the chief fruits of the crusades, more permanent effects for good. The foremost heroes of the first crusade were Netherlands. Godfrey of Bouillon, the leader of the expedition and the first king of Jerusalem, was duke of Lower Lorraine, and the names of his brothers Baldwin of Edessa and Eustace of Boulogne, and of Count Robert II. of Flanders are only less famous. The third crusade numbered among its chiefs Floris III. of Holland, Philip of Flanders, Otto I. of Gelderland and Henry I. of Brabant. The so-called Latin crusade of 1203 placed the imperial crown of Constantinople on the head of Baldwin of Flanders. At the siege and capture of Damietta (1218) it was the contingent of North-Netherlanders (Hollanders and Frisians under Count William I. of Holland) who bore the brunt of the fighting and specially distinguished themselves. To the Netherlands, as to the rest of western Europe, the result of the crusades was in the main advantageous. They broke down the intense narrowness of the life of those feudal times, enlarged men's conceptions and introduced new ideas into their minds. They first brought the products and arts of the Orient into western Europe; and in the Netherlands, by the impulse that they gave to commerce, they were one of the primary causes of the rise of the chartered towns. Little is known about the Netherlands towns before the 12th century. In the course of that period. No place was reckoned to be a town unless it had received a charter from its sovereign or its local lord. The charters were of the nature of a treaty between the city and its feudal lord, and they differed much in character according to the importance of the place and the pressure it was able to put upon its sovereign. The extent of the rights which the charter conceded determined whether the town was a free town (wille staed—ville franca) or a commune (gemeente—communa). In the case of a commune the concessions included generally the right of inheritance, justice, taxation, use of wood, war &c. The town's representative, entitled "justiciary" (schout) of "bailiff" (boljav), presided over the administration of justice and took the command of the town levies in war. The commune—consisting only of those bound by the communal oath for mutual help and defence—elected their own magistrates. These electors were often a small proportion of the whole body of inhabitants: sometimes a few influential families alone had the right, and it became hereditary. This governing oligarchy was known as the patricians. The magistrates bore the name of schabint (schappen) or "schepenen).
citizens to assist them a body of sworn councillors (geworrenen or juüts), whose presidents, styled "burgomasters," had the supervision of the communal finances. Thus grew up a number of municipalities—practically self-governing republics—semi-independent feudatories in the feudal state.

The most powerful and flourishing of all were those of Flanders—Ghent, Bruges and Ypres. In the 13th century these towns had become the seat of large industrial populations (varying according to different estimates from 100,000 to 200,000 inhabitants), employed upon the weaving of cloth with its dependent industries, and closely bound up by trade interests with England, from whence they obtained the wool for their looms. Bruges, at that time connected by the sea with the river Zwijn and with Sluis as its port, was the central mart and exchange of the world's commerce. In these Flemish cities the early oligarchic form of municipal government speedily gave way to a democratic. The great mass of the townsmen organized in trade guilds—weepers, fullers, dyers, smiths, leather-workers, brewers, butchers, bakers and others, of which by far the most powerful was that of the weavers—as soon as they became conscious of their strength rebelled against the rule of their guild masters, and compelled them to hand over the power. The patricians (hence called leiaertsa) relied upon the support of the French crown, but the fatal battle of Courtrai (1302), in which the handicraftsmen (clauwaert) laid low the chivalry of France, secured the triumph of the democracy. The power of the Flemish cities rose to its height during the ascendancy of Jacques van Artevelde (1285-1343), the famous citizen-statesman of Ghent, but after his fall the mutual jealousies of the cities undermined their strength, and with the crushing defeat of Roosebeke (1382) in which Philip van Artevelde perished, the political greatness of the municipalities had entered upon its decline.

In Brabant—Antwerp, Louvain, Brussels, Malines ( Mechlin)—and in the episcopal territory of Liège—Liège, Huy, Dinant—there was a feebler repetition of the Flemish conditions. Flourishing communities were likewise to be found in Hainault, Namur, Cambrai and the other southern districts of the Netherlands, but nowhere else the vigorous independence of Ghent, Bruges and Ypres, nor the splendour of their civic life. In the north also the 13th century was rich in municipal charters. Dordrecht, Leiden, Haslem, Delmen, Rotterdam in Holland, and Middelburg and Zierikzee in Zeeland, repeated with modifications the characteristics of the communes of Flanders and Brabant. But the growth and development of the northern communal movement, though strong and instinct with life, was slower and less tempestuous than the Flemish. In the bishopric of Utrecht, in Gelderland and Friesland, the privileges accorded to Utrecht, Groningen, Zutphen, Stavoren, Leeuwarden rather than the model of those of the Rhenish "free cities" than of the Franco-Flemish commune. In the northern Netherlands generally up to the end of the 14th century the towns had no great political weight; their importance depended upon their river commerce and their markets. Thus at the close of the 14th century, despite the constant wars between the feudal sovereigns who held sway in the Netherlands, the vigorous municipal life had fostered industry and commerce, and had caused Flanders in particular to become the richest possession in the world.

It was precisely at this time that Flanders, and gradually the other feudal states of the Netherlands, by marriage, purchase, treachery or force, fell under the dominion of the house of Burgundy. The foundation of the Burgundian rule in the Netherlands was laid by the succession of Philip the Bold to the counties of Flanders and Artois in 1384 in right of his wife Margaret de Maule. In 1404 Antony, Philip's second son (killed at Agincourt 1415), became duke of Brabant by bequest of his great-aunt Joan. The consolidation of the Burgundian power was effected by Philip the Good, grandson of Philip the Bold, in his long and successful reign of 48 years, 1419-1467. He inherited Flanders and Artois, purchased the county of Namur (1427) and compelled his cousin Jacqueline, the heiress of Holland, Zeeland, Hainault and Friesland, to surrender her possessions to him, 1428. On the death in 1430 of his cousin Philip, duke of Brabant, he took possession of Brabant and Limburg; the duchy of Luxembourg he acquired by purchase, 1443. He made his bastard son David bishop of Utrecht, and from 1456 onwards that see continued under Burgundian influence. Two other bastards were placed on the episcopal throne of Liège, an illegitimate brother on that of Cambrai. Philip did not live to see Gelderland and Liège pass definitively under his rule; it was reserved for his son, Charles the Bold, to push the independent communes of Liège (1468) and to incorporate Gelderland in his dominions (1473).

This extension of dominion on the part of the dukes of Burgundy implied the establishment of a strong monarchical authority. They had united under their sway a number of provinces with different histories and institutions and speaking different languages, and their aim was to centralize the government. The nobility and clergy were on the side of the ducal authority; its opponents were the municipalities, especially those of Flanders. Their strength had been severely menaced by the overthrow of Roosebeke, but Philip had made his accession found under his son once more advancing them in power and prosperity. He was quite aware that the industrial wealth of the great Flemish communes was financially the mainstay of his power, but their very prosperity made them the chief obstacle to his schemes of unifying into a solid dominion the loose aggregate of states over which he was the ruler. On this matter Philip would brook no opposition. Bruges was forced after strenuous resistance to submit to the loss of its most cherished privileges in 1438, and the revolt of Ghent was quenched in the "red sea" (as it was styled) of Gavere in 1452. The splendour and luxury of the court of Philip surpassed that of any contemporary sovereign. A permanent memorial of it remains in the famous Order of the Golden Fleece, which was instituted by the duke at Bruges in 1430 on the occasion of his marriage with Isabel of Portugal, a descendant of John of Gaunt, and was so named from the English wool, the raw material used in the Flemish looms, for which Bruges was the chief mart. The reign of Philip, though marred by many acts of tyranny and harshness, was politically great. Had his successor been as prudent and able, he might have made a unified Netherlands the nucleus of a mighty middle kingdom, interposing between France and Germany, and a revival of that of the Carolingian Lothaire.

Before the accession of Charles, the only son of Philip, two steps had been taken of great importance in the direction of unification. The first was the appointment of a grand council with supreme judicial and financial functions, whose seat was finally fixed at Malines (Mechlin) in 1473; the other the summoning of deputies of all the provincial "states" of the Netherlands to a states-general at Brussels in 1465. But Charles, rightly surmamed the Bold or Headstrong, did not possess the qualities of a builder of states. Impatient of control and hasty in action, he was no match for his crafty and plotting adversary, Louis XI, of France. His ambition, however, was boundless, and he set himself to realize the dream of his father—a Burgundian kingdom stretching from the North Sea to the Mediterranean. At first all went well with him. By his ruthless suppression of revolts at Dinant and Liège he made his authority undisputed throughout the Netherlands. His campaigns against the French king were conducted with success. His creation of a formidable standing army, the first of its kind in that age of transition from feudal conditions, gave to the Burgundian power all the outward semblance of stability and permanence. But Charles, though a brave soldier and good military organizer, was neither a capable statesman nor a skillful general. He squandered the resources left to him by his father, and made himself hateful to all classes of his subjects by his exactions and tyranny. When at the very height of power, all his schemes of aggrandisement came to sudden ruin through a succession of disastrous defeats at the hands of the Swiss at Grandson (March 2, 1476), at Morat (June 22, 1476).
and at Nancy (January 5, 1477). At Nancy Charles was himself among the slain, leaving his only daughter Mary of Burgundy, then in her twentieth year, sole heir to his possessions.

The catastrophe of Nancy threatened the loosely-knit Burgundian dominion with dissolution. Louis XI. claimed the reversion of the French fiefs, and seized Burgundy, Franche Comté and Artois. But the Netherlands provinces, though not loving the Burgundian dynasty, had no desire to see French master. Deputies representing Gelders, Brabant, Hainault and Holland met at Ghent, where Mary was detained almost as a prisoner, and compelled her (February 10, 1477) to sign the "Great Privilege." This charter provided that no war could be declared nor marriage concluded by the sovereign, nor taxes raised without the assent of the states, that natives were alone eligible for high office, and that the national language should be used in public documents. The central court of justice at Malines was abolished, but the Grand Council was reorganized and made thoroughly representative. The Great Privileges supplemented by the so-called "Royal Privileges of the Flemish Privilege granted (February 10), the Great Privilege of Holland and Zeeland (February 17), the Great Privilege of Namur and the Joyeuse Entrée of Brabant, both in May, thus largely curtailting the sovereign's power of interference with local liberties. On these conditions Mary obtained the hearty support of the states against France, but her humiliations were not yet at an end; two of her privy councillors, accused of traitorous intercourse with the enemy, were, despite her entreaties, seized, tried, and beheaded (April 3). Her marriage, for months later to Maximilian of Austria was the beginning of the long domination of the house of Habsburg. The next fifteen years were for Maximilian a stormy and difficult period. The duchess Mary died from the effects of a fall from her horse (March 1482), and Maximilian became regent (mamour) for his son. The peace of Arras with France (March 1483) freed him to deal with the discord in the Netherlands provinces, and more especially with the turbulent opposition in the Flemish cities. With the submission of Ghent (June 1483) the contest was decided in favour of the archduke, who in 1494, on his election as emperor, was able to hand over the country to his son Philip in a comparatively tranquil and secure state. Philip, surnamed the Fair, was fifteen years of age, and his accession was welcomed by the Netherlanders with whom Maximilian had never been popular. Gelderland, however, which had revolted after Nancy, had Charles of Egmont for its duke, and the two bishoprics of Liége and Utrecht were no longer subject to Burgundian authority. In 1496 Philip married Joanna of Aragon, who in 1500 became heiress apparent to Castile and Aragon. That same year she gave birth at Ghent to a son, afterwards the emperor Charles V. Philip's reign in the Netherlands was chiefly noteworthy for his efforts for the revival of trade with England. On the death of Queen Isabel, Philip and Joanna succeeded to the crown of Castile and took up their residence in their new kingdom (January 1506). A few months later Philip unexpectedly died at Burgos (September 25th). His Burgundian lands passed without opposition to his son Charles, then six years of age.

The claim of the emperor Maximilian to be regent during the minority of his grandson was recognized by the states-general. Maximilian nominated his daughter Margaret, widow of Philippe, duke of Savoy, to act as governor-general, and she filled the difficult post for eight years with great ability, courage and tact; and when Charles at the age of fifteen assumed the government he found the Netherlands thriving and prosperous. In the following year, by the death of Ferdinand of Aragon, his maternal grandfather, and the incapacity of his mother Joanna, who had become hopelessly insane, he succeeded to the crowns of Castile and Aragon, which came to him with their large possessions and the whole dominion of the New World of America. In 1519 Maximilian died, and the following year his grandson, now the head of the house of Austria, was elected emperor. Charles V. had been born and brought up in the Netherlands, and retained a strong predilection for his native country, but necessarily he had to pass the larger part of his life, at that great crisis of the world's history, in other lands. During his frequent absences he entrusted the government of the Netherlands to the tried hands of his aunt, Margaret, who retained his confidence until her death (November 1530), and secured the affermation of all Netherlanders. Margaret was assisted by a permanent council of regency, which was specially charged with the administration of the finances, sometimes under the name of superintendent of the finances, sometimes under the title of treasurer-general and controller-general. The duties of this minister were of special importance, for it was to the Netherlands that Charles looked for much of the resources wherewith to carry on his many wars. During this time Charles consolidated his dominion over the Netherlands. In 1524 he became lord of Friesland by purchase, and in 1528 he acquired the temporalities of Utrecht. He now ruled over seventeen provinces—i.e. Castile, and Aragon, Guelders, Brabant, Gelderland, Limburg and Luxemburg, Zeelant and Zutphen; the magistrature of Antwerp; and five lordships—Friesland, Meclin, Utrecht, Overysel, and Groningen with its dependent districts.

After the death of Margaret, Charles appointed his sister Mary, the widowed queen of Hungary, to the regency, and for twenty years she retained her post, until the abdication in fact of Charles V. in 1555. She too governed ably, though in entire subservience to her nephew, but was not of such intimate touch with the native peculiarities of the Netherlanders as her predecessor. At the time of her accession to office Charles changed the form of administration by the creation of three separate councils, those of State, of Finance, and the Privy Council. The regent was president of the council of state, of which the knights of the Golden Fleece were members. The policy of Charles towards the Netherlands was for many years one of studied moderation. He redressed many grievances, regulated the administration of justice, encouraged commerce, reformed the coinage, but as time went on he was compelled to demand larger subsidies and to take severer measures against heretical opinions. Mary was forced to impose taxation which met with violent resistance, especially in 1539 from the stiff-necked town of Ghent. The emperor himself was obliged to intervene. On the 14th of February 1540 he entered Ghent at the head of a large army and visited the city with severe punishment. All its charters were annulled, its privileges and those of its guilds swept away, and a heavy fine imposed. It was a lesson intended to teach the Netherlanders the utter futility of opposition to the will of their lord. The struggle, however, with the Protestant princes of Germany not only led to continual demands of Charles for men and money from his Netherlands dominions, but to his determination to prevent the spread of Protestant opinions; and a series of edicts was passed, the most severe of which (that of 1550) was carried out with extreme rigour. Its preamble stated that its object was "to extirpate the root and ground of this pest." By its enactments, men holding heretical opinions were condemned to the stake, women to be buried alive. Yet despite the efforts of the government the Reformation made progress in the land. In 1548 Charles laid before the states a scheme for making the Netherlands an integral part of the empire under the name of the Circle of Burgundy; but the refusal of the German Electors to make his only son Philip king of the Romans led him to abandon the project, which was never renewed. Already the emperor was beginning to feel weary of the heavy burdens which the government of so many realms had imposed upon him, and in 1549 he presented Philip to the states of the Netherlands, that they might take the oath of allegiance to him, and Philip swore to maintain all ancient rights, privileges and customs. The abdication of Charles V. took place on the 29th of October 1555 in the great hall of the palace at Brussels, and Philip II. entered upon his long and eventful reign. His external policy
was at first successful. Chiefly through the valour of Lamoral, count of Egmont, two great victories were won over the French at St Quentin (August 10, 1557) and at Gravelines (July 13, 1558). The terms of the treaty of Cateau-
Cambrésis (February 1559) were entirely favourable to Philip. Internal difficulties, however, confronted him. His proposal to impose a tax of 1½% on real property and of 2½% on movable property was rejected by all the larger provinces. As a thorough
Sutherlanders the number and the language of his Netherland subjects Philip was from the first distrusted and his acts regarding them with suspicion. He himself never felt at home at Brussels, and in August 1559 he set sail for Spain, never again to revisit the Netherlands.

He appointed as regent, Margaret, duchess of Parma, a natural
daughter of Charles V, by a Flemish mother, and like the other
women of the House a strong and capable ruler. She was nominally assisted by the members of the three councils—the Council of State, the Privy Council and the Council of Finance, but in reality all power was placed by Philip in the hands of three confidential councillors styled
the Consulta—Barlaymont, president of the Council of Finance, Viglius, president of the Privy Council, and Antony
Perrenot, bishop of Arras, better known by his later title as Cardinal Granvelle. This extremely able man, a Burgundian
by birth, was the son of one of Charles V’s most trusted
councillors, and it was largely to him that the government
of the Netherlands was confined. Two burning questions at
the outset confronted Margaret and Granvelle—the question
of the new bishoprics and the question of the presence of
Spanish troops in the Netherlands. The proposal to
reorganize the bishoprics of the Netherlands was not a new
one, but was the carrying out of a long-planned project of
Charles V. In 1555 there were but three dioceses in the Netherlands—those of Tournay, Arras and Utrecht—all of unwieldy size and under the jurisdiction of foreign metropolitan. It was proposed now to
establish a more numerous hierarchy, self-contained within
the limits of Burgundian rule, with three archbishops and fifteen
dioceses. The primatial see was placed at Malines (Mechlin),
having under it Antwerp, Hertogenbosch, Roermond, Ghent,
Bruges, and Ypres constituting the Flemish province; the
second archbishopric was at Cambray, with Tournay, Arras, St
Omer, and Namur,—the Walloon province; the third at
Utrecht, with Haarlem, Middleburg, Leeuwarden, Groningen
and Deventer,—the northern (Dutch) province. All these with
the exception of Cambray and St Omer were within the boundaries
of the Netherlands. The scheme aroused almost universal
distrust and opposition. It was believed that its object was
the introduction of the dreaded form of the Inquisition established in
Spain, and in any case more systematic and stringent measures for the suppression of heresy. To the clamours of the Consulta it excited also to be alarmed
of the nobles jealous of their privileges, and of the monasteries,
which were called upon to furnish the revenues for the new sees.
Granvelle was made first archbishop of Malines, and all the
odium attaching to the increase of the episcopate was laid at
his door, though he was in reality opposed to it. The continued
presence of the Spanish troops caused also great dissatisfaction.
The Netherlanders detested the Spaniards and everything
Spanish, and this foreign mercenary force, together with the
new bishops, was looked upon as part of a general plan for the
gradual overthrow of their rights and liberties. So loud was the outcry that Margaret and Granvelle on their own responsibility
sent away the Spanish regiments from the country (January
1561). The most serious difficulty with which Margaret had to
deal arose from the attitude of the great nobles, and among these
especially of William (the "Silent") of Nassau, prince of Orange,
Lamoral, count of Egmont, and Philip de Montmorency, count
of Hoorn. These great magnates, all of them Knights of the
Fleece and men of peculiar weight and authority in the country,
were disposed to find that, though nominally councillors of state, their advice was never asked, and that all power was placed in the hands of the Consulta. They began to be alarmed
by the severity with which the edicts against heresy were being

The Tridestine decrees.

The compromise.

The Beggars.

The iconoclasts.
any interference on the part of the magistracy to wreak their
will upon its spendid and priceless contents.

The effect of the outbreak was in every way disastrous. The
regent was alienated from the popular leaders, and was no longer
disposed to help William of Orange, Egmont, and Hoorn to secure
a mitigation of religious persecution; and the heart of Philip
was hardened in its resolve to exterminate heresy in the Nether-
lands. He disseminated until such time as he could despatchet
his greatest general, the duke of Alva, to Brussels at the head of a
picket force to crush all opposition.

William of Orange was not deceived by the specious temporiz-
ing of the machinists. He was the coming storm, and he did his
 utmost to induce Egmont, Hoorn and other prominent
members of the patriotic party to unite with him in
taking measures for meeting the approaching danger.

Egmont and Hoorn refused to do anything that might be con-
structed into disloyalty; in these circumstances William felt that
the time had come to provide for his personal safety. He with-
drew (April 1567) first to his residence at Breda, and then to
the ancestral seat of his family at Dillenburg in Nassau.

Margaret of Parma meanwhile, with the aid of a considerable
body of mercenaries, began to round up the unruly, paralyzing
punishment upon the iconoclasts and Calvinist sectaries.

A body of some 2000 men drawn principally from
Antwerp were cut to pieces at Austerweel (March 13,
1567), and their leader John de Marnix, lord of Thou-
seule, slain. Valenciennes, the chief centre of disturbance in
the south, was besieged and taken by Philip de Noircarmes,
governor of Hainault, who inflicted a savage vengeance (April
1567). The regent therefore represented to her brother that the
disorders were entirely put down and that the time had come to
show mercy. But Philip's preparations were now complete, and
Alva set out from Italy at the head of a force of some 10,000
veteran troops, Spaniards and Italians, afterwards increased by
a body of Germans, with which, after marching through Bur-
gundy, Lorraine and Luxemburg, he reached the Netherlands
(August 8), and made his entry into Brussels a fortnight
later.

The powers conferred on Alva were those of military dictator.
The title of regent was left to the duchess Margaret, but she
speedily sent in her resignation, which was accepted
(October 6). Before this took place events had been
moving fast. On the 9th of September Egmont and
Hoorn were arrested as they left a council at the duke's
residence and were confined in the castle of Ghent. At the same
time Orange's friend, the powerful burgomaster of Antwerp,
Anthony van Stralen, was seized. The next step of Alva was
to create a special tribunal which was officially known as the
"Council of Troubles," but was popularly branded with the name
of the "Council of Blood," and as such it has passed down to
history. As a tribunal it had no legal status. The duke himself
was president and all sentences were submitted to him. Two
members only, Vargas and del Rio, both Spaniards, had votes.
A swarm of commissioners ransacked the provinces in search of
delinquents, and the council sat daily for hours, condemning the
accused, almost without a hearing, in batches together.

The executioners were ceaselessly at work with stake, sword
and gibbet. Crowds of fugitives crossed the frontier to
seek refuge in Germany and England. The prince of
Orange was publicly declared an outlaw and his
property confiscated (January 24, 1568). A few weeks later his
eldest son, Philip William, count of Buren, a student at the university
of Louvain, was kidnapped and carried off to Madrid.
William had meanwhile succeeded in raising a force in Germany
with which his brother Louis invaded Friesland. He gained a
victory at Heiligerlee (May 23) over a Spanish force under Count
Aremberg. Aremberg himself was killed, as was Adolphus of
Nassau, a younger brother of William and Louis. But Alva
himself took the field, and at Jemmingen (July 21) completely
annihilated the force of Louis, who himself narrowly escaped
with his life. One result of the victory of Heiligerlee
was the determination of Alva that Egmont and Hoorn
should die before he left Brussels for the campaign in
Friesland. They were pronounced by the Council of
Blood to be guilty of high treason (June 2, 1568).

On the 6th of June they were beheaded before the
Broodhuis at Brussels.

A few months after the disaster of Jemmingen, Orange, who
had now become a Lutheran, himself led a large army into
Brabant. He was met by Alva with cautious tactics.
The Spaniards skillfully avoided a battle, and in
November the invaders were compelled to withdraw
across the French frontier through lack of resources,
which had been disbanded. Alva was triumphant; but though
Alva's master had supplied him with an invincible army, he was
unable to furnish him with the funds to pay for it.
Money had to be raised by taxation, and at a meeting of the states-general
(March 20, 1569) the governor-general proposed (1) an immediate
tax of 1% on all property, (2) a tax of 5% on all transfers of
real estate, (3) a tax of 10% on the sale of all articles of commerce,
the last two taxes to be granted in perpetuity. Everywhere the
proposal met with uncompromising resistance. After a pro-
longed struggle, Alva succeeded in obtaining a subsidy of
9000 pieces of eight for the expenses of his state.

The Dutch Council of Blood went on, as did the exodus of thousands upon
thousands of industrious and well-to-do citizens, and with
each year the devastation felt for Alva and his rule steadily
increased.

All this time William and Louis were indefatigably making
preparations for a new campaign, and striving by their agents
to rouse the people to active resistance. The first
successes were however to be not on land, but on the
sea. In 1569 William in his capacity as sovereign
of Orange issued letters-of-marque to a number of vessels to prey upon the Spanish commerce in the
northern seas. These corsairs, for such they were, were known by the
name of Sea-Beggars (Guerreros de Mar). Under the command of the
lord of Lumbres, the lord of Treslong, and William de la Marck
(lord of Lume) they spread terror and alarm along the coast,
seized much plunder, and in revenge for Alva's cruelty com-
mitted acts of terrible barbarity upon the priests and monks
and catholic officials, as well as upon the crews of the vessels that fell
into their hands. Their difficulty lay in the lack of ports in
which to take refuge. At last by a sudden retreat the
work of the Blood Council was abandoned, and a body of Sea-Beggars seized the town of Brill at the mouth of
the Maas (April 1, 1572). Encouraged by this success they
next attacked and took Flushing, the port of
Zeeland, which commanded the approach to Antwerp; and the
inhabitants were compelled to take the oath to the prince
of Orange, as stadtholder of the king. They next mastered Delfs-
haven and Scheldam. These striking successes caused a wave of
revolt to spread through Holland, Zeeland, Gelderland,
Utrecht and Friesland. The principal towns gave in
their submission to the prince of Orange, and acknow-
ledged him as their lawful stadtholder. Within three
months of the capture of Brill, Amsterdam was the only town in
Holland in the hands of the Spaniards.

This revolt of the northern provinces was facilitated by the
fact that Alva had withdrawn many of the garrisons, and was
moving to oppose an invasion from the south. Louis
of Nassau, with a small force raised in France with the
connivance of Charles IX., made a sudden dash into
Hainault (May 1572) and captured Valenciennes and
Mons. Here he was shut in by a superior force of Spaniards, and
which to take refuge. At last by a sudden retreat the
army which Orange was collecting on the eastern frontier. On the
9th of July William crossed the Rhine, and captured Malines,
Ternode and Oudenarde, and was advancing southwards
when the news reached him of the massacre of St Bartholomew,
which deprived him of the promised aid of Coligny and his army of
12,000 men. He made an attempt, however, to relieve Mons,
but his camp at Harmignies was surprised by a night attack, and
William himself narrowly escaped capture. The next morning
he retreated, and six days later Mons surrendered.
Orange however did not despair, and resolved to throw in his lot for good and all with the rebel province of the north. Already at his summons the states of Holland had met at Dort (July 15) under the presidency of Philip de Marigny, lord of Sainte Aldegonde, and they had unanimously recognized William as their lawful stadtholder and had voted a large grant of supplies. The prince now took up his permanent residence at Delft, and a regular government was established, in which he exercised almost dictatorial authority.

Alva was now free to deal with rebellion in the north. Malines, which had surrendered to William, was given over for three days to the mercy of a brutal soldier. Then the army under Alva’s son, Don Frederick of Toledo, marched northwards, and the sack of Zutphen and the inhuman butchery of Naarden are among the blackest records of history. But the very horrors of Don Frederick’s advance roused a spirit of indomitable resistance in Holland.

The famous defence of Haarlem, lasting through the winter of 1572 to July 1573, cost the besiegers 12,000 lives, and gave the insurgent provinces time to breathe. The example of Haarlem was followed by Alkmaar, and with better success. The assault of the Spaniards was repulsed, the dykes were cut, and Don Frederick, fearing for his communications, beat a hasty retreat (August). A few weeks later (Oct. 11) the fleet of Alva on the Zuyder Zee was completely defeated by the Sea-Beggars and its admiral taken prisoner. Disgusted by these reverses, in bad odour with the king, and with his soldiers mutinying for lack of pay, the governor-general resigned. On the 18th of December 1573 Alva, who to the end had persisted in his policy of pitiless severity, left Brussels, carrying with him the curses of the people over whom he had tyrannized for six terrible years of misery and oppression.

Philip sent the grand commander, Don Luis Requesens, as governor-general in his place, and after some futile attempts at negotiation the war went on. The prince of Orange, who had now formally entered the Calvinist communion, was inexcusable in laying down three conditions as indispensable: (1) Freedom of worship and liberty to preach the gospel according to the Word of God; (2) the restoration and maintenance of all the ancient charters, privileges, and liberties of the land; (3) the removal of all Spaniards and other foreigners from all posts and employments civil and military.

In February 1574 the Spaniards by the fall of Middleburg lost their last hold upon Walcheren and Zeeland. This triumph was however far more than counterbalanced by the complete defeat of the army, led by Count Louis of Nassau, at Moorheide near Nijmegen (14th March). The gallant Louis and his younger brother Henry both lost their lives. This was a grievous blow to William, but his courage did not fail. The Spaniards laid siege to Leiden, and though stricken down by a fever at Delft the prince spared no exertion to save the town. The dykes were cut, the land flooded, but again and again a relieving force was baulked in its attempts to reach the place, which for more than four months bravely defended itself. But when at the last extremity through famine, a tempestuous flood enabled the vessels of Orange to reach Leiden, and the investing force was driven to retreat (October 3, 1574). This was the turning-point of the first stage in the struggle for Dutch independence. In honour of this great deliverance, the state of Holland founded the university, which was speedily to make the name of Leiden illustrious throughout Europe.

In the spring of 1575 conferences with a view to peace were held at Breda, and on their failure Orange, in the face of Spanish successes in Zeeland, was forced to seek foreign succour. He sought at first in vain. The sovereignty of Holland and Zeeland was offered to the queen of England, but she, though promising secret support, declined. The situation was, however, relieved through the sudden death of Requesens (March 1576). The stadtholder summoned a meeting of the states of Holland and Zeeland to Delft, and on the 25th of April an act of federation between the two provinces was executed. By this compact the prince was invested with all the prerogatives belonging to the sovereign. He was made commander-in-chief of both the military and naval forces with supreme authority, and in his hands was placed the final appointment of all the provincial official posts and to vacant city magistracies. He was required to maintain the Protestant reformed religion and to suppress “all religion at variance with the gospel.” He also had authority to confer the protectorate of the federated provinces upon a foreign prince.

In June 1576 the long siege of Zierikzee, the capital of Schouwen, ended in its surrender to the Spanish general Mon-dragon, after the failure of a gallant attempt by Admiral Boisot to break the leaguer, in which he lost his life. Things looked ill for the patriots, and Zeeland would be next when at the mercy of the conquering army had not the success been followed by a great mutiny of the Spanish and Walloon troops, to whom long arrears of pay were due. They chose their leader (dietto), marched into Brabant, and established themselves at Alost, where they were joined by other bands of mutineers. The principal fortresses of the country were in the hands of Spanish garrisons, who refused obedience to the council. William seized his opportunity, and with a body of picked troops advanced into Flanders, occupied Ghent, and entered into negotiations with the leader of the state-general at Brussels, for a union of all the provinces on the basis of exclusion of foreigners and non-interference with religious belief. The overtures were favourably received, the council at Brussels was forcibly dissolved, and a congress met at Ghent on the 9th of October to consider what measures must be taken for the pacification of the country. In the midst of their deliberations the news arrived that the mutineers had marched from Alost on Antwerp, overpowered the troops of Champagney, and sacked the town with terrible barbarities (Nov. 3). This tragedy, known as “the Spanish Fury,” silenced all disputes and differences among the representatives of the provinces. A treaty establishing a firm alliance between the provinces, represented by the states-general, assembled at Brussels on the one part, and on the other by the prince of Orange, and the states of Holland and Zeeland, was agreed upon and ratified under the title of the “Pacification of Ghent.” It was received with great enthusiasm. The provinces agreed first to eject the foreigner, then to meet in states-general and regulate all matters of religion and defence. It was stipulated that there was to be toleration for both Catholics and Protestants; that the Spanish king should be recognized as de jure sovereign, and the prince of Orange as governor with full powers in Holland and Zeeland.

Meanwhile Philip had appointed his natural brother, Don John of Austria, to be governor-general in the place of Requesens. After many delays he reached Luxemburg on the 4th of November (the date of the Spanish Fury at Antwerp) and notified his arrival to the council of state. His letter met with a cold reception. On the advice of the prince of Orange the states-general refused to receive him as governor-general unless he accepted the “Pacification of Ghent.” Negotiations were entered into, but a deadlock ensued. At this crisis the hands of Orange and the patriotic party were greatly strengthened by a new compact entitled “The Union of Brussels,” which was extensively signed, especially in the southern Netherlands. This document (Jan. 1577) engaged all its signatories to help in ejecting the foreign soldiery, in carrying out the “Pacification,” in recognizing Philip’s sovereignty, and at the same time in maintaining the charters and constitutions which that king on his accession had sworn to observe. The popular support given to the Union of Brussels forced Don John to yield.

Act of Federation between Holland and Zeeland.

The great Spanish Mutiny.

The Spanish Fury.

The Pacification of Ghent.

Don John of Austria becomes Governor-General.
He promised to accept the "Pacification of Ghent," and finally an agreement was drawn up, styled the "Perpetual Edict," which was signed by Don John (February 10th) and by Archduke Matthias. The statesman general undertook to accept Don John as governor-general and to uphold the Catholic religion, while Don John, in the name of the king, agreed to carry out the provisions of the "Pacification." The authority conferred upon Orange as stadtholder by the provinces of Holland and Zeeland was thus ratified, but that astute statesman had no confidence that Philip intended to observe the treaty any longer than it suited his convenience. He therefore refused, with the approval of the representatives of these provinces, to allow the publication of the "Perpetual Edict" in Holland and Zeeland. As events were to prove, he was right in the right.

Don John made his state entry into Brussels on the 1st of May, but only to find that he had no real authority. "The prince of Orange," he informed the king, "has bewitched the minds of all men. They keep him informed of everything, and take no resolution without consulting him." In vain the young soldier strove to break loose from the shackles which hampered him. He was, to quote the words of a contemporary, "like an apprentice defying his master." Irritated and alarmed, the governor suddenly left Brussels in the middle of July with some Walloon troops and went to Namur. It was a virtual act of abdication. The eyes of all men turned to the prince of Orange. Through his exertions the Spanish troops had not only been expelled from Holland and Zeeland, but also from the citadels of Antwerp and Ghent, which were now in the hands of the patriots. He was invited to come to Brussels, and after some hesitation, and not without having first obtained the approval of the states of Holland and Zeeland, he assented. William made his triumphal entry into the capital (September 23), which he had quitted as an outlawed fugitive four years before. In a brief period he was the acclaimed leader of the entire Netherlands people.

But it was not to last. The jealousy of Catholic against Protestant, of south against north, was too deeply rooted.

Archduke Matthias.

Two distinctive nationalities, Belgian and Dutch, were already in course of formation, and not even the tactful and conciliatory policy of the most consummate statesman of his time could unite those whom the whole trend of events was year by year putting farther asunder. On the 6th of October, at the secret invitation of the Catholic nobles headed by the duke of Parma, the archduke Matthias, brother of the emperor, arrived in Brussels to assume the sovereignty of the Netherlands. He was but twenty years of age, and his sudden intrusion was as embarrassing to the prince of Orange as to Don John. William, however, whose position had been strengthened by his nomination to the post of ruwbaar of Brabant, determined to welcome Matthias and use him for his own purposes. Matthias was to be the nominal ruler, he himself with the title of lieutenant-general to hold the reins of power.

But Philip had now become thoroughly alarmed, and he despatched Alexander Farnese, son of the duchess of Parma, to join his uncle Don John with a veteran force of 20,000 troops. Strengthened by this powerful reinforcement, Don John fell upon the patriot army at Gemblours near Namur on the 31st of January 1578, and with scarcely any loss completely routed the Netherlands. All was now terror and confusion. The "malcontent" Catholics now turned for help from Matthias to the duke of Anjou, who had invaded the Netherlands with a French army and seized Mons. At the same time John Casimir, brother of the elector palatine, at the invitation of the Calvinist party and with the secret and financial aid of Queen Elizabeth, entered the country at the head of a body of German mercenaries from the east. Never did the diplomatic talents of the prince of Orange shine brighter than at this critical crisis. The duke of Anjou at his earnest instigation accepted the title of "Defender of the liberties of the Netherlands," and promised, if the provinces would raise an army of 10,000 foot and 2000 horse, to come to their assistance with a like force. At the same time negotiations were successfully carried on with John Casimir, with Elizabeth and with Henry of Navarre, and their help secured for the national cause. Meanwhile Don John had aroused the distrust of his governor-general, and under his armed protection a fierce and intolerant Catholic reign supreme in that important city.

Farnese at once set to work with subtle skill to win over to the royalist cause the Catholic nobles of the south. The moment therefore arrived when the"Pacification of Ghent" and the "Pacification of Autriche" had fallen into the hands of John Casimir, and under his armed protection a fierce and intolerant Catholic reign supreme in that important city.

To the "Malcontents" (as the Catholic party was styled) the domination of heretical sectaries appeared less tolerable than the evils attendant upon alien rule. This feeling was widespread throughout the Walloon provinces, and found expression in the League of Arma (5th of January 1579). By this instrument the deputies of Hainault, Artois and Doany formed themselves into a league for the defence of the Catholic religion, and for the punishment of heretics. The political stipulations of the Union of Brussels, professed loyal allegiance to the king. The Protestant response was not long in coming. The Union of Utrecht was signed on the 29th of January by the representatives of Holland, Zeeland, Utrecht, Gelderland and Zutphen. By it the northern provinces bound themselves together "as if they were one province." to maintain their rights and liberties "with life-blood and goods" against foreign tyranny, and to grant complete freedom of worship and of religious opinion throughout the kingdom. This cultural and political achievement of the "League of Arma" was not to last. The League of Arma.

The death of Don John.

As the result of an intrigue, in which M. de Kerlerec had an active part, Don John was assassinated at his table on the 10th of January 1584. The news of his death was greeted with deep sorrow and regret throughout the whole of the Netherlands. The news of his death was greeted with deep sorrow and regret throughout the whole of the Netherlands.

The Duke of Anjou.

Archduke Matthias.

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causas de la rebelion de los dichos estados (1625); B. Mendoca, Commentaires memorables des guerres de Pianieres et Pas-Bas, avec une etymomaire description des Pas-Bas 1557-1577 (1591); F. Strada, De bello Belgico decades duae (1640-1647); L. Guicciardini, Descrittione di tutti i Paesi Bassi (1588). Later works: R. Fruin, Het voorspel van den tochthijgeraar oorlog (1866); J. M. B. C. Kerken van het Koolzaad en het Gezame, 3 vols. (1855, 1858, 1865); J. L. H. van Schiedam, Geschiedenis der Nederlandse bieren (2 vols., 1869); E. Marx, Studien zur Geschichte der Conrada (1902).


NETHESOLE, OLGA (1863- ), English actress, of Spanish descent, was born in London, and made her stage début at Brighton in 1887. From 1888 she played important parts in London, at first under John Hare at the Garrick, and in 1894 took the Court Theatre on her own account. She also toured in Australia and America, playing leading parts in modern plays, notably "John Barleycorn" (1896) and "The Fatal Flower." Her combination of these parts was such (cf. Ezr. 18:16), it was said, that she had an aptitude for the role of "Nathan." She is the author of the "Social Drama," which began with "Nathan." The book has also the singular form—"Nathan." In all, 613 Nethinim came back from the Exile and were lodged near the "House of the Nethinim" at Ophel, towards the east wall of Jerusalem so as to be near the Temple, where they served under the Levites and were free of all tolls, from which they must have been supported. It is mentioned that they had been ordered by David and the princes to serve the Levites (Ezr. viii. 20).

Notwithstanding their sacred service, the Nethinim were regarded by later Jewish tradition as especially degraded, being placed in tables of precedence below bastards (Talm. Jer. Hor. iii. 5, I. J. 29, 1). They were "given" or "dedicated," i.e. to the temple. The latter has also the singular form—"Nathin." (Jeb. 29-35), that the prohibition against intermarriage with the Moabites, Ammonites, Egyptians and Edomites, though given in the Bible, only applied for a certain number of generations and did not apply at all to their daughters, but, it is added, "Bastards and Nethinim are prohibited (to marry Israelites), and this prohibition is perpetual and applies both to males and females." To explain this combination of sacred service and exceptional degradation, it has been suggested by Joseph Jacobs that the Nethinim were the descendants of the Kedidim, i.e., women dedicated to the worship of Astarte and attached to the Temple before the Exile. There is evidence of these practices from the time of Solomon (I Kings xi. 4) down to Josiah (2 Kings xii. 4-6), and even as late as Ezekiel (Ezek. xxiii. 36-48), giving rise to the command of Deuteronomy xxiii. 17.

An examination of the name lists given in duplicate in Ezra ii. 43-48, Neh. vii. 46-59, together with the additional names in the Greek Esdras (v. 29-35), shows that the Nethinim were in charge of the rings and hooks connected with the temple service; they sheared the sheep offered for sacrifice in the temple and poured the libations. Some of them were derived from the wars which the temple was involved in and plagued the city of Jerusalem. There is mention of them in 1883—Damascus. One of the names given in 1 Esdras v. 34, was Solomon, ed. Fritzsche, Θωδης, ed. Swete, would seem to throw light on the puzzling reading θωδης (A.V. "Sabeans," R.V. "Drunkards") of Ezek. xxiii. 42, and if so would directly connect the list of the Nethinim with the degraded worship of Astarte in the Temple.

A large majority of the names of the parents mentioned seem to be feminine in form or meaning, and suggest that the Nethinim could not trace back to any definite pedigree; and this is confirmed by the fact that the lists are followed by the enumeration of those who could not "show their father's house" (Ezra ii. 60; Neh. vii. 62). The Greek versions, as well as Josephus, refer to them as ἱεροθεοῦχοι, which can mean one thing only.

The Talmudic authorities have an abstract term, Nethinuth, indicating the status of a Nethin (Tos. Kidd. v. 1 ed. Zuckermandel, p. 341), and corresponding to the abstract Mammith, "bastard." The existence of this degraded class up to the Exile throws considerable light upon the phraseology of the prophets in referring to licentious and the scenes connected with it as prostitution. Their continued existence as a pariah class after the Exile would be a perpetual reminder of the dangers and degradation of the most popular Syrian creed.

These unfortunate creatures had no alternative but to accept the provisions made for them out of the Temple treasury, but after the fall of the Temple they would naturally disappear by intermarriage with similar degraded classes (Mishna Kidd. viii. 3). In the Code of Khammurabi §§ 191, 192, they could be adopted by outsiders.

The above explanation of the special degradation of the Nethinim, though they were connected with the Temple service, seems to be the only way of explaining the Talmudic reference to their tabooed position, and is an interesting example of the light that can be reflected on Biblical research by the Talmud.

See Joseph Jacobs, Studies in Biblical Archaeology (1894), 104-122; W. Baudissin, Geschichte des Alterstumsmärchens Pfisterluthern, 142 seq. (This view, however, is not accepted by Cheyne, Encyclopaedia Biblica.)

NETLEY, a village in the Fareham parliamentary division of Hampshire, England, 3 m. S.E. of Southampton on the east shore of Southampton Water, and on a branch of the London & South Western railway. Here a Cistercian abbey was founded in 1237 by Henry III., and its ruins are extensive, including a great part of the cruciform church, abbot's house, chapter house and domestic buildings. The style is Early English and Decorated, and many beautiful details are preserved. The gateway was transformed into a fort in the time of Henry VIII.

Netley Hospital for wounded soldiers (1 m. S.E. of the abbey), was built in 1586 after the Crimean War. It is a vast pile giving accommodation for upwards of a thousand patients, and is the principal military hospital in Great Britain.

NETSCHER, GASPAR (1639-1684), German portrait and genre painter, was born at Heidelberg in 1639. His father died when he was two years of age, and his mother, fleeing from the dangers of a civil war, carried him to Arnheim, where he was adopted by a physician named Tullekens. At first he was destined for the profession of his patron, but owing to his great aptitude for painting he was placed under an artist named Koster, and, having also studied under Ter Borch, he set out for Italy to complete his education there. Marrying, however, at Liège, he settled at Bordeaux, and toiled hard to earn a livelihood by painting those small cabinet pictures which are now so highly valued on account of their exquisite finish. After removing to The Hague, he turned his attention to portrait-painting, and in this branch of his art was more successful. He was patronized by William III., and his earnings soon enabled him to gratify his own taste by depicting musical and conversational pieces. It was in these that Netscher's genius was fully displayed. The choice of these subjects, and the habit of introducing female figures, dressed in glossy satins, were imitated from Ter Borch; they possess easy yet delicate pencilling, brilliant and correct colouring, and many animated and graceful attitudes; but frequently their refinement passes into weakness. The painter was gaining both fame and wealth when he died prematurely in 1684. His sons Constantyn (1668-1722), and Theodorus (1661-1732), were also painters after their father's style, but inferior in merit.

NETTE (O. Eng. netfel, cf. Ger. Nessel), the English equivalent of Lat. Urtica, a genus of plants which gives its name to the natural order Urticaceae. It contains about thirty species in the temperate parts of both east and west hemispheres. They are herbs covered with stingy hairs, and with unisexual flowers on the same or on different plants. The male flowers consist of a
perianth of four greenish segments enclosing as many stamens, which latter, when freed from the restraint exercised upon them by the perianth-segments while still in the bud, suddenly uncoil themselves, and in so doing liberate the pollen. The female perianth is similar, but encloses only a single seed-vessel with a solitary seed. The stinging hairs consist of a bulbous reservoir filled with acrid fluid, prolonged into a long slender tube, the extremity of which is finely pointed. By this point the hair penetrates the skin and discharges its irritant contents beneath the surface. Nettle tops, or the very young shoots of the nettle, may be used as a vegetable like spinach; but an animal is made by eight crystalline (cystoliths) they contain are apt to be gritty, though esteemed for their antiscorbutic properties, which they do not possess in any exceptional degree. The fibre furnished by the stems of several species is used for cordage or paper-making.

Three species of nettle are wild in the British Isles: *Urtica dioica,* the common stinging nettle, which is a hairy perennial with staminate and pistillate flowers in distinct plants; *U. urens,* which is annual and, except for the stinging hairs, glabrous, and has staminate and pistillate flowers in the same plant; *U. phuliferus* (Roman nettle), an annual, is staminate with pistillate flowers in rounded heads, which occurs in waste places in the east of England, chiefly near the sea—the more virulent of the British species. From their general presence in the neighbourhood of houses, or in spots where house refuse is deposited, it has been suggested that the nettles are not really natives, a supposition that to some extent receives countenance from the circumstance that the young shoots are very sensitive to frost. In any case they follow man in his migrations, and by their presence usually indicate a soil rich in nitrogen. The trailing subterranean rootstock renders the common nettle somewhat difficult of eradication.

**NETTLERASH,** or *Urticaria,* a disorder of the skin characterized by an eruption resembling the effect produced by the sting of a nettle, namely, raised red or red and white patches occurring in parts or over the whole of the surface of the body and attended with great irritation. It may be acute or chronic. In the former variety the attack often comes on after indulgence in certain articles of diet, particularly various kinds of fruit, shell-fish, cheese, pastry, &c., also occasionally from the use of certain drugs, such as hembane, copaiba, cubebis, turpentine, &c. There is sometimes considerable feverishness and constitutional disturbance, together with sickness and faintness, which either precede or accompany the appearance of the rash. The eruption may appear on any part of the body, but is most common on the face and trunk. The attack may pass off in a few hours, or may last for several days, the eruption continuing to come out in successive patches. The chronic variety lasts with intermissions for a length of time often extending to months or years. This form of the disease occurs independently of errors in diet, and is not attended with the feverish symptoms characterizing the acute attack. As regards treatment, the acute variety generally yields quickly to a purgative and the use of some antacid, such as magnesia or liquor potassae. The local irritation is allayed by sponging with a warm alkaline solution (soda, potash or ammonia), or a solution of acetate of lead, and a lotion of ichthyol has been found useful. Chronic cases have been known to benefit from the administration of creosote or salol.

**NETTLESHIP, HENRY** (1839-1893), English classical scholar, was born at Kettering on the 5th of May 1839. He was educated at Lancing, Durham and Charterhouse schools, and Corpus Christi College, Oxford. In 1867 he was elected to a fellowship at Lincoln, which he vacated on his marriage in 1870. In 1868 he became an assistant master at Harrow, but in 1873 he returned to Oxford, and was elected to a fellowship at Corpus. In 1878 he was appointed to succeed Edwin Palmer in the professorship of Latin, which post he held till his death at Oxford on the 10th of July 1893. NettleShip had been from the first attracted to the study of Virgil, and a good deal of his time was devoted to his favourite poet. After Conington's death in 1869, he saw his edition of Virgil through the press, and revised and corrected subsequent editions of the work. In 1873 he had undertaken to compile a new Latin lexicon for the Clarendon Press, but the work proved more than he could accomplish, and in 1887 he published some of the results of twelve years' labour in a volume entitled *Contributions to Latin Lexicography,* a genuine piece of original work. In conjunction with J. E. Sandys, NettleShip revised and edited Seys-Sert's Dictionary of Classical Antiquities, and he contributed to a volume entitled *Essays on the Endowments of Research,* an article on "The Present Relations between Classical Research and Classical Education in England," in which he pointed out the great value of the preparatory school. In the *Lectures and Essays* which he compiled in 1889 for the Clarendon Press, in *Lectures and Essays on Subjects connected with Latin Literature and Scholarship,* NettleShip revised and republished some of his previous publications. A second series of these, published in 1895, and edited by F. Haverfield, contains a memoir by Mrs M. NettleShip, with full bibliography.


**NETTELY, RICHARD LEWIS** (1846-1898), English philosopher, youngest brother of Henry NettleShip, was born on the 17th of December 1846, and educated at Uppingham and Balliol College, Oxford, where he held a scholarship. He won the Hertford scholarship, the Ireland, the Gaisford Greek verse prize, a Craven scholarship and the Arnold prize, but took only a second class in Litterae Humaniores. He became fellow and tutor of his college and succeeded to the work of T. H. Green, whose writings he edited with a memoir (London, 1886). He left an unfinished work on Plato, part of which was published after his death, together with his lectures on logic and some essays. His thought was idealistic and Hegelian. His literary style was excellent; but, though he had considerable personal influence on his generation at Oxford, a certain nebulosity of view prevented his making any permanent contribution to philosophy. He was fond of music and outdoor sports, and rowed in his college boat. He died on the 25th of August 1892, from the effects of exposure on Mont Blanc, and was buried at Chamounix.

**NETTE TREE,** the name applied to certain trees of the genus *Celtis,* belonging to the family or natural order Ulmaceae. The best-known species have usually obliquely ovate, or lanceolate leaves, serrate at the edge, and marked by three prominent nerves. The flowers are inconspicuous, usually hermaphrodite, with a 4- or 5-parted perianth, as many stamens, a hairy disk and a 1-celled ovary with a 2-parted style. The fruit is succulent like a little drupe, a character which serves to separate the genus *Celtis* from the nettles and the elms, to both of which it is allied. *Celtis australis* is a common tree, both wild and planted, throughout the Mediterranean region extending to Afghanistan and the Himalayas; it is also cultivated in Great Britain. It is a rapidly growing tree, from 30 to 40 ft. high, with a remarkably sweet fruit, recalling a small black cherry, and was one of the plants to which the term "lotus" was applied by Dioscorides and the older authors. The wood, which is compact and hard and takes a high polish, is used for a variety of purposes. *C. occidentalis,* a North American species, is the hackberry (q.v.).

**NETTUNO,** a fishing village of the province of Rome, Italy, 2 m. E.N.E. of Anzio by rail, and 90 m. S.S.E. of Rome, 36 ft. above sea-level. Pop. (1901) 3406 (town), 5072 (commune). It has a picturesque castle built by Alexander VI. from the ruins of one formerly belonging to the Montalto family. It is said to have been a Saracen settlement. The picturesque costume of the women is now worn only at festivals. To the E. on the sandy coast on the way to Astur is a military camp and a range for the trial of field artillery.

**NETZE,** a river of Germany, having a small portion of its upper course in Poland. It is a right-bank tributary of the Warthe, and rises in the low-lying lake district, through which the Russo-German frontier runs, to the south of Inowrazlaw. The frontier crosses Lake Gopolke, which is not far from the source of the Netze, which on leaving it (in Prussian territory), flows
north-west to the Tralger lake, and continues thereafter in the same general direction, but with wide fluctuations, to Nakel. Here it joins the Bromberg canal, which gives access to the river Brate and so to the Vistula. The Netze then turns west-south-west and waters the moorland (much of which, however, has been brought under cultivation) known as the Netzbruch. It joins the Warthe at Zantoch, after a course of 273 m. It is navigable for 1130 m. up to the Bromberg canal and the Boiten for smaller boats for 40 m. up to Pakosch on the Tralger lake. Its drainage area is 5,400 sq. m. From 1772 to 1807 that part of Poland which was given to Prussia at the first partition was known as the Netze District, as it extended along the Netze. It was almost all given back to Russia at the peace of Tilsit, but was restored to Prussia in 1815 under the treaty of Vienna.

**NEU-BRANDENBURG.** A town of Germany, in the grand duchy of Mecklenburg-Strelitz, is situated on a small lake called the Tollense See, 58 m. N.W. of Stettin by rail. Pop. (1905) 31,443. It is still partly surrounded with walls, and possesses four interesting old Gothic gates, dating from about 1300. The principal buildings are the Marienkirche, a Gothic building of the 13th century, the Johannis kirche, the town-hall and the grand ducal palace. It possesses a bronze statue of Fritz Reuter (1803); a monument to Bismarck (1895); another commemorating the war of 1870-1 (1895); a small museum of antiquities; and an art collection. On the other side of the lake is the grand-ducal palace, Belvedere. Iron-founding, machine-making, wool-spinning and the making of paper, tobacco and musical instruments, and the trade in wool and agricultural products is considerable. The horse fair is also important. Neu-Brandenburg was founded in 1248, and has belonged to Mecklenburg since 1202.

See Boll, Chronik der Vorderstadt Neubrandenb (1875).

**NEUBREISACH.** A town and fortress of Germany in the imperial province of Alsace-Lorraine, situated on the Rhine-Rhone canal, 12 m. E. from Colmar by the railway to Freiburg-im-Breisgau. Pop. (1905—excluding a garrison of 2300 men) 3520. It is built in the form of a hexagon, and together with Fort Mortier, which lies on an arm of the Rhine-opposite, forms a place of great strategic strength. It contains an Evangelical (garrison) church, a Roman Catholic church and a non-commissioned officers' school. There are electrical works in the town.

Neubreisach was founded by Louis XIV. In 1699 and fortified by Vauban, the Neubreisacher canal being constructed to transport the necessary materials. In the Franco-German War, it was bombarded by the Germans from the 2nd to the 10th of November 1870, when it capitulated.

See Wolff, Geschichte des Bombardements von Schlettstadt und Neubreisach (Berlin, 1871); and von Neuburg, Die Erinnerung von Schlettstadt und Neubreisach im Jahre 1870 (Berlin, 1876).

**NEUBURG,** a town of Germany, in the kingdom of Bavaria, is pleasantly situated on the Danube, 12 m. W. of Ingolstadt, on the railway to Neuoffingen. Pop. (1905) 8332. It is a place of ancient origin, but is chiefly noteworthy because formerly for two centuries it was the capital of the princedom of Pfalz-Neuburg. Its most important building is the old residence of its princes, the handsomest part of which is in the Renaissance style of the 16th century. The town also contains an Evangelical and seven Roman Catholic churches, a town hall, several schools and convents, a theatre, and an historical museum with a valuable library. It has electrical works and breweries, while fruit and vegetables are cultivated in the neighborhood, a considerable trade in these products being carried on by the Danube.

Neuburg was originally an episcopal see. In the 10th century it passed to the counts of Scheyern, and through them to Bavaria, being ceded to the Rhenish Palatinate at the close of a war in 1507. From 1557 to 1742 it was the capital of a small principality ruled as a hereditary branch of the family of the elector palatine of the Rhine. This principality of Pfalz-Neuburg had an area of about 1000 sq. m. and about 100,000 inhabitants. In 1742 it was united again with the Rhenish Palatinate, with which it passed in 1777 to Bavaria.

See Gremmel, Geschichte des Herzogthums Neuburg (Neuburg, 1872); Führer durch die Stadt Neuburg und deren Umgebung (Neuburg, 1904).

**NEUCHÂTEL** (Ger. *Neuenburg*), one of the cantons of western Switzerland, on the frontier towards France. It is the only Swiss canton that is situated entirely in the Jura, of which it occupies the central portion (its loftiest summit is the Mont Racine, 4731 ft. in the Tête de Rang range). The canton has a total area of 311-8 sq. m., of which 267-1 sq. m. are reckoned "productive" (forests occupying 88-6 sq. m. and vineyards 44.4 sq. m.). It consists, for the most part, of the longitudinal ridges and valleys characteristic of the Jura range, while its drainage is very unequally divided between the Thiére or Zihl, and the Doubs, which forms part of the north-west boundary of the canton, and receives only the streams flowing from the Le Locle and La Chaux de Fonds valley. Three regions make up the territory. That stretching along the shore of the lake is called *Le Vignoble* (from its vineyards) and extends from about 1500 ft. to 2300 ft. above the sea-level. An intermediate region is named *Les Vallées*, for it consists of the two principal valleys of the canton (the Val de Ruz, watered by the Seyon, and the Val de Travers, watered by the Areuse) which lie to a height of about 2300 ft. to 3000 ft. above the sea-level. The highest region is known as *Les Montagnes*, and is mainly composed of the long valley in which stand the industrial centres of La Chaux de Fonds (q.v.), and Le Locle (q.v.) to which must be added those of La Sarthe, Les Ponts, and Les Verrières.

In 1571 the population numbered 126,270 souls according to the federal census (a cantonal census of 1906 makes the figure at that date 134,014), of whom 104,551 were French-speaking, 17,629 German-speaking and 566 Italian-speaking, while 107,201 were Protestants, 17,731 Romanists or Old Catholics, and 1020 Jews. There are three "established and state-endowed" churches, the National Evangelical (in 1907 a proposal to disestablish it was rejected by a huge majority), the Roman Catholic, and the Old Catholic (this sect in La Chaux de Fonds only), while the pastors of the Free Evangelical church and of the Jews (mostly in La Chaux de Fonds) are so far recognized as by the state as to be exempt from military service.

Besides the capital, Neuchâtel (q.v.), the chief towns are La Chaux de Fonds (the most populous of all), Le Locle and Fleurier (3740), the principal village in the Val de Travers. The most valuable mineral product is asphalt, of which there is a large and rich deposit in the Val de Travers, belonging to the state but worked by an English company. The wine of the Vignoble region (both sparkling and still) is plentiful and has a good reputation, the red wines of Neuchâtel, Boudry and Cornizol being largely exported, though the petit vin blanc of Neuchâtel is all but wholly consumed within the canton. Als Initiene is largely manufactured in the Val de Travers, but lace is no longer made there as of old. The well-known manufacturer of Suchard's chocolate is at Serrières, practically a suburb of the town of Neuchâtel, while in the canton there are also cement factories and stone quarries. The most characteristic industry is that of watch-making and the making of gold watch cases, which is chiefly carried on (since the early 18th century) in the highland valleys of La Chaux de Fonds and of Le Locle, as well as at Fleurier in the Val de Travers. At Courbet, also in the Val de Travers, there is a large factory of screws and knitting machines.

The canton is divided into 6 administrative districts, which
comprise 63 communes. The cantonal constitution dates in its main features from 1838, but has been modified in several important respects. The legislature or Grand Conseil consists of members elected (since 1893) in the proportion of one to every 1200 (or fraction over 600) of the population, and holds office for three years, while since 1906 the principles of proportional representation and minority representation obtain in these elections. Since 1906 the executive of 5 members (since 1882) or Conseil d'Etat is elected by a popular vote. The 2 members of the federal Conseil des États are named by the Grand Conseil, but the 6 members of the federal Conseil National are chosen by a popular vote. In 1876 the citizens have the right of "free referendum" as to all laws and important decrees, while since 1882 the same number have the right of initiative as to all legislative projects, this right as to the partial revision of the cantonal constitution dating as far back as 1848, the number in the case of a total revision having been raised in 1906 to 5000. We first hear of the novum castellum, regalisissimam sedem in the will (1011) of Rudolf III., the last king of Burgundy, on whose death (1032) that kingdom reverted to the empire. About 1034 the emperor Conrad II. gave this castle to the lord of seven castle towns. It was, however, only in 1070, under Frederic I. (or in his succum of establishing the domain permanently there in the 12th century and then taking the title of "count." In 1288 the reigning count resigned his domains to the emperor Rudolf, who gave them to the lord of Châlon-sur-Saône, by whom they were restored to the count of Neuchâtel on his doing homage for them. This act decided the future history of Neuchâtel, for in 1303 the house of Châlon succeeded to the principality of Orange by virtue of a marriage contracted in 1288. The counts gradually increased their dominions, so that by 1373 they held practically all of the present canton, with the exception of the lordship of Valangin (the Val de Ruz and Les Montagnes, this last region only colonized in the early 14th century), which was held by a cadet line of the house till bought in 1592.

In 1395 the first house ended in an heiress, who brought Neuchâtel to the count of Freiburg im Breisgau. As early as 1290 the reigning count had made an alliance with the Swiss Fribourg, in 1308 with Bern, and about 1324 with Soleure, but it was not till 1406 that an "everlasting alliance" was made with Bern (later in 1495 with Fribourg, and in 1501 with Lucerne). This alliance resulted in bringing the county into the Swiss confederation four decades later, while it also won for it a surname helping the Confederates from the battle of St Jakob (1444) onwards right down into the early 18th century. In 1457, through another heiress, the county passed to the house of the marquises of Baden-Hoehberg, and in 1504 similarly to that of Orleáns-Longueville (a bastard line of the royal house of France). From 1512 to 1529 the Swiss occupied it as the count was fighting for France and so against them. In 1532 the title of "prince" was taken, while by the treaty of Westphalia (1648) the principality became sovereign and independent of the empire. In 1539 (the very year Farel introduced the Reformation at Neuchâtel) the overlordship enjoyed by the house of Châlon-Orange passed by virtue of a marriage contracted in 1515, to that of Nassau-Orange, the direct line of which ended in 1702 in the person of William III., king of England. In 1707 the Longueville house of Neuchâtel also became extinct, and a great struggle arose as to the succession. Finally the parliament (states) of Neuchâtel decided in favour of Frederic I., the first king of Prussia, whose mother was the elder paternal aunt of William III., and so heiress of the rights (given in 1208) of the house of Châlon, to which the title had reverted on the extinction of the line of the counts of Neuchâtel. Thus the act of 1288 determined the fate of the principality, partly because Frederic I. was a Protestant, while the other claimants were Romanists. The nominal rule of the Prussian king (for the country enjoyed practical independence) lasted till 1857, with a brief interval from 1806 to 1814, when the principality was held by Marshal Berthier, by virtue of a grant from Napoleon. In 1814 its admission into the Swiss confederation was proposed and was effected in 1815, the new canton being the only non-republican member, just as the hereditary rulers of Neuchâtel were the last to maintain their position in Switzerland. This anomaly led in 1848 to the establishment (attempted in 1831) of a republican form of government, brought about by a peaceful revolution led by A. M. Piaget. A royalist attempt to regain power in 1856 was defeated, and finally, after long negotiations, the king of Prussia renounced his claims to sovereignty, though retaining the right (no longer exercised) to bear the title of "prince of Neuchâtel." Thus in 1857 Neuchâtel became a full republican member of the Swiss confederation.

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NEUCHâTEL, capital of the above Swiss canton, situated near the north-east corner of the lake of Neuchâtel. It is the meeting-place of several important railway lines, from Bern past Kerzers (27 m.), from Bienne (19 m.), from La Chaux de Fonds (19 m.), from Pontarlier (in France), by the Val de Travers, 33 m., and from Yverdon 23 m. The railway station (1575 ft.) at the top of the town is connected by an electric tramway with the shore of the lake some 150 ft. lower. The older portion of the town is built on the steep slope of the Chaumont, and originally the waters of the lake bathed the foot of the hill on which it stood. But the gradual growth of alluvial deposits, and more recently the artificial embankment of the shore of the lake, have added much dry ground, and on this site the finest modern buildings have been erected. The 16th-century castle and the 13th-century collegiate church of Notre Dame (now Protestant) stand close together and were founded in the 13th century. Those who have visited the picturesque Scenic Railway, which winds through the town, to which they granted a charter of liberties in 1214. Among the buildings on the quays are the Musée des Beaux Arts (modern Swiss paintings and also various historical collections, including that of Desor relating to the Lake Dwellings), the Gymnase or Collège Latin (in which is also the museum of natural history and the town library), the university (refounded in 1866 and raised from the rank of an academy to that of a university in 1909), the École de Commerce and the post office. The town owes much to the gifts of citizens. Thus David de Pury (1750-1806) founded the town hospital and built the town hall, while James de Pury bequeathed to the town the villa in which the ethnographical museum has been installed (1904). In 1811 J. L. de Pourtalés (1722-1814) founded the hospital which bears his name, while in 1844 A. de Meuron (1780-1852) constructed the lunatic asylum at Préfargier, a few miles from the town. Among natives of the town are the theologians J. F. Ostervald (1663-1747) and Frédéric Godet (1812-1900), the geologist E. Desor (1851-1882), the local historian G. A. Matile (1807-1881) and the politicians A. M. Piaget (1802-1879) and C. de Plancy (1833-1900). Neuchâtel, by far the most cosmopolitan town in Switzerland, particularly because over 50% of the French is spoken there) attracts many foreign students, while the town is a literary centre. In 1900 Neuchâtel numbered 20,843 inhabitants (in 1850 only 7277 and in 1870, 12,683), 15,277 being French-speaking and 4553 German-speaking; there were 17,237 Protestants, 3450 Romanists and 80 Jews. (W. A. B. C.)

NEUCHâTEL, LAKE OF. This lake, in W. Switzerland, is with the neighbouring lakes of Biécon and Morat (both connected with it by canals), the modern representative of the large body of water which at one time seems to have filled the whole of the lower valley of the Aar. It is now the most considerable sheet
of water which is wholly within Switzerland (since parts of those of Geneva and Constance belong to foreign countries), though it does not belong entirely to any one—of its total area of 928 sq. m., 364 sq. m. are in the Canton of Neuchâtel and rather over 33 sq. m. of that in Vaud, while Fribourg claims 283 sq. m. and Berne 2 sq. m. It is about 2135 m. in length, varies from 33 to 5 m. in width, and has a maximum depth of 303 ft., while its average is 143 ft. above sea level. It is mainly fed by the Thélle or Zihl river, which enters it at its southwestern end and issues from it at its north-eastern extremity, but it also receives, near its north-west end, the Areuse (flowing through the Val de Travers) and the Seyon (which traverses the Val de Vierne), as well as near its north-east end, the Broye (that flows through a canal from the Lake of Morat). Successive drainages have brought to light the remains of many lake dwellings, of which there is a good collection in the natural history museum at Neuchâtel. The scenery of the lake, though pleasing, cannot compare with that of the other Swiss lakes, despite the fact that from it the giants of the Alps, Blanc and Berthe, and of the Oberland ranges are clearly seen. The first steamer was placed on the lake in 1827. On the south-eastern shore the picturesque and historical little town of Estavayer is the chief place. At the south-western extremity of the lake is Yverdon (the Ébarvon of the Romans and the residence of the educationalist Pestalozzi, 1866-1825). Far more populated is the north-western shore, where, from S.W. to N.E., we find Grandson (famous for the battle of 1476 wherein Charles the Bold, duke of Burgundy, was defeated by the Swiss), Cortaillod (producing excellent sparkling wine), Serrieres (of which order the St. Benedictine monks claim to have made the first wine in Switzerland), and Neuchâtel itself. On the norther shore is La Tène, famous for the remarkable relics of the Iron Age that have been discovered there. (W. A. B. C.)

NEUENHAR, a spa of Germany, in the Prussian Rhine province, situated at the foot of a basalt peak, in the pleasant valley of the Ahr, 10 m. N.W. of Remagen on the Rhine by the railway to Adenau. Pop. (1909) 3388. It is well laid out, has an Evangelical and two Roman Catholic churches, and carries on a considerable trade in the red wines of the district. There are five alkaline springs with temperatures from 69° to 101° F., the waters of which are said to have medicinal properties. The use of the respiratory organs, gout, rheumatism and diabetes. In the immediate vicinity lies the Apollinaris spring. See Schmitz, Erfahrungen über Bad Neuenahr (5th ed., Ahreweiler, 1887); and Schwenke, Die Kurmitteil des Bades Neuenahr (Halle, 1900).

NEUENDORF, a village of Germany, in the province of Brandenburg, 2 m. E. from Potsdam, on the Nuthe, with a station on the railway from Berlin to Potsdam. Pop. (1905) 6877. The place has considerable industries, chief among which are carpenter-works, jute spinning and the manufacture of railway plant. Within its area lies the colony of Nowawes laid out by Frederick the Great in 1754.

NEUCHÂTLE, a town of eastern France, in the department of Vosges at the confluence of the Meuse and the Mosoun, 49 m. W.N.W. of Épinal by rail. Pop. (1906) 3924. The churches of St. Christopher (13th and 14th centuries) and St. Nicholas, the latter combining the Romanesque and Gothic styles and built above a Romanesque crypt, are of interest. A sub-prefecture, a tribunal of first instance and communal colleges are among the public institutions. Neuchâtel carries on wool-spinning and the manufacture of embroidery, naps and chains. The town, which is said to occupy the site of the Roman Neomagus, belonged in the middle ages to the dukes of Lorraine, ruins of whose castle are still to be seen. In 1641 it passed to France.

NUHALSCHILDEN, a town of Germany, in the province of Prussian Saxony on the Ohre, situated 18 m. N.W. from Magdeburg by the railway to Osbelefe and at the junction of a line to Eisleben. Pop. (1905) 10,421. It has an Evangelical church, a monument of a knight and a equestrian statue of Henry the Lion and a gymnasium. There are several active industries, notably the manufacture of majolica and terra-cotta wares, machinery, gloves, beer, malt, cheese and sugar, while large pig markets are held here.

See Behrends, Chronik der Stadt Neuhaldensleben (new ed., 1903).

NEUHOFF, THEODORE STEPHEN, Baron von (c. 1600-1756), German adventurer and for a short time nominal king of Corsica, was a son of a Westphalian nobleman and was born at Metz. Educated at the court of France, he served first in the French army and then with the Swedish army and the Dutch army and the Hanoverian army. Baron de Goeritz, minister to Charles XII., realizing Neuhoff's capacity for intrigue, sent him to England and Spain to negotiate with Cardinal Alberoni. Having failed in this mission he returned to Sweden and then went to Spain, where he was made colonel and married one of the queen's ladies-in-waiting. Deserting his wife soon afterwards he repaired to France and became mixed up in law's financial affairs; then he wandered about Portugal, Holland and Italy, and at Genoa he made the acquaintance of some Corsican prisoners and exiles, whom he persuaded that he could free their country from Genoese tyranny if they made him king of the island. He was made the king of the island in March 1736, but the Genoese having put a price on his head and published an account of his antecedents, he left Corsica in November 1736, ostensibly seeking foreign assistance. After trying in vain to raise a fleet of ships from the English government, he started off on his wanderings once more until he was arrested for debt in Amsterdam. On regaining his freedom he sent his nephew to Corsica with a supply of arms; he himself returned to the island in 1738, 1739 and 1743, but the combined Genoese and French forces and the growing strength of the party opposed to him again drove him to wandering about Europe. Arrested for debt in London he regained his freedom by mortgaging his "kingdom" of Corsica, and subsisted on the charity of Horace Walpole and some other friends until his death in London on the 11th of December 1756. His only son, Frederick (c. 1725-1797), entered the army of Provence and Great Britain, and afterwards acted as agent in London for the grand-duke of Württemberg.

Frederick wrote an account of his father's life, Mémoires pour servir à l'histoire de la Corse, and also an English translation, both published in London in 1769. In 1795 he published a Description of Corsica with an account of its union to the crown of Great Britain. See also Fitzgerald, King Theodore of Corsica (London, 1890).

NEUILLY-SUR-SEINE, a town of northern France, in the department of Seine, 33 m. N.W. of the centre of Paris, of which it is a suburb, between the fortifications and the inner city walls. Pop. (1901) 39,222. A castle at Neuilly, built by the count of Argenson in the 18th century, ultimately became the property and favourite residence of the duke of Orleans (Louis Philippe), the birthplace of nearly all his children, and the scene of the offer of the crown in 1830. The buildings were pillaged and burned by the mob in 1848. The park, which extended from the fortifications to the river, as well as the neighbouring park of Villiers (also belonging to the princes of Orleans), was broken up into building lots, and is occupied by many small middle-class houses and a few fine villas. Within the line of the fortifications, but on Neuilly soil, stands the chapel of St. Ferdinand, on the spot where the duke of Orleans died in 1842 from the results of a carriage accident. The stained-glass windows were made at Sèvres after designs by Ingres; the ducal cenotaph, designed by Ary Scheffer, was sculptured by de Triqueti; and the chapel also contains a "Descent from the Cross," by the last-named artist, and an angel executed in Carrara marble by the princess Marie d'Orléans, sister of the duke. The fine bridge, designed in the 18th century by Perronet, is noteworthy as the first level bridge constructed in France. The Galilani Institution, founded by the brothers Galilani for aged book-sellers, printers and others, has a commendation for its residents. The manufactures
include perfumery, chocolate, colours, varnish, automobiles, carpets, &c.

**NEUMANN, F. E.—NEUQUEN**

at Heidelberg, where he graduated Ph.D. After some experience in field-geology under C. W. von Glümbel he joined the Austrian Geodetical survey in 1864. Four years later he returned to Heidelberg but in 1873 he was appointed paleontologist in Vienna, and occupied this post until his death on the 29th of January 1890. His more detailed researches related to the Jurassic and Cretaceous Ammonites and to the Tertiary freshwater mollusca; and in these studies he sought to trace the descent of the species. He dealt also with the zones of climate during the Jurassic and Cretaceous periods, and endeavoured to show that the equatorial marine fauna differed from that of the two temperate zones, and the latter from that of the arctic zone, much as the faunas of similar zones differ from each other in the present day; see his "Über klimatische Zonen während der Jura und Kreidezeit" (Denkschr. K. Akad. Wiss. Wien, 1883); he was also author of Erdgeschichte (2 vols., 1887); and Die Sämmtle des Thierreiches (vol. 1 only, 1889).


**NEUMÜNZER, a town of Germany, in the Prussian province of Schleswig-Holstein, lies on both banks of the small river Schwale, in the basin of the Stör, 40 m. N. of Altona-Hamburg by rail, and at the junction of lines to Kiel, Varntrup (Denmark) and Lübeck-Rostock. It was occupied in 1793. It has an Evangelical and a Roman Catholic church, and several schools. It is situated near Altona, the most important industrial town in the province, and contains extensive cloth-factories, besides manufactories of leather, cotton, wadding, carpets, paper, machinery, beer and sweetmeats. Its trade is also brisk. The name, which was originally Wipendorp, is derived from an Augustine monastery, founded in 1130 by Vicelin, the abbot of Holstel, and is mentioned as “novum monasterium” in a document of 1346. Its industrial importance began in the 17th century, when the cloth-weavers of Segeberg, a town to the south-east, migrated to it. It became a town in 1836.

See Kirmis, Geschichte der Stadt Neumünster (1900); and Dittmann, Aus dem alten Neumünster (1879).

**NEUNKIRCHEN, or OBEN-NEUNKIRCHEN, a town of Germany, in the Prussian Rhine province, on the Blies, 12 m. N.W. of Saarbrücken by rail. Pop. (1905) 32,358, consisting almost equally of Protestants and Roman Catholics. It contains two Gothic Evangelical and a Romanesque Roman Catholic church, several schools, and a monument to Freiherr von Stumrn (d.1901), a former owner of the iron-works here. The principal industrial establishment is a large iron foundry, employing upwards of 4,500 hands, and producing about 3,250,000 tons of pig-iron per annum; and there are boiler-works, saw-mills, soap manufactories and a brewery. Around the town are important coal mines from which about 2½ million tons of coal are raised annually. The castle built in 1570 was destroyed in 1797, and is now a ruin. The town is first mentioned in 1280, and became important industrially during the 18th century.

**NEUQUEN, an inland territory of Argentina on the Chilian frontier, between the Colorado and Limay rivers, with the province of Mendoza on the N. and the territory of Rio Negro on the E. and S. Area, 42° 34' 59' S. Pop. (1890) 14,517; (1904, estimate) 18,022. The greater part of the territory is mountainous, with fertile, well-watered valleys and valuable forests. The eastern part, however, contains large barren plains, showing some stunted vegetation, and having numerous saline deposits. Long drouths prevail in this region and there is no inducement for settlement, the nomadic Indians visiting it only on their hunting expeditions. Guanacos and Argentine hares are found in abundance in Neuquen, and to a lesser degree the chinchilla and American opossum. The Neuquen, which unites with the Limay near the 68th meridian to form the Rio Negro, is the principal river of the territory. The largest of a group of beautiful lakes in the higher Andean valleys is the celebrated Nahuel-Huapi (Lion Grass), which is nearly 50 m. long from E. to W. and about 20 m. from N. to S. at its widest part, and which lies partly in the S.W. angle of the territory, partly in Rio Negro, and partly in the republic of Chile. It is the source of the Rio
Limay and receives the overflow from two smaller neighbouring lakes. The temperature of the Andean region is cold even in summer, but on the lower plains it is hot in summer, and only moderately cold in winter. The principal industry is the raising of stock for the Chilean markets, as there is little cultivation. Cereals, forage crops, vegetables and fruits of the cold temperate zone can be produced easily, but distance from markets and lack of transport have restricted their production to local needs. The principal means of transport is by a light-draft river steamer which ascends the Rio Negro to Fort Roca at the confluence of the Limay and Neuquen, and by a branch of the Great Southern railway from Bahia Blanca to the same point. The population is concentrated in a few small towns on the rivers and in some colonies, established by the national government to check Chilean invasions, in the fertile districts of the Andes. A majority of the population, however, is of Chilean origin. The capital is Chos Malal, a small town on the upper Neuquen, in the mountainous district in the northern part of the territory.

NEURALGIA (Gr. νευρα, nerve, and άγων, pain) denotes strictly the existence of pain in some portion or throughout the whole of the distribution of a nerve without any distinctly recognizable structural change in the nerve or nerve centres. This strict definition, if adhered to, however, would not be applicable to a large number of cases of neuralgia; for in not a few instances the pain is connected with some source of irritation, by pressure or otherwise, in the course of the affected nerve; and hence the word is generally used to indicate pain affecting a particular nerve or its branches from any cause. There are few ailments which give rise to greater distress than this condition of pain usually between a depressed or enfeebled state of health. It is often found to affect the hereditarily rheumatic or gouty. In weakened conditions of the system from improper or insufficient food, or as a result of any drain upon the body, or in anaemia from any cause, and in such diseases as syphilis or malaria, neuralgia is a frequent concomitant. Any strain upon the nervous system, such as mental overwork or anxiety, is a potent cause; or exposure to cold and damp, which seems to excite irritation in a nerve already predisposed to suffer. But irritation may be produced by numerous other causes besides this—such as decayed teeth, disease of bone, local inflammations in which nerves are implicated, by some source of pressure upon a nerve trunk, or by swelling of its sheath in its passage through a bony canal or at its exit upon the surface.

The pain is generally localized, but may come to extend beyond the immediate area of its first occurrence. It is usually of paroxysmal character, and not infrequently periodic, occurring at a certain time of the day or night. It varies in intensity, being often of the most agonizing character, or less severe and more of a tingling kind. Various forms of perennial nerve function may be found co-existing with or following neuralgia. Thus there may be hyperaesthesia, anaesthesia, paralysis, or alterations of nutrition, such as wasting of muscles, whitening of the hair, &c.

The forms in which neuralgia most commonly shows itself are facial neuralgia or tic douloureux, migraine (hemiplegia or brow ague), intercostal neuralgia and sciatica.

Facial neuralgia, or tic douloureux, affects the great nerve of sensation of the face (fifth nerve), and may occur in one or more of the three divisions in which the nerve is distributed. It is usually confined to one side. When the first or upper division of the nerve is involved the pain is mostly felt in the forehead and side of the head. It is usually of an intensely sharp, cutting or burning character, either constant or with exacerbations, and often periodic, returning at a certain hour each day while the attack continues. The skin over the affected part is often red and swollen, and, even after the attack has abated, feels stiff and tender to the touch. In this, as in all forms of neuralgia, there are certain localities where the pain is more intense, these "painful points," as they are called, being for the most part in those places where the branches of the nerves emerge from bony canals or pierce the fascia to ramify in the skin. Hence, in this form, the greater severity of the pain above the eyebrow and along the side of the nose. There is also pain in the eyelid, redness of the eye, and flow of tears. When the second division of the nerve is affected the pain is chiefly in the cheek and upper jaw, the painful points being immediately below the lower eyelid, over the cheek bone, and about the upper lip. When the third division of the nerve suffers the pain affects the lower jaw, and the chief painful points are in front of the ear and about the chin.

Hemianopia, migraine, brow-ague and sick headache are various terms employed to describe what by some is considered to be another form of neuralgia. An attack may come on suddenly, but, in general, begins by a dull aching pain in the brow or temple, which steadily increases in severity and extent, but remains usually limited to one side of the head. It attains at times an extreme degree of violence, and is apt to be aggravated by movement, loud noises or bright light. Accompanying the pain there is more or less of nausea, and when the attack reaches its height vomiting may occur, after which relief comes, especially if the head is massaged. An attack of this kind may last for a few hours or for a whole day, and after it is over the patient feels comparatively well. It may recur periodically, or, as is more common, at irregular intervals. During the paroxysms, or even preceding them, certain sensory disturbances may be experienced, more especially affections of vision, such as ocular spectras, hemiopia, diplopia, &c. Gout, eyestrain and intestinal toxanmia have been put forward as causes of migraine, and Sir W. Gowers regards it as the equivalent of a true epileptic attack.

Intercostal neuralgia is pain affecting the nerves which emerge from the spinal cord and as they emerge the spaces between the ribs. The pain is felt along the front of the body. This form of neuralgia affects the left side more than the right, is much more common in women than in men, and occurs generally in enfeebled states of health. It might be mistaken for pleurisy or some inflammatory affection of the lungs; but the absence of any chest symptoms, its occurrence independently of the acts of respiration, and other considerations well establish the distinction. The specially painful points are chiefly at the commencement of the nerve as it issues from the spinal canal, and at the extremities towards the front of the body, where it breaks up into filaments which ramify in the skin. This form of neuralgia is occasionally the precursor of an attack of a shingles (Herpes zoster) as well as a result of it.

Sciatica is another of the more common forms of neuralgia. It affects the great sciatic nerve which emerges from the pelvis and runs down the leg to the foot. It is in most instances traceable to exposure to cold or damp, to overuse of the limbs in walking, &c. Any source of pressure upon the nerve within the pelvis, such as may be produced by a tumour or even by constipation of the bowels, may excite an attack of sciatica. It is often connected with a rheumatic or gouty constitution. In general the nerve of one side only is affected. The pain which is felt: at first a little behind the hip-joint steadily increases in severity and extends along the course of the nerve and its branches in many instances as far as the toes. The specially painful points are about the knee and ankle joints; besides which a feeling of numbness is experienced throughout the whole limb. In severe cases all movement of the limb aggravates the pain, and the patient is obliged to remain in bed. In prolonged attacks the limb may waste and be drawn up and fixed in one position. Attacks of sciatica are often attended with great sufferings, and are apt to be very intractable to treatment. In the treatment of all forms of neuralgia it is of first importance to ascertain if possible whether any constitutional morbid condition is associated with the malady. When the attack is periodic the administration of a large dose of quinine two or three hours previous to the usual time of the seizure will often mitigate, and may even prevent the paroxysm. Many topical applications are of great efficacy. Liniments containing opium, belladonna or aconite rubbed into the affected part will often soothe the most severe local pain. And antipyrin, phenacetin, aspirin and similar analgetics are commonly taken. The plan at one time resorted to of dividing or excising a portion of the affected nerve is now seldom employed, but the operation
of nerve-stretching in some forms of neuralgia, notably sciatica, is sometimes successful. It consists in cutting down upon and exposing the nerve, and in seizing hold and drawing upon it so as to stretch it. Such an operation is obviously justifiable only in cases where other less severe measures have failed to give relief. The employment of electricity, in long continued and intractable forms of neuralgia, proves in many instances eminently serviceable. In the severest forms of tic doloreux complete relief has followed the extirpation of the Gasserian ganglion.

NEURASTHENIA (Gr. νευρατος, nerve, and ασθεσις, weakness), the general medical term for a condition of weakness or nervous ferment.

The symptoms may present themselves as follows: (1) general feeling of malaise, combined with a mixed state of excitement and depression; (2) headache, sometimes with the addition of vertigo, deafness and a transitory clouding of consciousness simulating petit mal or migraine; (3) disturbed and restless, unrefreshing sleep, often troubled with dreams; (4) weakness of memory, especially for recent events; (5) blurring of sight, noises or ringing in the ears; (6) variable disturbances of sensibility, especially scattered anaesthesia (partial or complete loss of the sense of touch) in the hands especially, and in women the breasts; (7) various troubles of sympathetic origin, notably localized coldness, particularly in the extremities, morbid heats, flushings and sweats; (8) various phenomena of nervous depression associated with functional disturbances of organs, e.g. muscular weakness, lack of tone, and sense of fatigue upon effort, dyspepsia and gastric atony with dilatation of the stomach and gastralgia; pseudo-anginal attacks and palpitation of the heart; loss of sexual power with nocturnal pollutions and premature ejaculations leading to apprehension of oncoming impotence. Objective signs met with in organic disease are absent, but the knee-jerks are usually exaggerated.

According to the complexity of symptoms, the neurasthenia is more particularly defined as cerebral, spinal, gastric and sexual. The cerebral form is sometimes termed psychasthenia, and is liable to present morbid fears or phobias, e.g. agoraphobia (fright in crowds), monophobia (fright of being alone), claustrophobia (fright of being in a confined place), anthropophobia (fright of society), batophobia (fright of things falling), siderodromophobia (fright of railway travelling). There may also be motoric ruminations, in which there is something connective from the above connected ideas from which there is, no breaking away, often most insistent at night and leading to insomnia. Sometimes there is arthromania (an imperative idea to count). Such cases often exhibit a marked emotionalism and readily manifest joy or sorrow; they may be cynical, pessimistic, introspective and self-centred, only able to talk about themselves or matters of personal interest, yet they frequently possess great intellectual ability, and although there may be mental depression, there is an absence of the insane ideas characteristic of melancholia.

Traumatic neurasthenia is the neurasthenia following shock from injury; it is sometimes termed "railway spine," "railway brain," from the frequency with which it occurs after railway accidents, especially in people of a nervous temperament. The physical injury at the time may be slight, so that the patient is able to resume work, but symptoms develop later which may simulate serious organic disease. As in all forms of neurasthenia, the subjective symptoms may be numerous and varied, whereas the objective signs are but few and slight. Many difficulties, therefore, present themselves in arriving at a sound opinion as to the future in such cases. It is desirable not only to study the case carefully, but to obtain some knowledge of the previous history of an individual who is claiming damages on account of traumatic neurasthenia.

NEUROTI, an ancient tribe placed by Herodotus (iv. 105) to the north-east of Scythia. He says of it that it is not Scythian, but has Scythian customs. Every member of it, being a wizard, becomes a wolf once a year. The position assigned to their district appears to be about the head waters of the Dniester and Bug (Bugh) and the central course of the Dnieper just the region which, on general grounds, place-names, recorded migra-

tions and modern distribution, appears to be the original location of the Slavs (q.v.). The wolf story again recalls the tales of werewolves so common among Slavonic peoples, and there's much probability in Schafarik's conjecture that the Neuri are nothing but the ancestors of the Slavs.

( E. H. M.)

NEURITIS (Gr. νευρως, nerve, and νηρις, bundle of nerve fibres), a term applied to the inflammation of one or more bundles of nerve fibres. Two varieties are known, the localized and the multiple. The localized form frequently follows on exposure to cold and may attack a single nerve. Facial paralysis (Bell's palsy) is commonly seen following a neuritis of the facial nerve. Neuritis may follow blows and is a nervous feature of severe or long continued pressure such as may occur in a dislocation of the elbow joint, or the nerve may share in the extension of a neighbouring inflammation. The first symptom of a localized neuritis is pain of a boring character along the course of a nerve and its distribution, the part being sensitive to pressure. There may be slight redness and oedema along the course of the nerve, movement becomes painful in the muscles to which the nerve is distributed, numbness may follow and the tactile sense be impaired, finally the muscles atrophy, and degenerative changes appear in the nerve cell. In time the pain may disappear, the feeling cold or injury may pass off in a few days, while severe cases such as those following the pressure of an unreduced dislocation may last for months.

Multiple neuritis or polyneuritis is a disease which may affect many of the peripheral nerves symmetrically and at the same time. For the pathological changes see NEUROPATHOLOGY. The difference in these changes is due mostly to the difference in the aetiology of the neuritis. The causes may be divided as follows:

1. The toxins of acute infective diseases, such as diphtheria, meningitis, typhoid fever, smallpox, scarlet fever and septicemia.
2. Acute or chronic poisoning by lead, arsenic, mercury, copper and phosphorus.
4. The local action of leprosy and syphilis.
6. Alcohol, the most common.

Alcoholic neuritis occurs as a result of constant steady drinking, particularly in those who drink beer rather than spirit. The earliest symptom is numbness of the feet and later of the hands, then painful cramps in the legs appear and there is pain on moving the limbs, or the patient complains of deafness, tingling and burning in the hands and feet, and superficial tenderness is occasionally present. In other varieties of the disease the earliest symptoms are weakness of the legs or internal organs, and the patient has a feeling of giving way, or marked inco-ordination of movement may occur and the gait become ataxic. Trophic changes soon appear, in some cases early and rapid muscular wasting occurs, the skin becomes dry and cold, and the nails become yellow. In time bony acro-structures takes place, the hip and knee-joints become flexed and the foot dropped at the ankle. In cases that recover there may be permanent deformity of the cases, the calves may become bedridden and powerless, and degenerative mental changes may take place, loss of memory, irritability of temper and emotional instability. Various complications such as bronchitis, fatty changes in the heart, albuminuria and a liability to pulmonary tuberculosis, tend to carry off the victim of chronic alcoholic neuritis. Cases seen early in the progress of the disease, who can be placed under supervision, may recover under treatment, but those in whom the disease has been neglected a great number of cases in whom there is mental impairment rarely make a complete recovery. The treatment consists in putting the patient to bed, with the administration of sedatives. The hypodermic syringe becomes the hypodermic syringe is the key to the position of the limbs so as to avoid the development of contractures. Cradles being used, the limbs kept in the correct positions by sand-bags, and gentle massage being employed as soon as possible. Should contractures have already formed some mechanical device adapted to stretch the contracted muscle must be resorted to. Biers' hyper-aeremic suction apparatus is very useful in the painless stretching of the limbs. To prevent adhesions, of course. Should adhesions have to be broken down under an anaesthetic, extension apparatus may have to be worn. In the later treatment the galvanic and faradic currents combined with massage are useful in helping to restore the wasted muscles. Cold hots, air baths and warm applications are appreciated. Arsenical neuritis mostly affects the lower extremities, as contrasted with lead, which mainly paralyses the fingers and wrists; recovery is even slower than in alcoholic neuritis, the treatment being of the same line, with the removal of the cause of the disease. In the neuritis of chronic lead poisoning a fine tremor of the hands is an early symptom and sensory symptoms are usually absent; the muscles affected are the extensors of the wrists, thumb and fingers.
The course of the disease is long, and an attempt should be made to eliminate the lead from the system by purgatives and the administration of potassium iodide.

The diabetic neuritis paraesthesia is slight, and the legs are chiefly affected. Paresthesia and ataxia may be present. Soreness on the soles are of frequent occurrence in this variety. The treatment is that of the disease.

Post-diphtheritic neuritis occurs in about 10% of all cases of diphtheria and is fatal in 30%; it is unilateral in the earliest stage, and this may be the only one, or the pharynx may be affected. The limbs are affected much later, usually about the 5th or 6th week. Atrophy of the muscles is frequently rapid. If the respiratory muscles are unaffected the prognosis is good, but the paralysis of the limbs may last for several months. The treatment is complete rest, good food and the administration of strychnine.

A neurologic symptom, ataxia, and motor weakness has been noted after influenza, together with slight muscular wasting and electrical degeneration. Later, loss of sensation in the peripheral portion of the limbs is complained of, and the motor weakness may affect the muscles of the trunk and face. Such cases tend towards complete recovery.

**NEUROPATHOLOGY**, the general name for the science concerned with diseases of the nervous system. As regards the anatomy and physiology, see the articles Nerve, Nervous System, Brain, Spinal Cord, and Sympathetic System. The morbid processes affecting the nervous system are numerous and variously modified by diseases extending into the nervous system, whether (1) organic disease, (2) functional disturbance. Such a classification depends upon whether or not symptoms observed during life can be associated with recognizable changes of the nervous system, gross or microscopical, after death. Sometimes this is the morbid process itself, sometimes only the ultimate result of the process. It must be remarked, however, that many diseases which we now look upon as functional may be found due to recognizable changes when suitable methods of investigation shall have been discovered. The paroxysmal neurones and psychoses may be considered a priori to be due to temporary morbid functional conditions. Our knowledge of the first group has naturally much more advanced than of the latter, for, given certain symptoms during life, we are able, as a rule, to predict not only the nature of the morbid process, but its particular locality.

The histological elements which make up the nervous system may also be divided into two groups: (1) the neurones or neurons, (2) the supporting, protecting and nutrient tissues. Organic diseases may start primarily in the nervous units or neurones and cause their degeneration; such are true diseases of the nervous system. But the nervous units may be affected secondarily by diseases existing in the supporting, protecting and nutrient tissues of the nervous system; such are essentially diseases within the nervous system, and include diseases of the blood-vessels, lymphatics, membranes and the special nervous connective tissue, neuroglia (a residue of the embryonal structure from which the nervous system was developed). Tumours and new growths must also be included.

The modern conception of the “neuron” as an independent complex cell with branching processes, in physiological rather than anatomical association with other neurones, has modified our ideas of the morbid processes affecting the nervous system, especially as regards degenerations of systems, communities or collections of neurones subserving special functions. It was formerly believed, and generally taught, that the primary systemic degenerations were due to a sclerosis; thus locomotor ataxy was believed to be caused by an overgrowth of the supporting glia tissue of the posterior column of the spinal cord, which caused a secondary atrophy of the nervous tissue. We now know that this overgrowth of glia tissue is secondary to the atrophy of the nervous elements, and the only true primary overgrowth of glia tissue is really of the nature of the new growth (glio). But even in this case it is doubtful if the mere proliferation of the glia tissue elements could destroy the nervous elements, if it were not for the fact that it leads to changes in the vessel walls and to ischaemorrhages.

The symptoms manifested during life depend upon the nature of the morbid process and the portion of the nervous system affected. A correct understanding of neuropathology involves the study of (1) the causes which give rise to morbid conditions, which are often complex and due to various combinations of causative factors within the body, and (2) the changes in the structure and function of the nervous system brought about by intrinsic and extrinsic causes.

The causes of pathological processes occurring in the nervous units (neurones) may be divided into internal and external, and it may be remarked that in all cases except direct injury the two groups are generally more or less combined.

**A. Internal Causes.**—Of all the causes of nervous disease hereditary predisposition stands pre-eminently first; it may be congenital, paternal, maternal; from grandparents or even remote ancestors. Moreover, no study of heredity is complete if it does not consider the rôle of the family, or the fact that both the diseases, and the predisposition to them, are of interest inasmuch as they affect members of a family, the same disease frequently commencing in each individual at about the same time. These are termed family diseases, and include hereditary ataxia (Friedreich's disease), hereditary (Huntingdon's) chorea, amaurotic idiocy and various forms of idiopathic muscular atrophy. Alcoholism, tuberculous, syphilitic, and in general all diseases in which there may be constitutional alteration in the body or nervous system, may produce a morbid condition of the nervous system, especially those which are latent and of neuritic symptoms. Such sympathetic changes in the nervous system have been observed in many diseases, and it is essential that these symptoms should be recognized, for it is necessary to change the general administration of the patient, and the habits of life. Many diseases, e.g. epilepsy, migraine, hysteria and neurotism; and to psychoses, e.g. delusional insanity, mania and melancholia, manic-depressive, recurrent or periodic insanity and dementia-precox or adolescent insanity.

In 70% of 150 cases of idiocy or imbecility in the London county asylums, Dr Tredgold found that the presence or absence, a hereditary condition, had some bearing on the intellectual condition of the patient, and that the inheritance of this condition was more than one. Strictly speaking, it is the tendency to nervous disease rather than the disease itself that is inherited, and this is frequently spoken of as a neuropathic or psychopathic taint. There are, however, a fair number of diseases which are hereditary, rare, are of interest inasmuch as they affect members of a family, the same disease frequently commencing in each individual at about the same time. These are termed family diseases, and include hereditary ataxia (Friedreich's disease), hereditary (Huntingdon's) chorea, amaurotic idiocy and various forms of idiopathic muscular atrophy. Alcoholism, tuberculous, syphilitic, and in general all diseases in which there may be constitutional alteration in the body or nervous system, may produce a morbid condition of the nervous system, especially those which are latent and of neuritic symptoms. Such sympathetic changes in the nervous system have been observed in many diseases, and it is essential that these symptoms should be recognized, for it is necessary to change the general administration of the patient, and the habits of life. Many diseases, e.g. epilepsy, migraine, hysteria and neurotism; and to psychoses, e.g. delusional insanity, mania and melancholia, manic-depressive, recurrent or periodic insanity and dementia-precox or adolescent insanity.
B. The external causes producing morbid changes in the nervous elements are: I. Abnormal conditions of the blood and lymph, by which the neurones are poisoned and their metabolism morbidly affected. II. Excess or deficiency of normal stimulation, or existence of abnormal stimulation. III. Injury or diseases of supporting, enclosing or vascular tissues.

I. Abnormal Conditions of the Blood and Lymph.—The immediate environment of all the cellular elements of the body is lymph; and in the central nervous system there is a special form of lymph, the cerebro-spinal fluid, which is secreted by the choroid plexus in the ventricles and the habenular like other cerebro-spinal nerves, are bathed in the lymph, and extract from it the materials necessary for their growth and vital activities, casting out the waste products incidental to the biochemical changes which are continually taking place. The lymph, therefore, serves as a medium of exchange between the blood and the tissues, consequently the essential causes of change in environment of the nervous elements (neurones) are: (1) Deficiency or absence of blood-supply to the nervous system in general (as after severe haemorrhage), or to some particular portion, owing to local vascular disturbance or occlusion. (2) Alterations in the composition of the blood and lymph, e.g. (a) absence of certain essential constituents, (b) excess of certain normal constituents, (c) the presence of certain abnormal constituents produced within the body, or entering it from without.

1. Quantity of Blood Supply.—Syncope or fainting occurs when the blood supply suddenly fails to reach the higher centres of the brain; this usually arises from sudden reflex arrest of the heart’s action. If the brain is deprived of oxygen it suffers. The effect of an insufficient blood supply by emboletic plugging or by clotting of the blood in a vessel with diseased walls, the portion of the brain substance thus deprived of blood undergoes softening, the nervous elements are destroyed and the sympathetic nerve fibres, which have had their trophic and genetic centres in the area destroyed, undergo secondary degeneration. Clotting of the blood in the veins may also give rise to destructive softening of the brain, and similar secondary degeneration.

2. Quality of Blood Supply.—(a) Insufficiency of oxygen, due to poverty of the colouring matter or of the number of the red corpuscles, which constitutes the various forms of anaemia, leads to functional depression, lassitude and mental fatigue. Impoverishment of the blood in women by frequent pregnancies and excessive lactation causes neuralgia, nervous exhaustion and, in the neuropath, hysteria, neurasthenia, neuritis and mental derangement. In the male the tendency that the various neurones and psychoses have to occur and recur at the time of the menstrual and climacteric periods in women, suggest the possibility of an alteration in the composition of the blood at these times. One such alteration is the condition known as “minimal deficiency,” as the probable contributory factor of the mental disturbance. It may be remarked that eclampsia, prepartum and postpartum, the relative compounding of insanity in women; although sometimes of septic origin, they more frequently are occasioned by some morbid metabolism as yet little understood. The most striking examples we have, however, of the effect of absence or “sub-minimal” deficiency of a necessary constituent of the blood upon the development and functions of the nervous system are afforded by cretinous idiots, who are born without thyroid glands, and whose brains never develop in consequence; and by those people who suffer from the disease known as myxedema, occasioned by the absence of iodinoid, a product of the internal secretion of the thyroid gland. The proof of this is shown by the disappearance of the symptoms of the disease with restoration of the gland, and a partial restoration of the mental faculties, e.g., after a preparation of the gland has been continuously administered by the mouth. Even cretinous idiots when subjected in early life to thyroid treatment improve considerably. The removal of the thyroid and the substitution of its action in the body by injection of thyrosin or animal extracts of the gland is the basis of thyroid therapy, which has been shown to be of value in the treatment of organic mental disease in children and adults. The most striking indication of the effect of this pathological condition is shown in the improvement of the general nervous temperament; for probably there is an internal secretion of this gland in the male, as of the ovary in the female, which has some influence upon the functional activity of the nervous system. The secretion of this gland may have some relation to a series of phosphorus-containing substances, which, lost to the body by sexual excess or onanism, have to be replaced by the blood; the necessity of these substances with respect to the brain is shown by the fact that, when specific compounds, is thereby robbed, and neuroasthenia ensues. Brown-Squard’s testicular injection treatment for many nervous complaints, based upon this idea, has not, however, met with much success.

(b) Excess of certain Normal Constituents in the Blood.—Excess of carbonic acid causes drowsiness, and probably in asphyxia is one of the causes of the convulsions. All the series of the nitrogenous waste products—the most highly oxidized, most soluble and least harmful of which is urea—are normal constituents of the blood; but should the oxidation process be incomplete, owing to functional or organic disease of the liver, or should these substances accumulate in the blood, owing to inadequate function of the kidneys, a toxic condition is produced under which the nervous manifestations which are headache, drowsiness, unconsciousness and convulsions, and sometimes symptoms of pyloric or uremic fever. Again, in Graves’s disease, nervous phenomena, in the form of exophthalmos, myxedema, and polyuria, polydipsia, and in particular, the calamine authorities have been explained by the excess of thyroid internal secretion, to the enlargement and increased functional activity of the gland. The successful treatment of Graves’s disease by the ablation of the thyroid gland and the introduction of thyroid extract (goats), which had the thyroid glands removed, supports this theory.

(c) The presence of abnormal constituents in the blood is a most interesting cause of nervous phenomena, every therapist might consider the subject under the following headings: Poisons produced within the body (a) by perverted function of organs or tissues, auto-intoxication; (b) by the action of micro-organisms, protozoa and higher organisms upon the living fluids and tissue; (c) poisons introduced into the body from without, in the food and drink, or by inhalation.

(a) Poisons resulting from perverted Function of the Organs.—In the process of digestion a number of poisonous substances, e.g. albumoses, &c., are produced, which, although absorbed in the alimentary canal, are prevented by the living epithelium, and possibly other barriers, from entering the blood. Fatigue products, e.g. sarcolactic acid in prolonged muscular effort lead to auto-intoxication. Excess of uric acid in the blood is associated with high arterial pressure, deposits of lithates in the urine, headache and renal and vascular disturbances. Excess of albumoses in the blood, resulting from obstructive jaundice, may be attended by stupor and psychical depression; and the term melancholia, signifying “black melancholy,” is applied to the condition of the patient as the liver is an organ the derangement of which causes nervous depression. The rapidly fatal results attending acute yellow atrophy of the liver, namely, the profound changes in the urine, the jaundice and the secondary complications, point out the danger of such cases. In the condition of coma, demonstrate the important part this organ plays in preserving the normal quality of the blood. The delirium and coma which sometimes supervene in diabetes, heralded by acetonuria, proves that the fundamental disease is one of the functions of the liver, due to the saturation of the sodium salts of the blood by aceto-acetic and oxo-butyric acids, products of imperfect proteid metabolism. The effect of this would be an interference with the elimination of the protein acid in the processes of tissue and pulmonic respiration. Again, in pernicious and certain grave anaemias, the degenerative changes in the spinal cord found in some cases is due, not so much to the destruction of the nerves, but to the deposits of oxalic acid, which probably arises from imperfect metabolism or absorption from the alimentary canal. In this question of auto-intoxication, it must be remarked that all the tissues of the body are mutually interdependent, and many diseases are secondary to the fundamental morbid condition, and is thereby apt to establish a vicious circle which is constantly enlarging; therefore nervous symptoms manifesting themselves in the course of the disease may be but symptoms of the primary condition.

(b) Poisons produced by Infective Micro-organisms.—Some of these poisons have a general devitalizing influence, by an alteration of the blood and the production of fever. In the course of the acute process, symptoms of phthisis, typhoid, scarlet fever, measles, influenza, also tuberculosis and septicaemia, delirium is a frequent complication; it may be the result of high fever or prolonged fever, or directly due to the poison, or the two combined. In severe cases stupor and coma may occur, and it has been shown that in this extreme stage the nerve cells undergo an acute morbid biochemical change. These particular poisons have no selective toxic action upon the nervous system, and the nervous symptoms are slow to develop, but, after the acute illness are liable to supervene, especially in a neuropathic individual. Thus many cases of neurasthenia, insanity, neuritis, also neuritis, date their origin from an acute infectious disease. In pneumonia, in which the lung and corresponding spinal cord, namely, locomotor ataxy, and the other affecting especially the frontal and central convolutions of the cerebral hemispheres, namely, general paralysis of the insane. A striking instance of the relation of organic disease of the nervous system to infection is in persons affected with acquired or inherited syphilis is a symptom known as Argyll-Robertson pupil found; this is the absence of the pupil reflex contraction to light, while that for accommodation, in the two diseases mentioned, it strengthens the presumption.
FIG. 1. Left hemisphere, case of delusional insanity; this in all respects might pass for a normal brain.

FIG. 2. Brain of a micro-cephalic idiot, which weighed only eight ounces although its possessor was an adult woman. The striking lack of development of the hemispheres is shown in their small size, whereby the cerebellum is almost entirely uncovered; moreover the convolutional pattern is simpler than that of an anthropoid ape's brain.

FIG. 3. Left hemisphere, case of abscess of the frontal lobe; the convolutions and sulci are obliterated and the membranes thickened, so that the fore part of the brain presents the appearance of a membranous bag; this contained a large amount of pus.

FIG. 4. Right hemisphere of a woman who for 11 years suffered with Motor aphasia paralysis of the lower half of the right side of the face, deviation of the tongue to the right and some weakness in the right leg and arm.

FIG. 5. Left hemisphere of a woman who for many years was the subject of sensory aphasia. The left hemisphere showed a similar lesion to the right but rather more extensive.

FIG. 6. Brain from a case of apoplexy: the tops of the hemispheres have been sliced off to show the hemorrhage (dark patch) in the right centrum ovale, which has ruptured the fibres proceeding from the motor area of the brain, situated between the basal ganglia.

FIG. 7. Left hemisphere: a case of advanced dementia, showing atrophy of the convolutions, with deep and wide sulci intervening.

FIG. 8. The brain of an adult congenital imbecile. There is a very simple convolutional pattern in comparison with the other brains shown in the figures. The convolutions are small, the secondary gyri are deficient in numbers. The sylvian fissure turns obliquely upwards and there is an obvious deficiency in the superior and inferior parietal lobes.

FIG. 9. Right hemisphere of a woman who for many years was the subject of sensory aphasia. The left hemisphere showed a similar lesion to the right but rather more extensive.

FIG. 10. Left hemisphere and cerebellum of a case of porencephaly. A local atrophy of the convolutions, owing to a vascular lesion before birth, is seen in the parietal lobe.
Fig. 1.—Trypanosoma gambiense in the blood from a case of sleeping sickness in a European. The undulatory membrane is clearly seen; the head of the organism with its micronucleus is in contact with a red blood corpuscle. Magnification 2000 diameters.

Fig. 2.—A. and B. The spirochaete pallidum. A shows the organisms seen in a section of mucous tubercle stained by Levaditi's silver method; the lowest with 8 equal spirals and a pointed end is the most typical. Magnification 1200. B. Spirochetes in a smear preparation stained by Leishman. Magnification 2260.

Fig. 3.—Section of the brain of a European who died of sleeping sickness, showing an enormous increase of large branching neuroglia cells around a small vessel of the cortex. Magnification 450.

Fig. 4.—Very marked syphilitic arteritis, showing great diminution of the lumen, mainly caused by an inflammatory thickening of the inner coat. Magnification 5.

Fig. 5.—Section of the base of the brain of a monkey that died of experimental sleeping sickness caused by inoculation of the Trypanosoma gambiense. Magnification 250.

Fig. 6.—Longitudinal section of a perivascular sheath of the cortex of a monkey that died of experimental sleeping sickness. The large branching neuroglia cells are seen undergoing proliferation. Magnification 600.

Fig. 7.—Longitudinal section of a small vessel of the cortex from a case of well-marked general paralysis of the insane. Magnification 250.

Fig. 8.—Transverse section of a small vessel of the cortex from a case of sleeping sickness, showing the perivascular cell infiltration of lymphocytes and plasma cells. Magnification 250.

Fig. 9.—Transverse section of a small vessel of the cerebral cortex from a case of syphilitic gummatous meningitis, showing the same perivascular cell infiltration of lymphocytes and plasma cells as seen in figs. 7 and 8. Magnification 250.
and syphilis. These changes were proliferation of the interstitial connective tissue cells forming the ganglion and hyperplasia of the lymphatic endothelial cells forming the capsule containing the nerve cells.

The diagram here given (fig. 1) after Volpino explains the supposed developmental cycle of the protozoan which is presumed to be the cause of rabies. The weak link in the chain is the assumed sporozoit which is so small as to be capable of passing through a Berkfeld filter. It has taken twenty years to lead to the complete knowledge of the life history of the malarial parasite and its relation to the disease, and all we can say is that there is now a certain amount of evidence forthcoming which tends to show that rabies is due to a protozoan, which Calkins, who discovered a similar body in the epithelial cells of variolas, places among the rhizopods.

There are certain chronic trypanosome infections in which the nevrosis becomes a specific feature of the disease, notably sleeping sickness (see Plate II, fig. 1) and a disease affecting horses, termed mal de coit or dourine.

The chronic trypanosome affections resemble in many respects syphilis; they are characterized by local infection, enlargement of the nearest lymphatic glands, a general polyadenitis and successive eruptions, accompanied by fever. The tissue changes are the same whether we examine the primary seat of infection, popular eruptions on the mucous membrane or the skin, or the lymphatic glands.

When the nervous system is affected a local or general chronic meningo-encephalitis is set up, characterized by a meningial and perivascular infiltration with lymphocytes and plasma cells, occasioned by a chronic irritative process, presumably caused in the case of sleeping sickness by the presence of trypanosomes in the cerebro-spinal fluid (see fig. 8, Plate II.). The same perivascular and meningeal infiltration with plasma cells and lymphocytes is found in syphilitic and parasplastic diseases of the nervous system (see Plate II., figs. 7 and 9).

The significance of pathological changes in the cerebro-spinal fluid has recently become of great importance in the diagnosis of nervous diseases, and a short account of the subject in this article will therefore not be out of place. The cerebro-spinal fluid is clear like water; it has a specific gravity of 1006 and resembles in its composition the blood with its corpuscular and albuminaceous constituents. It is secreted by the choroid plexus, and if any cause, such as tumour or meningitis, should interfere with its escape from the ventricles it gives rise by pressure to internal hydrocephalus and cerebral anaemia which may occasion epileptic convulsions and various degrees of drowsy stupor, lethargy, unconsciousness and even coma. Withdrawal of the fluid by lumbar puncture and by tapping the ventricles of the brain has been employed in treatment, but without very satisfactory results. If, however, lumbar puncture has proved of but little use in treatment, it has proved of inestimable service in the diagnosis of various kinds of diseases of the central nervous system. The fluid withdrawn may be examined in various ways which are complementary to one another.

It should be centrifuged and the deposit examined microscopically if necessary after staining by suitable methods; the existence of cells based on experience, that the syphilitic poison is the cause of these diseases of the majority of instances. Among syphilis, when it attacks the supporting, enclosing and nutrient vascular tissues, shows a predilection to affect structures about the base of the brain, and paralyses the third and fifth nerve of this character. Rabies, through the whole nervous system is charged with the poison, the medulla oblongata (as shown by the symptoms) is especially affected. Again, in tetanus the bacilli are only found in the muscles which have been destroyed by the animal's jerks; but they elaborate a virulent poison, which affects particular groups of neurons. The fact that lockjaw nearly always occurs first, shows that the poison selects the motor nucleus of the fifth nerve; but it is remarkable that experiment has shown that the tetanus toxin, if mixed with an emulsion of nervous matter before injection into an animal, loses its toxicity. This fact indicates its affinity for nervous matter, and also a power of absorption of the poison by some nervous matter, similar to that found by different procedures, is offered by diphtheria. A neuro-toxin is produced by the local action of the bacilli, for they do not become freely generalized in the blood and tissues. Whether the poison is a direct production of the bacilli themselves, or is an auto-toxin created in the body itself, by an influence exerted on the living fluids and tissues by a ferment-like product of the bacilli, is not determined. But whatever may be the source of the toxin, its effects upon the nervous system, as shown by the sufferings of the patients—paralysis of the soft palate, with nasal speech and regurgitation of fluids through the nose when swallowing is attempted; inability to read—owing to the paralysis of the visual and motor portion of accommodation; weakness of the supporting structure of the limbs, which may amount to paralysis; absence of the kneecaps; and often skin anaesthesia.

The remarkable to the existence of widespread diseases affecting men and animals is becoming yearly of greater importance and interest. Certain hitherto obscure diseases in which the nervous system is profoundly affected are now explained by the invasion of the tissues of the body by these lowly organisms, for example, Sleeping Sickness, the cause of which has been definitely proved to be the Trypanosoma gambiense (see Plate II., fig. 1).

The discovery by Schaudinn of the presence of the Spirochaetae Pallida (see Plate II., fig. 2) in the primary and secondary lesions of several diseases, and the general acceptance of this organism as the cause of the disease, taken together with the fact that in many respects it simulates the trypanosome in its mode of division and other characters, tend to prove that syphilis is also a protozoal disease.

The bacterial invasion of tissues is generally characterized by a migration of polymorpho-nuclear leucocytes, but protozoal invasion is characterized by a formative hyperplasia of the fixed cell tissues, endothelial, epithelial, and connective, and there is a close similarity in the defensive reaction of the tissues to all forms of protozoal invasion (see Plate II. with explanatory text).}

**Trypanosoma diseases and affections of the nervous system.**

![Stadio del virus filtrabile](https://via.placeholder.com/150)

*From a coloured plate in Centralblatt für Bakteriologie, by permission of Gustav Fischer.*

**NEUROPATHOLOGY**

**Plate 1**

**Protozoa and diseases of the nervous system.**

Fig. 1. The discovery by Schaudinn of the presence of the Spirochaetae Pallida (see Plate II., fig. 2) in the primary and secondary lesions of several diseases, and the general acceptance of this organism as the cause of the disease, taken together with the fact that in many respects it simulates the trypanosome in its mode of division and other characters, tend to prove that syphilis is also a protozoal disease.

Only a short time has elapsed since Negri showed that in cases ofabies, whether experimental or otherwise, curious bodies measuring from 1 to 20μ could be constantly found in the nerve cells, and that these bodies were not found in the nerve cells in any other disease so that even if the theory advanced that they are cellular forms of protozoa prove not true, yet the discovery affords a valuable and expedient means of determining whether a suspected animal suffered with rabies or not. It is known that the salivary glands and saliva contain the virus, even before the animal shows symptoms. It is known too that the central nervous system contains the virus and that it multiplies there. Experimental inoculation can be made either from the saliva or an emulsion of the central nervous system of an animal suffering with rabies. Moreover, the virus can pass through a Berkfeld filter; if the filtrate is to be injected into a rabbit, the fluid which will distill through the filter will exhibit the Negri bodies. There are only two conclusions to be drawn from these observations: (1) If it be a protozoal disease, the organism at one period of its developmental cycle must be so small as to be able to pass through the pores of the Berkfeld filter. (2) Negri bodies are the result of intra-cellular degenerative changes caused by an elective affinity of the virus for the protoplasm of the nerve cell. This discovery is of course, of the greatest importance in the diagnosis of rabies.

In a case of rabies, the diagnosis of rabies was made by microscopic examination of the spinal and sympathetic ganglia, particularly the ganglia of the vagus and fifth nerves. Changes were found similar to those met with in other protozoal diseases, namely, sleeping sickness, dourine...
in a fluid which normally contains no cellular elements indicates disease of the central nervous system. In general paralysis, syphilis of the nervous system and tabes dorsalis even in early stages of these diseases is usually characterized by a turbid fluid. Some evidence of the progress of the disease and the effect of treatment may be obtained by counting the number of cells at different periods. In tuberculous meningitis, for instance, the abundance of bacilli in the tuberculous fluid cannot readily be found, but bacilli are present, for injection of the fluid into a guinea pig is a certain means of determining whether it is tuberculous meningitis or not. Tubercular meningitis is not the only cerebro-spinal meningitis and the cells in the deposit are polymorpho-nuclear leucocytes, and in the leucocytes can be seen the specific organism Diplococcus intracellularis with its characteristic staining and rapid multiplication. However, this becomes blurred metalic grains. This may also invade the central nervous system giving rise to meningitis, and in these cases the deposit will be polymorpho-nuclear leucocytes, and the organisms are difficult to find. But if the disease is of the meningitic type; but if not, they can be obtained by cultural methods. In all operations of this kind antiseptic precautions must be adopted both for the safety of the patient and the reliability of the findings, otherwise organisms in the skin may contaminate the fluid withdrawn.

Other formed elements which may be found are large cells, macrophages containing blood pigment; these cells indicate that some haemorrhage has occurred. One of the most important uses of turbid centrifuged fluid is the discovery of the causation of the sickness. The fluid withdrawn and centrifuged contains, as one would expect from the lesions in the brain and spinal cord, large numbers of macrophages, white blood cells, lymphocytes, and, besides, the actively moving organisms (Trypanosoma gambiense) (see Plate II. fig. 1) which are the essential cause of the disease. It has been remarked that the normal cerebro-spinal fluid is devoid of protein, but if present in large quantities it is a sign of disease. In the cerebro-spinal fluid in sleeping sickness led to the belief that the specific organism of syphilis, Spirochaeta pallida, might be found in the cerebro-spinal fluid in syphilitic diseases of the nervous system, but although in a few instances successful inoculation of animals with syphilis by injection of the cerebro-spinal fluid has been effected, yet the organism has only once been found in the fluid withdrawn by lumbar puncture. It has long been a puzzle why only certain individuals, about 5%–8% of those infected with syphilis, should subsequently suffer with diseases of the nervous system. The skin and mucous orifices are the most common sites of the early appearance of the primary lesion, and irritation takes place in the central nervous tissues, but no tissue or structure in the body is exempt. It is probable that the virus attacks tissues when in a low state of resistance, alcohol and other stimulants being the most frequent agents. This also indicates that there is a specific reaction of the tissues to the living virus and the parasypilhics, an apparent cause, and the paralytic affections, which cause a feature, the former may be more successfully treated with mercury, which has the power of devitalizing the specific virus and preventing its multiplication, the same as atoxyl prevents the multiplication of the trypanosomes. Iodide of potassium favours the absorption of the degenerative products of the cells, and syphilus tumors may rapidly resolve with mercury under the influence of these drugs. Nervous symptoms even so severe as to threaten a rapidly fatal termination may disappear with energetic treatment when they are due to the syphilus tumors, and not to an inflammatory reaction of the tissues; not so, however, when the symptoms are slow, insidious and progressive, due to a primary decay of the nerves, e.g., the parasypilhics affectations tabes dorsalis and syphilis paralytica, the syphilus meningitis accompanying syphilus disease of the same cause. We can understand that it may be a chance whether a man suffers with true brain or spinal cord syphilis, because it may be a chance whether the virus is caused there by the blood-vessels and lymphatics, and if carried there finds a suitable nidus to develop. But the parasypilhics affects appear to be due to a premature primary decay of the neural elements owing to blood-poisoning and other sympathetic influences from the syphilus virus. There are a great many facts now forthcoming which show that the subjects of parasypilhics present mild symptoms of syphilis, and as the disease is so long it is not until ten years later that they develop nervous symptoms, and then in the middle of the tongue or the back of the mouth or tongue. Such subjects are immune to a second attack of syphilis, and the examination of the fluid and cerebro-spinal fluid by the Wassermann test will show absence of syphilus infection. It is in fact that there is a biochemical change; the presence of this reaction may be correlated with the fact that these fluids contain lipoid substances and a globulin in excess. The cerebro-spinal fluid contains these lipidoid substances and globulin in proportion to the degree of decay of the neural structure; they arise from the destructive metabolism of the neural elements. Lipoid, though produced only in the blood of syphilus individuals, consequently it must be supposed that in general paralysis and tabes certain groups and systems of neurenes undergo decay from exposure of some kind to syphilus venereum. (1) a biochemical stimulus, the syphilus poison, (2) excessive physiological stress, which in non-syphilus individuals would only lead to cerebral or spinal neurasthenia.

Terrified by a progressive lethargy, paresis, tremors and the signs and symptoms of neural exhaustion without neural destruction; it comes on slowly and insidiously often years after infection and eventually terminates fatally by the sensorial decay of the central nerve system. The symptoms of the central nervous system explains the fatal lethargy; the perivascular and meningeal lymphatics are filled with lymphocytes, and in these organs there is a considerable development of secondarily affected cells have undergone a rapid formative proliferation (Plate II. figs. 3 and 5). The effect of this morbid process is to deprive the neural elements of oxygen and nutrition; the neurenes in consequence, although not destroyed, are nevertheless unable to function for more than a few years.

(2) Poisons introduced into the Body.—The most widespread and pernicious of all medical diseases is the abuse of alcoholic stimulants. At least 20% of the natives of the asylums of London are admitted with a history of alcoholism. In not more than 10% is alcohol the efficient cause of the mental disease; in many it is only a contributory cause. Alcohol is a stimulant of the nervous system, and intemperance is the first sign of the mental breakdown. Most of the patients admitted inherit the neuropathic tendency, and it is a rare thing, among such, to find cirrhosis of the liver with ascites, a condition peculiar to male persons. A great Irish writer, from a very large experience as pathologist to the asylums of London, only remembers one such case, and that was in a notorious drunkard who was certified insane and was killed within four years. Neurasthenia, before she could be certified as of unsound mind, a fact which indicates that she inherited a very stable nervous constitution. To people with unstable nervous systems a relatively small quantity of alcohol is sufficient to act as a poison. This epitheloid, imbeciles, criminals, potential lunatics, hysteric, neuroexpression and the subjects of head injury are liable to become anti-social and dangerous to themselves and others by indulgence in quantities of alcohol which would have no effect on the stable nervous system. Alcohol may produce acute delirium, with fine tremors, and, generally, visual hallucinations of a horrible nature, indicating acute toxic influence upon the brain. This apparently acute form of alcohol poisoning is met with in chronic inebriates especially; it is much commoner in men than in women, and it is remarkable how a severe injury or illness, such as pneumonia, will bring out delirium tremens in about 4% of cases. If the patient has enough alcoholic in the system, the effect on the nervous system of chronic tipping may be dementia, a very characteristic manifestation of the mental degeneration being absence of knowledge of time and place, personal illusions and loss of memory of recent events, indicating a failure of receptivity and of the formation of memory-features of the higher centers, mental confusion, delusions of persecution, and especially a morbid jealousy with suspicions of fidelity of the husband by the wife or of the wife by the husband. A certain amount of improvement may occur, the dementia is a marked disorder. Apathy and proper control generally ends in recovery, but such cases so frequently relapse that it is fairly certain that alcohol is an exciting factor to a morbid or insane temperament. Besides mental symptoms of chronic alcoholic poisoning, there is frequently paralysis, affecting especially the lower limbs (structures suffer more where vitality is least), although the chronic alcoholic does not suffer from the acute symptoms of severe cases. The patient, usually of the female sex, becomes helpless and bedridden, and death frequently occurs from heart failure. Characteristic features of this affection are great tendingness on the part of the patient to the action of alcohol; this consists in a variable degree of skin anaesthesia, wasting of muscles and alteration of the normal electrical reactions, and frequently pyrexia. There is also a great tendency of the central nervous system to develop primary neuritis, muscular atrophy and marked dementia. This "complex of symptoms" points to a peripheral neuritis, although frequently changes occur also in the ganglion cells, from which the axis cylinders of the nerves have their...
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Alcoholic polyneuritic psychosis affecting women in many ways resembles delirium tremens; the fact that neuritis occurs much more frequently in women is probably associated with a greater liability to the influence of microbial toxins by absorption from the organs of men.

Fig. 2. Consciously not the imperfect origin (vide figs. 2, 3, 4, and 5). Alcoholic polyneuritic psychosis affecting women in many ways resembles delirium tremens; the fact that neuritis occurs much more frequently in women is probably associated with a greater liability to the influence of microbial toxins by absorption from the organs of men. Thus into the system produces progressive degenerative changes in the brain and spinal cord, which are manifested by psychical disturbances, such as slowness of thought, weakness of memory, dulness of perception, sometimes delirium and incoherence; other symptoms are blunted sensibility, dilated pupils, muscular spasms, perhaps even epileptiform fits, and ataxia, and, lastly, stupor deepening into coma. Sausage disease, due to eat- ing the meat and fish infected with Bacillus botu-linus, is associated with symptoms which: of a nature to terminate fatally, and it has been shown that the symptoms are due to a poison which has a toxic destructive effect upon the nerve cells (fig. 6).

II. Normal and Abnormal Stimulation.—The nervous system, in order to develop and manifest functional activity, requires suitable stimulation from without. Structural function and responses are mutually reciprocal and interdependent; for a structure which is not used will gradually lose its function, while its nutrition will also suffer, and in time atrophy may occur. Consciously and unconsciously, a continuous stream of impulses is pouring into the nervous system from without by the sensory channels, which are the avenues of experience and intelligence, and our somatic and psychical life depends upon the existence of such stimuli. The nervous system in the form of systems, groups and communities of neuromere, each with special functions, yet all woven together in one harmonious whole, develops in a particular way in consequence of the awakening influence of these stimuli from without. Consequently nervous structures which are not used are liable to undergo regressive metamorphosis and atrophy; thus amputation of a limb in early life causes atrophy of the nervous structures which presided over the sensation and movement of the part. This is seen both in the grey and white matter of the spinal cord; there is also an atrophy of the physio-motor neurones of the brain presiding over the movements of the limb.

A healthful physical, intellectual and moral environment of the individual is an essential factor in the prevention and cure of psychoses and neuroses, because it tends to develop and strengthen body and mind, deliberation, judgment and the higher controlling functions of the brain. A function not used will gradually disappear, and become more and more difficult to evoke. This fact is of importance in functional neuroses and psychoses, e.g. hysterical paralysis, melancholia and delusional insanity, because the longer mental or bodily function is left in abeyance, the more likely is the defect to become permanently installed. The converse is also true; the longer a perverted function exists, the more unlikely it is to disappear. Thus auditory hallucinations, a very important and frequent symptom of insanity, from the tones of which the mentally sick are followed by “voices,” which eventually become so distinct and real that the greater part of the patient’s psychological existence is centered upon, and determined by, this abnormal stimulus from within, indicating progressive strengthening and fixation of the perverted functions of the mind, and progressive weakening and dissolution of the normal functions.

Mental pain in the form of grief, worry, anxiety, fright, shock, violent emotions (pleasurable or painful), disappointed love, sexual excesses or perversions, and excessive brain work, frequently precede and determine, in persons with the insane or neuropathic taint, (a) attacks of delirium, e.g. mania, melancholia, delusional insanity; (b) of neuroses, e.g. hysteric, epilepsy, hysteria, hystero-epilepsy; (c) organic brain disease, e.g. apoplexy, thrombosis, general paralysis.

Vascular reflex irritation affords many examples of neuroses and psychoses, the symptoms of which are set up by irritation of the viscera, e.g. intestinal worms. Teething and indigestible food are often the exciting cause in infants and young children of convulsive spasms of the glottis and tetany. Various functional and organic
diseases of the female reproductive organs act as exciting causes in the production of hysteria, hystero-epilepsy, melancholia and mania; menstrual disturbances caused by the monthly and annual changes, however, do not always occur at the menstrual period or menopause. The irritation of a curious tooth may produce spasmodic tic and trigeminal neuralgia. Wax in the ear may occasion vertigo and tinnitus; and eczema or of the feet, which often even tend to excite epileptic fits in a person suffering from epilepsy. Numerous other examples of peripheral disturbance could be mentioned as exciting causes of nervous affection in neurotic individuals. Irritation of the terminals of the vagus in any part of its widespread visceral distribution may lead to vomiting. The characteristic pain of angina pectoris, which radiates down the inner side of the left arm, is explained by the fact that the cardiac branches of the sympathetic arise from the same segments of the spinal cord as the sensory branches of the ulnar nerve; consequently the pain is referred to the corresponding skin area supplied by this nerve. This is a typical example of referred pain.

III. Injury or disease of enclosing or supporting structures may lead to paralytic or irritative lesions of the nervous system, or the two may be combined. Blows or wounds of the head and spine may damage or destroy the nervous structures by shock or direct injury. Concussion of the brain or spinal cord may occur, as a result of injury, without any recognizable serious damage of the enclosing structures or even the central nervous system. Shock, due to concussion, can only be explained by a molecular or bio-chemical change in the nervous structures. Direct injury or a fall fracturing the skull, driving the fragment of bone into the cavity of the brain, is one of the most common causes of interruption of the function of the tissue; but wounds and diseases of the enclosing and supporting structures, if producing simple non-infective inflammation, give rise only to such symptoms as accord with the nerve structure irritated or destroyed. Should, however, the wound or diseased structure become infected with micro-organisms, the disease spreads and becomes generalized likewise the symptoms. Of all the causes of infective inflammation, middle-ear disease, on account of its frequency and insidious onset, is the most important. It is very liable, when neglected, to be followed by a secondary lymphatic infection, which abscesses and frequent seat of which is in the adjacent temporal lobe, but it may be in other parts of the brain, e.g., the cerebellum and frontal lobe (Plate I. fig. 3). The peripheral nerves may be destroyed or irritated by direct injury, disease or new growth in adjacent tissues, or they may be involved in the cellus thrown out round the seat of a fracture.

Diseases of the blood-vessels are among the most frequent causes of organic brain disease. Arteries or veins—more frequently the former—may become blocked or ruptured from various causes. The immediate effect is a disturbance or loss of consciousness, leading to a stroke of the brain (cerebral apoplexy) and never regain consciousness (see Coma). Should the individual recover consciousness more or less permanent loss or disturbance of function will be the result. Paralysis of some form, especially hemiplegia, is the commonest result, but the loss or disturbance of function will depend upon the extent of the injury.

The cerebral arteries may be occluded by embolism; a portion of a clot or vegetation from a diseased valve of the left side of the heart may be detached, and escape into the circulation; and this is carried into the large blood-vessels of the brain, usually the internal carotid; the blood-vessels on the inner side of the right side of the brain, and the blood-vessels on the inner side of the left side of the right brain. The area of brain tissue supplied by that artery is deprived of blood, and undergoes softening in consequence, resulting in infarction or death of the opposite half of the brain (hemiplegia) associated with aphasia when the paralysis affects the right side in a right-handed person (Plate I. figs. 5 and 9). When the embolus is infective, as it frequently is in ulcerative endocarditis, its lodgment in an artery of the brain, not only blocks the vessel but leads to an infective inflammation and softening of its walls, with the formation of an abscess. The aneurysm may suddenly rupture into the substance of the brain and produce apoplexy. In fact the majority of cases of apoplexy from cerebral hemorrhage occurring in young people are due to this cause. Softening may also arise from coagulation of the blood (thrombosis) in the arteries or veins. There are many cases which generate combine or conspire together to produce thrombosis, viz., a weak acting heart, heart altered conditions of the blood, and sometimes independently of vascular disease spontaneous coagulation in a vessel of the brain may occur. It is sometimes met with in the cachexia of certain grave diseases, viz., in phthisis and cancer, in typhus and pneumonia, after paraparitis and in marasmus at all periods of life, but especially in the very young and very old. But thickening, roughening and a degenerated condition of the cerebral arteries known as arteriosclerosis, associated with a weak acting heart is especially liable to give rise to thrombosis and softening, and this is a very common cause of apoplexy, paralysia and dementia in people who have passed middle life. General disease of the arteries of the body, associated especially with acute Bright's disease and high arterial pressure, is frequently attended with the formation of minute aneurysms upon the cerebral arteries, which may rupture and cause apoplexy. Hemorrhage into the brain from this cause is especially liable to occur in certain situations; one vessel in particular, supplying the basal ganglia, most frequently gives way, the effused blood tearing through the most superficial layers of brain, proceeding from the cerebral cortex in the shape of a funnel, become aggregated together to form the neck between the two masses of grey matter—the optic thalamus and the corpus striatum (Plate II, fig. 6). The result is hemiplegia of the opposite side of the body. Apoplexy of the spinal cord and nervous system, occurring in a person under forty, is generally due to syphilis, the virus of which produces an inflammation of the coats of the vessel, especially the inner (see Plate II. figs. 4, 9, 10). The thickening and narrowing of the lumen with loss of elasticity of the arteries of the brain generally, may suddenly or gradually set up conditions of cerebral anemia and give rise to semi-comatose and comatose or even apoplectic states. Occlusion by the inflammatory proliferation or by the sudden clotting of blood in the diseased vessel may occur, the immediate effect of which may be an epileptic or apoplectic fit; the result is softening; and seeing that any or all the branches of the involved vessel are affected, or affected at random, the symptoms may be manifold. They may be general or local, and not uncommonly are associated with inflammation of the meninges or of the dura mater and membranes about the brain, or at the opposite side of the body, may manifest themselves, showing that the disease has attacked a fresh set of arteries. Disseminated sclerosis (insular) is another random morbid area, occurring especially the white matter, with certain characteristic symptoms of a progressive character, the pathology of which is not understood fully, but is probably due to some toxic cause. Islands of nervous tissue undergo a morbid change, commencing in

FIG. 7.—Diagram of left cerebral hemisphere, showing localization of function. The motor region is situated in front of the central sulcus, and is arranged in a series from the "toe to larynx" downward, corresponding in an inverse manner to the spinal series. Irritation of any part of this area will cause localized convulsive spasms, which may spread in a definite march to the whole motor area, as in Jacksonian epilepsy. Destructive lesions will cause paralysis. The centre for "taste and smell" is represented at the tip of the uncinate convolution. The "motor speech center" or "language center" is only in small part represented, for the larger part is on the mesial surface. "Hearing" is represented occupying the posterior half of the first temporal convolution, but only a small part of the centre is seen, for the greater part lies above within the fissure of Sylvius. Included in this area, but in the left hemisphere only, is the centre for "auditory word memory"; destruction of this causes inability to understand the meaning of written words uttered, although the patient is able to read. Behind this, in the angular gyrus, is the centre for "visual word memory"; destruction of this causes loss of power of understanding of written or printed words—therefore inability to read. In front of the motor area is the "motor convolution", the centre of "motor speech"; destruction of this produces motor aphasia, or inability to articulate words. Above this is a centre which is connected with written speech. The centres concerned with verbal and written language are connected to "command", local, fibres, and destruction of these produces language leads to various defects in verbal and written language. It will be understood from this diagram that diseases of the left hemisphere in right-handed persons are associated with results of more significance than similar affections of the right hemisphere.
the myelin sheath and ending in an increase of the supporting neuroglia tissue at the expense of the true nervous tissue.

Tumours and new growths in the central and peripheral nervous systems may be primary or secondary: the former arise in the supporting, enclosing or nutrient tissue elements; the latter are metastatic deposits from tumours originating elsewhere. Tumours may be single or multiple, the special symptoms occasioned depending upon the seat of the tumour and whether it destroys or only irritates the adjacent nervous tissue. Tumours situated within the cranial cavity cause general symptoms, namely, optic neuritis, severe head-ache and vomiting; these symptoms, which are caused by increased intracranial pressure, are more severe in rapidly-growing vascular tumours, even though small, than in large slow-growing tumours.

Fig. 8.—Diagram of section of the spinal cord in the upper cervical region, showing recent degeneration of the crossed pyramidal tract of the right side and direct pyramidal tract of the left side. The black dots indicate the degenerated fibres stained by the Marchi method. This degeneration is secondary to haemorrhage into the internal capsule of the left hemisphere, and it will be observed by the number of degenerated fibres that the greater bulk have crossed over to the right side of the spinal cord, thus agreeing with the fact that the paralysis is of the right half of the body.

Fig. 9.—A diagram to indicate afferent, efferent and association systems of neurones. It will be observed that there are three nervous circles indicated by the arrows—spinal, cerebellar and cerebral. In every perfect co-ordinate movement impulses properly adjusted are flowing along these three systems of neurones. In systemic degenerations one or more of these systems may be affected, and the symptoms will depend partly upon the function which is lost or disturbed, and partly upon the disturbance of equilibrium of the three co-ordinated systems.

Fig. 10.—Diagram of spinal cord, fifth lumbar segment, from a case of advanced tabes dorsalis. The posterior column is shrunken, and but faintly stained, except in the anterior part; the shrinking and the loss of stainability are due to the absence of fibres of the posterior roots, which normally form the greater part of this region of the cord. The fibres which are seen in the anterior part of the posterior column are derived from cells within the spinal cord, and belong to spinal association neurones.

Fig. 11.—Diagram illustrating the relative number and wealth of cells and fibres in the cerebral cortex in the normal brain, in amentia and dementia. The horizontal systems of fibres are association systems, and it will be observed that these are especially diminished in amentia, and still more in dementia, whereas the radial fibres are less affected. In the normal, there are five layers of cells arranged in columns (Meynert's); in the pathological conditions it will be observed that the pyramidal-shaped cells no longer have their apical processes pointing vertically upwards. The processes are broken off, the cells are distorted in shape and diminished in numbers, and the degree of dementia in a wasted brain is proportional to the atrophy and destruction of the small and medium-sized pyramids of the whole cerebral cortex, and the disappearance of the superficial layers of fibres. This is specially manifested in paralytic dementia and the dementia of chronic insanity.
Some tumours are highly vascular and a large thin-walled vessel may suddenly rupture and cause an apoplectic fit. If the growth is situated in a portion of the cortex having some special localizing function, e.g. the motor area (vide fig. 7), it may give rise to epileptiform convulsions, starting in a limb or definite group of muscles; but the irritation usually spreads to the whole motor area of the same side, and even extends to the opposite hemisphere, by an overflow of the discharge through the corpus callosum. In such case there is a loss of consciousness. If, however, the tumour destroys the cerebral cortex of a particular region, it may give rise to a paralytic lesion, e.g. paralysis of the arm (vide Plate 1., fig. 4).

Organic diseases of the blood-vessels, or of supporting and enclosing tissues, produce secondary degenerations of the nervous system. The symptoms, like the lesion, are obvious, coarse and obtrusive; frequently arising suddenly, they may in a short time terminate fatally, or tend towards partial or complete recovery. Various forms of motor and sensory loss and disturbance of function may arise, indicating destruction or disturbance of particular regions of the central nervous system; and degenerations in certain tracts and systems of fibres arise, corresponding to histological features with those observed when a nerve fibre is separated from its cell of origin by section (secondary degeneration of Waller and Türck) (vide fig. 8, with explanation). This form of degeneration must be distinguished from primary degeneration, which is due to an inherent nutritional defect of the nerve cell and all its processes (the neurone), in which a regressive metamorphosis occurs; it starts in the structures of the neurone latest developed (namely, the myelin sheath and the fine terminal twigs of the axis cylinder and dendrons), and proceeds back to the main branches and trunk, eventually destroying the trophic and genetic centre itself, the nerve cell. These primary degeneration processes are insidious in origin, progressive in character, and nearly always fatal in termination; they affect definite systems, groups and communities of neurones in a progressive manner, and, therefore, are associated with a progressive evolution of symptoms, related to the structures affected (vide figs. 9 and 10).

To cite some examples: (1) Locomotor ataxy, on the one hand, is a primary degeneration affecting the afferent system of neurones; it is characterized by muscular incoordination without wasting, inability to stand with the eyes shut, painful or aching in the limbs, absent knee-jerks, Argyll-Robertson pupils, and other symptoms pointing to a morbid process affecting especially the afferent sensory system of neurones. (2) Progressive muscular atrophy, on the other hand, is a disease of the efferent motor system of neurones of the brain and spinal cord, characterized by progressive wasting of groups of muscles innervated by groups of neurones which are undergoing degeneration. A far more chronic form of this disease frequently arises from affection of the medulla oblongata, causing what is known as bulbar paralysis. Infantile paralysis is an acute inflammation of the anterior horns of the spinal cord, causing destruction of the spinal motor neurones of the anterior horn. It differs from the above chronic disease in its sudden onset and non-progressive character; it resembles it in producing paralysis of muscles without sensory disturbance of the general kind. (3) General atrophy of all the neurones of the central nervous system is a degeneration which begins in the association system of neurones of the cerebral cortex, but which may be, and frequently is, associated with degeneration of the afferent or efferent systems (fig. 9).

Neurones and psychoses have not hitherto been satisfactorily explained by definite morphological changes in the brain (Plate I., fig. 1). We know little or nothing accurately about the morbid histology of insanity, except as regards the morphological changes met with in cases of amentia and dementia. The conditions of amentia, namely, idiocy and imbecility, are associated with arrest of development of the brain, as a whole or in part, the naked-eye evidence of which may be afforded by small size and simplicity of convolutions of the brain as a whole or in part (Plate I., figs. 2, 8 and 10); and the microscopical evidence by arrest of development, or imperfect development, of structures connected with the higher functions of the mind, namely, the association neurones in the superficial layers of the cerebral cortex (fig. 11). Conditions of dementia, primary or secondary, are associated with progressive decay and atrophy of the superficial layers of the grey matter of the cortex, and naked-eye evidence thereof is afforded by partial or general wasting of the cerebral hemispheres, accompanied with thickening of the pia-arachnoid membrane, atrophy of the convolutions, and with deepening and widening of the intervening sulci (Plate I., fig. 7).

The cerebro-spinal fluid fills up the space in the cranial cavity caused by the atrophy of the brain; consequently there is a great

FIG. 13.

FIG. 14.

Motor Cells, drawn from Microphotographs of Preparations stained by Nissl method to show Microchemical Changes produced by various diseases.

FIG. 12.—Normal motor cell from cerebral cortex, showing a mosaic pattern of the cytoplasm due to a substance stainable by basic aniline dyes; this stainable substance exists also on the dendrons. By comparing the appearances of this cell with the other figures a just idea can be obtained of the morbid changes which result in various pathological conditions.

FIG. 13.—Cell from a case of hyperpyrexia—disappearance of the mosaic pattern, substance uniformly stained; absence of the chromatic elements on the dendrons, due to a precipitation of all globulin by the heat.

FIG. 14.—Cell in an advanced stage of coagulation necrosis, complete absence of mosaic pattern; diffusé fine dust-like stain; breaking off of the processes; all caused by softening of the brain from vascular obstruction.

FIG. 15.—Another specimen from the same brain in a still more advanced stage of destruction, and showing a phagocyte attached to the cell and devouring the decayed structure.

FIG. 16.—A cell with enormously swollen nucleus, the result of hydration due to absorption of fluid after ligature of cerebral vessels. Such a cell will probably recover. 

excess of this fluid. Before general paralysis was recognized as a disease some of the cases which died suddenly in a fit were doubtless termed serious apoplectic. This wasting so characteristic of general paralysis is especially due to atrophy of the cells and fibres of the superficial grey matter of the cortex, sections of which, examined microscopically, after suitable methods of staining have been employed, show great poverty, or complete loss, of three sets of delicate myelinated fibres, namely, tangential, super-radial and the inter-radial corresponding to the line of Baillarger. This degeneration
of the superficial association fibres of the cerebral cortex affects especially the frontal and central convolutions, and is the earliest and most constant microscopical change in progressive paralytic dementia; it is accompanied usually by meningeal and vascular changes, atrophy of the nerve cells, and proliferation of the neuroglia (fig. 11); especially characteristic is the perivascular infiltration with lymphocytes and plasma cells (see Plate II, fig. 7). It was indeed thought that this condition of the vessels was pathognomonic of general paralysis; it certainly is not, for it is found throughout the central nervous system in sleeping sickness and cerebro-spinal syphilis (Plate II., figs. 8 and 9). It sometimes occurs in the neighbourhood of cerebral tumours but it is not found in uræmia or lead encephalitis. Possibly new methods may enable us to show changes of structure in diseases such as epilepsy and delusional insanity, in which hitherto no naked eye or microscopical structural defects accounting for the symptoms have been certainly demonstrated.

In conditions of acute mania there is usually considerable vascular engorgement. The histological changes, however, probably be more correct in assuming that insanity (especially those forms in which there is neither amentia or dementia) is due to alterations in the quality

![Diagram](image-url)

**Fig. 17.—Diagram to illustrate various stages in degeneration and regeneration of medullated nerve fibres.**

1. Normal medullated nerve with node of Ranvier.
2. Degenerated nerve, ten days after section, showing degenerated myelin stained black; disappearance of axis-cylinder.
3. Central end of cut nerve, showing at the top an axis-cylinder budding out, proliferated neurilemmal cells, and still some degenerated myelin in sheath.
4. Peripheral cut end of same, showing proliferated neurilemmal cells, still some degenerated myelin.
5. Complete absorption of degenerated myelin, proto-plasmic basis of new fibre formed out of neurilemmal cells.
6. A new fibre, with axis-cylinder.
7. Central end of cut nerve at junction, showing an axis-cylinder sprouting and forming a number of axis-cylinder processes, which grow into the central end to form new channels of conduction.
8. Is a new regenerated fibre resembling a sympathetic fibre in having as yet no myelin sheath; as the nerve becomes excitable and stimulus passes, a myelin sheath is formed.

rather than the quantity of blood in the brain. The primary dementia of adolescence, which in 80% of the cases occurs before the age of 25, in which hereditary taint is most common, and which frequently is accompanied by, or terminates in, tuberculosis, can be explained by the effect of toxaemic conditions of the blood on cerebral neurones with an inborn low specific energy and metabolic activity. The histological changes found in the brain do not serve to explain the symptoms, and we must look to bio-chemical changes in the body acting upon an innately unstable brain to explain the problems of the disordered mind in this disease.

**NEUROPATHOLOGY**

**Microscopical Changes in Degeneration of the Neurone.—** About 1850, Waller demonstrated that a nerve fibre underwent degeneration to its termination when separated from its cell of origin; hence the term "Wallerian degeneration." Embryological researches by Professor His showed that the axis-cylinder process (the essential conducting portion of the nerve fibre) is an outgrowth of the nerve cell. The cell, therefore, is the trophic and genetical centre of the nerve fibre. Acute alterations and death of the nerve cells may occur from toxic conditions of the blood; from high fever (107°-110° F.); arrest of the blood supply, as in thrombosis and embolism; or actual destruction by injury, haemorrhage or inflammation. These morbid processes produce, as a rule, bio-chemical as well as morphological changes in the nerve cell and its processes. Space will not allow of a full description, but some of these changes are indicated in figs. 18-22, with explanatory text. When a nerve cell dies, the nerve fibre undergoes secondary degeneration and death; that is to say, the whole neurone dies, and regeneration, at any rate in the higher vertebrates, does not take place. Restoration, or partial restoration, of function is due to other structures taking on the function, and the more specialized that function is, the less likely is restoration to take place. If, however, a peripheral nerve is divided, its component fibres are merely severed from their cells of origin. All that portion of the nerve which is in connexion with the nerve cells of origin practically undergoes no change. The peripheral portion undergoes degeneration, but from the central end of the nerve new axis cylinders again grow out and a new nerve is formed. With this regeneration comes restoration of function, which may be hastened by suturing the ends of the cut nerve. A similar regeneration, however, does not occur after section of fibres of the white matter of the central nervous system, and this may be due to the fact that the nerve fibres of the white matter of the cerebro-spinal axis possess no nucleated sheath of Schwann, which, by the light of recent investigations, is shown to play an important part in regeneration; in the writer's opinion, the neurilemmal sheath of the old fibre forms a new protoplasmic basis, into which the axis-cylinder from above grows, the passage of stimulus determining its function. Fig. 17, Nos. 1-8, with explanatory text, shows the changes which occur in degeneration and regeneration of a peripheral nerve after section, with loss of function; and subsequent union, with restoration of function. The writer, in conjunction with Professor Halliburton, has shown that the characteristic microscopical changes in the myelin sheath which occur in the process of regeneration are due to a splitting up of the complex phosphoretted substance "protagon" into glycerophosphoric acid, choline and oleic acid by a process of hydration. The Marchi reaction, which has been found so useful for demonstrating degeneration of the central and peripheral nervous systems, is dependent upon the fact that the myelin sheath, after hardening in a solution of bichromate of potash, does not turn black when acted upon by osmic acid, whereas the simpler non-phosphoretted fatty product of degeneration is stained black. When the Marchi reaction of degeneration is fully developed, it has been ascertained that the nerve yields no phosphorus. The degeneration resulting from section of a nerve is termed secondary, to distinguish it from another, primary, due to slow
NEUROPTERA

and progressive decay of the whole neurone, beginning usually at the terminal twigs and proceeding back to the cell body with its contained nucleus. There is primary degeneration of systems of neurones, correlated by function rather than by anatomical situation. Examples are afforded by locomotor ataxy and progressive muscular atrophy, the former being a degeneration of the afferent sensory system of neurones, the latter of the motor efferent system. The cause of primary degenerations is probably a defect inherited or acquired in the "vita propria" of the neurones affected. They slowly atrophy and disappear, and their place is filled up by an overgrowth of the supporting neuroglia tissue (figs. 10 and 18). This overgrowth of dense tissue is termed sclerosis, and was erroneously considered to be the cause, instead of the effect, of the atrophy of the nervous tissue.

For further information the reader may consult the Croonian Lectures on the Degeneration of the Neurilemma, by F. W. Mott, published in the Lancet (1900); and the same writer's "Introduction to Neuropathology." In Allbutt's System of Medicine. Also Gower's Handbook of the Nervous System, von Monakow's Gehirn Pathologie, Ford-Robertson's Pathology of Mental Diseases and Mott's Archives of Neurology, vols. 1, 2, 3 and 4. (F. W. M.)

NEUROPTERA (Gr. νευρόν, a nerve, and πτερόν, a wing), a term used in zoological classification for an order of the class Hexapoda. The name (from the class Hexapoda) in the original sense has had many varying meanings given to it by different authors. As first used by Linnaeus (1735) it included all insects with mandibulate jaws and two pairs of net-veined wings—dragon-flies, May-flies, stone-flies, lacewing-flies and caddis-flies—and it has been employed in the same wide sense by D. Sharp (Cambridge Nat. Hist. vol. v., 1895). But detailed study of these various groups of insects shows that beneath their common superficial resemblances lie important distinctions in structure, and essential differences in the course of the life-history. Some of the families—the stone-flies, for example—have the young insect in a larval stage, the adult, growing its wings visibly outside the thoracic segments, and active at all stages of its life. The dragon-flies and May-flies are also active throughout their lives and possess external wing rudiments, though the young insects differ rather strikingly from their parents. All such families—falling into the group Exopterygota as defined in the classification of the Hexapoda—were separated from the Neuroptera by W. E. Erichson (1839) and united with the Orthoptera, with which order some entomologists still associate them under the name of "Pseudo-orthoptera." The other groups of the old Linnean order (such as lacewing-flies and caddis-flies)—which are hatched as larvae markedly unlike the parent, develop wing-rudiments hidden under the larval cuticle, and only show the wings externally in a resting pupal stage, passing thus through a "complete" metamorphosis and falling into the sub-class Endopterygota were retained in the order Neuroptera, which thus became much restricted in its extent. More recently the subdivision of the Linnean Neuroptera has been carried still further by the separation of the caddis-flies and scorpion-flies as distinct orders (Plecoptera and Mecoptera respectively), and by the withdrawal of the "Pseudo-orthoptera" from the Orthoptera—with whose typical families they have little in common—and their division into a number of small orders. Altogether, eight orders are recognized in the classification adopted here, the first five of these belonging to the sub-class Exopterygota and the last three to the Endopterygota (see HEXAPODA).

The multiplication of orders is attended with practical difficulties, and the distinctions between the various groups of the Linnean Neuroptera are without doubt less obvious than those between the Coleoptera (beetles) and the Diptera (two-winged flies) for example. But if classification is to have practical usefulness it is impossible to associate in the same order families whose kinship to insects of other orders is nearer than their kinship to each other. And no student can doubt that the stone-flies are akin to Orthoptera and the caddis-flies to the Lepidoptera, while dragon-flies and May-flies stand in an isolated position with regard to all other insects. In the present article, for the sake of convenience, all the insects which have been regarded by Linnaeus and others as "Neuroptera" are included, but they are distributed into the orders agreed upon by the majority of modern observers, and short characters of these orders and their principal families are given. For further details the reader should consult the special articles on these groups, to which cross-references will be found.

Sub-class EXOPTERYGOTA

Order Plecoptera.

This order was founded (1869) by F. Brauer—the name having been long previously suggested by H. Burmeister (1832)—to include the single family of the Perlidae or stone-flies. They resemble the Orthoptera more nearly than any other group of the Linnean Neuroptera, having the anal area of the hind-wings folding fanwise beneath the costal area and the whole hind-wing covered by the fore-wing when the insect is at rest, though the fore-wing is not firmer in texture than the hind-wing, as is the case in the Orthoptera. In the opinion of J. H. Comstock and J. G. Needham the wing-neuration in this order is the most primitive to be found in the Hexapoda. The tenth abdominal segment carries a pair of jointed cerci which are often elongate, and the feelers are always long, while the jaws are usually feeble and membranous, though the typical parts of a mandibulate mouth are present—mandibles, maxillae with inner and outer lobes and palps, and second maxillae (labium) whose lacinia are not fused to form a ligula. Both head and trunk are somewhat flattened dorso-ventrally, giving the insects a very distinct and characteristic aspect. The stone-flies further resemble the Orthoptera in their numerous Malpighian excretory tubes, which vary in number from twenty to sixty. The reproductive organs, both ovaries and testes, become fused together in the middle of the body. A remarkable point in the Plecoptera is the presence in some forms (Pteronarca) of small branching gills on the three thoracic and the front abdominal segments. These organs appear, however, from the observations of H. A. Hagen not to be functional in the adult insect—though they may only survive from the aquatic nymphal stage.

Life-history and Habits.—The nymphs of the Perlidae are closely like their parents and breathe dissolved air by means of tracheal gills on the thoracic segments, for they all live in the water of streams. They feed upon weaker aquatic creatures, such as the larvae of May-flies.

The perfect insects, whose flight is feeble, are never found far from the water, a curious feature among them is the frequent reduction of the wings in the males of certain species, contrary to the usual condition among the Hexapoda, where if the sexes differ in the development of their wings, it is the female which has them reduced. The Plecoptera are world-wide in their range and fossils referable to them have been described from rocks of Eocene, Miocene and Jurassic age, while C. Bronniart states that allied forms lived in the Carboniferous Period.

Order Isoptera.

The two families included in this order agree with the Plecoptera in the young insect resembling the parent, but they are all terrestrial.
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G. Enderlein. The eleventh abdominal segment which carries the short jointed cerci (fig. 1, b, c) may remain in a reduced condition distinct from the tenth. There are only six or eight Malphigian tubes—contrasting with the large number of these excretory organs found in the Orthoptera and Plecoptera.

The Embididae are feeble, somewhat soft-skinned insects with the prothorax small and the mesothorax and metathorax elongate. The feelers are long and simple, and the wings are very narrow, each with a sub-costal, a radial, a median and a cubital nervure. The branches of the median and the cubital, however, as well as the radial nervures, are vestigial, and there are a few short cross-bars between the radial and the median. Some Embididae are entirely wingless in the adult state, and it has been suggested that this is always the condition in the juvenile state. Recent investigations of K. W. Verhoeoff, the family contains only thirteen known species. The Embididae live in warm countries, and are very retiring in their habits, hiding under stones where they spin webs formed of silk produced by a gland of the fore-feet.

The Termitidae (so-called “white ants”) are the other family of Isoperta. They are relatively shorter and broader insects than the Embididae with large prothorax and long wings, which have a transverse line of weakness at the base and are usually shed after the nuptial flight. The Termitidae are numerous in species in warm countries. The vast majority of individuals in a community consist of wingless forms—“workers” and “soldiers,” which are well developed members of either sex. Their economy is fully described in a special article on Termites.

Order Corrodentia.

The insects included in this order differ from those of the two preceding orders in their more condensed abdomens which bear no cerci, while the number of Malphigian tubes is reduced to four. In the absence of cerci the Corrodentia are more specialized than the Isoperta and Plecoptera, but some of them show a more primitive character in the retention of vestigial maxillulae—the minute pair of jaws that are found behind the mandibles in the Ants (fig. c). A large proportion of the Corrodentia are wingless. When wings are present the front pair are much larger than the hind pair, and the neuromere is remarkable for the concrescence of the median with the which have wings of the type described above, are further characterized by the presence of minute but distinct maxillulae, while the inner lobe (lacinia) of the first maxilla is an elongate, hard structure (the “pick,” fig. 3, c) and the outer lobe is convex and soft. The labial (second maxillary) palps are reduced to small, rounded prominences, which are vestigial, and the abdominal extremities consist of a great number of small sacs, resembling the lobes (fig. 3, c). The feelers of these insects are elongate and thread-like, consisting of from a dozen to nearly thirty segments.

The Book-louse are familiar wingless insects, often found in houses running about among old papers and neglected biological collections. They belong to the family Psocidae which has a few score species—most of them winged—living out of doors on the bark of trees and among vegetable refuse. In some Psocidae the wings are in a vestigial state, and the fully winged species rarely if ever fly. H. A. Hagen observed that some genera possess wing-like outgrowths on the prothorax, comparable to those seen in certain insects of the Carboniferous Period. The Psocidae themselves have not been traced back beyond the Oligocene, in the amber of which period their remains are fairly numerous.

Mallophaga.—This term was first applied by C. L. Nitzsch (1818) to the degraded wingless parasites (fig. 4) commonly known as bird-lobe biting-lice, differing from the true lice (see Hemiptera, Lousia) by their jaws adapted for biting (not for piercing or sucking). By their structure they are evidently allied to the Copeognatha. They are abundantly distinct, however, through the short feelers (not only three to five segments and the conspicuous prothorax. The head is relatively large, but the eyes are degraded and often absent. A remarkable feature is the frequent occurrence of vestigial outgrowths on the body and in some cases, even their fusion with the anterior abdominal segments. The legs are stout and spiny, and well adapted for clinging to the hair of the host and for clinging to the hair of the animal. It is usual to divide the Mallophaga into two families—the Lioheidae, possessing labial palps and two claw-like outgrowths, which are capable, on the death of their host, of seeking another, and the Philopteridae, without labial palps and with a single claw-like outgrowth. This claw is modified for clasping (fig. 4) which never leaves the host and perish themselves soon after its death.

Order Ephemeroptera.

This order includes the single family of the Ephemeridae or May-flies. The name, although quite recently proposed by A. E. Shipton, should be used rather than A. S. Packard’s older term Pteroptera on, c. Magnified 30-50 times.

Fig. 4.—Biting-louse (Trichodectes scutalis) of cattle. Magnified 50-150 times.

Order Odonata.

The distinctiveness of the dragon-flies from other insects included in Linnaeus’s Neuroptera was long ago recognized by J. C. Fabricius, also proposed for the order the common name of Odonata (5). They resemble the May-flies in their “hemimetabolous” life-history; the young insects are markedly unlike their parents, inhabiting fresh water and breathing dissolved air, either through gills or outgrowths at the tips of the antennæ, or through air-tubes on the walls of the rectum into which water is periodically admitted. The winged insects resemble the May-flies in their short fore-wings and in the form of their tubular or Malphigian tubes, but are most strikingly from those insects in their strong well-armoured bodies, their powerful jaws adapted for a predaceous manner of life, and the close similarity of the hind-wings to the fore-wings. The wings of the glassy appearance, and very complex in their neuromere; a remarkable and unique feature is that a branch of the radius (the radial sector) crosses the median nervure, while, by the development of multitudinous cross-nervures, the wing-area becomes divided into an indefinitely large number of segments. The tenth abdominal segment carries strong, unjointed cerci, while the presence of reproductive armature on the second abdominal segment.

Fig. 3.—Book-louse (Atropes divinatoria, Fab.), Europe. a. From below. b. Second maxille. c. From above, magnified 30-40, Mandible. times (eyes, feeler, feet and e, Lacinia or “pick” of first claws more highly magnified. maxillula. d. Mandible. f. Labium. Highly magnified. cubital trunk, and the zigzag course of many of the branches. All the insects of this order are of small size and the cuticle is imperfectly ciliated, so that the body is as whole is soft. The name Corrodentia was first used by H. Burmeister (1832) and has reference to the biting habits of the insects. Originally, however, the Corrodentia included the order which Enderlein has recently separated as Isoperta (see above). As at present restricted, the Corrodentia include two distinct sub-orders.

Copeognatha.—This sub-ordinal name has been applied by Enderlein to the “book-llice.” These frail insects, the majority of

Fig. 2.—Head of termite. a. Front view. b. Hind view, showing jaws (note the distinct inner and outer lobes of the second maxillulae. Magnified 20-30.

After Macflett, Ent. Bull. 4 (N.S.), U.S. Dep't Agric.
of the male is a character found in no other order of the Hexapoda. See special DRAGON-FLY.

Sub-class ENDOPTERYGOTA

Order Neuroptera

The insects retained in the order Neuroptera as restricted by modern systematists are distinguished from the preceding orders by the perfection of the maxillo-maxillary joint, the "complete metamorphosis" is undergone. Structurally the Neuroptera are distinguished by elongate feelers, a large, free prothorax, a labium with the former lobes of the maxillae fused together to form a median ligula, membranous, net-veined wings without hairy covering, those of the two pairs being usually alike, the absence of abdominal cerci, and the presence of six or eight Malpighian tubules. The Apodemata, as well as the Neuroptera, have 8 segments of the "campodeiform" type, but destitute of cerci; they are preaceous in habit, usually with slender, sickle-shaped mandibles, whereby they pierce various insects so as to suck their juices. The order contains mainly families, and the eruciform larva of the neuroptera are insects in the geographical distribution. Fossil Neuroptera occur in the Lias and even in the Trias if the relationships of certain larvae have been correctly surmised.
Roman Catholics. The chief industries are tanning, dyeing, and the manufacture of damask, linen, woolen stuffs, leather and beer.

In 1745, 1760 and 1779 engagements between the Austrians and Prussians took place near Neustadt, on which the last occasion was bombarded and set on fire.

See Weltzel, Geschichte der Stadt Neustadt (Neustadt, 1870).

NEUSTADT-AN-DER-HAARDT, a town of Germany, in the Bavarian Palatinate, picturesquely situated under the eastern slope of the Haardt Mountains and at the mouth of the valley of the Speyerbach, 14 m. W. of Spires, and at the junction of railway lines to Worms, Weissenburg and Monsheim. Pop. (1905) 18,575. It has four churches, two Evangelical and two Roman Catholic. The Protestant abbey church, a fine Gothic edifice dating from the 14th century, contains the tombs of several of the counts palatine of the Rhine. The Roman Catholic Ludwigskirche is a modern Gothic structure. The chief industries of the town are cloth, paper, furniture, soap, starch and hats. It has also breweries and distilleries.

A brisk trade is carried on in wood, grain, fruit and wine, all of which are extensively produced in the vicinity. Neustadt, which became a town in 1275, is one of the centres of the Rhenish "grape-cure," and thus attracts numerous visitors.

NEU-STETTIN, a town of Germany, in the Prussian province of Pomerania, on the small Strelitz lake, 90 m. by rail N.E. of Königsberg, the gateway to the N. of Neudorf, Posen and Stolpimünde. Pop. (1905) 10,785. Its industries are iron-founding, dyeing, brewing and the manufacture of machinery, soap and matches. There is a considerable trade in cattle, grain and other agricultural produce, and in timber and spirits.

Neu-Stettin was founded in 1313 by Wratlaisla, duke of Pomerania, on the model of Stettin.

See Willecke, Chronik der Stadt Neu-Stettin (Neu-Stettin, 1862); and W. Kaisski, Beschreibung der vorherrschender Alterthümer in Neu-Stettin (Danzig, 1881).

NEU-STRELITZ, a town of Germany, capital of the grand-duchy of Mecklenburg-Strelitz, situated between two small lakes, the Zierer See and the Glamecker See, 60 m. N. of Berlin, on the railway to Stralsund, at the junction of lines to Warnemünde and Buschoff. Pop. (1905) 11,656. It is built in the form of a star, the eight rays converging on a market-place adorned with a statue of the grand-duke George (d. 1866). The ducal residence is a handsome edifice in a pseudo-classical style, with a library of 75,000 volumes, and collections of coins and antiques.

Other buildings are the churches (two Evangelical and one Roman Catholic), the Carmelitum (a large hospital), the town hall, the market-place, the post-office, and the post-station, which are iron-ware, machinery, pottery, beer and mineral waters. Its trade, chiefly in corn, meal and timber, is facilitated by the Zierer See and by a canal connecting the town with the Havel and the Elde.

About 15 m. to the south lies Alt-Strelitz, the former capital of the duchy, a small town the inhabitants of which are employed in the manufacture of tobacco, leather and wax candles. Neu-Strelitz was not founded till 1776. In the vicinity is the château of Hohen-Zellert, where Queen Louise of Prussia died in 1810.

NEUSTADT-AN-DER-HARZ, a town of Germany, is a principal station of the western kingdom of the Franks, as opposed to the eastern kingdom, Austrasia (q.v.). The most ancient form of the word is Nistur, from niust, which would make the word signify the "most recent" conquests of the Franks. The word Neustria does not appear as early as the Historia Francorum of Gregory of Tours, but is found for the first time in Fredegarius. The kingdom of Chilperic was retrospectively given this name, and in contemporary usage it was given to the kingdom of Clovis II., as opposed to that of Sigebert III., the two sons of Dagobert; and after that, the principality of Stitar was the western part of the realm of Neustria, and those reigning in the East, kings of Austrasia. Under the new Carolingian dynasty, Pippin and Charles Martel restored the unity of the Frankish realm, and then the word Neustria was restricted to the district between the Loire and the Seine, together with part of the diocese of Rouen north of the Seine; while Austrasia comprised only the Frankish dominions beyond the Rhine, perhaps with the addition of the three cities of Mainz, Worms and Speirs on the left bank. The districts between Neustria and Austrasia were called Media Francia or simply Francia. In 843 both the duchies were united under the name of Neustria. The capital was later transferred to the city of Rouen.

At the time of Charlemagne, Lombardy was divided into five provinces: Neustria, Austrasia, Aemilia, Littoraria maris and Tuscia. Austrasia was the name given to eastern Lombardy, and Neustria that given to western Lombardy, the last part occupied by the Lombards.


NEUTITSCHEN (Czech Nový Jičín), a town of Austria, in Moravia, 75 m. N.E. of Brunn by rail. Pop. (1900) 11,801, chiefly German. It is situated on a spur of the Carpathians, and on the banks of the Tisch, an affluent of the Oder. It is the chief place of what was until 1862 a separate administrative unit. The principal industries are the manufacture of woolen cloth, flannel, hats, carriages and tobacco are carried on; and it is also the centre of a brisk trade. The town was founded in 1311. The town became the headquarters of the Austrian field-marshall Loudon, who died here in the same year and is buried in the parish church.

NEUTRALITY, the state or condition of being neutral (Lat. neuter, neither of two), of not being on or inclined to one side or another, particularly, in international law, the condition of a state not participating in a dispute between other states. Neutrality is the most progressive branch of modern International Law. It is also that branch of International Law in which the practice of self-restraint takes the place of the direct sanctions of domestic law most effectively. The rapid changes it is undergoing are in fact bringing the state-system of the modern world nearer to the realization of the dream of many great writers and thinkers, of a community of nations just as much governed by legal methods as any community of civilized men. While the right of war was simply the right of the stronger, there was no room for neutral rights, for, without place in the law, a neutral's rights are nothing but survivals of the right of brute strength. No nation or community down to comparatively recent times was treated as having a right to what it could not keep. It is the growth of a law of neutrality, through the modern possibility of concerted action among neutral states, which is bringing about improvement, and, though the signs of our times are not always reassuring, we have taken a long stride forward since Molloy, in his De Jure maritimo et navalis (1680), wrote: "As a neuter neither purchases friends nor frees himself from them, he refrains from taking a part in a dispute between other states. Neutrality is held more advantageous than to remain in a state wherein he is in all probability of being ruined by the one or the other."

It was the great commercial communities, the Hansa in the north and Venice and the Mediterranean maritime republics in the south, which were first able to insist on some sort of regulation of the usages of war for their own protection. With the growth of intercourse among nations a further advance was made, by treaty stipulations entered into in time of peace, to provide rules for their guidance in the event of war, but it is only in our own time that the idea of a substantive neutral right has obtained legal recognition. To our own time belongs the final acceptance of the principle that the neutral flag protects an enemy's goods except contraband, the conception of neutralization of territory, the abolition of fictitious blockades, the practice of declarations of
neutrality, the detachment from the high sea and neutralization of the zone called territorial waters, and the Areopagus of nations called the European Concert, in which the right of neutrals is asserted as a brake upon the operation of the still venerated right of conquest. The rights of neutrals have received their most recent affirmation in several of the decisions of the Hague Peace Conferences.

International trade and intercourse have become so intricate that war can no longer be waged without causing the most serious loss to neutral nations, which, moreover, suffer from it without any of the possible contingent advantages it may procure for them. This is so, that most great powers have found it necessary for their self-protection to enter into defensive alliances with others, the direct object of which is the preservation of European peace by the threat of making war so gigantic a venture that no state will again embark on it "with a light heart." The next step will probably be alliances between states which, by their nature or by their having reached the limit of their expansion, have nothing further to gain by war with each other, for the purpose of securing perpetual peace as between themselves.

Differences have been made to define neutrality, but the word defines itself, so far as a succinct definition serves any purpose. The subject covers too wide and varied an area of matter to be condensed into a short statement of any kind. Neutrality entails rights and duties on both the belligerent and the neutral sides. Theoretically, neutrality, to be complete, would require the neutral to abstain from everything which could even remotely be of assistance to either belligerent. To this obligation would theoretically correspond that the belligerent should carry on the war without doing anything which could even remotely disturb or interfere with the neutral state or the free activity of its citizens. Neither the one nor the other is found to be practicable. It is not easy for the belligerent to observe absolutely the duty of doing no direct injury to neutral territory. A battle may be fought to the very edge of the neutral frontier, and shells may explode in any neutral town within the firing range of modern artillery. The present respect paid by belligerents to territorial waters is a palliative in the case of a seaboard frontier; but even the three-mile limit acknowledged by most countries would permit belligerents with present range of artillery to fire landwards far into neutral territory. Compensation—it is true—would be due for any damage done, but this does not alter the fact that acts of war can produce direct consequences on neutral territory which have the character of carrying war into a neutral state. The neutral state, moreover, is obliged to incur heavy expenditure to protect its frontier from being traversed by either belligerent, and thus avoid itself being exposed to claims for compensation for an act which it would otherwise be powerless to prevent. In the case of a maritime war, the neutral state is also bound to exercise strict supervision to prevent its ports from being used by either belligerent for the purpose of increasing its military strength. In short, war cannot be carried on without heavy expense and inconvenience to neighbouring neutral states. The inconvenience to the intercourse of neutral citizens is still greater. Their ships are liable to be taken out of their course, and their cargoes to be discharged to the bottom of the hold in search of articles which are contraband according to circumstances over which they have no control, and they may be confiscated without recourse by judges appointed by one of the interested parties. Even their whole trade with specific ports of the one belligerent may be stopped by the ships of the other belligerent without indemnity. On the other hand, a great deal of vital assistance can be given by neutral citizens to the one or the other belligerent in money, or by supplies of arms, ammunition, food and other commodities, which it is not at present the duty of neutral states to interfere with.

The respective rights and duties of belligerent neutrals in current practice may be subdivided as follows:

1. Belligerent duty to respect neutral territory and neutral territorial waters.

2. Neutral right of official representation and mediation of intercourse of neutral citizens with citizens of either belligerent of convoy, &c.

3. Belligerent right of blockade, angry, visit and search, capture and confiscation of contraband of war.

4. Neutral duties: (absolute) of abstention from any direct corporate assistance to either belligerent, of enforcement of respect by both belligerents for neutral territory; (relative) of prevention of any recruiting for either belligerent, or arming or equipping of vessels for their service; and (contingent) of all the above rights and duties of the belligerent without distinction, and of granting impartially to one or the other belligerent any rights, advantages or privileges, which, according to the usages recognized among nations, are not considered as an intervention in the struggle.

This subdivision, we believe, covers the whole ground of neutrality. We shall follow it in this article. Belligerent Duty.—It is now universally recognized among European states that a belligerent army must make no use of its strength in the field to carry its operations into the territory and into the ports of another belligerent. Belligerent forces entering neutral territory are by the practice of nations bound to surrender their arms to the neutral state, and remain hors de combat till the close of the war. (Compare arts. 11 and 12 of the Hague Convention relating to the "Rights and Duties of Neutral Powers and persons in case of war on land" 18th of October 1907.) Through territorial waters belligerent vessels are allowed to pass freely as in time of peace. Nor does the usage of nations forbid a belligerent vessel from entering a neutral port. Motives of humanity have sanctioned this distinction; between territorial and maritime warfare. The Admiralty Instructions (1893) set out the rights of belligerents as Great Britain views them as follows: "Subject to any limit which the neutral authorities may place upon the number of belligerent cruisers to be admitted into any one of their ports at the same time, the captain, by the comity of nations, may enter a neutral port with his ship for the purpose of taking shelter from the enemy or from the weather, or of obtaining provisions or repairs that may be pressingly necessary (I. section 592). He is bound to submit to any regulations which the local authorities may make respecting the place of anchorage, the limitation of the length of stay in the port, the interval to elapse after a hostile cruiser has left the port before his ship may leave in pursuit, &c. (I. section 593). He must abstain from any acts of hostility towards the subjects, cruisers, vessels or other property of the enemy which he may find in the neutral port (section 594). He must also abstain from increasing the number of his guns, from procuring military stores, and from augmenting his crew even by the enrolment of British subjects" (section 595).

Nor may the commander of a British warship take a capture into a neutral port against the will of the local authorities (Holland, Manual of Naval Prize Law, 1888, section 299). This subject was one of those dealt with at the Hague Conference of 1907. (See art. 18 of the "Convention relating to the rights and duties of neutral powers in naval war."")

Neutral Rights.—Neutral powers have the right to remain, as far as possible, unaffected by the war operations, and, therefore, continue their diplomatic relations with the belligerent states. The immunities and extraterritoriality of their diplomatic agents attach to them as in time of peace, subject only to necessity of war, which may entitle a belligerent to place restrictions on this intercourse. Thus, during the Franco-German War, on the surrounding of Paris, foreign diplomats in the besieged city were refused by the German authorities all possibility of corresponding with their governments, except by letters left open for their inspection. Neutral legations may also undertake the representation of private interests of subjects of the one belligerent on the territory of the other. Thus in the Franco-German War of 1871 the Germans in France were placed under the protection of the United States legation, and the French in
Germany under that of the British legation; in the war of 1866 between the United States and Spain, American interests in Spain were committed to the care of the British legation, and those of Spaniards in the United States to that of the Austro-Hungarian legation. By legations are understood both diplomatic and consular authorities. The protection granted is in the nature of mere mediation. It confers no rights on the belligerent subjects in question, nor does it give the neutral legation any right to protect a belligerent subject or his property against any ordinary rights of war.

Good offices, properly speaking, are a mild form of mediation or tentative mediation, i.e., mediation before it has been accepted by the parties. Article 3 of the Hague Convention of 1899 for the pacific settlement of international disputes (3oth March 1899), provides that "powers strangers to the dispute, have the right to offer good offices or mediation, even during the course of hostilities," and that "the exercise of this right can never be regarded by one or other of the parties in conflict as an unfriendly act." The Hague Convention puts an end to the doubt whether a neutral power can mediate without involving itself in some way with the one or the other side in the dispute. Mediation had already been provided for in several existing treaties, such as the Treaty of Paris (30th March 1856), which provides that "any cession should arise between the Sublime Porte and one or more of the other signatory powers and threaten the maintenance of their good relations, the Sublime Porte and each of these powers before resorting to force shall give an opportunity to the other contracting parties in order to prevent such extreme measures" (article 8); the Treaty of Yedo between the United States and Japan (29th July 1858) stipulating that in the case of difference between Japan or any other state, "the president of the United States, at the request of the Japanese government, will act as a friendly mediator in such matters of difference as may arise between the government of Japan and any other European power," (article 2); and the General Act of Berlin relating to West Africa (1885), which provides that "in the case of a serious disension having arisen on the subject of, or within the territories" in question, between the signatory powers, they undertake, before taking up arms, to have recourse to the mediation of one or more of the friendly powers (article 12).

In the Venezuela-Guiana boundary question, the mediation of the United States government was declined by Great Britain, but its good offices were accepted. In the difficulty which arose between Germany and Spain in connexion with the hoisting of the German flag on one of the Caroline Islands, Spain did not consider arbitration consistent with the sovereign power she claimed to exercise over the island in question, but she accepted the mediation of the pope, and the matter was settled by protocols, signed at Rome (17th December 1885). These incidents show the uses of variety and gradation in the methods of diplomacy.

Neutral subjects have the right to carry on trade and intercourse with belligerent subjects in so far as they do not interfere with the operations or necessities of war, and it is no abuse of a belligerent subject, or of any foreign ship in belligerent soil, to state in the neutral character that this trade or intercourse is of benefit to either side. This is subject always to the belligerent right to capture and confiscate contraband of war (see below). On the other hand, the property of subjects and citizens of neutral states follows the fortune of the belligerent state within whose territorial jurisdiction it is situated. It is liable to the same charges as that of native subjects and citizens, and in case of military contributions neutral subjects on belligerent soil can claim no protection or exemption (see below, Angery). They have also the same rights to all indemnities for loss as are granted to native subjects and citizens.

The position of neutral public ships and the relative assimilation to them of mail steamers has been the subject of some controversy. A public ship is a ship having an official character. It includes not only warships, but also any ships affected to any specific and exclusive government purpose. Public ships in this sense are invested with an extra-territorial character, and the state to which they belong is directly responsible for any breaches of the law. This is not the case with mail steamers. The ships are therefore not liable to visit and search for contraband of war, are exempt from territorial jurisdiction even in belligerent waters. As regards vessels which are engaged partly in private traffic and partly on public service, such as mail steamers and government packets, the position is necessarily different. Under the Japanese Prize Law, adopted in view of the Chino-Japanese campaign, any vessel carrying contraband of war, whose destination is hostile, may be detained, without exception being made for mail steamers. The United States proclamation of April 1856 in connexion with the Spanish War stated that mail steamers would not be stopped in search of contraband of war, and that the passengers and crew would not be arrested. Under the Chinese prize law, some interesting decisions have been handed down, and the Chinese admiral had directed that British ships under his orders should afford protection to such merchant vessels, and not to allow them to be molested in any way. Professor Takahashi, in his 'International Law of the China-Japanese War,' relates that the Japanese admiral replied that "as the matters demanded by the British admiral belonged to the sphere of international diplomacy, and consequently were outside his official responsibility, they should be communicated to the proper authorities of the government of the British admiral," observes Professor Takahashi, "seemed to be not only to claim a right of convoy, which has never been recognized..."
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in treaties with Mexico (5th April 1831), Venezuela (20th January 1836), Peru (6th Sept. 1870), Salvador (6th December 1876) and Italy (26th February 1871), have agreed to accept the commander's declaration as provided in the Japanese Prize Law. Wharton quotes in his International Law Digest a passage from a despatch of Mr Secretary Forsyth (18th May 1837) in which he states that "it is an ordinary duty of the naval force of a neutral during civil or foreign wars to convoy merchant vessels of the nation to which it belongs to the ports of the belligerents. This, however, has not always been done in exact accordance with such rights as defined by the law of nations or by treaty." The Spanish Naval Instructions (24th April 1809) in the war with the United States granted unconditional exemption to convoyed neutral ships (article 11). The subject has now been dealt with by the Declaration of London (1908-1909), which requires the commander of a convoy to give a statement in writing as to the character of the vessels and cargoes (see CONVOY). A neutral merchant ship, travelling under enemy's convoy, places itself, with the assistance of the belligerent force, beyond the application of the belligerent right of visit and search, and thus commits a breach of war if it does not proceed to the neutral port.

Belligerent Rights.—Since the declaration of Paris providing that blockades in order to be binding must be effective, that is to say, must be maintained by a force sufficient really to prevent access to the enemy's coast, the tendency has been to give a precise form to all the obligations of the blockading belligerent. Thus it is now generally agreed that notification to the neutral should be sufficiently detailed to enable neutral vessels to estimate, with practical accuracy, the extent of their risks. French writers consider a general notification, though desirable, as insufficient, and hold an individual notification to each neutral ship which presents itself at the line of blockade as requisite. This theory was applied by France in the Franco-German War, and earlier by the Northern States in the American Civil War. The new Japanese Prize Law (1894) does not attempt to prescribe any such notification to each ship, but sets out that notice of blockade to each ship is either actual or constructive. "Actual" it describes as being when the master is shown to have had knowledge of the blockade, in whatever way he may have acquired such knowledge, whether by direct warning from a Japanese warship or from any other source; "constructive," when a notification of its existence has been made to the proper authorities of the state to which the vessel belongs, and sufficient time has elapsed for such authorities to communicate the notification to the subjects of that nation, whether or not they have in fact communicated it. No blockade, however, was attempted by the Japanese government, and the application of the rules was not put to the test.

In the war with Spain the United States proclamation of the investment of Cuba stated that an efficient force would be posted, so as to prevent the entrance and exit of vessels from the blockaded ports, and that any neutral vessel approaching or attempting to leave any of them, "without notice or knowledge" of the establishment of the blockade, would be duly warned by the commander of the blockading forces, who would endorse on her register the fact and date of such warning, and where such endorsement was made. The words "without notice or knowledge" were explained fully in the instructions to blockading vessels (20th June 1898). "Neutral vessels," said these instructions, "are entitled to notification of a blockade before they can be made prize for its attempted violation."

"The character of this notification is not material. It may be actual, as by a vessel of the blockading force, or constructive, as by a proclamation of the government maintaining the blockade, or by common notoriety. If a neutral vessel can be shown to have notice of the blockade in any way, by British prize courts, but also to extend it over all waters of the Far East, where British warships were not actually engaging in combat, the Japanese government made no difficulty. On 11th August the under-Secretary of the Japanese Foreign Office received a letter from the British Minister in Tokyo stating that there must be some misunderstanding, and that the British government would never try to interfere with belligerent right."

she is good prize and should be sent in for adjudication; but should the formal notice not have been given, the rule of constructive knowledge arising from notoriety should be construed in a manner liberal to the neutral." Thus the United States government abandoned the system of individual notification inserted in the proclamation of 10th April 1861, which was only found practicable in the case of vessels which had presumably sailed without knowledge. In such cases it was provided by the more recent instructions that they should be boarded by an officer, who should enter the notice that an attempt had been made to include the name of the blockading vessel giving notice, the extent of the blockade, and the date and place, verified by his official signature. The vessel was then to be set free, with a warning that, should she again attempt to enter the same or any other blockaded port, she would be good prize. The Declaration of London (1908-1909) exhaustively treats of this subject and has regulated it with a leaning towards continental views (see BLOCKADE).

Angry, or Droit d'Angerie, is a contingent belligerent right, without any apparent military necessity. Ordinary private neutral property on belligerent soil, it must be remembered, follows the fate of private property generally. The only distinction between the right of angry and the right of assimilating private neutral property to private property generally on belligerent soil which seems based on reason is that, whereas private property of neutrals generally which has remained on belligerent soil is sedentary, or, so to speak, domiciled there, neutral vessels are mere visitors with a distinct external domicile. The writer thinks the assimilation of neutral railway carriages to neutral vessels in this respect not unreasonable.²

A neutral state in its corporate capacity, we have seen, must abstain from acts which can be of assistance to either belligerent, and it is bound to exercise reasonable diligence to prevent its territory being used as a base for belligerent operations. The duties of a neutral state as a state go no further. Commercial acts of its citizens, even the export of arms and munitions of war to a belligerent country, do not, in the present state of international usage, so long as both belligerents are free to profit by such acts alike, involve liability on the part of the neutral state. But relief from the obligation of repressing breaches of neutrality by contraband traffic of subjects has its counterpart in the right granted to belligerent warships of visit and search of neutral merchant vessels, and in the possible condemnation, according to circumstances, of the ship and confiscation of goods held to be contraband.

Footnotes:

1. Angaria (from אנגיא, a messenger), a post station. The French word Angaria, as the ship is, is probably of the same origin.
2. Treaties between the Zollverein and Spain (30th March 1868) and between Germany and Portugal (2nd March 1872) contain special provisions for the fixing of indemnities in case of any forced utilization by either state of private property of the citizens of the other.
Contraband is of two kinds—absolute contraband, such as arms of all kinds, machinery for manufacturing arms, ammunition, and any materials which are of direct application in naval or military armaments; and conditional contraband, consisting of articles which are fit for, but not necessarily of direct, application to hostile uses. The British Admiralty Manual of Prize Law (1888), following this distinction, enumerates as absolutely contraband: arms of all kinds and machinery for manufacturing arms; ammunition and materials for ammunition, including lead, sulphate of potash, muriate of potash, chlorate of potash and nitrate of soda; gunpowder and its materials, saltpetre and brimstone; also guncotton; military equipments and clothing; military stores, naval stores, such as masts, spars, rudders, anchors, cable, hemp and cordage, sailcloth, pitch and tar, copper fit for sheathing vessels, marine engines and the component parts thereof, including screw propellers, paddle wheels, cylinders, cranks, shafts, boilers, tubes for boilers, boiler plates and fire-bars, marine-cement and the material used in the manufacture thereof, blue lias and Portland cements; iron in any of the following forms—anchors, rivet iron, angle iron, round bars of iron of from $\frac{3}{8}$ to $\frac{3}{4}$ of an inch diameter, rivets, strips of iron, sheets, plate iron exceeding $\frac{3}{8}$ of an inch, and Low Moor and Bowling plates; and as conditionally contraband: provisions for food, such as rice, potatoes, beans, flour, oils, lard, hemp and cordage, salt, fish, salted meat, lard, salt, tea, coffee, tobacco, and other foodstuffs of various kinds, with the exception of provisions for the manufacture of arms; arms and ammunition, in a condition such as to be useful for military purposes; mineral fuels, such as coal, lignite and lignite coal, wood, coal-tar, wood-oil, pitch, tar, copper, and iron; materials for the construction of vessels, such as teak, eucalyptus, mahogany, iron, in the form of planks, rails, beams and bolts; and materials used for the construction of boilers, engines, and machinery. The above-mentioned goods are contraband when they are on board a vessel which either has a hostile destination or calls at any port of the enemy. (2) Provisions and liquors, money, telegraphic materials, such as wire, platinum, sulphuric acid and zinc, porous cups, materials for the construction of a railway, as iron bars, sleepers, &c., coal, timber and so forth; the above-mentioned goods are contraband in a condition such as to be useful for the construction of a railway or a hostile port, used exclusively or mainly for naval or military equipment. When it is clearly known that, though goods detailed in the above sections 1 and 2 are found on board a vessel, they are merely for her own use, they cannot be deemed contraband goods.

The clashing of coal as conditional contraband has given rise to much controversy. Great Britain has consistently held it to be so. During the war of 1870 the French and German warships were only allowed to take at English ports enough to return to a French or German port respectively. In 1883, during the Franco-Italian campaign, after protest by the Chinese government, Great Britain applied the same rule at Hong-Kong and Singapore. During the Spanish-American War neither belligerent seems to have treated coal as contraband. In the case of the coal-ships which were prevented from landing their cargoes at Cuba, the prevention seems to have been connected with the blockade only. At the West African conference of 1884 Russia declared that she would "categorically refuse her consent to any articles in any treaty, convention or instrument whatever which would imply the recognition of coal as contraband of war (Parliamentary Papers, Africa, No. 4, 1883)." Coal is a harmful article, so far as its nature itself is concerned, that it is impossible to avoid classing it as conditional contraband, so long as such contraband is recognized. The alternative, of course, would be to allow both belligerents freely to supply themselves at neutral ports, and neutral vessels freely to supply belligerent coaling stations.

During the Franco-Chinese campaign of 1885 and the South African War there was controversy as to the legality of treating foodstuffs as conditional contraband. During the former the subject-matter was rice, and the circumstances were exceptional. The hostilities being at the outset reprisals, and not actual war, France at first exercised no right of search over British merchant ships. Great Britain, on her side, for the same reason did not object to French war vessels coaling, victualling and repairing at British ports. On China protesting against this indulgence to France, Great Britain, as above stated, put in force her practice of treating coal as contraband, and thereupon France exercised her corresponding belligerent right of searching British vessels. The closing of British coaling stations in French warships for use by serious inconvenience to France, and she proclaimed "that in the circumstances in which war was being carried on" the cargoes of rice which were being shipped to the northern Chinese ports were contraband. By depriving the Chinese government of part of the annual tribute sent from the southern provinces in the form of rice she hoped to bring pressure on the Peking government. This was a manifest stretching of the sense of conditional contraband. Besides, no distinction was made as to destination. The British government protested, but no case was brought into the French prize courts, and the legality of the measure has never been judicially examined.

The controversy during the South African War was confined to theory. In practice no stoppage of food-stuffs seems to have taken place, though the fact that the whole able-bodied population of the enemy states formed the fighting force opposed to Great Britain made it clear that the free import of food supplies from abroad helped the farmer-soldiers to carry on warfare without the immediate care of raising food crops.

The two cases cited show the great difficulty of fixing the character of conditional contraband. Besides, the cases referred to are instances of contraband seizures. During the Russo-Japanese War (1904-1905) there was a warm controversy between the British and Russian governments on the scope of the belligerent right to declare certain articles contraband. The Conference of London (1906-8), by enumerating the articles which are absolute contraband, limiting those which may be declared contraband, and fixing certain articles which can in no case be declared contraband, has endeavoured to meet the difficulties which arise in practice (see Contraband).

Trade between neutrals has a prima facie right to go on, in spite of war, without molestation. But if the ultimate destination of goods, though shipped first to a neutral port, is enemy's territory, then, according to the "doctrine of continuous voyages," the goods may be treated as if they had been shipped to the enemy's territory direct. This doctrine, though Anglo-Saxon in its origin and development, has been put in force by an Italian court in the case of the *Dodslevi*, a Dutch vessel which was adjudged good prize on the ground that, although bound for Jibouti, a French colonial port, it was laden with a provision of arms—a model which had been left behind there, and which might be used in the future by the Abyssinians, with whom Italy was at war. The subject has been fully discussed by the Institute of International Law, by whom the following rule has been adopted: "Destination to the enemy is presumed where the shipment is to one of the enemy's ports, or to a neutral port, if it is unquestionably proved by the facts that the neutral port was only a stage (etape) towards the enemy as the final destination of a single commercial operation."

The question of the legality of the doctrine was raised by Chancellor von Böllow during the South African War in connexion with the stopping of German ships bound for Delagoa Bay, a neutral port. He contended that such vessels were, "The only person in that eminent assemblage who raised an objection to the principle of the doctrine was the distinguished French writer on maritime law, M. Desjardins, who declined to acknowledge that any theory of continuous voyages was, or could be, consistent with the existing law of neutrality, juridically known to International Law. He admitted, at the same time, that penalties of contraband would be incurred if the shipping to a neutral port were effected purely in order to deceive the belligerent as to the real destination of the cargo. This was the French ruling in the *Frau Houswina* case (26th May 1853). He proposed to restrict the operation of the principle, and was opposed by three Italian professors of international law, Professors Fusinato, Catellani and Buzzati, on the ground that it would exclude, as it obviously would do, the contingency of goods shipped to a neutral port, not for the purpose of deceiving the belligerent, but for that of being ultimately delivered to a belligerent not in possession of a seaport. The article as quoted in the text was also supported by the greatest German authority on International Maritime Law, Director Perels of the German admiralty.
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at all times, outside belligerent jurisdiction, and that only the authorities of the neutral port were entitled to stop contraband on its way to a belligerent force. He did not, however, press the point, and only reserved the right of raising it at a future date. It was fully discussed at the London Conference of 1908-1909. In order to effect a compromise between conflicting theories and practice, a distinction was made in the declaration between actionable contraband, the transmission of intelligence and the doctrine of continuous voyages not being applicable to conditional contraband when documented to be discharged at a neutral port, except where the enemy country has no seaport (Declaration of London, arts. 30 to 36).

Unneutral Service.—Under this heading the London Conference of 1908-1909, concerning the laws of naval war, dealt with analogues of contraband, and neutral vessels assisting or in the service of the enemy. The articles adopted are as follows:

A neutral vessel will be condemned and will, in a general way, receive the same treatment as a neutral vessel liable to condemnation for carriage of contraband: (1) If she is on a voyage specially under taken with a view to the transport of individual passengers who are enemy nationals or at the instigation of or in the service of the enemy. (2) If, to the knowledge of either the owner, the charterer, or the master, she is transporting a military detachment of the enemy, or one or more persons in the course of the voyage, directly assist the operations of the enemy.

In the cases specified under the above heads, goods belonging to the owner of the vessel are likewise liable to condemnation.

The provisions of the present article do not apply if the vessel is encountered at sea while unaware of the outbreak of hostilities, or if the master, after becoming aware of the outbreak of hostilities, has had no opportunity of discharging the contraband goods to the authorities. This means that a neutral vessel thereby deemed to be aware of the existence of a state of war if she left an enemy port subsequently to the outbreak of hostilities, or a neutral port subsequently to the notification of the outbreak of hostilities to the power to which such port belongs, provided that such notification was made in sufficient time.

A neutral vessel will be condemned and, in a general way, receive the same treatment as a neutral vessel liable to condemnation for carriage of contraband: (1) If she takes part in hostilities, (2) If she is under the orders or control of an agent placed on board by the enemy government, (3) If she is in the exclusive employment of the enemy government, (4) If she is exclusively engaged at the time either in the transport of enemy troops or in the transmission of intelligence in the interest of the enemy.

Any individual emboldened in the armed forces of the enemy who is found on board a neutral merchant vessel may be made a prisoner of war, the thing there be no ground for the capture of the vessel.

The procedure employed to ascertain whether a neutral vessel carries contraband or not is called Visit and Search (see Search), a belligerent right universally recognized and justified by the considerations that merchant ships of the enemy might evade capture by hoisting a neutral flag, if the belligerent had not the right of ascertaining the real character of the ship, and that private neutral vessels might carry contraband goods and generally help the enemy, if the belligerent had not the right of examining their cargo. All neutral private vessels in time of war are liable to visit by belligerents on their courses whatever their destination, or even if the ship is immediately disarmed. The visiting officer has the right to inspect any lockers, stores or boxes, and in case of refusal to open them he is justified in using such coercive measure as the case warrants. If after the visit and search the commander has reason to entertain suspicion he gives the master an opportunity of explanation, and if the explanation is unsatisfactory he detains the vessel. If the seizure turns out after all not to have been justified, the ship and cargo are immediately released and compensation is due for the loss through the detention. In the case of the stoppage and search of German vessels during the South African War, the German government proposed the appointment of arbitrators to decide upon the claims for compensation but this was an innovation to which the British government did not assent.

Resistance to search entails consequences which Art. 63 of the Declaration of London (1908-1909) has expressed as follows:—

Forcible resistance to the legitimate exercise of the right of stoppage, search and capture involves in all cases the condemnation of the vessel. The cargo is liable to the same treatment as the cargo of enemy vessels. No claims belonging to the master or owner of the vessel are treated as enemy goods.

The consequence of carrying contraband are capture, trial by a belligerent prize court, and possible confiscation of the ship and cargo, or of the cargo alone or of a part of the cargo, according to the facts of the case. All are agreed as to articles which are absolute contraband, being liable to capture. As regards conditional contraband, British law, in so far, at least, as concerns naval and victualling stores, is less severe, the Lords of the Admiralty being entitled to purchase such stores without condemnation in a prize court. In practice such purchases are made at the market value of the goods, with an additional 10% for loss of profit. This proceeding is known in International Law as the right of pre-emption. It is not, however, as yet officially recognized on the continent of Europe, though the need of some palliative for confiscation, in certain cases, is felt, and some continental jurists, moved by the same desire to distinguish unmistakable from so to speak constructive contraband, and protect trade against the vexation of uncertainty, have tried to argue conditional contraband away altogether.

The right of compensation of continental authorities is seen in the rule drawn up in 1805, after several years of discussion, by the Institute of International Law, a body composed exclusively of international jurists of acknowledged standing. The majority which adopted it represents authoritative opinion in Germany, Denmark, Italy, Holland and France, showing that the old antagonism between the British and continental views on conditional contraband has ceased to exist. To prevent confusion the Institute declares conditional contraband abolished, and then adds that "nevertimel, the belligerent has, at his option and on condition of paying an equitable indemnity, a right of sequestration or pre-emption as to articles (objets) which, on their way to a part of the enemy, may serve equally for use in war or in peace." The proposed rules goes beyond the directions of the British Prize Act, and it could only come into operation under a verbal alteration of the Declaration of Paris, under which "contraband" alone is excepted from the protection of the neutral flag, a fact which seems to have escaped the notice of the Institute. British prize law is at present governed by the Prize Act of 1864. This act must be overhauled to meet the requirements of the new international law of the subject; the creation of an International Court of Appeal and the new rules adopted by the conferences of the Hague and London will make many changes necessary.

Absolute Duties of Neutrals.—The very sense of neutrality obviously implies abstention from direct corporate assistance. The duty of neutral states to enforce respect for their territory has become a very serious one. A belligerent cannot be allowed to cross the neutral frontier or carry on war operations in neutral waters, without the same right being granted to the other belligerent. Pursuit of one force by the other would amount to waging war on the neutral territory. It is agreed among nations that the avoidance of such a contingency is in the interest of them all. During the Franco-German War both France and Germany,

2 The Naval Prize Act 1864, sect. 38.
as belligerents, and Belgium and England, as neutrals, rigorously observed their duties and enforced their rights, and no difficulty occurred. It is, nevertheless, conceivable that, under pressure of military necessity, or on account of an overwhelming interest, a power might decide to violate the territory of a weak neutral state and leave the consequences to diplomacy. The South African War was exceptional, in that the Portuguese government exposed itself to no international difficulty through allowing a belligerent, whose final victory was certain, and of necessity entailed total suppression of the conquered belligerent, to cross its colonial territory. At the same time it is an unfortunate precedent of taking advantage of the practical powerlessness of neighbouring neutral states to commit a violation of the law of nations, respect for which it is a primary duty of every self-respecting state to encourage. In other words, if belligerent soldiers pass the frontier, they have to be turned back. If they claim the

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droit d'asile, they are arrested, disarmed, and kept in such a manner as to render it impossible for them to take any further part in the hostilities. In the case of territorial waters, as has already been pointed out, the neutral state is not in the same position as on land, all ships without distinction having a right of innocent passage through them. Belligerent ships also have the right to enter neutral ports, but the neutral authority is bound to take precautions to prevent any favour being shown to the one party or the other.1

1 The right of way claimed and accorded to under the Anglo-

Portuguese Treaty of 11th June 1891 was a mere right of transit for merchandise, and could not in any way be construed as diminishing the exclusive obligation to a belligerent who was no party to the treaty.

2 The rules laid down on this subject by the British authorities during the Spanish-American War were as follows:

Refugees. 

1. In the case of the belligerent state of war all warships of either belligerent are prohibited from making use of any port or roadstead in the United Kingdom, the Isle of Man or the Channel Islands, or of any of Her Majesty's colonies or foreign possessions. This is subject to a number of exceptions relating to the jurisdiction of the British crown, as a station or place of resort for any warlike purpose, or for the purpose of obtaining any facilities for warlike equipment; and no ship of war of either belligerent shall hereafter be permitted to leave such port, roadstead or waters from which any vessel of the other belligerent (whether the same shall be a ship of war or a merchant ship) shall have previously departed until after the expiration of at least twenty-four hours from the departure of such last-mentioned vessel beyond the territorial jurisdiction of Her Majesty.

Rule 2.—If there is now in any such port, roadstead or waters such ship as above described, the belligerent shall take over such ship of war of either belligerent, such ship shall leave such port, roadstead, or waters within such time, not less than twenty-four hours, as shall be reasonable, having regard to all the circumstances and the condition of the case of the ship of war of the United States of the Alabama. The British Government, with the idea of strict neutrality, there is no movement to alter the usages to the disadvantage of neutral interests. That the Geneva Arbitral Tribunal found in favour of the United States in the case of the Alabama, but that the International Law had undergone any change. The tribunal was bound by the antecedent fixation of the Washington rules, and laid down no new principle. On the other hand, the magnitude of the Geneva award was not likely to promote change in the direction of increasing neutral duties, except as part of a general regulation of neutral and belligerent rights. The whole subject was laid before the Hague Conference of 1907, which adopted the main principles of the rules enunciated in the Treaty of Washington (see Art. 8 of the Convention relating to the rights and duties of neutral states in maritime war).

Rule 3.—No ship of war of either belligerent shall hereafter be permitted to enter any such port, roadstead or waters subject to the territorial jurisdiction of Her Majesty, to take in any supplies, except such provisions and such other things as may be requisite for the sub-

Relative Duties of Neutrals.—Relative duties embrace those duties which citizens are bound to observe and for which states incur a relative responsibility. It was the non-observance of these relative duties that led to difficulties between Great Britain and the United States at the close of the American Civil War and which brought the two countries themselves to the verge of conflict. The Treaty of Washington (5th May 1871) referring these difficulties to arbitration defined the scope of the duties in question for all future purposes between the two peoples (see below, "Proclamations of Neutrality"). Under this treaty the parties bind themselves to use "due diligence," where they have "reasonable ground" to believe that any acts have a belligerent character, in "preventing" them. They are bound to prevent—

(1) Fitting out, arming, or equipping any vessel;

(2) Departure from their jurisdiction of any vessel, having been specially adapted in whole or in part within such jurisdiction to warlike uses;

(3) The making use by a belligerent of their ports or waters as a base of naval operations against the other;

(4) The making use thereof for the purpose of the renewal or augmenting of military supplies or arms;

(5) The making use thereof for the recruitment of men.

The contracting states undertook to bring the rules they adopted on this subject to the knowledge of other maritime nations, and to follow in their practice the rules accepted by a majority of them. It is not a duty to make the rules recognized by us, and after they shall have been so recognized, the rules shall not be disregarded.

There was evident reluctance among foreign states to commit themselves to the obligation of exercising "due diligence." It is clear that the duty of a state to forbear from committing any act which may be of assistance to either belligerent can never be formulated as an absolute one in regard to the acts of private persons, merchants, or neutral vessels, within the neutral jurisdiction. In recent times it has certainly become possible for states to exercise a more effective control than formerly over these acts; but at the present moment, though a much greater degree of control is possible, there are certain cases in which the idea of strict neutrality, there is no movement to alter the usages to the disadvantage of neutral interests. That the Geneva Arbitral Tribunal found in favour of the United States in the case of the Alabama, but that the International Law had undergone any change. The tribunal was bound by the antecedent fixation of the Washington rules, and laid down no new principle. On the other hand, the magnitude of the Geneva award was not likely to promote change in the direction of increasing neutral duties, except as part of a general regulation of neutral and belligerent rights. The whole subject was laid before the Hague Conference of 1907, which adopted the main principles of the rules enunciated in the Treaty of Washington (see Art. 8 of the Convention relating to the rights and duties of neutral states in maritime war).

Rule 3.—No ship of war of either belligerent shall hereafter be permitted to enter any such port, roadstead or waters subject to the territorial jurisdiction of Her Majesty, to take in any supplies, except such provisions and such other things as may be requisite for the sub-

Rule 4.—Armed ships of either belligerent are interdicted from carrying prizes made by them into the ports, harbours, roadsteads or waterways of the neutral state, unless the ship of war of the other belligerent shall have been captured or seized within the territorial jurisdiction of Her Majesty, without special permission, until after the expiration of three months from the time when such coal may have been last supplied to her within British waters as aforesaid.

Rule 5.—If, in any case, it be necessary that any such ship of war shall be prevented from proceeding, without stopping, and without making use of the port or roadstead, the competent authorities of the Neutral State shall not, except in such cases, when it may be shown that such a step is absolutely requisite for the protection of the Neutral State, prevent the ship taking in a supply of water, provisions, or other necessaries of life, necessary for the continuance of the voyage of the ship; the port or roadstead may not hindrance in the least degree, the provisions of this article.
To some extent the difficulty of determining the extent of relative neutral duty is overcome by the issue of proclamations of neutrality; but neutrality and its rights and duties are in no respect dependent on their being proclaimed by the neutral power. Germany issues no proclamation; at least the German empire has issued none in connexion with the different wars which have taken place since 1870. The Austro-Hungarian government during the same period only has been the case of the war of 1870 itself, and in 1877, issued proclamations, and these probably had objects outside the ordinary purposes of proclamations of neutrality, and its usual practice is the same as that of Germany. France usually issues a short general proclamation, and Great Britain a more detailed one, which must be as old as the "ancient custom" of its being publicly read from the steps of the Royal Exchange by the sergeant-at-arms and common crier of the City of London. The British proclamation practically recites the Foreign Enlistment Act 1870 (an act to regulate the conduct of His Majesty's subjects during the existence of hostilities between foreign states, with which His Majesty is at peace), admonishes all persons entitled to British protection to observe and respect the exercise of those belligerent rights which "We and Our Royal Predecessors have always claimed to exercise," and warns them that any such persons "breaking, or endeavouring to break, any blockade lawfully and actually established" by either belligerent, "or carrying officers, soldiers, despatches, arms, ammunition, military stores, or materials, or article or articles, considered and deemed to be contraband of war, according to the law or modern usages of nations, for the use or service of either belligerent," rightfully incurs the penalty of the law, and the penalties denounced by the law of nations in that behalf." During the South African War no proclamation of neutrality was issued by any country.

Proclamations of neutrality may be made to serve the twofold purpose of warning the belligerent of the length to which the neutral government considers neutral duty to extend, and neutral subjects of the exceptional measures to which a foreign war exposes them. They may also be used to give effect to any modification of neutral right or duty which the neutral state may consider warranted by special or altered circumstances.

No purely mercantile transactions are considered a violation of neutrality. Six years before the American Civil War, President Pierce, in his message to the Thirty-fourth Congress, first session, made the following statement:—"The laws of the United States do not forbid their citizens to sell to either of the belligerent powers articles of contraband of war, or to take munitions of war or soldiers on board their private ships for transportation; and although in so doing the individual exposes his person or property to some of the hazards of war, his acts do not involve a breach of the national neutrality, nor of themselves implicate the government." This statement of international practice has been confirmed by art. 7 of the Hague Convention of October 18, 1907, on the Rights and Duties of Neutral States and Persons on Land (see below).

During the Franco-German War there was correspondence between the Prussian diplomatic representatives in London and at Washington and the British and United States foreign secretaries concerning shipments of arms and ammunition to the French armies, in which the Prussian government contemplated that it was incompatible with strict neutrality that French agents should be permitted to buy up neutral countries under the eyes and with the cognizance of the neutral government, "many thousands of breech-loaders, revolvers, and pistols, with the requisite ammunition, in order to arm there-with the French people, and make the formation of fresh army corps possible after the regular armies of France had been defeated and surrounded." Nothing, however, was done to prevent the departure of these supplies. Both the British and United States governments claimed entire liberty for the traffic in question.

1 The Times, 26th April 1898.
again take part in the hostilities. This neutral state shall discharge the same duties if it be entrusted with the wounded or sick of the other party.

Art. 15.—The Geneva Convention applies to sick and wounded interned on neutral territory (see Geneva Convention).

Art. 16.—The natives of a state not taking part in the hostilities are entitled to the same treatment as the nationals of the other belligerent state.

Art. 17.—A neutral person cannot take advantage of his neutrality:
(a) If he commits hostile acts against a belligerent;
(b) If he commits acts in favour of a belligerent, for instance, if he voluntarily takes service in the ranks of the army of one of the parties.

In each case the neutral shall not be treated with more severity by the belligerent against whom he has acted in contravention of his neutrality than a native of the other belligerent state would be for the same acts.

Art. 18.—The following shall not be considered as acts committed in favor of one of the belligerents, in the sense of Art. 17 (b):
(a) Supplies or loans made to one of the belligerents provided the purveyor or the lender inhabits neither the territory of the other party nor territory occupied by it, and provided the supplies do not come from these territories;
(b) Services rendered in matters of police or civil administration.

An ART. 19.—The rights of neutral powers may be exercised by such states, whether it belongs to these states or to companies or to private persons, and recognizable as such, cannot be requisitioned or utilized by a belligerent, except in such cases and in such a manner as the rights of neutrality are exercised. Such property shall be returned to its country of origin as soon as possible.

The neutral state can, in case of necessity, keep and utilize to that extent property coming from the territory of a belligerent state. An account shall be kept, proportioned to the amount of the property utilized and the duration of utilization.

The clauses of the Convention relating exclusively to neutrality in naval war, which are still fuller, are:

Convention of 1899 on neutralities in naval war.

Art. 1.—Belligerents are bound to respect the sovereign rights of neutral powers and to abstain, either on the territory or in neutral waters, from acts which might constitute in the part of the powers permitting them a non-observance of their neutrality.

Art. 2.—Selection of means of capture, including and the exercise of the right of visit and search, by belligerent ships of war in the territorial waters of a neutral power, constitute a breach of neutrality and are strictly forbidden.

Art. 3.—When a vessel has been captured in the territorial waters of a neutral power, this shall, if the prize is still within its jurisdiction, use all means in its power to effect the release of the prize and its officers and crew, and that the crew placed on board by the captor shall be interned. If the prize is out of the jurisdiction of the neutral power, the capturing government shall, on the request of the former, release the prize with its officers and crew.

Art. 4.—Belligerents are forbidden to make neutral ports and waters the base of naval operations against their adversaries, except in case of self-defense, the equipping or arming of any vessel, which may serve as means of communication with belligerent forces on sea or on land.

Art. 5.—The supply, under any ground whatsoever, either directly or indirectly, by neutral power to a belligerent power, of ships of war, or of munitions or of material of war in any kind, is forbidden.

Art. 6.—A neutral power is not bound to prevent the exportation or transit, for the account of either belligerent, of armaments, munitions of war, or in general, of anything which may be useful to an army or a fleet.

Art. 7.—A neutral government is bound to use the means at its disposal to prevent, when it has reason to believe, the equipping or arming of any vessel, which it has any reasonable suspicion of being destined to act as a cruiser or to join in hostile operations against a power with which it is at peace.

It shall be bound to exercise the same surveillance to prevent the departure out of its jurisdiction of any vessel intending to act as a cruiser or take part in hostile operations, and which, within the said jurisdiction, may have been adapted either wholly or in part for warlike purposes.

Art. 8.—A neutral power must apply equally to the two belligerents the restrictions, conditions and interdictions specified by it relating to adaptation of vessels, equipment, or arming of any vessel, which it has any reasonable suspicion of being destined to act as a cruiser or to join in hostile operations against a power with which it is at peace.

A neutral power may, however, forbid access to its ports and roadsteads, to any belligerent vessel which may have neglected to comply with the orders and directions issued by it or may have committed a breach of neutrality.

Art. 10.—The neutrality of a power is not compromised by the passage through its territorial waters of belligerent ships of war and of their neutral crew.

Art. 11.—A neutral power may allow ships of war of belligerents to make use of its licensed pilots.
ports or roadsteads and in its waters any violation of the preceding provisions.

Art. 26.—The exercise by a neutral power of the rights defined by the present Convention can never be considered as an unfriendly act by either belligerent who has accepted the articles relating thereto.

Art. 27.—The contracting powers will communicate to each other, as soon as feasible, all the laws, ordinances and other provisions which within their jurisdiction govern belligerent ships of war in their ports and waters, by means of a notification addressed to the government of the Netherlands and immediately transmitted by the latter to the other contracting powers.

Art. 28.—The provisions of the present Convention are only applicable as between contracting powers, and only if the belligerents are all parties thereto.

Other reforms may be expected from the Conference of 1915. Germany in the course of the South African War and Great Britain in that of the Russo-Japanese War showed great irritation at the stoppage of certain of their merchant vessels, and Great Britain in the one case had to consent to and in the other to demand a modification of belligerent right under International Law—a modification which, be it said, is a perfectly justifiable one, viz. that the right of search for contraband of war be restricted to a specified area. It is probable that, in future wars, powerful neutral states will show, in similar cases, quite as much irritation as did Germany and Great Britain. (T. BA.)

**NEUILLIVE, ALPHONSE MARIE DE** (1836-1885), French painter, was born, the son of wealthy parents, at Saint-Omer, France, on the 31st of May 1836. From school he went to college, where he took his degree in bachelier ès lettres. In spite of a broken leg, he learnt to paint as a boy. He entered the naval school at Lorient, and it was here, in 1856, that his artistic instincts first declared themselves. After being discouraged by several painters of repute, he was admitted to work in Ficot's studio. He did not remain there long, and he was painting by himself when he produced his first picture, "The Fifth Battalion of Chasseurs at the Gervais Battery (Malakov)." In 1860 de Neuville painted an "Episode of the taking of Naples by Garibaldi" for the Artists' Club in the Rue de Provence, and sent to the Salon in 1861: "The Light Horse Guards in the Trenches of the Mamelon Vert." He also illustrated Le Peuple du monde and Guizot's History of France. At the same time he painted a number of remarkable pictures: "The Attack in the Streets of Magenta by Zouaves and the Light Horse" (1864), "A Zouave Sentinel" (1865), "The Battle of San Lorenzo" (1867), and "Dismounted Cavalry crossing the Tchernaia" (1869). In these he showed peculiar insight into military life, but his full power was not reached till after the war of 1870. He then aimed at depicting in his works the episodes of that war, and began by representing the Bivouac before Le Bourget (1872). His fame spread rapidly, and was increased by the Last Cartridges (1873), in which it is easy to discern the vast difference between the conventional treatment of military subjects, as practised by Horace Vernet, and that of a man who had lived through the life he painted. In 1874 the "Fight on a Railroad" was not successful, and was followed by the "Attack on a House at Villerssexel" (1875) and the "Railway Bridge at Stiring" (1877). In 1878 the painter exhibited (not at the Great Exhibition) "Le Bourget," the "Surprise at Daybreak," "The Intercepted Despatch-bearer," and a considerable number of drawings. He also exhibited in London some episodes of the Zulu War. In 1880 he was made an officer of the Legion of Honour for "The Cemetery of Saint-Privat" and "The Despatch-bearer." During these years de Neuville was at work with Détaille on an important though less artistic work, "The Panorama of Rézonville." De Neuville died in Paris on the 18th of May 1885. At the sale of his works the state purchased for the Luxembourg the "Bourget" and the "Attack on a Barricaded House," with a water-colour "The Parley," and a drawing of a "Turco in Fighting Trim."

**NEUWILLER,** a town of Germany, in the imperial province of Alsace-Lorraine, situated under the Voges Mountains, 6 m. N. from Zabern by the railway to Rastatt. Pop. (1905) 1906.

It is an interesting medieval town, still surrounded by walls. The Romanesque Evangelical church dates from the 12th century; there are also a Romanesque Roman Catholic church, which was restored in 1832, a synagogue, and an old town-hall. The town has a considerable trade in hops and wine. Above it rise the ruins of the fortress of Herrenstein, and of the castle of Huneburg.

See Fischer, Geschichte der Abtei und Stadt Neuwied (Zabern, 1876).

**NEUWIED,** a town of Germany, in the Prussian Rhine province, the capital of the mediatized countship of Wied, is situated on the right bank of the Rhine, 8 m. below Coblenz, on the railway from Frankfort-on-Main to Cologne. Pop. (1905) 18,177. The principal edifice is the château of the princes of Wied. This is situated in a fine park, and contains a collection of Roman antiquities. The town has an Evangelical and a Roman Catholic church. Its chief products are starch, sugar, tobacco, cigars, chcolate, buttons and enamelled goods. Here are large rolling-mills, and in the vicinity are several large iron-foundries. The schools of Neuwied enjoy a high reputation.

Neuwied was founded by Count Frederick of Wied in 1662, on the site of the village of Langendorf, which was destroyed during the Thirty Years' War, and it rapidly increased owing to the toleration accorded to all religious sects. Among those who sought refuge here was a colony of Moravian Brethren; they still occupy a separate quarter of the town, where they carry on manufactures of porcelain stoves and dercskin gloves. Near Neuwied one of the largest Roman castra on the Rhine has been discovered. In 1807 the French, under General Hoche, defeated the Austrians near Neuwied, this being their first decisive success in the revolutionary wars. Legenhau, in the neighbourhood, is one of the residences of the princes of Wied.

See Wirgten and Bleneke, Neuwied und seine Umgebung (Neuwied, 1901).

**NEVA,** a river of Russia, which carries off into the Gulf of Finland the waters of Lakes Ladoga, Onega, Ilmen and many smaller basins. It issues from the south-west corner of Lake Ladoga in two channels, which are obstructed by sandstone reefs, so that the latter of the two has a depth of only 7 ft. to 15 ft. A little farther down it becomes completely navigable, and attains a breadth of 4200 ft.; but between the village of Ostrovki and that of Ust-Tosna it passes over a limestone bed, which produces a series of rapids, and reduces the width of the river from 1050 to 840 and that of the navigable passage from 350 to 175 ft. Nine or ten miles before reaching its outfall the river enters St Petersburg, and 5 or 6 m. lower down breaks up into the Great Neva (850 to 1700 ft. wide), the Little Neva (945 to 1365), and the Great Nevka (280 to 1250), this last, 2 m. farther on, sending off the Little Nevka (470 to 1130 ft.). Its total length is only 40 m. In front of the delta are sandbanks and rocks which prevent the passage of vessels except by a canal, 18 m. long, 124 to 226 ft. wide, and admitting vessels with a draught of 83 ft., from Kronstadt to St Petersburg. Most of its alluvial burden being deposited in the lakes, the Neva takes a long time to alter its channels or extend its delta. The ordinary rise and fall of the river is comparatively slight, but when the west wind blows steadily for a long time, or when Lake Ladoga sends down its vast accumulations of block-ice, inundations of a dangerous kind occur, as in 1777, 1824, 1879 and 1903.

According to observations extending from 1706 to 1899, the mean daily of the freezing of the Neva is November 25th, the earliest October 28th, the latest January 9th, and the latest December 26th. The mean day of opening is April 21st, the earliest March 18th, and the latest May 12th. The mean number of days open is 218, the least 172, the greatest 279.

**NEVADA** (a Spanish word meaning "snow-clad" or "snowy land," originally applied to a snow-capped mountain range on the Pacific slope), one of the far western states of the American Union, lying between 33° and 49° N. and 114° 1' 34" and 120° 34' W. (37° and 45° W. of Washington). It is bounded N. by Utah, S. and Idaho, E. by Utah and Arizona, the Colorado River separating it in part from the latter state, and S. and W. by California. Nevada ranks sixth in size among the states of the Union. Of its total area of 110,690 sq. m., 869 sq. m. are
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water surface. Its extreme length, N. and S., is 483 m., and its extreme width, E. and W., is 321 m. (For map, see CALIFORNIA.)

Physiography.—With the exception of its N.E. and S.E. corners, the state lies wholly within the Great Basin, the floor of which is really a vast table-land between 4000 and 5000 ft. above the sea. This plateau, however, is not a plain, but contains many buttes and mesa and isolated mountain ranges rising from 1000 to 8000 ft. above its surface. In the N.E. an unnamed range of highlands, with an E. and W. trend, forms the water-park of the Humboldt streams and boundary of the Humboldt river in Nevada and those that flow into the Snake river through Idaho and Oregon and thence to the Pacific Ocean. This range is very broken and ill-defined, with peaks often reaching altitudes of from 9000 to 12,000 ft., and with numerous spurs diverging N. and S. from the main divide. Between this ridge and the valley of the Colorado river lies all that portion of the Great Basin included within the state. The surface of this table-land is very rugged, and frequently broken by mountain ranges running N. and S. and from 5 to 20 m. wide at their bases. Intersecting the mountains in places.

Between these ranges lie valleys of about the same width as the bases of the mountains. These valleys are generally-level,

floored, but at their borders gradually slope upward, and are filled, often to a depth of several thousand feet, with the detritus of gravel, sand and silt from the neighbouring hills. This is a

region of innumerable faulted crust blocks, the elevated ones creating the N. and S. mountain ranges, and the depressed ones the valleys that lie between. It is for this reason that the mountain slopes are generally more abrupt on one side than on the other. Several valleys often unite into a large elevated plain, broken only by scattered buttes and spurs. The combined areas of the valleys and the area occupied by the mountains are about equal.

The mean elevation of the state is 5500 ft. There are 5400 sq. m. between 2000 and 3000 ft. above the sea; 11,100 sq. m. between 3000 and 4000 ft.; 23,700 sq. m. between 4000 and 6000 ft.; 29,800 sq. m. between 5000 and 6000 ft.; 30,100 sq. m. between 6000 and 7000 ft.; 7800 sq. m. between 7000 and 8000 ft.; and 2800 sq. m. between 8000 and 9000 ft. The highest point is Wheeler Peak, near the centre of the eastern boundary, with an elevation of 13,507 ft.; the lowest points are along the Colorado river, where the altitudes range from 700 to 800 ft. With the exception of this dip in the S.E. corner, the entire state lies above the 2000 ft. line.

The Sierra Nevada range, which forms the western rim of the basin, sends into the state a single lofty spur, the Washoe Mountains. At the foot of this range there is, relatively speaking, a depression, with few if any streams in it, and their full extent the drainage of the eastern slopes of the Sierra and what little drainage there is in the northern half of Nevada. From this depression eastward the general level of the plateau gradually rises to an elevation of 6000 ft. near the eastern borders of the state. The mountains also increase in height and importance as far as the East Humboldt range, a lofty mass about 60 m. W. of the Utah boundary. This range is the water-parting for nearly all the westward-flowing streams of the state, and is by far the steepest and most rugged within Nevada; a number of its peaks attaining a height of 11,000 or 12,000 ft. On its eastern slope the waters soon disappear within the sand of the desert to the eastward, and the only permanent rivers are those cold springs that form the source of the Ruby and Franklin lakes; on its western side the descent is more gentle, and the waters form the South Fork of the Humboldt. Below the centre of the state lie the Toiyabe Mountains, with several peaks from 10,000 to 12,000 ft. in height. The waters on the eastern on the eastern slope flow into the Smoky Valley; those on the other side assist the nephis of the Bear and Carson rivers, the former of which flows N. toward the Humboldt, but seldom has sufficient volume to enable it to reach that stream. Above 100 m. E. of the Carson river is a third important range, the Humboldt Mountains, whose highest peak, Mount Jefferson, rises 9275 ft. above the sea. Owing to their great height these three ranges receive heavier rainfall than the surrounding country and are fedier to the northern valley than any other region of the state. Many of the block mountains of the Great Basin are of complicated internal structure, showing rocks of all ages—state, limestone, dolomite, granite, multi-coloured volcanic rocks, and large areas of lava over.

From the valley of the Humboldt river southward the plateau gradually rises until the divide between this stream and the Colorado river, in the vicinity of the White Pine Mountains, is reached. From this point there is a fall, which is gradual as far as the 38th parallel, and then more abrupt. Thus at Pioche the altitude is 6225 ft.; near Winnemucca 3880 ft. The eastward drainage of the region of the Humboldt is toward the Colorado river, which reach the sea, but either terminate in lakes having no outlet or else vanish in sloughs or "sinks." Small streams often sink from sight in their beds of gravel, and after flowing some distance underground reappear as springs. Of the many springs in Nevada the Humboldt is most important. Rising in the N.E., it flows in a tortuous channel in a general S.W. direction for 300 m. and drains 7000 sq. m. The upper streams empty into the Humboldt lake, the overflow from which goes into the Colorado river at no part of its course is a large river, and near its mouth its waters are sub-alkaline. The Truckee river flows with more vigour, having its source in Lake Tahoe, in California, at an altitude of 6225 ft., and entering the Carson river through an irrigation canal completed in 1905; before this date it flowed into Pyramid Lake and Lake Winnemucca in the depression at the foot of the Sierra Nevada. A few streams from the west of the Humboldt range and Walker rivers, receive their waters from the eastern slope of this range and empty into lakes bearing their names. Of this group of lakes the largest is Pyramid Lake, 80 miles long. Lake Winnemucca is the largest, being 33 m. long and 14 m. wide. Fed by the same streams as its western neighbour, Lake Winnemucca, a much smaller lake. The waters of these two lakes are only moderately saline and may be used for irrigation. The Truckee is formed by the waters of Walker lake, 33 m. long and 6 or 7 m. wide, whose waters are strongly saline. On the western boundary, and partly included within the limits of Nevada, is Lake Tahoe, 20 m. long and 10 m. wide, which is 6553 ft. deep at its centre and whose waters have never been known to freeze, notwithstanding the lake's elevation. The topography and the climate of Nevada have led to the formation of two principal kinds of vegetation, the desert and the perennial. The perennial lakes, such as those just described, hold their waters for years and perhaps centuries; but the ephemeral lakes usually evaporate in the course of the summer. The latter class is formed by waters that can find no outlet. The barrens and deserts are covered by the growth forming in the valleys shallow bodies of water yellow with the mud held in suspension. The largest of these occurs in the Black Rock Desert, in the N.W., and at times is from 450 to 500 m. in length and only a few inches deep. Such bodies of water become nothing but vast sheets of liquid mud, and are called "mud lakes," a term most frequently applied to the sloughs led by Quinn's river. When the waters evaporate in the summer they leave a clay bed of remarkable hardness, which is sometimes encrusted with saline matter of a snowy whiteness and dazzles the eyes of the traveller. When such is the case the beds are called "alkali flats." During the glacial period much of the Great Basin was covered with glaciers and these 1600 years ago, and the glaciers left behind them uniting to form the ancient "Lake Lahontan," in northwestern Nevada. As these lakes shrank after the return of an arid climate, they left elevated beaches and deposits of various minerals, which are now rich in silver, lead, zinc and copper. The Mammoth hot springs are numerous, with temperatures ranging from 50° to 204° F.

In the S.E. corner of the state is the third drainage system. In the Washoe Mountains, as in the rest of the Sierra Nevada range of Arizona and flows S.W. for 60 m. until it joins the Colorado river. The latter stream flows for 150 m. along the S.E. boundary towards the Gulf of California.

Plants and Flora.—Of native animals the varieties are few and the numbers of individuals small. In the arid valleys coyotes (prairie wolves), rabbits and badgers are found. Large animals, such as the black and the grizzly bear, and deer are found on the slopes of the mountains, and small species of antelope and the black-tailed gazelle are found in the northernmost valleys in the winter. At rare intervals antelope appear in the southern deserts. Here also are found the sage thrasher, Le Conte's rooster, and the black antelope. Certain species of grouse are common high in the timbered mountains. Several varieties of water-fowl, especially curlews, pelicans, gulls, ducks, terns, geese and snipe, are found in the winter. The Spring Valley is noted for the size and number of its springs. The "black mouse" or Carson field mouse (Microtus montanus) is found throughout Nevada, as well as in Utah, north-eastern California, and eastern Oregon; it multiplies rapidly under favourable conditions. The ephedra (Ephedra viridis) causes serious injury to the grazing sheep. The flora of Nevada, although scanty, varies greatly according to its location. With the exception of the alkaliflats, no portion of the desert is devoid of vegetation, even in the driest seasons. In the Washoe Mountains, as in the rest of the Sierra Nevada range there is a heavy growth of conifers, extending down to the very valleys; but in many places these mountains have been almost
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In very limited spaces
deforested to provide timbers for the mines.
on other mountains there are scattered trees the pinon (nut
pine) and the juniper at an altitude between 5000 and 7000 ft.
on all but the lowest ranges, the trees rarely reaching a height of
over 15 ft.; and the stunted mountain mahogany on the principal
ranges at an altitude of 6800 ft. Several varieties of poplar are
found in the upper canyons, and trees of the willow-leaved species in
the Humboldt Mountains often attain a height of 60 ft. But except
for these infrequent wooded strips, the mountains are even more
bare than the valleys, because their shrubs are dwarfed from exposure. The trees, except in the Washoe Mountains, are of very
slow growth and therefore knotty and ill-adapted for timber. As a
rule, the elevation of the timber line on the mountains increases as
the latitude decreases. On the foothills are found phlox and lupine,
and in the N. much bunch grass, which is valuable for grazing purThe valleys are covered with typical desert shrubs; greaseposes.
wood (sarcobatus vermiculatus) creosote bushes (larrea tridentata) and
sage-brush (artemisia tridentata); the first-named plant is abundant,
chiefly in the N. This vegetation, covering plains, mesas, and even
extending up the sides of the mountains, gives the entire landscape
the greyish or dull olive colour characteristic of the Great Basin.
To the southward, as the valleys become increasingly sandy and
saline, even the sage-brush disappears, and little vegetation besides
the cactus and the yucca is to be seen. The valleys are treeless,
except in the vicinity of the Truckee river, where considerable
quantities of the cotton wood and a small amount of willow, birch,
and wild cherry are found. The mesquite grows some distance
from water, and is especially common near the Colorado river. In
January 1910 there were seven national forests in the state, created
since July 1908 and chiefly in 1909, containing 7983-76 sq. m.
As the lofty range of mountains on the W. deprives the
Climate.
winds from the Pacific of nearly all their moisture before they reach
the Great Basin, the climate of Nevada is characterized by an exThe skies are clear nearly every day in the year.
cessive dryness.
The mean annual precipitation varies from 3 in. in the S.W. (Esmeralda county) to 12 in. in the E. (White Pine county). In the
central, north-eastern and north-western sections, embracing the
counties of Nye. Elko and Humboldt, the average annual rainfall
varies from 7 to 8 in. ; in the west-central section, at the foot of the
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"
so-called
Sierra, the average is about 10 in.
rainy season
lasts from October to April, but the precipitation is chiefly in the
form of snow on the mountains. Except at great altitudes snow lies
on the ground only a few days each year. The melting of the
mountain snow-caps in the spring causes severe freshets, which in
turn are followed by long seasons of drought at a time when water
is most needed for agricultural purposes.
Fogs and hail are rare,
but, as in all treeless countries, the rain comes in unequal quantities,
and cloudbursts are not unknown. The mean annual temperature
for the state is 49 F., but varies from 54 in the S.W. to 46 in the
N. The daily and annual variation is very great, and is intensified
toward the E., where the altitudes are greater. At Elko, Elko
county, in the N.E., the mean temperature for the year is 46 F.
for the winter (December, January and February) it is 26
with
extremes reported of 73 and -42 , the mean temperature for the
summer (June, July and August) is 69, with extremes of 108 and
20. At Hawthorne, Esmeralda county, in the S.W., the mean
temperature for the year is 54; for the winter it is 36, with extremes of 69 and -6; the mean temperature for the summer is
72, with extremes of 102 and 32. At the head of the Humboldt
river frosts are of almost nightly occurrence, and in the Carson
Valley damaging frosts often occur in June. In the extreme S. the
isothermal lins run almost due E. and W. but farther northward
they take a N.W. and S.E. direction. The annual range of temperature is about 124; the highest temperature ever recorded being
119, and the lowest -42. In spite of the high temperatures of
summer, however, the low humidity prevents the heat from being
oppressive, and cases of sunstroke are unknown. While the western
mountains keep out the moisture, they do not ward off the winds
which pour dowa the steep slopes in the winter and spring and
raise clouds of dust.
Early-sown grain is often injured by flying
sand and gravel. In the summer and autumn the winds are light.
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Because of this extreme aridity, agriculture
dependent on irrigation. The three principal areas

Agriculture.

Nevada

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which irrigation is practicable are along the Humboldt river, in the
plains watered by the Carson, Truckee and Walker rivers, and at
the foot of the mountains along the western edge of the state.
There are various places also near the mouths of desert canyons,
where_ small amounts of water are obtainable for irrigation purposes
from intermittent streams. The total number of acres irrigated in
1899 was 504,168, an increase of 124-7% in the decade. In 1902
the total irrigated acreage was 570,001, an increase of 13-1% in
three years.
In 1902 Congress provided for the beginning of extensive irrigation works in the arid West, and Nevada (where preliminary reconnaissances had been made in 1889-1890) was the
first state to profit from this
The survey for the
undertaking.
Truckee-Carson system was begun in 1902, with the object of
the
waters
to
in
waste
western
Nevada for the
utilizing
flowing
irrigation

and reclamation

of the adjacent arid regions in Churchill,
counties.
canal 31 m. long, diverting the waters
river into the Carson river, was completed in 1905

Lyon and Storey
of the Truckee

A

A system of reservoirs (the main reservoir
Lake Tahoe with an area of 193 sq. m.), distributing canals, and
drain ditches was also projected, making it possible to reclaim
231,300 acres of the desert. It was estimated that the works would

at a cost of $1,250,000.
is

require nine years for their completion, at a total cost of $9,000,000,
although the first 200,000 acres could be reclaimed at a cost of
$2,700,000. The works were to be operated by the government for
ten years, and the cost assessed against the holders of the land. 1
At the conclusion of this period the system was to pass into the control
of the landholders, with no further charge by the government.
The soil when reclaimed is well adapted for forage crops, cereals,
vegetables and deciduous fruits. Nevada is a great ranching state,
and stock-raising has shown a rapid extension. In 1900, 88-9%
of its farm acreage was devoted to hay and forage crops, being
more than doubled in the decade. Fifty-one per cent, of the improved lands in 1899 were devoted to the cultivation of these crops.
With the growing of grasses as the chief agricultural product,
farming in Nevada is necessarily extensive rather than intensive.
In 1899 the average size of the farms was 1174 acres. 1 The value
of the different kinds of agricultural products for 1899 was as follows
:

live stock, $4,373.973;

hay and

grain, $1,535,914; dairy produce,

It thus appears
$385,220; vegetables, $216,600; fruits, $20,900.
that the live stock industry is one of the most important in the
state; the value of its product in 1899 excee ded its output of gold
and silver, which had then reached its lowest point, by over one
million dollars.* About 64% of the value of the live stock was
represented by neat cattle; 19% by sheep; 10% by horses, and
the remainder by mules, swine, asses, burros and goats.
In spite of the predominating interest in stock-raising, intensive
cultivation of the soil is practicable where the water supply is
sufficient. Nevada, for example, ranked third in 1909 in the amount
of wheat produced to the acre (28-7 bushels), 4 but in the total amount
produced (1,033,000 bushels) ranked only thirty-eighth, and furnished only 0-145% of the crop of the United States. In 1909 in
the amount of barley per acre (38 bushels) Nevada ranked third,
and in the average farm price per bushel ($0-75) ranked first among
the barley-producing states of the country, but in the total amount
produced (304,000 bushels) held only the twenty-second place and
in the same year the average yield of potatoes per acre in Nevada
was 1 80 bushels, exceeded in two states the average for the
entire country was 106-8 bushels per acre but the total crop in
Nevada (540,000 bushels) was smaller than in any state or Territory
of the Union, except New Mexico.
The prevailing soils are sand and gravel loams, but other varieties
are numerous, ranging from rich alluvial beds of extinct lakes, as
in
of Lyon and Esmeralda counties, to the strongly alkaline
parts
The most productive part of the
plains of the southern deserts.
state is the Humboldt Valley and the region near Pyramid Lake,
the
counties
of
Humboldt, Elko and Washoe.
including
singular menace to agriculture in Nevada was the plague in
These first appeared in large
1907-1908 of Carson field mice.
numbers in the lower part of the Humboldt Valley in the summer of
1906, and in October and November 1907 it was estimated that
they numbered on certain ranches from 8000 to 12,000 on every
acre.
The alfalfa crop suffered particularly, the total loss being
about $300,000. After unsuccessful attempts to rid themselves
of the mice, the farmers appealed to the United States Biological
Survey, and alfalfa hay poisoned with strychnia sulphate was used
successfully in the Humboldt Valley in January 1908 and in the
Carson Valley, where a similar plague threatened, in April 1908.'
Minerals. To its mineral wealth Nevada owes its existence as a
state; but for the richness of its veins of gold and silver ore it would
be still little more than an arid waste. Extending from central
California S.E. along the dividing line between that state and
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1
The public lands are open to entry free of charge, but the
government withholds the title until all the payments for water
have been made. The yearly payments amount to $2-60 per acre
under the present system this amount covers the cost of maintenance and operation and also of a_ thorough drainage system, which
is as important to the settler as irrigation.
Lands already held in
private ownership are supplied with water at the same price as
;

public lands.
1

Compare

fornia,

this figure with that for the neighbouring state of Calisize of the farms was 397-4 acres.

where the average

8

That conditions are favourable to the animal industry is shown
by the fact that in 1897 the valleys of northern Nevada were so
overrun with wild horses, to the detriment of the grazing grounds
for cattle, that the legislature authorized the killing of such animals.
For a time this was a profitable pursuit, as the horse hides brought
good prices.
4
This is the yield reported by the United States Department of
Between its reports and those of the Census Bureau
Agriculture.
in census years there are sometimes great discrepancies. According
to the Year Book of the Department of Agriculture in 1909 a crop
of 165,000 bushels of oats was grown in Nevada on 7000 acres;
there was no crop reported of Indian corn or of rye.
6
See Stanley E. Piper, The Nevada Mouse Plague of 1907-190%
(Washington, 1909), Farmers' Bulletin 352, U.S. Department of
Agriculture.


NEVADA

Nevada, and thence past the Colorado river into Arizona, is one of the richest mineral belts in the world. Gold was found in Gold Canyon near Dayton, Nevada, as early as July 1849. In 1859 the discovery of silver at Fairview, near Virginia City, caused a rush to that locality and to the building of Virginia City, a prosperous community on the side of a mountain where human beings under ordinary conditions would not have settled. In 1860 there was a new gold excitement. The mines of this one district had produced, up to 1902, $371,248,288, of which $148,145,385 was in gold, $204,653,040 in silver, and the remainder in uncalled tins. For the years 1898 to 1902 the production of the state was $11,000,000; in the second period of great productivity (1873-1878), the output of the lead (by John W. Mackay and his partners, Flood, Fair and O'Brien) in the Comstock Lode of the Great Bonanza mines of Nevada, the maximum annual output for the mines was attained, being $36,301,527. For the three years 1875-1877 the production of gold and silver in Nevada was $20,000,000, and was considerably more than the annual output of the other American states and Territories. After this last year the output of the Comstock mines declined on account of the exhaustion of the ore supply, the increased expense of mining at great depths, and the decrease in the price of silver. The yield reached its lowest point in 1899, but subsequently increased through the application of improved machinery, although the old diggings were treated by the cyanide process with profitable results. In 1899 the mines were worked only for their gold; the lead, silver, and zinc of the miners threw away the “black stuff” which was really valuable silver ore with an assay value four times as great as that of their base metal. By 1902 the output of lead was about equal to the unproductive silver. But the fall in the price of silver led to a reaction, and from 1893 the gold output predominated. The gold production of 1907 was valued at $12,099,435; the silver production at $1,464,470.

In connexion with the operation of the Comstock mines was built (in 1869-1879) the Sutro Tunnel, named in honour of its engineer, Adolph Sutro (1830-1898), piercing the mountain horizontally far below the mouth of the Comstock Lode, and at a distance of nearly 4 miles, striking the shafts of the Comstock Lode, securing ventilation and cool air for the miners, draining the mines above its level, and obstructing floods and hoisting water. Two or three tunnels were also constructed, making the total length 61 miles. Another mining region that attained importance in the early period was the Eureka District, in Eureka county, about 90 miles from Virginia City. During the first years of its operations it was worked by the Sutro Tunnel Company, which had been formed in 1864, but it was five years before the mines became productive. By 1882 they had produced $60,000,000 of precious metals.

With the working out of the deposits in the Comstock region, the mining industry declined, and between 1879 and 1902 there was a period of great depression, in which Nevada fell from first to sixth place among the silver-producing states and Territories. In May 1900, however, very rich deposits of gold and silver were discovered in Nye county, near the summit of the San Antonio Mountains, and a new era began in Nevada’s mining industry. The village of Tonopah sprang into existence as soon as the rush of newcomers to that region had overcome their first difficulties. In two years $7,000,000 worth of gold and silver had been taken from the Tonopah mines and it was asserted that they would prove as rich as the mines of the Comstock Lode. The Tonopah ores were richer in silver than the Comstock ore, and in 1903 there were using being approximately in the proportion of three to one. This discovery gave a new impetus to prospecting in south-western Nevada, and the variations of temperature that the district was not an isolated mining region but was in the heart of a great mineral belt. Tonopah is at the outcropping of a number of ledges which continue for several hundred feet below the surface for an unknown distance. In 1902, in Esmeralda county, 24 m. S. of Tonopah, rich ores were found in the Goldfield District, and within three years there were 8000 people in this region. During 1903 the town of Goldfield had a period of mushroom growth, then quieted, and finally became a thriving little city. Lead and zinc were also worked in this region. The production of the Goldfield District in 1904 amounted to $3,341,079. This discovery was followed in 1904 by that of the Bullfrog District, in Nye county, 60 miles south-west from the Eureka District; and the town of Bullfrog, although 100 m. from a railway, had an electric lighting plant, an ice plant and a hotel. In 1905 gold was discovered in Nye county, 29 m. N.E. of Tonopah, in what became known as the Goldfield District. At the time the population of New York City was 5,775,000, while the population of Manhattan was a mile in length and contained 3000 inhabitants.

After 1902 the production of gold and silver steadily increased, being worth $1,984,675 in 1903, $2,724,745 in 1906, and $4,747,700 in 1907. By far the larger portion of these metals came from the southern part of the state. In production of gold in 1907 Esmeralda county ranked first with $8,533,617 (nearly 70% of the total); Nye county, second, with $2,724,745; and Storey county’s a little more than $250,000. In the production of silver county ranked first in 1907 ($3,667,973, of which $3,541,788 was from Tonopah), Churchill county second ($342,617, from Ruby City); and Esmeralda county, third ($282,370), the lead silver ores) and Storey county were third and fourth respectively. Copper, lead and zinc are produced in small quantities, being found notably in the Eureka district and in the Goldfield district. The production of copper in 1907 was 1,278,571 lb. valued at $356,514. The output of lead in 1907 was 6,271,341 lb. (valued at $322,381). The output of zinc was 2,168,783 lb. (valued at $127,958).

Other important minerals extracted in Nevada are: coal, gravel, silica, and clay. Salt deposits are extensive and commercially important in Washoe and Churchill counties. After 1900 the production of salt rapidly increased up to 1906, when it was 11,249 bbls.; in 1907 it was only 6457 bbls., all graded as commercial coarse salt. Salt deposits are found chiefly in Washoe county; chalcedony (ore containing quicksilver) in Esmeralda county; cinabari (ore containing quicksilver) in Washoe county; haematite in Elko and Churchill counties; cerasite (iron sulphide) in Pershing county; and argentiferous galena (ore of tungsten) at Round Mountain, White Pine county. In 1903 and 1907 Nevada ranked second among the American states in the production of sulphur, but its output is very small in comparison with that of Louisiana.

Manufactures.—The manufacturing interests of Nevada are not important. Of the manufacturing establishments in the state in 1900, 10, or 47.8% were situated in Reno, Carson City and Virginia City, named in the order of their importance. These places employed 35.9% of the labour engaged in manufacturing, and the value of their products was 38.8% of the total for the state. Manufacturing establishments on the products of mines and quarries (clay, glass, stone and metal works) constituted about one-fifth of the whole product. Car construction and general shop work of steam railways was the leading manufacturing industry in 1903; next in importance came the manufacture of newspapers and journals, printing and publishing of newspapers and periodicals. Such statistics of the special census of manufactures (under the factory system) of 1903 as are comparable with those of 1900 show 99 factories in 1900 and 115 in 1903, an increase of 16.2%. Their capital in 1900 was $1,251,208 and in 1903 $2,891,997, an increase of 134.1%. The value of their products in 1900 was $1,261,005, and in 1903 $3,096,274, an increase of 145.5%.

Transportation.—In its industrial development Nevada has always been hampered by lack of transportation facilities. There are no navigable waterways, and the railway mileage is small. There were 460 miles of railways in the state in 1907, of which 213 were in the district; 42 miles were lines of less than 10 miles in length, and wagon trains were the only means of transporting the products of the mines across the desert. An unsuccessful attempt was made, beginning in 1886, to build a railway from this point; for this purpose the railway mileage in 1880 was 739 m., in 1900 148 m., and in the following decade railway building was at a standstill. Since 1900, however, there has been considerable development, and the total mileage on these lines in January 1908 was 922 m. The line is from east and west by three main lines of railway, parts of the great transcontinental systems, the Southern Pacific and the Western Pacific in the northern part of the state and the San Pedro, Los Angeles & Salt Lake in the southern. The oldest of these trunk lines, the Southern Pacific (formerly the Central Pacific), follows the course of the Humboldt and Truckee rivers. It is met at several points by lines which serve the rich mining districts in the south; at Cobre by the Nevada Northern from Ely in White Pine county, on the Robinson copper mining district; at Palisade by the Eureka & Palisade, a narrow-gauge railway, connecting with the lead and silver and coal mining of the district; and at Winnemucca by the Nevada Central, also of narrow gauge, from Austin; at Hazen by the Nevada & California (controlled by the Southern Pacific) which runs to the California line, connecting in that state with other parts of the great Southern Pacific system. Nevada, with the Tonopah & Goldfield, which runs to Tonopah and thence to Goldfield, thus giving these mining regions access to the Southern Pacific’s transcontinental lines; the Truckee & Palisade, a narrow-gauge line, close to the boundary, by the Virginia & Truckee, connecting with Carson City; and the South Pass and Humboldt, which runs from the Carson Valley, and Virginia City, in the Comstock District, and by the Nevada-California-Oregon, projected to run through northern California, to be one of the transcontinental lines of the Western Pacific railway, completed in 1910, extending from Salt Lake City to San Francisco, and running entirely east to west.

It is interesting to note that in 1875 the Nevada legislature passed an act forbidding camels to run at large. This law remained on the statute books until 1908, when it was formally repealed.
across the state of Nevada, is parallel with the Southern Pacific for some distance in the eastern part of the state, and crosses the mountains at Beckwith Pass 20 m. north of Reno. The San Pedro, Los Angeles & Salt Lake railway, also an important factor in east and west, is a new article in the nation's growth. As has been of special value in the development of the southern part of the state, it crosses a section that is mostly desert, but is connected with the Bullfrog District by the Las Vegas & Tonopah, which runs from Goldfield through Beatty and Rhynolet, and meets the San Pedro, Los Angeles & Salt Lake at Las Vegas. The Goldfield and Bullfrog districts have a further outlet to the south through a second railway, the Nevada Short Line (Bullfrog-Goldfield & Tonopah & Tidewater railways) which connects with the Atchison, Topeka & Santa Fe at Ludlow in California.

Population.—Nevada is the most sparsely settled state of the Union. Its population in 1860 was 68,573; in 1870, 42,491 in 1880, 63,766; in 1890, 45,761; in 1900, 43,335; and in 1910, 81,875 (6.7 per sq. m.). In 1900, 10,036 were foreign-born (mostly English, Irish, Germans, Italians and Chinese in almost equal proportions); and there were 35,405 white persons, 5216 Indians, 1520 Chinese, 228 Japanese and 134 negroes. There were then only three towns of importance: Reno, Virginia City and Carson City, the capital.

The Indian population consists of Paiute, Shoshoni and the remnants of a few other tribes of Shoshonean stock. On the Duck Valley reservation (488 sq. m.), established in 1877, in Elko county, between the forks of the Owyhee river and lying partly in Nevada and partly in Idaho, and of the western Shoshoni (boarding school), 55 pupils, in 1880, were found in Paiute, 238 Shoshoni and 1 Hopi in 1908; on the Pyramid Lake reservation (503 sq. m.), established in 1874, in Washoe county, on the borders of the lake from which it is named, 486 Paiute; on the Walker river reservation (70-37 sq. m.), established in 1874 (partly opened to settlement in 1906) along Walker river and Walker Lake, 466 Paiute; on the Moapa river reserve (15-6 sq. m.), in the south-eastern part of the state, 117 Paiute.

In 1906, of the 14,044 members of religious denominations, 9,070 were Roman Catholics, 1,270 Protestant Episcopalians, 1,105 Latter-Day Saints (Mormons), 615 Methodist and 220 Presbyterians.

Administration.—Nevada is governed under the original constitution of 1864, with the amendments adopted in 1880, 1889, 1904 and 1906. The constitution as adopted limited the suffrage to adult white males, but this provision was annulled by the fifteenth amendment to the Federal constitution; and in 1880 amendments to the state constitution were adopted striking out the word "white" from the suffrage clause and adding a new article granting rights under the law to persons without regard to race, colour or previous condition of servitude. A residence in the state of six months and in the district or county of thirty days preceding the election is required of all voters. Persons guilty of treason or felony in any state or Territory and not restored to civil rights, idiots and insane persons, are excluded from the suffrage. An unusual provision in the constitution, a result of its adoption in the midst of the Civil War, gives soldiers and sailors in the service of the United States the right to vote, but only their votes to be applied to the township and county in which they were enlisted and the power to vote is limited to 15 years after the date of discharge. The legislature has the right to make the payment of the poll tax a requirement for voting, but no such provision is in force.2 A law passed in 1887, requiring all voters to take an oath against polygamy, with the object of disfavouring Mormons, was declared unconstitutional by the State Supreme Court.

A governor, lieutenant-governor, secretary of state, attorney-general, controller, treasurer, superintendent of public instruction and survey general are chosen by popular vote every four years. Their functions are similar to those of the administrative officers of other states, but the fact remains that the governor does not possess the usual pardoning power but that the governor himself is a member of the pardoning board. The governor and lieutenant-governor must each be at least twenty-five years old at the time of election to office. The legislative department consists of a Senate, with members chosen every four years, about half of whom retire every two years; and an Assembly, whose members are chosen biennially. The constitution requires that the number of senators shall not be less than one-third nor more than one-half the number of the members of the Assembly, and that the total membership of both shall not exceed seventy. Bills of any character may originate in either house. The legislative sessions are biennial and are limited to fifteen days; special sessions are limited to twenty days. The judicial department consists of a supreme court with a chief justice and two associate justices, chosen for six years, and district courts, with judges chosen for four years.

The state is divided into fifteen counties, each of which is governed in local matters by a board of county commissioners, and is divided for purposes of taxation into townships. The constitution requires that township and county governments shall be uniform throughout the state. For each township there is a justice of the peace, chosen biennially by its voters. The homestead exemption extends only to the land actually occupied and cultivated by a person who is not a legal resident of the state, for a value not exceeding $6000; but no exemption is granted against a process to enforce the payment of purchase-money, or for improvements, or for legal taxes, or of a mortgage to which both the husband and wife were consents. The exemption can be obtained by a husband or wife only with the wife's consent, if the wife is at the time a resident of the state. The exemption is not affected by the death of the husband or wife, but inures to the benefits of the surviving members of the family. For divorce a residence in the state of six months is necessary; the grounds for divorce are desertion or neglect to provide for one year, conviction of felony, habitual drunkenness, cruelty or physical incapacity.

There are a number of unusual provisions in the constitution of Nevada. The assertion in the "Declaration of Rights" that "no power exists in the people of this or any other state of the Federal Union to dissolve their connexion therewith or perform any act tending to impair, subvert, or resist the supreme authority of the government of the United States," is a result of the drafting of the instrument during the Civil War. There is also a provision that the jurors for criminal trial be selected by the returned veterans of the war. There is a provision that no law be enacted which provides that whenever 10% of the voters of the state, as shown by the votes of the last preceding election, express a wish that any law or resolution of the legislature shall be submitted to the people, the Act or Resolve shall be voted on at the next election of the state or county officers, and if a majority of the voters approve the measure it shall stand; otherwise, it shall become void.

Nevada thus became the fourth American state to adopt the referendum.

Institutions.—The state maintains a penitentiary at Carson City and an insane asylum at Reno. The dead, dumb and blind are cared for in the state asylum for the disabled. The University of Nevada.

The State University, established at Elko in 1874 and removed to Reno in 1887, is supported by the income from a Federal grant of two townships (72 sq. m.) of public land and an additional grant, under the Morrill Act, of 8760 acres of 8760 acres of which is to be used for the support of an Agricultural and Mechanical College. An agricultural experiment station and a normal school are conducted in connexion with the university. The constitution provides that no institution in aid of religion is to be supported by public funds. At Virginia City is a school of mines, established by the state in 1903. The Federal government maintains three boarding schools for Indians in the state.

The public school system of Nevada is supported by a Federal grant of 2,000,000 acres of public land (given in lieu of the usual sixteenth and thirty-sixth sections) supplemented by state and local taxation. The constitution provides that a special state tax shall be levied for the support of the schools, and that there shall be provided for school purposes. All fines collected under the penal laws, all escheats and 2% of the receipts of toll roads and bridges go into the school fund, which is invested in state and Federal securities and the
NEVADA

interest apportioned among the counties according to their school population. The administration of the school system is in the hands of a superintendent of public instruction.

American party. The reason of the leave on the 31st of December 1908 amounted to $550,000, of which the state held an irredeemable bond for $350,000; the actual redeemable bonded debt of $170,000 was due to the investment of the school and university funds. From this bond the state is limited by its constitution to $300,000, except for the extraordinary purpose of repelling invasion or suppressing insurrection. Practically all the revenue is derived from the taxation of real and personal property. Mines and mining claims are exempt from taxation, but a quarterly tax is levied on the net proceeds of mines, and is not to be paid a second time so long as the products remain in the hands of the original producer. The rate for state purposes is fixed by the legislature, and for county purposes by the board of county commissioners. A poll tax is required of all males between the ages of 21 and 50 years, one half of which goes to the county in which it is collected and the rest to the state. At the close of 1908 the state receipts for the year amounted to $1,004,041, and expenditures to $875,541.

History.—The first recorded person of European descent to enter the limits of Nevada was Francisco Garés (1738-1781), of the Order of St. Francis, who set out from Sonora in 1775 and passed through, as is now the "extramural" portion of Clark county on his way to California. Half a century later a party of trappers of the Hudson's Bay Company entered Nevada and plied their trade along the Humboldt river. American trappers came at the same time. Emigrants to California followed the trappers, and many crossed Nevada in the early forties of the 19th century. During 1843-1845 John C. Frémont made a series of explorations in this region. By the treaty of Guadalupe Hidalgo, negotiated in 1848, at the close of the war with Mexico, Nevada became United States territory. It was then a part of California. Thereafter, its mines and resources were explored; the first silver mine was discovered in 1851. Nevada produced $300,000 in 1852, $550,000 in 1853, $1,000,000 in 1854, $3,000,000 in 1855, $5,184,000 in 1856, and $10,000,000 in 1857. The annual value of gold and silver produced from 1860 to 1864 was one of rapid development accompanied by the wildest speculation. This was followed by a reaction and a general collapse of inflated values until 1873, when the discovery of the Great Bonanza mine brought about a revival of industry and of speculation. A second period of decline followed the working out of this mine and lasted until 1900, when the discovery of a new mineral belt in southern Nevada brought renewed prosperity. Until 1870 the state was regularly Republican, but in this year the Democrats gained most of the offices, including the seat in the national House of Representatives. The Republicans, however, secured 3 electoral votes of Nevada in 1872 and in 1876, and in 1878 were again in full control, only to suffer defeat in 1880. Not until the silver currency question became a political issue did Nevada take a prominent part in national politics. In 1883, the Nevada Silver Association was formed for the purpose of advocating the free and unlimited coinage of silver. Both parties in the state in 1888 declared in favour of free coinage, and in 1892 instructed their delegates to the national conventions to oppose any candidate who did not favour this policy. As a means of asserting their views effectively, the citizens, irrespective of party, organized local silver clubs, and these eventually led to the formation of the Silver party of Nevada, which drafted a "platform" and nominated a state ticket and presidential electors who were instructed to support the Populist national ticket. The Republicans in the state divided, and the majority of them went over to the Silver party. At the national election in this year the Silver ticket received in Nevada 7264 votes; the Republican 2813; the Democrat 714; and the Prohibitionist 86. In the state election of 1894 the Silver party was again victorious, and not a Democrat was returned to the legislature. In the election of 1896 all the parties in the state declared in favour of the free and unlimited coinage of silver at the ratio of 16 1. The Democratic and Silver parties united, with the result that the state's electoral vote went to Bryan and Sewall, the Democratic nominees, while the Silver party retained most of the state offices. In the presidential election of 1900 the Nevada Republicans pursued a non-committal policy with regard to the silver question, declaring in favour of "the largest use of silver as a money metal in all matters compatible with the best interests of our government." The Democratic and the Silver parties again
NEVADA—NEVERS

united, and subsequently dominated the politics of the state.

Territorial Governor.—James W. Nye, 1861-1864.
L. H. Miller, Dem., 1870-1877.
Jewett W. Adams, Dem., 1883-1886.
Christopher C. Stephenson, Rep., 1887-1889.¹
Frederick B. Stearns, Rep., 1890-1894.
John E. Jones, Silver, 1895.²
Reinhold Sadler, Silver, 1895-1902.
John Sturtevant, Dem. (Silver), 1903-1906.
D. S. Dickerson, Dem., 1907-1910.
T. L. Oddie, Rep., 1911.


NEVADA, a city and the county-seat of Vernon county, Missouri, U.S.A., in the south-western part of the state, about 90 m. S.by E. of Kansas City. Pop. (1900) 7461, of whom 235 were foreign-born and 168 negroes; (1910) 7176. It is served by the Missouri Pacific and the Missouri, Kansas & Texas railway systems. The principal public buildings are the county court house, the federal building and the high school. Nevada is the seat of Cottey College for girls (Methodist-Episcopal, South, 1884) and of a state hospital for the insane, and there is a state camp ground for the National Guard of Missouri. There are three parks, one of which, Lake Park, is a pleasure and health resort, with a lake and chalybeate and sulphur springs. The smelting of lead and zinc and the manufacture of paper, lumber, sheet metal and bricks are among the city’s industries. Nevada is a trading centre for the surrounding country, and an agricultural market, in which Indian corn, oats, wheat, clover, Timothy and blue-grass are grown; coal is mined in the vicinity. The city’s water-supply is drawn from artesian wells. Nevada (“Nevada City” until 1869) was platted in 1855, was burned down in 1865 during the occupancy by the state militia in war time, was incorporated as a town in 1869, was entered by the first railway in 1870, and was chartered as a city in 1880.

NEVADA CITY, a township and the county-seat of Nevada county, Missouri, U.S.A., about 130 m. N.E. of San Francisco. Pop. (1890) 2524; (1900) 3250 (764 foreign-born); (1910) 2680. It is the terminus of the Nevada County Narrow Gauge railway, which connects with the Southern Pacific railway at Colfax, 23 m. S. An electric line extends to Grass Valley (pop. in 1900, 4710), 4 m. S.W. Situated in a hilly and picturesque region, 2580 ft. above the sea, Nevada City is frequented as a health and summer resort (annual mean temperature, about 53° F., mean summer temperature, about 66°). Gold-mining and quartz-mining are its principal industries, and in 1907 Nevada county’s output of gold ($1,000 76 oz. worth $2,278,840 in California; the county is the leading producer

¹ Died the 21st of September, 1890, and Frank Bell became governor by virtue of his office as lieutenant-governor.
² Died the 10th of April 1895, and R. Sadler became governor by virtue of his office as lieutenant-governor.

from quartz mines. Among the manufactures of the township are carriages and products of planing mills, foundries and machine shops; and grapes and fruits are raised in the surrounding country. Gold was first discovered within what is now Nevada City, on Deer Creek, in the summer of 1848, by James W. Marshall, who, in January of the same year, had found the metal near what is now Coloma, Eldorado county. The first settlement was made here in 1849; rich deposits of gold were soon afterwards found on or near the surface, and the settlement had the characteristic growth of a western mining town; its output of gold reached its maximum in 1850—1851. Nevada City was first incorporated in 1851 under a special act of the legislature (repealed in 1852); it was reincorporated in 1856 and again in 1878.

NÉVÉ, or FIRN, the name given to the partly consolidated masses of snow and ice which form in the hollows on the sides of mountains below the belt of freshly fallen snow and just above the compact glacier-ice. The névé, which generally consists of broad sheets of great beauty, is formed from the freshly fallen snow during a series of alternate thaws and frosts. These processes are accompanied by a gradual descent down the mountain side during the winter, and the névé finally consolidates, until it becomes compact glacier-ice. The névé is the feeding ground of the glacier (q.v.). The word névé (Lat. nivis, snow) is adopted from the French dialect of the French Alps; nivis is German, meaning “last year’s snow.”

NEVERS, a town of central France, capital of the department of Nièvre, 159 m. S.S.E. of Paris by the Paris-Lyons-Méditerranée railway to Nîmes. Pop. (1900) 23,502. Nevers is situated on the slope of a hill on the right bank of the Loire at its confluence with the Nièvre. Narrow winding streets lead from the quay through the town where there are numerous old houses of the 14th to the 17th centuries. Among the ecclesiastical buildings the most important is the cathedral of St. Cyr, which is a combination of two buildings, and possesses two apses. The apse and transept at the west end are the remains of a Romanesque church, while the nave and eastern apse are in the Gothic style and belong to the 14th century. There is no transept at the eastern end. The lateral portal on the south side belongs to the late 17th century; the massive and elaborately decorated tower which rises beside it to the early 16th century. The church of St. Étienne is a specimen of the Romanesque style. In that part of the church which is accompanied by the apse and from which the three radiating chapels is characteristic. It was consecrated at the close of the 11th century, and belonged to a priory affiliated to Cluny. The ducal palace at Nevers (now occupied by the courts of justice and an important ceramic museum) was built in the 15th and 16th centuries and is one of the principal feudal edifices in central France. The façade is flanked at each end by a turret and a round tower. A middle tower containing the great staircase has its windows adorned by sculptures relating to the history of the house of Clèves by the members of which the greater part of the palace was built. In front of the palace lies a wide open space with a fine view over the valley of the Loire. The Porte du Croux, a square tower, with corner turrets, dating from the end of the 14th century, is among the remnants of the old fortifications; it now contains a collection of sculptures and Roman antiquities. A triumphal arch of the 18th century, commemorating the victory of Fontenoy and the hôtel de ville, a modern building which contains the library, are of some interest. The Loire is crossed by a modern stone bridge, and by an iron railway bridge. Nevers is the seat of a bishopric of tribal character and of a departmental court of assizes and has a chamber of commerce and a branch of the Bank of France. Its educational institutions include a lycée, a training college for female teachers, ecclesiastical seminaries and a school of art. The town manufactures porcelain, agricultural implements, chemical manures, glue, boilers and iron goods, boots and shoes and fur garments, and has distilleries, tanneries and dye-works. Its trade is in iron and steel, wood, wine, grain, live-stock, &c. Hydraulic lime, kaolin and clay for the manufacture of faience are worked in the vicinity.
NEVILLE

Neviodunum, the early name of Nevers was in later times altered to Nevirnum. The quantities of medals and other Roman antiquities found on the site indicate the importance of the place at the time when Caesar chose it as a military depot for corn, money and hostages. In 52 B.C. it was the first place seized by the revolting Aedui. It became the seat of a bishopric at the end of the 5th century. The countship (see below) dates at least from the beginning of the 10th century. The citizens of Nevers obtained charters in 1194 and in 1231. For a short time in the 13th century the town was a university, transferred from Orleans, to which it was restored.

COUNTS AND DUKES OF NEVERS. Having formed part of the duchy of Burgundy, the county of Nevers (Nevirnais) was given by Duke Henry I. in 987 to his stepson, Otto William, afterwards count of Mâcon, who five years later handed it over to his son-in-law Landri. The first house of the hereditary counts of Nevers originated in this Landri, and was brought to an end in 1192 by the death of Agnes, countess of Nevers, wife of Pierre de Courtenay (d. 1217). The county subsequently passed by successful marriages into the houses of Donzy,Chartillon et Bourbe; Maubu de Bousescus (d. 1214), lord of the county of Nevers, together with those of Auxerre and Tonnerre, to her husband Odo (Eudes), son of Hugh IV., duke of Burgundy, in 1248. Her eldest daughter, Yoland, received the county of Nevers as her dowry when in 1265 she married Jean Tristan, son of King Louis IX. She became a widow in 1270, and in 1272 married Robert de Dampierre, who became count of Flanders. Her descendant by her second marriage, Marguerite, daughter and heiress of Louis II. de Male, count of Flanders, married successively two dukes of Burgundy, Philip I. de Bourbon and Philip II. the Bold. Philip (d. 1415), the third son of Philip the Bold, received the counties of Nevers and of Rethel and the barony of Donzy; his last male descendant, John, died in 1491. The house of Cleves then inherited the Nivernais, which was erected into a duchy by King Francis I. for Francis of Cleves in 1539. In 1565 Louis de Gonzaga (d. 1592), son of Frederick II., duke of Mantua, married Henrietta of Cleves, duchess of Nevers, and one of his descendants, Charles (d. 1669), sold the Nivernais to Cardinal Mazarin in 1659. The cardinal devised it to his nephew Philippe Jules Mancini, whose descendants possessed it until the French Revolution. The last issue of this house was the marriage of Louis IV. of Nivernais, Louis Jules Barbon Mancini Mazarini, died in 1798.

NEVILLE, or NEVILL, the family name of a famous English noble house, descended from Dolwin son of Uchtred, who had a grant from the prior of Durham in 1131 of "Staindropshire," co. Durham, a territory which remained in the hands of his descendants for over four centuries, and in which stood Raby castle, their chief seat. His grandson, Robert, son of Meldred, married the heiress of Geoffrey de Neville (d. 1192-1193), who inherited from her mother the Bulmer lordship of Brancepeth near Durham. Henceforth Brancepeth castle became the other seat of the house, of which the bull's head crest commemorates the Bulmers; but it adopted the Norman surname of Neville (Neville). Robert's grandson, another Robert (d. 1283), held high position in Northumbria, and sided with Henry III. in the Barons' War, as did his younger brother Geoffrey (d. 1283), ancestor of the Nevills of Horby. This Robert's son Robert (d. 1271) extended the great possessions of the family into Yorkshire by his marriage with the heiress of Middleham, of which the powerful Norman castle still stands. The summons of their son Ranulf (d. 1351) to parliament as a baron (1294) did not recognize the position of the Nevills as a barony in the north country. Ralph (d. 1357) the second baron—whose elder brother "the Peacock of the North" was slain by the Douglas in 1318—was employed by Edward III. as a commander against the Scots and had a leading part in the victory of Neville's Cross (1346), where David Bruce was captured, and by which Durham was saved. His active career as head of his house (1331-1367) did much to advance its fortunes and to make the name of Neville a power on the Scottish march. Of his younger sons, Alexander became archbishop of York (1374-1388) and was a prominent supporter of Richard II., attending him closely and encouraging his absolutist policy; in consequence of which he was one of those "appealed of treason" by the opposition in 1388 and being found guilty was outlawed, and died abroad in 1392. His younger brother William, a naval commander, took the opposite side, was a leading Lollard and a friend of Wiclif, and in 1388-1389 acted with the lords appellant.

John, the 3rd baron (d. 1388), a warden of the Scottish marches and lieutenant of Aquitaine, a follower of John of Gaunt and a famous soldier in the French wars of Edward III., conducted the royal policy in the west strengthening the family's position by marriage; his sisters and daughters became the wives of great northern lords; his first wife was a Percy, and his second Lord Latimer's heiress; and his younger son, Thomas, became Lord Furnival in right of his wife, while his son by his second wife became Lord Latimer. His eldest son Ralph (1364-1425), 1st earl of Westmorland (see WESTMORLAND, EARLS OF), carried the policy further, marrying for his second wife a daughter of John of Gaunt and securing heriresses for five of his sons, four of the younger ones becoming peers, while a fifth, Robert, was made bishop of Durham (1458-1457). Among his daughters married the Duchesses of Cleves (Richard iv. and Richard iii.) and an abbess of Barking. The Nevills were thus closely connected with the houses of Lancaster and York, and had themselves become the most important family in the realm. Of the earl's sons by his second marriage, Richard, earl of Salisbury (and three of his sons) and William, earl of Kent, are the subjects of separate notices.

The greatness of the Nevills centred in the "kingmaker" (Richard's son) and the heads of his house, after the 1st earl remaining, sprung from George and Edward, sons of his second marriage. George, who was Lord Latimer, was father of Sir Henry, slain at Edgcote fight, and grandfather of Richard, 2nd lord (1469-1530), a soldier who distinguished himself in the north, especially at Flodden Field. His grandson (d. 1577) was the last lord, but there were male descendants of his younger sons, one of whom, Edmund, claimed the barony, and after 1601 the earldom of Westmorland, but vainly, owing to its attainder. In this line may still exist a male heir of this mighty house.

The heirs male of Edward, Lord "Bergavenny" (now "Abergavenny" co. Monmouth), who died in 1476, have retained their place in the peerage under that style to the present day by a special and anomalous deviation. His wife, the only child of Richard (Beauchamp), earl of Worcester (d. 1422), brought him the great estates which had come to her line with Fitz Alan and Despencer heiresses, and in 1450 he was summoned as Lord Bergavenny, though not seized of that castle. Their grandson, George (c. 1471-1535) the 3rd lord, was in favour with Henry vii. and Henry viii., and recovered from the latter in 1512 the castle and lands of Abergavenny. He was prominent in the French campaigns of 1513-14 and 1523. On the death of his son, Henry, the 4th lord, in 1587, a long-famous contest ensued between his daughter, Lady Fane, and his heir male, Edward Neville, which was eventually ended by James I., in 1604, assigning the barony of Abergavenny to Edward's son and that of Despencer to Lady Fane. The former subsequently descended (on uncertain grounds) to the heirs-male with the old Beauchamp estates under special entails. In 1784 the Lord Abergavenny received an earldom, and the next lord erected at Eridge, Sussex, the present seat of the family, on which the marquises of Abergavenny and earldoms of Lewes were conferred in 1876. Its Sussex estates are mainly derived through the Beauchamps, from the Fitz Alan, heirs of the Warennes. The Nevills of Billingeard, Berks, were a junior line, of whom
was Sir Henry Nevill (d. 1615), courtier and diplomatist, who became a leading figure in parliament under James I. His grandson, another Sir Henry (d. 1664), was an author of some note and a Republican opponent of Cromwell, by whom he was beheaded from London. Archbishop Nevill took the oath of allegiance in 1740, and in 1762 Richard Aldworth (1717-1793), on inheriting Bilingbear, took the name of Nevill. From him descend the Lords Braybrooke.

Neville is a common French name, and it is not clear whether all the Nevills who occur in the 12th and 13th centuries were of the same stock as the lords of Raby. The baronial line of Nevill of "Essex" was founded by the marriage, temp. Richard 1., of a Hugh de Neville to the heiress of Henry de Cornhill, a wealthy Londoner. He went on crusade with Richard I. and was afterwards an active supporter of John, who named him to the Greek Charter (1215). His descendant, Hugh de Neville, was summoned as a baron in 1311, as was his son John, who served in the French and Flemish campaigns, and died, the last of his line, in 1358.

See Rowland's Historical and Genealogical Account of the Family of Nevill (1830); Drummond's Noble British Families (1846); Swallow's De Novo Castellis (1745); Bagot's sketch in The Anecdote, No. 175; also Du Cauvynel's Complete Peerage; J. H. Round's Feudal England; and for the Nevill castles Mackenzie's Castles of England. For the Kingmaker, see Oman's monograph (1885).

NEVILLE, GEORGE (c. 1432-1476), archbishop of York and chancellor of England, was the youngest son of Richard Neville, earl of Salisbury, and brother of Richard Neville, earl of Warwick, known as the "Kingmaker." He was educated at Balliol College, Oxford, and was from his childhood destined for the clerical profession, in which through the great influence of his family he obtained rapid advancement, becoming bishop of Exeter in 1458. From this time forward Neville took a prominent part in the troubled politics of the period. He was present with his brother Warwick at the battle of Northampton in July 1460, immediately after which the great seal was committed to his keeping. He took part in the coronation of Edward of York as king, who confirmed his appointment as chancellor. In 1463 he was employed on a diplomatic mission in France; and in 1464, after taking part in negotiation with the Scots, Neville became archbishop of York. During the next few years he as well as his brothers fell into disfavour with Edward IV.; and in 1469, after a successful rising in Yorkshire secretly fermented by Warwick, the king fell into the hands of the archbishop, by whom, after a short imprisonment, he was permitted to escape. When Warwick was in turn defeated by the king's forces at Stamford Bridge, Neville took the oath of allegiance to Edward, but during the short Lancastrian restoration which compelled Edward to cross to Holland, Neville acted as chancellor to Henry VI.; and when the tide once more turned he again trimmed his sails to the favouring breeze, making his peace with Edward, now again triumphant, by surrendering Henry into his hands. The archbishop for a short time shared Henry's captivity in the Tower. Having been pardoned in April 1471, he was re-arrested a year later on a charge of treason and secretly conveyed to France, where he remained a prisoner till 1475, when he returned to England. Bishop Neville died in the Tower on the 8th of June 1476. Archbishop Neville was a respectable scholar; and he was a considerable benefactor of the university of Oxford and especially of Balliol College.


NEVILLE, RALPH (d. 1244), bishop of Chichester and chancellor of England, was a member of the great Neville family, but of illegitimate birth. In 1214 he became dean of Lichfield, and obtained several rich livings; and in 1224 he was consecrated bishop of Chichester. In 1226 he was appointed chancellor by the council governing during the minority of Henry III.; and when the king in 1236 demanded the return of the great seal, Neville refused to surrender it, on the ground that only the authority that had appointed him to the office had power to deprive him of it. In 1231 he was chosen archbishop by the monks of Canterbury, but the election was not ratified by the papacy. He died in the castle of Lincoln in 1244. Neville’s residence in London was a palace in the street opposite the Temple, which from this association obtained the name of Chancery Lane, by which it is still known; while the palace itself, after passing into the hands of Henry de Lacy, earl of Lincoln, was called Lincoln’s Inn after that nobleman when it became the abode of students of law. Neville bequeathed this property to the see of Chichester, and the memory of his connexion with the locality is perpetuated in the name of a passage leading from Chancery Lane to Lincoln’s Inn which still bears the name of Chichester Rents.

NEVIN, JOHN WILLIAMSON (1803-1886), American theologian and educationalist, was born on Herron’s Branch, near Shippensburg, Franklin county, Pennsylvania, on the 20th of February 1803. He was a descendant of Hugh Williamson of North Carolina, and was of Scotch blood and Presbyterian training. He graduated at Union College in 1821; studied theology at Princeton Theological Seminary in 1823-1828, being in 1826-1828 in charge of the classes of Charles Hodge; was licensed to preach by the Carlisle Presbytery in 1828; and in 1830-1840 was professor of Biblical literature in the newly founded Western Theological Seminary of Allegheny, Penn., whence he removed to the Theological Seminary of Mercersburg, Pa., and thus passed from the Presbyterian Church into the German Reformed. He soon became prominent; first by his contributions to its organ the Messenger; then by The Anxious Bench—A Tract for the Times (1843), attacking the vicious excesses of revivalistic methods; and by his defence of the Inauguration address, The Principle of Protestantism, delivered by his colleague Philip Schaff, which aroused a storm of protest by its suggestion that Presbyterianism was not the last word in the development of the church but that a Johannine Christianity was to be its outgrowth, and by its recognition of Petrine Romanism as a stage in ecclesiastical development. To Dr Schaff’s 122 theses of The Principle of Protestantism Nevin added his own theory of the mystical union between Christ and believers, and both Schaff and Nevin were accused of a "Romanizing tendency." Nevin characterized his critics as pseudo-Protestants, urged (with Dr Charles Hodge, and against the Presbyterian General Assembly) the revival of Roman Catholic baptism, and defended the doctrine of the "spiritual real presence" of Christ in the Lord’s Supper, notably in The Mystical Presence: A Vindication of the Reformed or Calvinistic Doctrine of the Holy Eucharist (1846); to this the reply from the point of view of rationalistic puritanism was made by Charles Hodge in the Princeton Review of 1848. In 1849 the Mercersburg Review was founded as the organ of Nevin and the "Mercersburg Theology"; and to it he contributed from 1849 to 1853. In 1851 he resigned from the Mercersburg Seminary in order that its running expenses might be lightened; and from 1847 to 1853 he was president of Marshall College, and vice-president of Mercersburg College. With Dr Schaff and others he was on the committee which prepared the liturgy of the German Reformed Church, which appeared in provisional form in 1857 and as An Order of Worship in 1866. In 1861-1866 he was instructor of history at Franklin and Marshall College (in which Marshall College had been merged), of which he was president in 1866-1876. He died at Lancaster, Penn., on the 6th of June 1886.

See Theodore Appel, The Life and Work of John Williamson Nevin (Philadelphia, 1889), containing Nevin’s Life and Work (1879). Nevis, an island in the British West Indies, forming with St Kitts one of the five presidencies in the colony of the Leeward Islands. Pop. (1901) 12,774. It lies in 17° 14’ N. and 63° 33’ W., and is separated from St Kitts by a shallow channel 2 m. wide at its narrowest point. In form it is almost round, and from the sea has the appearance of a perfect cone, rising gradually to the height of 3200 ft. Its total area is 50 sq. m. Although the
island is subject to severe storms, the climate is healthy, the average temperature being 82° F. Sugar, rum and molasses are exported, and corn, yams, coffee and fruit are grown. There are medicinal springs and large deposits of sulphur. The chief town, Charlestown, lies on a wide bay on the S.W. The legislative council of St Kitts-Nevis meets at Basseterre, the capital of St Kitts. Nevis was discovered by Columbus in 1498 and first colonized in 1628 by the English from St Kitts. During the period of the slave trade it was a leading mart for slaves in the West Indies.

NEVYANSK, NEVYANSKY or NEVINSKY ZAVOD, a town of Russia, in the government of Perm, 57 m. by rail N.N.W. of Ekaterinburg, on the eastern slope of the Ural mountains, in the populous mountain valley of the Neyva, in a district very rich in iron and auriferous sands. Pop. (1881) 13,980; (1897) about 16,000, all Great-Russians and mostly Nonconformists, who are employed, partly at the iron-works, partly in various small industries, such as the manufacture of boxes, widely sold in Siberia, iron wares and boots, and partly in agriculture. The iron-works at Nevans are the oldest in Russia, having been founded in 1699. In 1702 Peter the Great presented them to Demidov, with 3,000,000 acres of land. Several other iron-works are situated within a short distance, the chief being Verkhne-Nevinsky, 18 m. S.; Neyvo-Rudinsky, 8 m. S.; Petrokamensk, 32 m. N.E.; Neyvo-Shaltansk, 20 m. lower down the Neyva; and Neyvo-Alapayevsk, 64 m. N.E. of Neviansky.

NEW ABBEY, a parish and village of Kirkcudbrightshire, Scotland. Pop. of parish (1901) 937. The hill of Criffel and Loch Kindar are situated within the parish boundaries. The lake contains 12 islands, of which one was a crannog, and the other the site of an ancient kirk. The village, which lies 6 m. S. of Maxwelltown, is famous for the ruin of Sweetheart Abbey, a Cistercian house built in 1275 by Devorguila in memory of her husband John de Bally, who had died at Barnard Castle in 1269. His heart, embalmed and enshrined in a coffin of ebony and silver, which she always kept beside her, was, at her death in 1290, buried with her in the precincts of the abbey, which thus acquired its name (Abbacia Dulcis Cordis, or Douxquer). The building afterwards became known as the New Abbey, to distinguish it from the older foundation at Dunieden, which had been erected in 1142 by Eugeus of Galloway. The remaining part of the abbey chiefly consist of the shell of the beautiful Cruciform church, with a central saddleback tower rising from the transepts to a height of over 90 ft., and a graceful rose window at the west end of the nave. Most of the work is Early English with Decorated additions. The abbott’s tower, a stately relic, stands about ½ m. N.E. of the abbey.

NEW ALBANY, a city and the county-seat of Floyd county, Indiana, U.S.A., on the N. bank of the Ohio river, at the head of low water navigation, nearly opposite Louisville, Kentucky, with which it is connected by three railway bridges, and 156 m. below Cincinnati, Ohio. Pop. (1860) 21,059; (1900) 20,628, of whom 1563 were foreign-born and 1905 negroes; (1910) 20,629. It is served by the Baltimore & Ohio South-western, the Chicago, Indianapolis & Louisville, the Pittsburg, Cincinnati, Chicago & St Louis and the Southern railways, by electric railways to Louisville, Indianapolis, &c., and by steamboats on the Ohio; it is connected by a belt line with the Louisville & Nashville, the Chesapeake & Ohio, the Illinois Central and other railways. The city is situated on an elevated plateau above the river, in an amphitheatre of wooded hills. It has a good public library, a well-organized public school system and several private schools and academies. Within the city limits is a national cemetery. The manufactures include leather, iron, foundry and machine shop products, furniture and veneer, lumber, cotton goods and hosiery, distilled liquors and stores. The value of the factory products in 1905 was $4,110,700, 13% more than in 1900. Originally settled about the beginning of the 19th century. New Albany was platted in 1813 and was chartered as a city in 1839. The city owed much of its early industrial importance to the plate-glass works successfully established here by Washington Charles de Pauw (1822–1887), who endowed the De Pauw College for Young Women (opened as the Indiana Asbury Female College in 1852). The glass works left the city because of the superior and cheaper fuel supplied by natural gas in central Indiana. The De Pauw College for Young Women was relatively unimportant after the endowment of Indiana Asbury University (now De Pauw University) by W. C. de Pauw in 1883, but it continued to give instruction until 1903.

NEW AMSTERDAM, a town of British Guiana, situated in 6° 20' N. and 99° 15' W. on the east bank of the Berbice river, about 4 m. from the mouth. Formerly the capital of the colony of Berbice, it is now the capital of the county of that name. It is a picturesque little town composed almost entirely of wooden houses, having a population estimated in 1904 at 7450. The Colony House, standing in handsome grounds beside the small but pretty botanical gardens, was formerly the residence of the governor and the seat of the legislature, and now contains the treasury and supreme courts. The town is lighted by municipally owned electric works, and contains various government institutions, a town hall and market. The local government is Scottland was the county town, the revenue (a little less $12,000 annually) being mainly raised by a direct rate on house property. The expenditure is principally on streets, street lighting, fire brigade, water supply and drainage. New Amsterdam is connected by ferry and rail with Georgetown, to which there is also a bi-weekly steamer service.

NEWARK, DAVID LESLIE, LORD (1601–1682), Scottish general, was born in 1601, the fifth son of Sir Patrick Leslie of Pitcairny, Fife-shire, commissary of Lindores, and Lady Jean Stuart, daughter of the 1st earl of Orkney. In his early life he served in the Army of James Louis, where he rose to the rank of colonel of cavalry. In 1640 he returned to his native country to take part in the impending war for the Covenant. In 1643, when a Scottish army was formed to intervene in the English Civil War (see Great Rebellion) and placed under the command of Alexander Leslie, earl of Leven, the foremost living Scottish soldier, Leslie was selected as Leven’s major-general. This army engaged the Royalists under Prince Rupert at Marston Moor, and Leslie bore a particularly distinguished part in the battle. He was then sent into the north-western counties, and besieged and took Carlisle. When, after the battle of Killiecrankie, Leslie was recalled from England in 1645, and made lieutenant-general of horse. In September he surprised and routed Montrose at Philiphaugh near Selkirk, and was rewarded by the committee of estates with a present of 50,000 merks and a gold chain; but his victory was marred by the captured Irish—men, women and children—to whom quarter had been given. He was then declared lieutenant-general of the forces, and, in addition to his pay as colonel, had a pension settled on him. Leslie returned to England and was present at the siege of Newark. On his return to Scotland he reduced several of the Highland clans that supported the cause of the king. In 1648 he refused to take part in the English expedition of the “engagers,” the enterprise not having the sanction of the Kirk. In 1649 he purchased the lands of Abercrombie and St Monance, Fife-shire. In 1650 he was sent against Montrose, who was defeated and captured by Major Strachan, Leslie’s advanced guard commander; and later in the year, all parties having for the moment combined to support Charles II., Leslie was appointed to the chief command of the new army levied for the purpose on behalf of Charles II. The result, though disastrous, abundantly demonstrated the ability of Leslie’s arm and it is said that a claim was made for him that Cromwell and the English regulars proved no match for him until his movements were interfered with and his army reduced to indiscipline by the representatives of the Kirk party that accompanied his headquarters. After Dunbar Leslie fought a stubborn defensive campaign up to the crossing of the Forth by Cromwell, and then accompanied Charles to Worcester, where he was lieutenant-general under the king, who commanded in person. On the defeat of the royal army Leslie, intercepted in his retreat through Yorkshire, was committed to the Tower, where he remained till the Restoration.
in 1660. He was fined £4000 by Cromwell’s “Act of Grace” in 1654. In 1661 he was created Lord Newark, and received a pension of £500 per annum. He died in 1682. The title became extinct in 1790.

NEWARK (NEWARK-UPON-TRENT), a market town and municipal borough in the Newark parliamentary division of Nottinghamshire, England. Pop. (1901) 14,992. It lies in a flat, fertile lowland near the junction of the river Devon with the Trent, but actually on the Devon. By means of a canal 23 m. in length it is connected with the Trent navigation. It is 13 m. N. N.W. from London by the Great Northern railway, and is on the Melton Mowbray joint branch of that company and the London & North-Western, and on the Nottingham & Lincoln branch of the Midland railway. The church of St Mary Magdalene, one of the largest and finest parish churches of England, is specially notable for the beauty of the tower and of the octagonal spire (223 ft. high) by which it is surmounted. The central pier of the old church, dating from the 12th or 13th century, remain, and the lower part of the tower is a fine example of Early English when at its best. The upper parts of the tower and nave are Decorated, completed about 1350; the spire, from between 1384 and 1393, and the chancel from 1480. The sanctuary is bounded on the south and north by two chantry chapels, the upper of which has on one of its panels a remarkable painting of the “Dance of Death.” There are a few old monuments, and an exceedingly fine brass of the 14th century. The castle, supposed to have been founded by Egbert, king of the West Saxons, was partly rebuilt and greatly extended by Alexander, consecrated bishop of Lincoln in 1122, who established it as a mint. It rises picturesquely from the river, and from its position and great strength was for a long time known as the “key of the North.” Of the original Norman stronghold the most important remains are the gate-house, a crypt and the lofty rectangular tower at the south-west angle. The building seems to have been reconstructed in the early part of the 13th century. In the reign of Edward III. it was used as a state prison. During the Great Rebellion it was garrisoned for Charles I., and endured three sieges. Its dismantling was begun in 1649, immediately after the surrender of the king. There is a very beautiful and interesting cross (the “Beaumont” cross) of the latter part of the 13th century in good preservation in the town. A pair of tall piers was added in the reign of Henry VIII., and endowed by Archdeacon Magnus, and there are other considerable charities. The other principal public buildings are the town-hall in the Grecian style (erected in 1774), the corn exchange (1848), the Stock library and Middleton newsroom (1828), the mechanics’ institution (1836), a free library and a fine hospital (1881). There is a large trade in malt, coal, corn and cattle. There are iron and brass foundries, boiler-works, agricultural implement manufactories and breweries. Gypsum and limestone are obtained in the neighbourhood, and plaster of Paris is extensively manufactured. The town is governed by a mayor, 6 aldermen and 18 councillors. Area 1931 acres.

Newark (Newerca, Nowerk) owed its origin, possibly in Roman times, to its position on the great road called the Fosse Way, in the valley of the Trent. In a document which purports to be a charter of 664 Newark is mentioned as having been granted to the abbey of Peterborough by Wulfhere. In the reign of Edward the Confessor it belonged to Godiva, who granted it to the monastery of Stow, and it remained in the hands of the bishops of Lincoln until the reign of Edward VI. The castle was erected by Bishop Alexander in 1122, and the bridge about the same time. Under Stephen a mint was established. There were burgesses in Newark at the time of the Domesday Survey, and in the reign of Edward III. there is evidence that it had long been a borough by prescription. It was incorporated under an alderman and twelve assistants in 1540, and the charter was confirmed and extended by Elizabeth. Charles I., owing to the increasing commercial prosperity of the town, reincorporated it under a mayor and aldermen, and this charter, except for a temporary surrender under James II., has continued the governing charter of the corporation. Newark returned two representatives to parliament from 1673 until 1855. A weekly market on Wednesdays, and a fair on the eve, day and morrow of the Invention of the Holy Cross, granted to the bishop of Lincoln by John, are still held; another fair at St Mary Magdalene and the four preceding days was granted by Henry III., and is probably represented by the fair now held on the 14th of May. A market for corn and cattle is still held on Wednesdays, and another on Tuesdays for fat stock has been added.

NEWARK, the largest city of New Jersey, U.S.A., a port of entry, and the county-seat of Essex county, on the Passaic River, about 8 m. W. of New York City. Pop. (1890) 181,830; (1900) 246,970, of whom 71,363 were foreign-born, and 6604 were negroes; (1910 census), 347,469. Of the total foreign-born population in 1900 (45,329 of whom had been in the United States at least ten years), 25,130 were from Germany, 12,792 from Ireland, 8537 from Italy, 5874 from England, 5512 from Russia and 4074 from Austria. Of the total population, 143,306 were of foreign parentage on both sides, 56,404 German, 52,261 Irish, 13,668 Italian, 8561 English and 8531 Russian. Newark is served by the Pennsylvania, the Baltimore and Ohio, the Erie, the Delaware, Lackawanna & Western and the Central of New Jersey railways, and by steamboats engaged in coastwise and river commerce. By electric lines it is connected with most of the cities and towns within a radius of 20 m., including Jersey City, Paterson and the residential suburbs, among which are the Oranges, Montclair, Bloomfield, Glen Ridge, Belleville and Nutley. It has a frontage on the river and bay of 10½ m., and a total area of 23:4 sq. m. The site is generally level, but the ground rises toward the western part. Broad Street, 120 ft., and Market Street, 90 ft. wide, the principal thoroughfares, intersect. The most prominent public buildings are the City Hall, completed in 1906; County Court-House, designed by Cass Gilbert (b. 1859), with sculpture by Andrew O’Connor and decorations by Howard Pyle, Will H. Low, Kenyon Cox, H. O. Walker, C. Y. Turner, F. D. Millet, George W. Maynard and Edwin H. Blashfield; United States Government Building; Public Library, finished in 1901, and City Hospital. There is a Roman Catholic Cathedral, and the city is the see of a Roman Catholic and of a Protestant Episcopal bishop. The Prudential Life Insurance Company and the Mutual Benefit Life Insurance Company have fine office buildings. Many of the tanneries and other manufacturing concern have been cleaned up or near the city. In Military Park is a monument to Major-General Philip Kearny (1815-1862), and in Washington Park is a monument to Seth Boyden (1785-1870), a Newark inventor of malleable iron, of machinery for making nails, and of improvements in the steam-loomotive. Newark has also a monument to Frederick Theodore Frelinghuyzen (1817-1855), secretary of state in the cabinet of President Chester A. Arthur, and to Abraham Coles (1813-1881), a poet and physician, both of whom lived here. On the banks of the Passaic is a house having as a part of its walls the old walls of Cockfost Church, in which Washington Irving frequently sojourned, and of which he gave a charming description in Salmagundi. In the vicinity are the remains of Peterborough, the home of Colonel Peter Schuyler (1710-1762), who served against the French in 1746-48 and in the French and Indian War. At the corner of Broad and William streets stood until 1835 the parsonage in which Aaron Burr was born.

In 1910 Newark had 658 acres in public parks, of which 637 acres were under the administration of the Essex County Park Commission. To Washington, Military and Lincoln parks, the older ones next the heart of the city, there have been added Branch Brook (277 acres), Weequahic (265-8 acres), West Side (23 acres), and East Side (12-5 acres) parks. The principal cemeteries are Mount Pleasant, overlooking the Passaic in the northern part of the city, and Fairmount in the western part; about 1891 the remains of the early settlers were removed from the Old churchyard. 1

1 The river channel before improvement had a navigable depth of 7 ft. at mean low water; the depth was increased to about 10 ft. by the Federal government before 1902; in 1907 further improvement was authorized by Congress, the channel to be made 300 ft. wide and 16 ft. deep.
NEWARK

Burying Ground to Fairmount Cemetery and placed in a large vault marked by a monument.

As parts of its public school system the city maintains twelve summer, winter and evening schools, a normal and training school for the education of teachers, a school of drawing, and a technical school, the last for evening classes. The Newark Academy, founded in 1792, is the leading private school; and there are various Roman Catholic academies. In the township of Verona (pop. in 1905, 2,576), about 7 m. N. W. of Newark, is the City Home for boys, in which farming, printing and other trades are taught. The Public Library (opened in 1889) contained about 166,000 volumes in 1910, and the library of the New Jersey Historical Society about 26,000 books, about 21,000 of which are permanent. The Newark, New Jersey, Fire Insurance Company has a law library of about 20,000 volumes; and the Essex County Lawyers' Club has one of 5000 volumes or more. Among the charitable institutions are the City Hospital, Saint Michael's Hospital, Saint Barnabas Hospital, Saint James Hospital, the German Hospital, a Babies' Hospital, an Eye and Ear Infirmary, a City Dispensary, the Newark Orphan Asylum, a Home for Crippled Children, a Home for Aged Women and three day nurseries. The municipality owns and operates the water-works, and the water is brought from reservoirs in the Passaic Valley and to the north and north-west of the city.

The city charter (1857) provides for government by a mayor, elected biennially, and a unicameral council, elected by popular vote. By popular vote, also, the board of street and water commissioners is chosen. The council chooses the city clerk, treasurer and tax receiver, and the mayor appoints the city attorney, police justices, the board of education, the trustees of the public library, and the excise and assessment commissioners, and, subject to the ratification of his choice by the council, the comptroller, auditor and the tax, police, health and fire commissioners.

Newark has long been one of the leading manufacturing cities of the country. The manufacture of shoes and other leather products, particularly patent leather, became an important industry early in the 19th century; in 1770 there was one tannery here; in 1792 there were three; a large one, still in operation, was built in 1827; in 1837 there were 155 curriers and patent leather makers in the city, which then had an annual product of leather valued at $590,300; in 1905 the value of the leather, tanned, curried and finished was $13,577,719. The manufacture of felt hats (product, 1905, $4,586,040, Newark ranking third in the country), the manufacture of daguerreotypes, of the city of the United States), carriages, chairs and jewelry (an industry established about 1830; product, 1905, $8,238,095), developed rapidly early in the 19th century, and there are extensive manufactures of malleable irons (product, 1905, $10,017,003), and of clothing (product, 1905, $9,037,188), ironworks and machine shops (product, 1905, $6,254,153), and large establishments for smelting and refining lead and copper, the product of the lead smelters and refining establishments being in 1905 the most valuable in the city. Among the other important manufactures in 1905 were: chemicals, valued at $5,906,726; slaughtering and meat packing, $2,923,877; varnish, $2,89,305; porcelain ware, $2,686,760; enumerated goods, $2,613,350; boots and shoes, $2,838,251; reduction of gold and silver, not from ore, $2,436,150; corrsets, $2,081,761; paints, $1,812,663; silverware and silver-smithing, $1,780,966; tobacco, cigars and cigarettes, $1,742,682; hardware, $1,615,755; buttons, $1,281,258, and saddlery hardware, $1,151,780. In 1905 an art pottery was established for making "crystal patina" and "'robin's egg blue" wares, in imitation, to a certain extent, of old oriental pottery, and Clifton India was in imitation of pottery made by the American Indians. The total value of Newark's factory products increased from $112,738,045 in 1900 to $150,055,227 in 1905, or 33.1%. In 1905 the value of the city's factory product was almost one-fifth of that for the whole state, and Newark ranked tenth among the manufacturing cities of the entire country. In the same year Newark manufactured more than one-half (by value) of all the jewelry, leather and malt liquors produced in the state.

Insurance is another important business, for here are the headquarters of the Prudential, the Mutual Benefit Life and the American Fire, the Finkleman's and the Newark Fire Insurance companies. The city's foreign trade is of very little value; its imports was $850,442 in 1907; of its exports $664,525, but its river traffic is heavy, amounting to about 3,000,000 tons annually, and being chiefly in general merchandise (including food-stuffs, machinery and manufactured products), ores and metals, chemicals and colours, stone and sand and brick.

Newark was settled in 1666 by about thirty Puritans from Milford, Connecticut, who were followed in the next year by about the same number of their sect from Branford and Guilford. Because of the union of the towns of the New Haven Jurisdiction by an act of the General Court of Connecticut in 1711, and again by an act of the General Assembly of the Province of New York in 1777, the city may be considered as belonging rather to church than to civil rights, these Puritans resolved to remove and found a new town, in which, as originally in the New Haven towns, only church members should have a voice in the government. They bought practically all of what is now Essex county from the Indians for "fifty double bands of powder, one hundred bars of lead, twenty axes, twenty coats, ten guns, twenty pistols, ten kettles, ten swords, four blankets, four barrels of beer, ten pairs of breeches, fifty knives, twenty horses, eighteen hundred and fifty fathoms of wampum, six ankers of liquor (or brandy) of the value of four dollars each, and twenty sickles." The church was in Broad Street, nearly opposite the present First Presbyterian Church, with cupola and flanks from which "watchers" and "wards" might discover the approach of hostile Indians, and as an honour to their pastor, Rev. Abraham Piers, (1668-1768), who came from Newark-on-Trent, they gave the town its present name, having called it Milford upon their first settlement. The town was governed largely after the Mosaic law and continued essentially Puritan for fifty years or more; about 1730 Presbyterianism superseded Congregationalism, and in 1734 Colonel Josiah Ogden, having caused a schism in the preceding year, by the purchase of wheat one dry Sunday in a wet season, founded with several followers the first Episcopal or Church of England Society in Newark—Trinity Church. Partly because of its Puritanic genesis and partly because of its independent manufacturing interests, Newark has kept, in spite of its nearness to New York City, a distinct character of its own. The College of New Jersey, now Princeton University, was situated here from 1747 to 1756, for all but the first few months under the presidency of the Rev. Aaron Burr, who published in 1752 the well-known Newark Grammar, long used in Princeton and originally prepared for the reading of very successful boys' school in Newark. The city received large additions to its foreign-born population immediately after the revolution of 1838, when many Germans settled here—a German daily newspaper was established in 1837. Newark was incorporated as a township in 1693, was chartered as a city in 1836 and received another charter in 1837; from it the township of Orange was formed in 1806 and the township of Bloomfield in 1812.

See H. L. Thowell, Historical Sketch of the City of Newark, New Jersey (Newark, 1902); F. J. Urquhart, Newark, The Story of its Early Days (Newark, 1904); and J. Atkinson, The History of Newark, New Jersey (Newark, 1878).

NEWARK, a city and the county-seat of Licking county, Ohio, U.S.A., at the confluence of three forks of the Licking river, on the Ohio Canal, and 33 m. E. by N. of Columbus. Pop. (1800) 14,270; (1900) 18,157, of whom 1342 were foreign-born and 300 were negroes; (1910 census) 25,404. Newark is served by the Baltimore & Ohio, and the Pittsburg, Cincinnati, Chicago & St. Louis railways, and by inter-urban electric lines. It lies on a level plain, but is surrounded by hills. Along two of the forks of the Licking there are some of the most extensive earthworks of the "mound builders"; they occupy a central area of 3 sq. m., and have a great variety of forms: parallel walls, circles, semicircles, a parallelogram, an octagon, &c. About 10 m. S.W. and connected with Newark by electric line is Buckeye Lake, an artificial body of water about 8 m. long and 1 m. wide, frequented as a summer resort. Among the city's attractive features are Idlewilde Park and a beautiful auditorium, built
as a memorial to the soldiers and sailors of the Civil War. Newark is the trade centre of an agricultural region, which also abounds in natural gas and coal; natural gas is piped as far as Cincinnati. The city has electric car and steam car shops and various manufactories, including stores and furnaces (the most important), bottles, table glass-ware, cigars, rope halters, machine furniture and bent wood. The total factory product in 1905 was valued at $5,253,596, an increase of 9.49% over the latter of 1900. Newark was laid out about 1801 and was incorporated in 1834.

For an account of the earthworks see Gerard Fowke, *Archaeological History of Ohio* (Columbus, 1902).

NEW BEDFORD, a city and port of entry, and one of the county-seats of Bristol county, Massachusetts, U.S.A., 56 m. S. of Boston, at the mouth of the Acushnet river, and at the head of New Bedford Harbor, an arm of Buzzard's Bay. Pop. (1890) 40,733; (1900) 62,442, of whom 25,529 were foreign-born, including 8,559 French Canadians, 5,889 English, 4,802 Portuguese and 3,030 Irish; (1910 census) 66,651. New Bedford is the terminus of two divisions of the New York, New Haven & Hartford railroad, and is connected with Taunton (the other county-seat), Fall River, Brockton and other cities by interurban electric railways. Passenger steamboat lines connect with Martha's Vineyard, Nantucket and Buzzard's Bay points; a freight line and, in summer, daily passenger service to New York are maintained; the Insular Navigation Co. (Empreza Insulana de Navegação) runs passengers and freight steamers from New Bedford to Lisbon, and to the Azores; and there is a regular sailing packet service between New Bedford and the Cape Verde Islands. Two bridges connect New Bedford with the township of Fairhaven, on the E. side of the harbour; one, a steel bridge, is almost 1 m. in length and cost $1,500,000. New Bedford is attractively situated, and, commercially, occupies a particularly favourable position. It covers about 20 sq. m., and extends along the W. side of the river and harbour for several miles. Unusual dockage facilities are thus provided. The harbour was improved by the Federal government, between 1840 and 1906, the channel from Buzzard's Bay through the harbour being 18 ft. deep and 200 ft. wide; under a project of 1907 it was contemplated to increase the depth of the channel 66 ft. and the width to 300 ft. There is a broad highway along the shore of the harbour to Clark's Point at the entrance, where during the Civil War the United States government erected a stone fort, Fort Rodman, in which a garrison of artillery is still maintained; New Bedford was one of the 26 places reported by the U.S. Chief of Engineers in 1909 as having "permanent seacoast defences." Among the principal buildings and institutions are the post office and custom house, the city hall, the county court house, the registry of deeds building, the masonic building, the merchants' national bank, the New Bedford merchants' national bank, and St. Luke's hospitals, the Swain free school, St Mary's (Roman Catholic) school, the Friends' academy, a state textile school, a state armory and St Mary's home. The public library, established as a private society library in 1802, taken over by the city in 1853, and housed in the refitted old city hall building, was one of the first free public libraries in the United States; it contains about 100,000 volumes, and has notable collections relating to the whaling industry and to the Quakers. The Sailors' Bethel, built in 1851, and containing memorial tablets reminiscent of the whaling days, is of interest. The Old Dartmouth Historical Society was organized in 1903. A fine park system, aggregating 555 acres, includes the Common, and Brook- lawn, Buttonwood, Hazelwood, Grove and Triangle Parks. The city owns and operates a fine water-supply system.

When whale-oil was a widely used illuminant, New Bedford was long the principal port of the world's whaling industry; and in point of tonnage owned it is perhaps still so, as many New Bedford vessels now sail from San Francisco. As early as the middle of the 19th century vessels sailed on whaling voyages from the mouth of the Acushnet river, but it was not until 1765, when Joseph Rotch, a Nantucket merchant, bought a tract of land on the W. side of the river and constructed wharves and warehouses, that the industry became established here. At first the whales were obtained principally off the Virginia and Carolina coasts, but by the outbreak of the War of Independence, the New Bedford whalers sought their prey as far as West Indian and even South American waters. The War of Independence temporarily ruined the industry, but it was soon re-established, and the field of operations was much extended, after 1791 many ships regularly rounding Cape Horn into the Pacific Ocean. By 1824 there were 59 whaling vessels registered from New Bedford. The unsettled commercial conditions of the early years of the 19th century and the Embargo combined to ruin the business once more, but the close of the War of 1812 ushered in the greatest era of prosperity for the industry. By 1845 only New York, Boston and New Orleans of American ports exceeded New Bedford in tonnage. The production was greatest in that year, New Bedford whalers importing 158,000 blls. of sperm oil, 272,000 blls. of whale oil and 3,000,000 lb. of whalebone. The beginning of Arctic whaling in 1848 marked a new step in the industry, and the tonnage was much increased. The highest point in total, tonnage and vessels was reached in 1857, when New Bedford possessed 329 registered whaling ships, representing an investment of $17,000,000 and employing almost all 10,000 hands. From a succession of causes, of which the introduction of petroleum into general use as an illuminant was the chief, the industry began to decline from this time. The Civil War was a great blow to the whalers; 25 vessels were sunk by Confederate cruisers, entailing a loss of $1,650,000, and many more were bought by the government to be sunk at the entrances of southern harbours, or to be used as colliers or store ships. In 1871 and 1875 the vessels were lost in the Arctic ice, involving losses of several millions. Still the industry survives on a comparatively small scale; in January 1900 there were 13 steamers and barns, 1 brig and 4 schooners, with an aggregate tonnage of 4710, employed, chiefly in sperm whaling, and the whalebone product of 1908 was valued at about $350,000.

The prosperity that New Bedford lost with the decline of the whaling industry has been more than made up by the growth of the cotton spinning industry. In 1895 New Bedford ranked second among the cities of the United States in the manufacture of cotton goods (including cotton small wares), producing 5% of the total for the country; the specialty of the mills is the finer cotton goods. The first cotton mill, a five-storey stone structure, was built by Joseph Grinnell (1789–1883) and his associates in 1847, and began operations in the following year with 15,000 spindles and 200 looms. This was the beginning of the Wamsutta Mills, in 1907 comprising 8 buildings, 228,000 spindles and 4500 looms. In 1900 the city had some 50 mills, with a total of over 2,137,000 spindles. The value of cotton goods manufactured in 1905 was $22,411,936, or 76.1% of all manufactured products of the city, and the total value of this, and the exports at the city, was $8,185,286; in 1900 $16,748,783. Among the city's other manufactures are tools, cordage and twine, boots and shoes, glass, oils, lubricants (notably black-fish oil, a lubricant for watches and clocks, of which almost the entire supply is manufactured here), mechanical toys, beer, ale, woolen and silk goods, and paints. The total value of all factory products was $23,397,491 in 1900 and $29,469,349 in 1905. There is an extensive commerce in coal, raw cotton, lumber and fish; the direct foreign trade is comparatively small—in 1900 the imports were valued at $44,005, and the exports at $44,473.

The site of New Bedford was visited in 1602 by the English navigator, Bartholomew Gosnold, who traded with the Indians at the mouth of the Acushnet or Acosnet. It was originally part of the town of Dartmouth, which was occupied by settlers from Plymouth, who in 1632 purchased the land from Massasoit, Sachem of the Narragansets, and his son Wamsutta (called Alexander by the whites). About 1665 there was a considerable influx of Quakers, and members of this sect have always formed a large proportion of the population. The town was incorporated in 1667.
an important and influential element in the population. There were few settlers on the site of Newbern until the middle of the 18th century, and there was no village, properly speaking, until 1760. The town was first called Bedford after Joseph Russell, one of the founders, whose family name was the same as that of the dukes of Bedford; and it was later called Newbern to distinguish it from Bedford in Middlesex county.

During the War of Independence the harbour became a rendezvous for American privateers; this led to an attack, on the 5th of September 1778, by a fleet and armed force under Earl Grey, which burned many ships and almost destroyed the town. In 1782 Newbern was set off from Dartmouth and separately incorporated as a township; in 1812 the township of Fairhaven was separated from it. Newbern was chartered as a city in 1847. Its first newspaper, the Marine Journal, was established in 1792. The Mercury, founded in 1807, now one of the oldest newspapers in continuous publication in the country, was for some time edited by William Ellery Channing (1815–1901). There are Portuguese and French weekly newspapers.

See Daniel Ricketson, History of New Bedford (New Bedford, 1868); Z. W. Pease and G. W. Hough, New Bedford (New Bedford, 1890); History of Bristol County (Philadelphia, 1868); L. B. Ellis, History of New Bedford and its Vicinity 1602–1892 (Syracuse, N.Y., 1892); W. S. Tower, A History of the American Whale Fishery (Philadelphia, 1907); and The Old Dartmouth Historical Sketches (1903 seq.), published by the Old Dartmouth Historical Society.

NEWBERRY, a city, port of entry and the county-seat of Craven county, North Carolina, U.S.A., near the head of the estuary of the Neuse river and at the mouth of the Trent river, about 90 m. N.E. of Wilmington. Pop. (1890) 7843; (1900) 9900, of whom 587 were negroes; (1910 census) 9671. Newbern is served by the Atlantic Coast Line and the Norfolk & Southern railways. The Federal government has improved both the Neuse and the Trent rivers for navigation; the Neuse has a channel of 8 ft. at low water to Newbern and one of 4 ft. from Newbern to Kinston, and the Trent a channel of 3 ft. from Newbern to Trenton. The Trent and the Neuse are both spanned here by railway and county bridges. The "Waterway between Newbern and Beaufort," projected in 1884, had in 1908 a controlling depth at mean low water of only 2 to 2½ ft.; it was decided to abandon this waterway on the completion of an inland waterway about 18 m. long with a channel 10 ft. deep at low water. The Federal surveyors have extended this waterway by about 2000 ft. along the shore, which would give Newbern an outlet to the ocean at Beaufort.

The remains of Tryon Palace, the residence of the royal governor and the meeting-place of the legislature, which was built by William Tryon (q.v.) in 1765–1770, and was said to be the finest building of its time in the colonies, are of historic interest, and among the principal buildings are the United States government building, the county court house, the county jail and the county house. At Newbern is one of the national cemeteries of the Federal government, containing many fine monuments.

The most important industries are the manufacture of lumber (especially pine) and trucking. The total value of factory products in 1895 was $5,343,184. In 1897 about 1000 men, mostly negroes, were employed in the saw-mills, whose annual product averages about 175,000,000 ft. Among the manufactures are fertilizers, cotton seed oil and carriages; repair shops of the Norfolk & Southern railway are here; the fisheries are of considerable importance; and the city ships quantities of fish, cotton and market-garden produce—much of the last being forced under canvas with steam heat. It is the port of entry of the Pamlico custom district; in 1908 its imports were valued at $71,421.

Newbern was settled in 1710 by a company of Swiss and Germans under the leadership of Baron Emanuel de Graffenried (d. 1735) and was named for Bern, Switzerland. It was incorporated as a city in 1723, but its present charter dates from 1890 with amendments adopted in 1907. For several years it was the capital of the province and for a long time was the chief seaport of the state. Although strongly fortified early in the Civil War, Newbern was captured by a Union force under General A. E. Burnside on the 14th of March 1862 after an engagement near the city in which the loss to the Confederates, who were under the command of General Lawrence O'Brien Branch, was about 578 killed, wounded, captured and missing, and the loss of the Union force was 90 killed and 380 wounded. Unsuccessful attempts to recapture the city were made by the Confederates on the 14th of March 1863, and on the 1st of February and the 5th of May 1864.

NEWBERRY, JOHN STRONG (1832–1892), American geologist, was born at Windsor, Connecticut, on the 22nd of December 1832, and received a medical education at Cleveland, Ohio, taking the degree of M.D. in 1848. He completed his medical studies in Paris. He was employed in 1846 by collecting coal-measure plants from mines that had been opened by his father, and an acquaintance with Professor James Hall established his interest in the science. Hence while in Paris he studied botany under A. T. Brongniart. In 1851 he settled in practice at Cleveland, but in 1855 he was appointed surgeon and geologist to an exploring party in northern California and Oregon, and in 1857 his reports on the geology, botany and zoology were published. Between then and 1861 he was employed on similar work in the region of the Colorado river under Lieutenants Ingersoll and Matthews, and published on that subject in 1861. In the following year he was employed by the government in a large area of previously unknown country in Utah, Arizona and New Mexico, the further results being published in 1876. During the Civil War he did important work as a member of the U.S. Sanitary Commission, his organizing capacity being specially marked during the operations in the Mississippi Valley. In 1866 he was appointed professor of geology and paleontology at the Columbia School of Mines, New York, where he commenced the formation of a magnificent collection of specimens; in 1869 he was made state geologist of Ohio and director of the (second) Geological Survey there, and in 1884 palaeontologist to the U.S. Geological Survey. Four volumes of the geology of Ohio were published while he was director of the survey, his own reports being confined to the surface geology and to the coal-measures and their fossil plants. He devoted much labour to the study of Triassic, Cretaceous and Tertiary plants, and in particular to those of the Laramie stage. He also carried on researches on the Palaeozoic and Triassic fishes of North America. Among his other publications may be mentioned The Origin and Classification of Ore Deposits (1880). His work throughout was characterized by great care and conscientious study, and it was under Lieutenant Ingersoll that most of the extended surveys of America and the Old World. He received the Murchison medal of the Geological Society of London in 1888, and was president of the American Association for the Advancement of Science (1897), of the New York Academy of Sciences (1897–1897), and of the International Congress of Geologists (1891). He died at New Haven, Conn., on the 7th of December 1892.

Memoir (with portrait) by J. J. Stevenson, American Geologist (July 1893).

NEWBOLT, HENRY JOHN (1869– ), English author, was born on the 6th of June 1862, the son of H. F. Newbolt, vicar of St Mary's, Bilston. He was educated at Clifton College, where he was head of the school in 1881 and edited the school magazine, and at Corpus Christi College, Oxford. He was called to the bar at Lincoln's Inn in 1887 and practised until 1899. His first book was a story, Taken from the Enemy (1892), and in 1893 he published a tragedy, Mordred; but it was the publication of his ballads, Admirals All (1897), that created his literary reputation. These were followed by other volumes of stirring verse, The Island Race (1898), The Sailing of the Long-ships (1902), Songs of the Sea (1904). From 1900 to 1905 he was the editor of the Monthly Review. Among his later books his novels The Old Country (1906) and The New Men (1909) attracted considerable attention.

NEW BRIGHTON, formerly a village (coextensive with the town of Castleton) of Richmond county, New York, U.S.A., but since the 1st of January 1898 the first ward of the borough of Richmond, New York City. It is at the north-eastern end of Staten Island, about 6 m. S.W. of the borough of Manhattan, with which it is connected by ferry. Pop. (1890) 16,423; (1900)
NEW BRIGHTON—NEW BRUNSWICK

21,441, of whom 6575 were foreign-born and 1295 negroes; (1905 state census) 23,650. At New Brighton is the Sailors' Snug Harbor, founded under the will of Robert Richard Randall (c. 1740–1801), who in 1771 became a member of the Marine Society of New York (an organization for the relief of indigent masters of vessels and their families), and in 1790 bought from Baron Poelnitz the "Minto farm," about 21 acres of land in what is now the Fifteenth Ward of the Borough of Manhattan. This tract, with four lots in what is now the First Ward of Manhattan, and cash and stocks to the value of about $20,000 Randall (who, himself seems to have followed the sea for a time, and was called "Captain") bequeathed to a board of trustees, directing that the income should be used "for the purpose of maintaining and supporting aged, decrepit and worn-out sailors," who had served at least five years under the American flag, and that the institution established for this purpose should be called "the Sailors' Snug Harbor." The will was bitterly contested by relatives, but finally was fully upheld in 1830 by the United States Supreme Court. The Sailors' Snug Harbor was incorporated in 1836, and was chartered in 1839, and named in 1846. Randall's body was removed to the grounds in 1834, and buried under a marble monument, and in 1884, a life-size bronze statue of him, by Augustus Saint Gaudens, was placed in front of the main building. In 1900 the institution comprised the main building, a hospital, a chapel, a parsonage, residences for the officials, and several other buildings. The grounds were about 10 acres, but employ themselves at simple trades, or at work about the grounds; the use of intoxicating liquors is strictly prohibited, but the men are furnished with plenty of tobacco, and are well cared for. The present immense value of the land bequeathed by Randall makes Snug Harbor one of the most liberally endowed charitable institutions in New York City. At New Brighton are also a Home for Destitute Children of Seamen, founded in 1846 at Stapleton, Staten Island, removed to a new building on the Snug Harbor property in 1854, and maintained by contributions and gifts; and the Samuel R. Smith Infirmary, founded in 1861 by the Medical Society of the Richmond county, and named in honour of a Staten Island physician. At New Brighton there are dry docks, paper and plaster mills, and silk-dyeing and printing works. The village as incorporated in 1866 included the northern half of the township of Castleton, and as incorporated in 1872 included all of that township.

NEW BRIGHTON, a borough of Beaver county, Pennsylvania, U.S.A., on Beaver river, 2 m. from its confluence with the Ohio and 28 m. N.W. of Pittsburg. Pop. (1890) 3616, (1900) 6820 (487 foreign-born and 179 negroes); (1910) 8326. It is served by the Pennsylvania railway, and is connected by bridge with Beaver Falls. The borough has a public art gallery, a public park and a general hospital. Coal and fireclay abound in the vicinity, the Beaver river furnishes good water power, and the borough has various manufactures. New Brighton was laid out as a town in 1815 and was incorporated as a borough in 1838.

NEW BRITAIN, a city of Hartford county, Connecticut, U.S.A., near the centre of the state, about 9 m. S.W. of the city of Hartford; land area 33-00 sq. m. in 1906. Pop. (1890) of the township, including the city, 19,007; of the city, 16,519; (1900) of the township, including the city, 28,202; of the city, 25,998, of whom 9203 were foreign-born, including 1860 Irish and 1811 Swedes, who have a weekly published here; (1910 census) 43,016. It is served by the New York, New Haven & Hartford railway, and by several inter-urban electric railways. The city is the seat of a state normal school, and has a free public library, formerly the New Britain Institute, and a public park of about 100 acres. New Britain is an important manufacturing centre; its principal products are hardware, cutlery and table-goods, boots, shoes, and foundry and machine shop products. In 1905 the capital invested in manufacturing was $10,079,717 (an increase of 45.1% since 1900) and the value of the factory products was $14,959,543 (an increase of 34.8%). More than one-half of the product-value was in hardware ($7,537,652). New Britain, which was settled in 1687, was originally a part of the township of Farmington. On account of ecclesiastical difficulties the "New Britain Society"—a parish—was organized in 1754. New Britain became a part of Berlin when that township was established in 1785. In 1830 the township of New Britain was incorporated, and in 1871 the city was chartered. A part of the state in 1905 the township of New Britain and the city of New Britain were co; the first election under the new charter was in April 1906. The city was one of the first in the country to build a municipal subway for electric light, telephone and telegraph wires.

See D. N. Camp's History of New Britain (New Britain, 1889).

NEW BRUNSWICK, a province of the Dominion of Canada, lying between 45° 2' and 48° 3' N. and 63° 46' and 60° 3' W. Its length from N. to S. is 230 m., its greatest breadth 190 m., and it has a seaboard of about 350 m.

Physical Features.—The surface is generally undulating, but in the 65 m. farther, nearest over the rainy season holds up to 2000 to 2000 ft. in height, rising in Bald Mountain to 2400 ft. These elevations are an extension of the Appalachian Mountains and traverse the province from the state of Maine. This whole section of the province is densely wooded. The southern region embraces the district along the Bay of Fundy. Its coast is rocky and bold and interrupted by ravines. Inland the numerous rivers, flowing through the soft sandstone and conglomerate rocks, have cut broad valleys, the soil of which is extremely rich and fertile. Along the shores of the east coast, the rivers separate into several streams, and are composed of mosses and marshes, but beyond that distance, it rises into gently sloping hills, which extend as far as St John.

New Brunswick is a network of rivers, bays and lakes, several of which are navigable for vessels of large tonnage. The principal rivers are the St John, Miramichi, Restigouche, Saint Croix, Petitcodiac, Richibucto and Nipisiguit. The St John, which is famous for its scenery, rises in the state of Maine and is over 350 m. in length. It is navigable for vessels of moderate tonnage from St John on the Bay of Fundy to Fredericton, a distance of about 88 m., but steamers of light draught ply as far as Woodstock, on the New Brunswick and Nova Scotia railways. The Richibucto and Nipisiguit are the two main branches of the St John, with a total length of 140 m., and which, with the Grand Falls, and the Petitcodiac, forms one of the most important systems of navigation in the province. The Nipisiguit and Tobique (a tributary of the St John) in the N. are in much repute among anglers.

The coast-line of New Brunswick is indented with numerous fine bays and harbours. The Bay of Fundy is an arm of the sea separating New Brunswick from Nova Scotia and terminating in two smaller bays, Chignecto Bay and the Basin of Minas. Its length up to Chignecto Bay is 140 m. and its extreme breadth 43 m. It is noted for its high tides, which rise about 30 ft. at St John and over 50 ft. at the head of Chignecto Bay. At Bay Verte, 14 m. distant, on the opposite side of the Inlet of Chignecto, the tide rises little more than 4 or 5 ft. The Bay of
Chaleur, which has several excellent harbours, is over 90 m. in
length and from 20 to 25 m. in breadth. The other inlets of
consequence on the east coast are Miramichi, Richibucto,
Buctouche, Cocagne and Shediac Bays; on the south coast are
Fassinaquddy Bay, St John Harbour and Chignecto Bay.

At the mouths of the rivers are in nearly every case excellent
harbours. To the province belong the islands of Campobello
and Grand Manan, at the entrance of the Bay of Fundy, from
both of which important fisheries are carried on.

Geology.—Along the Bay of Fundy, for about 30 m. inland, is
a band of hard Cambrian and Cambro-Silurian rocks, with
smaller areas of Devonian, Huronian and Laurentian. The city of St
John is built upon very hard Cambrian slates, in which interesting fossils are found. North of this belt grey sandstones and con-
glomerates of Carboniferous age occupy a triangular area, the apex
of which is near Oromocto Lake, the south side extending to Nova
Scotia and the north-west side to Bathurst. Along the western border this area is 400 to 600 ft. high, but near the coast it is low
and flat. The Carboniferous area of New Brunswick is continuous
across the isthmus of Chignecto with that of Nova Scotia, so that
from Miscou on the Bay of Chaleur to Sydney on the Atlantic coast
of Cape Breton, the whole coast of the Gulf of St Lawrence is
bordered by coal-bearing rocks.” (S. E. Dawson, North America,
London, 1861.) Northward of the Carboniferous are 40 to 50
m. wide is occupied by Ordovician and pre-Cambrian formations,
with large masses of intrusive granite. The Ordovician is composed
of schistose, micaeous, and foliated slates and quartzites, in places
highly altered and disturbed. The pre-Cambrian rocks consist of
very hard crystalline reddish felsite, chloritic quartzites, and fels-
laphic and micaceous schists. The whole of this region is rugged
and broken into numerous ranges of hills. The remainder of the
province to the north-western boundary is occupied by Silurian
rocks, mostly calcareous slates and shales associated with beds of
limestone. The whole province has been mantled with ice in the
Pleistocene period, and boulder-clay and later modified deposits
occupy the surface. Marine clay and sand containing fossil shells
are found along the coast.

Climate.—The climate, though subject to extremes, is healthy.
The average mean temperature in summer is 66° F., and in winter
19° F. The average rainfall for thirty years (1875 to 1905 in-
clusive) was 32.6 in., whereas in the neighbouring province of
Nova Scotia, with its larger coast-line, it was 39.6. The winters are
severe, and snow falls to a great depth, but the harbour of St John
is open throughout the winter. During the years 1892-1893 the
average yearly snowfall was 97.5 in., 20 in. more than in Nova
Scotia. The autumn is delightful, especially during the “Indian
summer,” after the first frost, but before the weather has broken.

Area and Population.—Including the islands, the total area of the
province is 27,985 sq. m., of which 74 are water. It thus occupies an area rather larger
than that of the mainland of Scotland. The population of 1801 was 30,000; with occasional
stationary, there being little or no immigration, and a steady exodus to the United States and
to the western provinces of the Dominion. The number of males slightly exceeds that of females.
The bulk of the people are of English descent, the remainder Irish and French. The Scots,
so numerous in nearly all the other districts of the Dominion, are here less conspicuous. Of
the original Indian inhabitants of the province, who were of Algonquian stock and divided into
twelve tribes, twelve of which are known, between 1700 and 1750, many of whom have a greater or
lesser proportion of white blood.

The capital is Fredericton, on the St John (pop. in 1901, 7117). The chief shipping
and commercial centre is St John (pop. in 1901, 49,711). Moncton is a large railway centre (pop.
in 1901, 2030). None of the other towns exceeds 5000 inhabitants. Owing to the large Irish and
French element over one-third of the population belongs to the Roman Catholic Church.
Campbellton (pop. 5000), a northern port on Chaleur Bay, with an important lumber trade,
was destroyed by fire in July, 1910.

Education.—There is a good system of primary and secondary schools under provincial
control. When in 1871 the system of free denominational
primary schools was supported by the pro-
vince was introduced, feeling rose so high among
the Roman Catholics that rioting broke out and
life was lost. In view of the provisions in the
area under protection, the Roman Catholics sought to have the new system declared unconstitutional, but the case, after being carried to the judicial committee of the imperial privy council, was decided against them. In the case of the Education Bill, practical though not theoretical satisfaction is given to that church. Renewed rioting broke out among the French Roman Catholics in 1890, but after some years the compromise of 1875 was confirmed. At Fredericton an office of education is maintained, and a school for the deaf and dumb. The Lazenarro for lepers at Tracadie and the marine hospital at St John are supported by the Dominion. At Fredericton is a small provincial university, founded in 1800 and re-established in 1859, at Sackville is the university of Mount Allison College under Methodist control, and at Memmecook one, working chiefly among the French, is owned by the Roman Catholics. In all these an adequate training is given in law, theology and the literary subjects, but for science, whether pure or applied, most of the provincial students go either to the United States or to the universities of Upper Canada.

Either owing to the excellence of its education New Brunswick has produced a school of poetry,
headed by Charles Roberts, which is unique in the Dominion.

Agriculture.—The great predominance of the lumber industry has tended to keep agriculture in the background. There is also a steady flow of the most active young men to the greater opportunities
offered by the Canadian and American west. Thus the area under crop declined from 6000 sq. m. in 1875 to about 1500 and about 700 for pasture, the rest being for the most part still covered with forest. In all the river valleys, and especially on the fertile alluvial lands along the coast, and where the climate
is mild and prosperous farms are scattered with a size from 100 to 240
acres, and good crops of wheat, oats, buckwheat and all the staple
grains and roots are raised. Fruits, dairy and poultry raising, and the production of cheese and butter, are becoming industries of importance. A dairy school is maintained by the provincial government
at Sussex (King’s county). Though no great development of agriculture is possible, a quiet, equable prosperity is attained by
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hundreds of farmers. Much crown land still remains unoccupied, and is sold by the provincial government on easy terms to bona fide settlers.

1924—Its great forests, through which flow numerous rivers with excellent harbours at or near their mouths, have long made New Brunswick a centre of lumbering. This industry has affected the whole development of the province, and the wilder and more unpromising parts of the land have been settled, and the population of the province has spread from the Bay of Fundy on the south to the borders of Ontario or of the west. The most valuable and most widely-spread tree is the black spruce (Abies nigra), from which is made a yearly increasing quantity of wood-pulp for paper-making. The hemlock (Abies balsamea), the cedar, birch, bough, oak, ash and many other valuable trees, are also widely spread. The chief ports for shipping are St John, at the mouth of the St John river, and Chatham, at the mouth of the Miramichi.

Though much remains, much has been destroyed by forest fires. To this day traces may be seen of the fire which in 1825 utterly destroyed hundreds of square miles of timber along the river Miramichi.

The same forests are also a paradise for sportsmen. The game laws are being made increasingly strict, and the province draws a large revenue from the sale of licences, extra fees being imposed on sportsmen from other countries. Moose (Cerus alces), caribou and deer may only be shot during about two months in the autumn, and the number allowed to each gun is strictly limited. In 1902 the provincial and federal government set aside 1,400,000 acres of the lands adjoining the sources of the Tobique, Nipisiquit and Miramichi rivers for a national park and game preserve.

1926—The mineral wealth of the province is small. Copper, lead, zinc and plumbago have been worked on a small scale at various times. Coal seams are numerous, but are worked solely for local consumption. Albite, a species of coal found in Albert county and giving a very hot flame in the furnace, is the most widely sought for. Limestone and gypsum are extensively quarried near St John and in Albert county.

The fisheries, on the other hand, are extensive, though less so than those of Nova Scotia. This industry centres in the counties of Charlotte and Gloucester, herring, salmon, lobsters, sardines and cod forming the chief catch. The Restigouche and other rivers near the northern border are much frequented by anglers in search of trout and salmon.

Manufactures.—The chief manufactures, apart from the shipping of St John, are connected with lumbering and with agriculture. The manufacturing of lumber is of course growing in importance. Co-operation in the manufacture of butter and cheese has produced excellent results, and numerous cheese and butter factories are scattered through the province. In no sense, however, does New Brunswick play an important part in the manufactures of the Dominion.

Communications.—The rivers are still the main arteries of the province. The roads, though improving, are as a rule bad. The main road system has since 1876 been that of the International, owned and operated by the federal government, by which the province is linked to Nova Scotia on the east and to the rest of Canada on the west. The Pacific Coast Traction Company runs through the province, and by the Canadian Pacific and the Maine Central it has communication with the United States. Various lines of steamers run, chiefly from St John, to American and other eastern ports.

History.—Until 1784 New Brunswick formed part, first of the French province of Acadia, later of the British province of Nova Scotia. The first settlement within its borders was made in 1604 by Pierre de Guast, seigneur de Monts, with whom was Samuel de Champlain. Their colony at the mouth of the St Croix river was soon abandoned, but throughout the French régime the district was frequented by bands of fur-traders. In 1762 the first English settlement was made at Maugerville on the St John river, and in 1764 a body of Scottish farmers and labourers took up land along the Miramichi. On the 18th of May 1783 a convention of the loyalists settled at the mouth of the St John. Thousands more followed, and in 1784 New Brunswick was declared a separate province. At first governed by a representative assembly and an irresponsible council, it obtained responsible government in 1847—1848, after a constitutional struggle in which no little ability was shown. In 1867 it entered without reluctance but without enthusiasm into the Canadian Federation. Its economic and educational history, both more important than its political, have been indicated in earlier parts of this article. (For the boundary dispute, see MAINE.)

1897—The Acadian Geology (edit. of 1891), is the most easily accessible work on the geological history of New Brunswick. Numerous studies have been published, chiefly by the Geological Survey of Canada, by L. W. Bailey, R. W. Ellis, A. P. Low, and G. F. Matthew. Valuable papers on various provincial subjects have been published in the Transactions of the Royal Society of Canada by W. F. Ganong. The provincial government issues a yearly volume of sessional papers; Acadianism, a magazine published in St John, should also be consulted. The earliest account of New Brunswick is given by Nicholas Denys, Description géographique (published Paris, 1672; republished by W. F. Ganong with notes and introduction, 1903); there is no good modern history; but by G. E. Fenety, Political Notes (1867); James Hannay, History of Acadia (1879), and Lives of Wilmoit and Tilley (1907) may be consulted.

NEW BRUNSWICK, a city and the county-seat of Middlesex county, New Jersey, U.S.A., on the Raritan river, at the junction of the Delaware & Raritan canal, about 23 m. S.W. of Newark. Pop. (1890) 18,603, (1900), 20,006, of whom 325 were foreign-born and 755 were negroes; (1910 census) 23,388. It is served by the Pennsylvania and the Raritan River railways, and by daily steamboats to New York. There is a fine stone bridge across the Raritan. In the city are the Wells Memorial Hospital, St Peter's General Hospital, a Carnegie library, a Federal building and a Soldiers' Monument. New Brunswick is the seat of the Theological Seminary of the Reformed Church in America, and of the oldest theological school in the United States; founded in 1784 in New York City, situated at Flatbush, Long Island, in 1796-1810, and removed to New Brunswick in 1810, and of Rutgers College (originally Dutch Reformed, now non-sectarian), which was founded in 1766 as Queen's College, was rechartered in 1770 as a college for "the education of youth in the learned languages, liberal and useful arts and sciences and especially in divinity," was first opened for instruction in 1775, was closed during 1785-1807 and 1816-1825, and was renamed in 1825 in honour of Colonel Henry Rutgers (1745-1839), of New York City, a liberal benefactor. The college embraces two schools: the classical school and the scientific school, which in 1864, in pursuance of the Morrill Act of 1862, was constituted by the state legislature as the state college for the benefit of agriculture and the mechanic arts; a preparatory school is also controlled by its trustees. An agricultural experimental station is maintained in connexion with the college. In 1908-1909 there were 306 students. In 1908 the library of Rutgers College contained 57,000 volumes, and that of the Theological Seminary 48,000 volumes. The city has a variety of manufactures, and the total value of factory products in 1903 was $8,916,983, 54% manufactures, and 46% others.

A settlement was made here in 1681, and for a time the place was known as Prigmore's Swamp; later, after John Inian had established a ferry across the river, it was called Inian's Ferry; the present name was adopted in honour of the house of Brunswick. New Brunswick received a city charter from the royal governor in 1730, and was chartered as a city by the state legislature in 1784. During the War of Independence, General Washington and his army entered New Brunswick on the 28th of November 1776, but on the approach of the enemy evacuated it, and from the 3rd of December 1776 to the 13th of April 1777 it was occupied by the British under Lord Howe. Cornelius Vanderbilt was for several years the proprietor of the Bellona Hotel of New Brunswick, now a tenement house.

NEWBURGH, or Newburg, a city of Orange county, New York, U.S.A., on the W. bank of the Hudson river, about 57 m. N. of New York City. Pop. (1890) 23,687, (1900) 24,943, of whom 4346 were foreign-born and 538 negroes; (1910 census) 27,895. It is served by the Erie, the West Shore, and—by ferries across the Hudson—the Central New England and the New York Central & Hudson River railways. Across Newburgh Bar, as it is called, is the village of Fishkill, and an electric line connects with the village of Walden (pop. in 1910, 4004), about 12 m. N.W., which has various manufactures, the most important being pocket-knives. The city occupies a commanding position on terraces rising abruptly from the river, and on the flat plateau above, whence a view may be obtained of the Catskill Mountains to the N.W., of the Highlands of the Hudson to the S. and of the Hudson river for many miles in both directions. Orange Bridge, between Newburgh and Walden, is known for its ice
NEWBURGH—NEWBURY

yachting and skating races. Washington Park is in the central part of the city. Downing Park, named in honour of the horticulturist and landscape gardener Andrew Jackson Downing, (1815-1852), a native of Newbury, lies on a high plateau overlooking the city and the surrounding country. Among Newbury's institutions are a public library, St Luke's Hospital, a Children's Home, Mount St Mary's Academy (Roman Catholic) and a business college. In Colden Square there is a statue of Governor George Clinton. Cotton, woolen and silk goods, laces, paper, plaster, plush, felt and felted hats, carpets, engines and boilers, and mill and farm machinery are manufactured, and there are ship and brick yards. In 1903 factory products were valued at $7,142,327, an increase of 33.3% over their value for 1900. Newbury was first settled in 1709 by a colony of Germans from the Rhenish Palatinate under their minister, Joshua Rockethal (d. 1719), and was known as "the Palatine Parish of Quassicus." Toward the middle of the century many of the Germans removed to Pennsylvania, and Scottish and English settlers took up their abandoned lands. In 1752 the place was renamed Newbury, after the town of that name in Scotland, whence many of the new settlers had come. From the spring of 1782 until August 1783 Washington made his headquarters here, occupying the Hasbrouck House (built by Jonathan Hasbrouck between 1750 and 1770), which is still standing in Washington Park, and was bought by the state in 1840. It long contained a collection of historical relics, for which the state has erected a brick building in Washington Park. In 1865, he wrote his famous letter of rebuke to Colonel Lewis Nicola (1717-1807), who had written to him on behalf of a coterie of army officers, it is said, suggesting that he assume the title of king. Here, also, Washington made his reply to the so-called "Newbury Addresses," written by John Armstrong, and calling for action on the part of the army to force Congress to redress its grievances. Here the arrangements were completed for the disembarkation of the Continental Army, and the centenary of the disembarkation was celebrated here on the 18th of October 1883. In commemoration of the disembarkation also a monument known as the "Tower of Victory." (53 ft. high, with a life-sized statue of Washington), was erected in Washington Park by Federal and State authorities. Newbury was incorporated as a village in 1800 and chartered as a city in 1865. The U.S. Geographic Board spells the name Newbury, but the spelling Newbury is adopted locally and by the U.S. Post Office.

See E. M. Ruttenber, History of the Town of Newbury (Newbury, 1859) and History of Orange County (Newbury, 1872).

NEWBURY, a royal and police burgh of Fifeshire, Scotland. Pop. 2,061. It is on the N.W. of Ladybank Junction by the North British Railway. Its industries chiefly consist of the making of linen and floorcloth, matting and quarrying, and there are fisheries, especially of salmon. The harbour is used for the transhipment of the cargoes of Perth-bound vessels of over 200 tons. On high ground, about 1 m. S.W., stands the remains (only the pedestal) of Macduff's Cross, which marks the spot where the clan Macduff—in return for the chief's services against Macbeth—was granted rights of sanctuary and composition for murder done in hot blood. Denmylin castle, about 1 1/2 m. S.E. of Newbury, was the home for more than 250 years of the Balfour family, of which the two brothers, Sir James (1600-1657), the annalist and Lyon King, and Sir Andrew (1630-1664), founder of the Botanic Garden in Edinburgh, were the most distinguished members. Lindores abbey, the gem of the district, is situated on the Tay, close to Newbury, and 1 1/2 m. N. of the village of Lindores. Of the Benedectine abbey, founded in 1178 by David, earl of Huntingdon, brother of William the Lion, there only remain the groin arch of the principal entrance, a portion of the west tower and other Early English fragments, but the ground plan of the whole structure can still be traced. The church had the deanery of Newbury, and their orchards famous. At Blackearnside, a forest of alders, to the east of the village, Wallace defeated the earl of Pembroke in 1298.

NEWBURN, an urban district in the Tyneside parliamentary division of Northumberland, England, on the Tyne, 53 m. W. of Newcastle by a branch of the North Eastern railway. Pop. (1901) 12,500. It has collieries, and iron, steel, engineering, tool and fire-clay works, and there is a large industrial population. Newburn is of considerable antiquity. Roman remains have been discovered in proximity to cultural trade, and a church hither was destroyed by fire in 1572 in the course of a dispute between two claimants of the earldom of Northumberland. Here in 1640 the Scottish Covenanters planted guns to protect them while fording the river, after which they defeated the English on the Durham side at Stellaheugh, and subsequently occupied Newcastle. The name of Scotswood, one of the manufacturing villages between Newburn and the city, commemorates one of their positions. The district has many associations with the famous engineer George Stephenson, born at Wylam, 3 m. W.

NEWY, a market town and municipal borough in the Newbury parliamentary division of Berkshire, England, 53 m. W. by S. of Reading by the Great Western railway. Pop. (1901) 11,061. It is beautifully situated in the narrow well-wooded valley of the Kennet, which is followed by the Kennet and Avon canal. The town has north and south communications by the Didcot, Newbury & Southampton railway (worked by the Great Western company), and is the terminus of the Lambourn Valley light railway. The church of St. Nicholas is a large Perpendicular building of the beginning of the 16th century. The chief's dwelling house, built at the charge of John Winchcombe or Smales, father-in-law of John II. of Scotswood, a clothier, who, according to the brass to his memory, died in February 1550. A few picturesque old buildings remain in the town, including part of Winchcombe's house and the Jacobean cloth hall, now a public museum. The almshouses called King John's Court are supported by a foundation known as St Bartholomew's Hospital, to which in 1215 King John granted by charter (rewound in 1596 to the corporation) the profits of a fair on St Bartholomew's day (24th of August). Shaw House, on the outskirts of the town to the north-east, is an Elizabethan mansion of brick, dating from 1581; to the north of Donnington castle, retaining a Perpendicular gateway and other fragments. The suburb of Speenhamland was formerly an important posting station on the Bath road. At Sandleford Priory, to the south of Newbury, the site and part of the buildings of an Augustinian priory (c. 1200) were utilized in the erection of a mansion, in 1781, for Mrs Elizabeth Montague. The householders of Newbury have the right to elect boys and girls to the educational foundation of Chriss's Hospital. The cloth industry is long extinct in Newbury, but large wool fairs are held annually; there are numerous warehouses, there are Looms, and numerous clothiers. A racecourse was opened in the vicinity of the town in 1905, and six meetings are held annually. The borough is under a mayor, 6 aldermen and 18 councillors. Area, 1,828 acres.

Newbury (Neubiri, Neubir) possibly owes its origin to the village of Speen on the other side of the Kennet, which probably marks the site of the Roman station Spinae. The name Newbury (new town or borough) is first mentioned by Odericus Vitalis; it is probable, however, that the manor of Ulteritone, entered in Domesday as held by Ernulf of Hesdine and containing fifty-five houses, was the present town, which was from the twelfth century upwards the manor seat of the baron's of Newbury. The manor was subsequently held by the Marshalls, and later by the Mortimers, through whom it passed to the house of York and the crown. It formed part of the dowry of several queens-consort, and was held by Elizabeth before her accession. In 1627 it was granted by Charles I. at a fee-farm to her corporation. Newbury was a borough by prescription; in 1857 its inhabitants are called "burgesses" and a document of the time of Edward I. speaks of it as "burgus." It was incorporated by a charter of Elizabeth (1566) which was confirmed by Charles I. and renewed by Charles II. in 1665. Newbury sent two representatives to the parliament of 1672 and delegates to a council held in the reign of Edward III.

Newbury early became a centre of the woolen industry,
NEWBURYPORT

NEWBURYPORT, a city and port of entry and one of the county-seats of Essex county, Massachusetts, U.S.A., on the S. bank of the Merrimac river, about 3 m. above its mouth, and about 18 m. N. W. of Boston (1850, 13,947; 1900, 14,478), of whom 2863 were foreign-born; (1900 census) 14,949. Area, about 12-85 sq. m. The city is served by two divisions of the Boston & Maine railroad, and by coast and river freight steamers. There are many houses dating back to the 17th century; of these the stone "garrison" house (in Newbury), with walls 4 ft. thick and built in the form of a cross, is an interesting example. Other private houses worthy of mention are the former homes of "Lord" Timothy Dexter and Caleb Cushing, the birthplace of William Lloyd Garrison, and 33 m. from Newburyport in the township of West Newbury Indian Hill Farm, the birthplace of the journalist Ben Perley Poore (1820-1887), author of Perley's Reminiscences of Sixty Years in the National Metropolis (1886). Among the public buildings and institutions are the Marine Museum, the Public Library (founded in 1834 by Josiah Little and containing about 45,000 volumes), the old Tracy mansion (built in 1771 or 1772), which forms part of the Public Library building, the Anna Jacques and Homoeopathic hospitals, homes for aged women and men, a Home for Destitute Children, Old South Church, in which is the tomb of George Whitefield, and the Young Men's Christian Association building, which is a memorial to George Henry Corliss (1817-1888), the inventor, erected by his widow, a native of Newburyport. The General Charity Society is a benevolent association. The city has a good public school system. The Female High School was opened in 1843 and is said to be the first high school for girls to be established in the United States. The Putnam Free School, now part of the public school system, was endowed early in the 19th century by Oliver Putnam of Newburyport and afterwards of Hampstead, New Hampshire. Three parks, Washington, Cushing and Atkinson, are maintained by the city; and there are a statue of George Washington (1879), by J. Q. A. Ward, one of William Lloyd Garrison by D. C. French, and a memorial to the soldiers and sailors of the Civil War—a bronze statue, "The Volunteer"—by Mrs Theo (Ruggles) Kitson. A curious chain suspension bridge across the Merrimac, connecting Newburyport with Amesbury, was built in 1827, replacing a similar bridge built in 1819, which was one of the first suspension bridges in America.

Newburyport in the early part of the 18th century was one of the most prosperous commercial centres in New England. At that time fishing, whaling and shipbuilding were its principal industries, the clipper ships built here being among the fastest and best known on the seas. After the Civil War manufacturing became Newburyport's chief interest. In 1905 its factory product was valued at $6,800,979, an increase of 32.5% since 1900; 57.6% was in boots and shoes, and the manufactures of combs and silverware, silversmithing products, cotton goods and electrical supplies are also important.

Newburyport, including the site of the present Newburyport, was settled in 1635 by a company under the leadership of the Rev. Thomas Parker (1595-1677), who had taught in Newbury, England, in his youth. In 1639 a portion of the territory was set off to form the town of Rowley, and in 1764 about 647 acres were set off and incorporated as the town of Newburyport. In 1819 the town of Parsons (now West Newbury) was formed from Newburyport, with its area considerably enlarged, became a city in 1851. During the War of Independence and the War of 1812 it sent out many privates. In 1811 a fire destroyed 360 buildings, including the greater part of the business portion of the town.

See Caleb Cushing's History and Present State of the Town of Newburyport (Newburyport, 1826); Joshua Coffin, History of Newburyport, Newburyport, and West Newbury, 1635-1845 (Boston, 1845); Mrs E. V. Smith, History of Newburyport (Boston, 1854); D. H. Hurd, History of Essex County (Philadelphia, 1888); J. J. Bean, History of Newbury from the First Settlement of the Town to the Beginning of the Twentieth Century (Boston, 1902), History of Newburyport, 1764-1905 (Newburyport, 1906), and Oub3 Newbury, Historical and Biographical Sketches (1892).

NEW CALEDONIA (Fr. Nouvelle-Caledonie), an island in the western Pacific Ocean, belonging to France. (For map, see Pacific Ocean.) It is about 250 m. long, and has an extreme breadth of 35 m. and an area including adjacent islets of 6450 sq. m.; is situated at the southern extremity of Melanesia, between 20° 5' and 23° 10' S., and between 164° and 167° 30' E., and, like all the chief islands of that chain and the chain itself, lies north-west and south-east. An almost unbroken barrier reef skirts the west shore at about 5 m. distance, enclosing a navigable channel; on the east, which is more abrupt and rocky, it is a continuous reef. It is entirely surrounded by coral reefs, which continue, marking the former extension of the land, for about 100 m., ending with the Huon Islands. The Isle of Pines, so called from its araucarias (its native name is Kunie), geologically a continuation of New Caledonia, lies 30 m. from its south-east extremity. It formerly abounded in sandalwood, and consists of a central plateau surrounded by a belt of cultivation. At the two extremities of New Caledonia, parallel longitudinal ranges of mountains enclose valleys; for the rest the island consists essentially of confused masses and ranges of mountains, rising to an extreme elevation of 5387 ft., the plains being chiefly the deltas of rivers. The landscape is rich and beautiful, varied with grand rock scenery, the coast-line being broken by numerous small bays, into which flow streams rarely navigable even for short distances, but often skilfully utilized by the natives for irrigation; and sometimes flowing in subterranean channels. The larger rivers in the wet season form impassable morasses, especially in the S.E., where the mountains rise in isolated masses from flat plains.

Geology.—Speaking generally, New Caledonia may be described as a band of Palaeozoic and probably Lower Palaeozoic rocks, associated doubtless with some Archean beds; this band lies from north-west to south-east, through the whole length of the island. The second element in the composition of the island consists of Mesozoic beds, which occur in a broken band along most of the south-western coast. Most of the island is occupied by the band of the old rocks, which include mica, glauconite and sericite-chists and slates; there are small intrusions of granite, and numerous dikes and masses of basic eruptive rocks. The slates are interbedded with limestones containing fossil brachiopods, which have led to their determination as Silurian or Devonian; but L. Peletan classes all these limestones as Triassic. Triassic beds of the Pacific coastal type occur in a band along the south-western coast. They are covered by marine Jurassic beds and they in turn by Cretaceous coal-bearing, terrestrial deposits, resembling those of New Zealand. According to E. Glasser, the basic igneous rocks which are associated with the mineral deposits of New Caledonia were intrusive in Cenozoic times, at the severing of the connexion between New Caledonia and New Zealand. New Caledonia is part of the Austrasian Festoon, a great arc of islands, marginal cherts and limestones, and other strata of possible Mesozoic age. The main mineral deposits are the nickel ores, occurring as veins of garnierite, associated with peridotite dikes, in the ancient rocks of the eastern slope of the island.

**NEW CALEDONIA**

**Climate, Flora, Fauna.**—The hottest and wettest months are from November to March, but there is usually a fresh trade-wind blowing and the climate is healthful. Pineapples are the growth of the lowlands and the flora is of a less tropical character than farther north; it has some Polynesian and New Zealand affinities, and on the west coast a peculiar ‘wingless’ tree, found nowhere else, is common. The cocoa nut, maize, sugar-cane, coffee, cotton, rice and tobacco (which last does not suffer like other crops from the low temperatures in the night) are grown. Mammals are very few; they include the rat and *Pteropus* and other bats. The commonest birds are pigeons (the large *noumea* and other varieties), doves, parrots, kingfishers and ducks. The *Kagu* (*Rhynchochloa jubata*), a peculiar ‘wingless’ bird, is found here only. Turtle abound on the coast, and fish, of which some kinds are the tetrodons (*globe-fish*), are poisonous, especially at certain seasons. Land and marine molluscs are numerous, and include various edible haliotids.

**Population.**—At the census of 1901 the population of New Caledonia numbered 51,415, consisting of 12,295 free Europeans (colonists, soldiers, officials), 20,106 natives, 10,056 convicts. In 1868, however, the introduction of convicts into the island ceased. The centres of population are Nouméa (Noumea), the capital, on a fine harbour of the west coast near the southern extremity of the island, with 7000 inhabitants; Bourail, an agricultural penal colony (1800); La Foa, in the centre of the coffee plantations: Moindou, St Louis and St Vincent. The natives, whom the French call Kanakas (*Canuques*), a word meaning "man," applied indiscriminately to many Pacific peoples, live on reservations. They are Melanesians of mixed blood, the two fairly distinct types, one sub-Papuan and the other Polynesian. Of the first the physical characteristics are a small, thin-limbed body, hair black, short and woolly, projecting jaws, rounded, narrow, retreating forehead, long and narrow head, enormous eyebrow ridges, flat nose and dark skin. The second type is characterized by a lighter skin, sometimes of a reddish-yellow, longer, less woolly hair, body taller with better-proportioned limbs, and head broader. This is the prevailing type in the east and south of the island. There is nowhere a real defining line between the two (many New Caledonians having black skins and woolly hair with Polynesian suppositions of limb), but the Polynesian type is generally found among the chiefs and their kindred.

Both sexes among the natives pierce the lobes of the ear for ornaments. Tattooing is almost entirely confined to the women. Both sexes go naked, or with the scantiest loin-cloth. Their huts are usually beehive-shaped, with a single apartment, low narrow door, and floor of grass. Their chief customs are chieftainships, and a supreme chief recognized by all. In some other Pacific islands, when a son is born the chieftship passes to him, but the father continues to govern as regent. All property descends to the eldest son by birth or adoption, though custom demands that the younger members of the family should have a share. The people have to work on the chief's plantations and fisheries, and also work in parties for each other, breaking up new land, &c. This often ends in feasting and in dances (*plu pila*), which include allegorical representations of events or ideas. The supreme chief's authority is limited by the advice of a council of elders, whom he is obliged to summon in certain cases. Standards of morality is low; women are practically slaves, and infancy was formerly common.

The Kanakas are excellent agriculturists, being accounted superior in this respect to every other race of the Pacific. About the middle of the 19th century the indigenous population was 60,000. Returns for 1904 showed that this had fallen to rather less than half.

The languages of the different tribes are mutually unintelligible. They express the same peculiar character; on the highest mountains, for instance, there are several words for eating, each applied to a particular article of food. Their reckoning shows the same peculiarity. The numbers go up to five, and for living objects the word *bird* is added, for inanimate *yam*, *banana*, *bottle*; for bunches of bananas, bunches of sugarcanes, rows (planted) of yams, &c.; and sometimes things are counted by threes. Ten is a five fives, 15 three fives, 20 is a "man" (ten fingers and ten toes), 100 is 15 men, and so on.

**Administration and Industries.**—The colony is administered by a governor, who exercises military power through a marine infantry colonel, and civil power with the assistance of a privy council, a director of the interior, a judicial head, and a director of the penitentiary administration. There is also an elective general council. Nouméa is the seat of a superior tribunal, a tribunal of first instance, and a tribunal of commerce. There is also a permanent Fasti of the island, and the Fis of the Polynesian tribes.

Nouméa alone has (since 1879) a municipality, other localities being administered by commissioners. There are about 2000 inhabitants in the town, but the population is much lower in the country districts. The tobacco, rice, sugar-cane, maize, tobacco, sugar-cane, the vine, vegetables, potatoes, and some of the cereals are grown with success. Coffee was introduced about 1870, and has prospered well. Cheap agricultural labour is supplied by the convicts, by the liberated convicts, the Kanakas, and (to some extent) labourers from the New Hebrides. The soil is in three domains: that of the state, for the working of which concessions may be granted; that of the penitentiary administration; and that of the native reserve. Many horses, cattle and sheep have been imported, and the meat-preserving industry is prosecuted. Gold is found in the valley of the Dibot, as well as lead and copper at Bal Bay. Iron is found everywhere. The yearly output of nickel and chrome is considerable, and these minerals, with coal, constitute the characteristic wealth of the island. Coal has been worked near Nouméa, and kaolin is found in places. Gypsum and marble also deserve mention. The chief industrial establishments are smelting furnaces for cobalt, meat-preserving works at Uaou, sugar-works and distilleries at Nouméa and La Foa, tobacco, oil and soap factories at Nouméa. The commerce in 1888 amounted to £480,000, of which £200,000 represented tobacco, £90,000 the first crop of which £240,000 was for imports and £134,000 for exports, the share of France in that year having been 45% of imports and 47% of exports. The island imports wines, spirits, tobacco, coffee and tobacco, clothing and ironmongery; and exports ores, nickel, cobalt and chrome (which represent over three-quarters of the total exports in value), preserved meats and hides, coffee, copra and other colonial produce. There are about 150 m. of carriage roads, and in the mountainous regions there are many footpaths. A railway running north-westward from Nouméa to Dumbéa, &c., is designed to connect the capital with Bourail. The islands annexed to the colony of New Caledonia are Bal Bay, the Isle of Pines, used as a place of detention for habitual criminals; the Loyalty Islands (q.v.); E. of New Caledonia; the Huen Islands, a practically barren group; the Wallis Archipelago (q.v.); and Futuna and Alofa, S. of the Wallis group.

**History.**—New Caledonia was discovered by Captain Cook in 1774. He touched at the haven of Balade (the original name of the island) near the north-western extremity, as did d'Entrecasteaux in 1793, who closely explored the coast and surrounding seas. They subsequently became known to sealers and traders in sandalwood, who, however, established no friendly relations with the natives. In 1843 French missionaries arrived at the island, and it was claimed (for France, but on British representations the claim was renounced. In 1852 a landing party from a French vessel lying at Balade was attacked by the natives, and massacred with the exception of a single member. France was now determined on the annexation, and the flag was raised at the same spot in 1853, but simultaneously the commander of a British vessel was in negotiation with the native chief of the Isle of Pines, and the British flag was hoisted there. The chief, however, subsequently sided with the French, and the British flag was lowered and withdrawn. Nouméa was founded in 1854 (it was then called Port de France); in 1860 New Caledonia became a colony distinct from the French possessions in the Pacific at large; in 1864 the first penal settlement was made on Nou Island, off Nouméa. In 1878 there was a serious native insurrection, and another in 1888 was only put down after much bloodshed.

NEWCASTLE, DUkes OF

(Paris, 1893; Moncelon, Le Baye et la colonisation pénale à la Nouvelle-Caledonie (Paris, 1886); A. Bernard, L'Archipède de la Nouvelle-Caledonie (Paris, 1892); Nouvelle-Caledonie, ses riches, son avenir (Paris, 1901); In Unnatural Prison Land (London, 1901); Carol, La Nouvelle-Caledonie miniature et agricole (Paris, 1900); Vallet, La Colonisation française en Nouvelle-
Caledonie (Paris, 1903).

NEWCASTLE, DUkes OF. Within the space of a century there were no less than four successive creations of dukes of
Newcastle in the British peerage. William Cavendish (see below), nephew of the 1st earl of Devonshire, was raised to the

dignity of duke of Newcastle-upon-Tyne in 1665. His son and
successor Henry (1630-1691) died leaving daughters only, and
one of these married John Holles (1662-1711), earl of Clare, who
was created duke in 1694. This duke died also without male issue,
leaving his estates to his sister's son, Thomas Pelham (see below),
who, with other dainties, had the title of duke of Newcastle-
upon-Tyne conferred on him in 1715, and a second and
similar ducal title (that of Newcastle-under-Lyme) in 1756.
The first dukedom became extinct at the death of its second
title was granted him with remainder to Henry Fiennes Clinton,
earl of Lincoln, at once his nephew and nephew-in-law. From
his heir, who ranks as the 2nd duke, Henry Fiennes Clinton
(1720-1794), the dukedom passed through father and son from
Thomas Pelham Clinton (d. 1795), Henry Pelham Fiennes Pelham
Clinton (1785-1851), Henry Pelham Fiennes Pelham Clinton
(1811-1864), Henry Pelham Alexander (1834-1879), to the
7th duke, Henry Pelham Archibald Douglas Pelham Clinton
(b. 1864). The three principal dukedoms are more fully noticed
below.

1. WILLIAM CAvENDISH, duke of Newcastle (1592-1676),
eldest surviving son of Sir Charles Cavendish and of Catherine,
doughter of Cuthbert, Lord Ogle, and grandson of Sir William
Cavendish and "Bess of Hardwick," was born in 1592 and
educated at St John's College, Cambridge. On the occasion of
the creation of Prince Henry as prince of Wales in 1610 he was
made a knight of the Bath, subsequently travelled with Sir
Henry Wotton, then ambassador to the duke of Savoy, and on
his return married his first wife, Elizabeth, daughter of William
Basset of Blore, Staffordshire, and widow of Henry Howard,
3rd son of the earl of Suffolk. His fortune was immense, and he
several times entertained James I. and Charles I. with great
magnificence at Welbeck and Bolsover. On the 3rd of November
1620 he was created Viscount Mansfield, on the 7th of March
1628 earl of Newcastle, and in 1629 the barony of Ogle was
restored to his mother, this title, together with an estate of
£3,000 per annum, descending to him. In 1638 he was made
governor of the prince of Wales, and in 1639 a privy councillor.
When the Scottish war broke out he assisted the king with a
loan of £10,000 and a troop of volunteer horse, consisting of
120 knights and gentlemen. In 1641 he was implicated in the
Army Plot, and in consequence withdrew for a time from the
court. He was sent by Charles on the 11th of January 1642
to seize Hull, but was refused admittance. When the king
declared open war, Newcastle was given the command of the
four northern counties, and had the power conferred on him of
making knights. He maintained troops at his own expense,
and having occupied Newcastle kept open communications with
the queen, and despatched to the king his foreign supplies.
In November 1642 he advanced into Yorkshire, raised the siege
of York, and compelled Fairfax to retire after attacking him
at Tadcaster. Subsequently his plans were checked by the latter's
recapture of Leeds in January 1643, and he retired to York.
He escorted the queen, who returned from abroad in February,
to York, and subsequently captured Wakefield, Rotherham and
Sheffield, though failing at Leeds, but his successes were once
more ravished from him by Fairfax.
In June he advanced again,
defeated the Fairfax's at Adwalton Moor on the 30th of June,
and obtained possession of all Yorkshire except Hull and Wressel
Castle. It might now have joined the king against Essex, but
continued his march towards London, and then turned to attack
the eastern association, and taking Gainborough and Lincoln.
Thence he returned to besiege Hull, and in his absence
the force which he had left in Lincolnshire was defeated at
Winchby by Cromwell on the 11th of October 1643, which caused
the loss of the whole county. On the 27th of October 1643
he was created a marquis. Next year his position was further
threatened by the advance of the Scots. Against prevailing
numbers he could do little but harass and cut off supplies. He
retreated to York, where the three armies of the Scots, Fairfax
and Manchester surrounded him. On the 1st of July Rupert
raised the siege, but, on the next day threw away his success by
engaging the three armies in battle, contrary to Newcastle's
desire, at Marston Moor. After this disaster, notwithstanding
the entreaties of the king and the remonstrances of Rupert,
Newcastle immediately announced his intention of abandoning
the cause and of quitting England. He sailed from Scarborough
accompanied by a considerable following, including his two sons
and his brother, resided at Hamburg from July 1644 to February
1645, and removed in April to Paris, where he lived for three
years. There he married as his second wife Margaret (see below),
and had married Margaret (see below),

2. THOMAS PELHAM (1611-1700), 2nd duke of Newcastle-upon-
Tyne (d. 1672), son of the 1st duke, was born in London on
March 27, 1611, and educated at Trinity College, Cambridge.

At the Restoration Newcastle returned to England, and
succeeded in regaining the greater part of his estates, though
burdened with debts, his wife estimating his total losses in the
war at the enormous sum of £41,303. He was reinstated in the
offices he had filled under Charles I.; he was invested in 1661
with the Garter which had been bestowed upon him in 1650, and
was advanced to a dukedom on the 16th of March 1665. He
retired, however, from public life and occupied himself with his
estate and with his favourite pursuit of training horses. He
established a racecourse near Welbeck, and published another work on
horsemanship, A New Method and Extraordinary Invention to Dress
Horses and Work them according to Nature . . . (1667). He
wrote also several comedies, The Country Captain and The Varietie
(1659), The Humorous Lovers and The Triumphant Widow (1677).

Dryden's assistance he translated Molière's L'Étourdi as
Sir Martin Mar-All (1688). He contributed scenes to his wife's
plays, and poems of his composition are to be found among her
works; and he was the patron of Johnson, Shirley, Davenant,
Dryden, Shadwell and Fleetnoe, and of Hobbes, Gassendi and
Descartes. He died on the 25th of December 1676, and was
buried in Westminster Abbey. By his first wife he had
three children, of whom one son, Henry, survived him and became
2nd duke of Newcastle, dying in 1691 without male issue; the
title then became extinct and the estates passed to his third
daughter Margaret, wife of John Holles, earl of Clare, created
duke of Newcastle in 1694.

As a commander in the field Clarendon spoke contemptuously of
Newcastle as "a very lamentable man, and as fit to be a
general as a bishop."1 It can hardly be denied, however, that
his achievements in the north were of great military value to
the king's cause. For politics he had no taste, and adhered
to the king's cause merely from motives of personal loyalty, from
hatred of "whatsoever was like to disturb the public peace," and
doubtless the monarchy "was the foundation and support of
his own greatness." Even Clarendon concedes that he was
"a very fine gentleman," which is perhaps the best summary of
his character.

His second wife, Margaret, duchess of Newcastle (c. 1625-
1673), had been maid of honour to Henrietta Maria, and after
she married the duke in 1645 they continued to cherish a mutual
admiration of each other's character, each regarding the other
as endowed with transcendent merits both of person

1 Calendar of Clarendon Papers, ii, 63.
NEWCASTLE

and mind. The duchess cultivated literary composition with equal wanton fervour, and kept a herd of maids of honour obliged to be ready at all hours "to register her Grace’s conceptions." Walpole speaks of her as a "fertile pedant" with an "unbounded passion for scribbling"; and, although giving evidence of learning, ingenuity and imagination, her writings are fatally marred by a deficiency in judgment and self-restraint. She is best known by the Life of her husband, originally printed by A. Maxwell at London in 1667. She also published Philosophical Fancies (1653); Poems and Fancies (1653); The World’s Ohio (1653); Nature’s Picture drawn by Fancie’s Pencil to the Life, which includes an autobiography (1656); Philosophical and Physical Opinions (1653); Orations (1653); Essays (1656); Sociable Letters (1664); Observations upon Experimental Philosophy (1666); Letters and Poems (1676).

The Life of William Cavendish, Duke of Newcastle, by Margaret, duchess of Newcastle, has been edited by C. H. Firth (1886); it was criticized by Pepys as "the ridiculous history of my Lord Newcastle writ by his wife, which shows her to be a mad, conceited, ridiculous woman, and he an ass to suffer her to write what she writes to him," but on the other hand eulogized by Charles Lamb as "the casket is rich enough, no case sufficiently durable to honour and keep soft such a stone also."

2. THOMAS PELHAM HOLLES, duke of Newcastle (1603-1678), whose official life extended throughout the Whig supremacy of the 18th century, was the elder son of Thomas, first Lord Pelham, by his second wife Lady Grace Holles, younger sister of John Holles, duke of Newcastle-on-Tyne, who died in 1711, and left the whole of his vast estates to him. In 1712 he also succeeded his father in his peerage and estates, and in 1714, when he came of age, was one of the greatest landowners in the kingdom. He vigorously supported the Whig party at Queen Anne’s death, and had much influence in making the Londons accept King George. His services were too great to be neglected, and in 1714 he was created earl of Clare, and in 1715 duke of Newcastle-on-Tyne. He also became lord-lieutenant of the counties of Middlesex and Nottingham and a knight of the Garter in 1718, in which year he increased his Whig connexion by marrying Lady Henrietta Godolphin, granddaughter of the great duke of Marlborough.

In 1717 he first held political office as lord chamberlain of the household, and in 1724 was chosen by Sir Robert Walpole to be secretary of state in place of Lord Carteret. This office he held continuously for thirty years (1724-1754), and only changed it in the premiership on his brother’s death. His industrial experience as office and his connexion with his inexhaustible wealth, and some praise must be given to his inhaustible activity and great powers of debate. He was a peculiarly muddle-headed man, and unhappy if he had not more to do than he could possibly manage, but at the same time he was a consummate master of parliamentary tactics, and knew how to manage the Houses of Lords and Commons alike. Lord Hervey (Memoirs) compares him with Walpole in 1735, and says: "We have one minister that does everything with the same seeming ease and tranquillity as if he were doing nothing; we have another that does nothing with the same seeming indifferency as if he did everything." He continued in office on Walpole’s fall in 1742, and became more powerful on his younger brother Henry becoming prime minister in 1743. On Henry Pelham’s death in March 1754, Newcastle succeeded him as premier; but people who had been accustomed to him as secretary of state would not stand him as premier, and in November 1756 he gave place to the duke of Devonshire. For his long services he was created duke of Newcastle-under-Lyme, with remainder to Henry Fiennes Clinton, 9th earl of Lincoln, who had married his eldest daughter of the same name.

In July 1757 he again became prime minister—for Pitt, though a great statesman, was a bad party leader—on the understanding, according to Horace Walpole, that "Mr Pitt does everything, the duke gives everything." Under this ministry England became famous abroad, but it gradually fell before the young king’s affection for Lord Bute, who, after supplanting Pitt, became prime minister in the room of Newcastle in May 1762. The duke went into strong opposition, and lost his two lord-lieutencies for opposing the peace of 1763. In 1765 he became lord privy seal for a few months, but his health was fast giving way, and he died in November 1768. The duke was certainly not a great man, but he was industrious and energetic, and to his credit be it said that the statesman who almost monopolized the patronage of office for half a century twice refused a pension, and finally left office £300,000 poorer than he entered it.


3. HENRY PELHAM FIENNES PELHAM CLINTON, 5th duke of Newcastle (1811-1864), the eldest son of Henry, the 4th duke, was educated at Eton and at Christ Church, Oxford, where he graduated in 1832. He was member of parliament for South Nottinghamshire from 1832 to 1846, when he became member for the Falkirk Burghs, retaining this seat until he became duke of Newcastle in January 1851. As earl of Lincoln he was first commissioner of woods and forests from 1842 to February 1846, when he was appointed chief secretary to the lord-lieutenant of Ireland, but the ministry fell in June of the same year. In 1852 Newcastle became secretary for war and the colonies under Lord Granville, and in 1854, when the outbreak of the Crimean War occurred, was made a peer and placed in charge of it. As secretary for war he was regarded as being largely responsible for the terrible hardships which befall the British troops in the Crimea in the winter of 1854, and as the result of a vote of censure he left office with his colleagues in January 1855. He was secretary for the colonies from 1859 to 1864, and died on the 18th of October 1864, being succeeded as 6th duke by his eldest son, Henry Pelham Alexander.


NEWCASTLE, a seaport of Northumberland county, New South Wales, Australia, at the mouth of the Hunter river, 102 m. by rail and 62 m. by sea N. by E. of Sydney, in 32° 55' S., 15° 49' E. Newcastle is the second city in New South Wales, the fourth port of Australia, and the seat of an Anglican bishop. The city rises steeply from the sea, and possesses numerous fine buildings, among which may be mentioned the railway station, post office, custom-house, the cathedral of Christ Church, the school of art with its large library, and the Victoria Theatre. There are also two state-subsidized hospitals, a college, a school of mines, a technological museum, several large and handsome churches, and numerous subsidized charitable institutions. Communication between the different parts is maintained by tramways, and steam ferry-boats ply between the city and its suburbs on the shores of the harbour. The industries include brewing, shipbuilding, copper and iron-founding, carriage-building and fellmongery; there are boot factories, engineering works, biscuit factories and smelting works at Cockle Creek. There is also a large trade in frozen meat. There are numerous coal mines in the vicinity, yielding coal of the finest quality. Newcastle has a fine harbour, with an area of 540 acres, protected by two breakwaters; the breadth of the channel at its entrance is 1,000 ft., and the depth at the bars is 25 ft. Vessels of the largest tonnage can enter and lie alongside of the wharves, which are 5 m. in extent, equipped with travelling cranes, hydraulic and steam cranes, lighted by electric light and connected with the Great Northern railway by a branch line. There is a floating dock to lift 2,000 tons, and at Stockton there is a patent slip to take large vessels for repair. The facilities for the shipment of coal are excellent, and Newcastle is the chief coal port in the southern hemisphere. The harbour is protected by two forts, Fort Scratchley, the strongest in Australia, and Shepherd’s Hill Fort. The city exports coal, wool, coke, horses, cattle, flour, meat, silver, lead, copper, tallow, hides and country produce. Newcastle returns three members to the legislative council and six members to the legislative assembly. Most of the suburbs are separate municipalities, namely, Stockton, Carrington, Wickham, Hamilton, Merewether, Adamstown, Waratah, New
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Lambton, Lambton, Wallsend and Blattsburg. The population of the municipality of Newcastle is 14,425; of the town and suburbs about 70,000. The mouth of the Hunter river (named after Governor John Hunter), now known as Newcastle Harbour, was discovered in 1797 by Lieutenant John Shortland, who accompanied Hunter to New South Wales. For many years after its discovery it was used as a convict station. It became a free settlement in 1821, and in 1859 was erected into a municipality. The centenary of the landing of Shortland was celebrated in 1897, when a monument commemorating the event was erected.

NEW CASTLE, a city of New Castle county, Delaware, U.S.A., in the northern part of the state, at the head of Delaware Bay, on a high point of land extending into the Delaware river, 6 m. south of Wilmington. Pop. (1900) 410; (1900) 3280 (315 foreign-born); (1910) 3351. It is served by the Philadelphia, Baltimore & Washington (Pennsylvania System), and (old Wilmington) the Baltimore & Ohio railways, and by steamship lines connecting with Baltimore, Philadelphia and other ports. The city, on land granted by the Swedes, is in New Castle county; and there is a public library, the Immanuel Protestant Episcopal Church (partly built in 1689), and several residences of Dutch and colonial types. The city has a good harbour and an excellent river front for manufacturing sites and for shipping; it is included in the customs district of Wilmington. Its industrial establishments include shipyards, rolling mills and steel works, flour-mills, and manufactories of cotton and woolen goods. The saltpetre fisheries are of some importance. In 1651 Governor Peter Stuyvesant of New Netherland established near the place Fort Casimir, as the first determined move in his aggressive policy against the Swedes, who had settled in this vicinity about 1640. The Swedes captured the fort in 1654, but this precipitated the crisis in which New Sweden (Delaware) was lost to the Dutch in 1655. Fort Casimir (renamed Fort Amstel) was made the seat of government of the local Dutch possessions, and in 1657 was placed under the jurisdiction of the City of Amsterdam, under which it remained, though prospering little—disease, famine and fears of English attack causing most of the inhabitants to leave in 1658 and 1659—until just before the English seized the settlements in Delaware in 1664. Under the English court house, possibly built by the Swedes, is in New Castle; and there is a public library, the Immanuel Protestant Episcopal Church (partly built in 1689), and several residences of Dutch and colonial types. The city has a good harbour and an excellent river front for manufacturing sites and for shipping; it is included in the customs district of Wilmington. Its industrial establishments include shipyards, rolling mills and steel works, flour-mills, and manufactories of cotton and woolen goods. The saltpetre fisheries are of some importance. In 1651 Governor Peter Stuyvesant of New Netherland established near the place Fort Casimir, as the first determined move in his aggressive policy against the Swedes, who had settled in this vicinity about 1640. The Swedes captured the fort in 1654, but this precipitated the crisis in which New Sweden (Delaware) was lost to the Dutch in 1655. Fort Casimir (renamed Fort Amstel) was made the seat of government of the local Dutch possessions, and in 1657 was placed under the jurisdiction of the City of Amsterdam, under which it remained, though prospering little—disease, famine and fears of English attack causing most of the inhabitants to leave in 1658 and 1659—until just before the English seized the settlements in Delaware in 1664. Under the English court house, possibly built by the Swedes, is in New Castle; and there is a public library, the Immanuel Protestant Episcopal Church (partly built in 1689), and several residences of Dutch and colonial types. The city has a good harbour and an excellent river front for manufacturing sites and for shipping; it is included in the customs district of Wilmington. Its industrial establishments include shipyards, rolling mills and steel works, flour-mills, and manufactories of cotton and woolen goods. The saltpetre fisheries are of some importance.
after the union of Scotland and England. The castle, from which the town takes its name, stood on a slight elevation rising abruptly from the river, and was erected by Henry II. between 1177 and 1177 on the site of an older structure built in 1080 by Robert, eldest son of the Conqueror. It was originally the strongest fortress in the north of England, and its keep is now one of the finest specimens of the Norman stronghold remaining in the country. While it was still incomplete, William the Lion was led within its walls after his capture at Alnwick; and within its great hall Balliol, on the 26th of December 1292, died, homage for the crown of Scotland to Edward I. The area of the castle within its outer walls and fosse was 3 acres. Fragments of these walls, with the principal entrance or Black Gate (portions of which are, however, of later construction) and the Watergate or southern postern remain, but the inner wall surrounding the keep has been entirely removed. The massive keep, with walls 14 ft. thick, is in a state of good preservation, as is also the chapel, a beautiful specimen of late Norman style. The castle was purchased by the corporation in 1809, and is under the charge of the Newcastle Society of Antiquaries, which restored it as an appropriate museum of Newcastle. The castle is St. Nicholas church, forming the cathedral of the diocese of Newcastle, instituted in 1882. The diocese covers practically the whole of Northumberland, with a very small portion of Cumberland. The church, which is principally Decorated, consists of nave, aisles, chancel and transept, the total length of the interior from east to west being 245 ft., and the width at the transepts 128 ft. The principal feature of the church is the lantern tower, a later addition and a very fine specimen of early Perpendicular. Among other interesting old churches is St. Andrew's church, erected in the 14th century and retaining Norman characteristics, with a low square tower and a peal of six bells. During the siege by the Parliamentary army in 1644 it was greatly damaged. St. John's church is a building of the 14th century with an ancient front. Of the nine conventual buildings at one time existing in Newcastle or its immediate neighbourhood, a few fragments of the monastery of the Black Friars remain, and the chapel of the hospital of St. Mary at Jesmond forms a picturesque ruin. There are a number of quaint Elizabethan houses in the steep street called the Side, and in the Sandhill at its foot.

Some of the modern streets of Newcastle are spacious and handsome, the most noteworthy are Great Street, in which a complete scheme of Grecian architecture is followed, and Grainger Street. This thoroughfare is named after Richard Grainger (1789-1861), a wealthy local architect who devoted himself to the beautifying of his city with remarkable energy. Of numerous modern churches may be noted that of St. George, Jesmond, a landmark for a great distance and finely decorated within, and the Roman Catholic cathedral of the diocese of Hexham and Newcastle. The most important public buildings are the corporation buildings, including a large public hall, and a corn exchange; the guildhall, originally a hospital called the Maison de Dieu, and afterwards used as "the stately court of merchant adventurers," re-erected in 1658; the moot-hall (1810) for the meetings of assizes and sessions and the transaction of county business; the exchange (1860); the central newsroom and art gallery (1838); the Wood memorial hall (1870), used for the meetings of the North of England Institute of Engineers; and the custom-house. The Grey monument in Grey Street, an Ionic column surmounted by a statue of Earl Grey, was erected in 1836 to commemorate the passing of the Reform Bill; the Stephenson monument near the railway station was erected in 1861; a marble statue of Queen Victoria in front of the Royal Victoria Infirmary was unveiled in 1906, and a bronze statue of the queen in 1903 in the cathedral square.

Among educational establishments the chief are the colleges of medicine and of physical science of the university of Durham; the first granting degrees in medicine and surgery; the second, with which the school of art is incorporated, degrees in science and literature. The college of science, or Armstrong College as it is called in commemoration of the first Lord Armstrong, was founded in 1871; the north-east wing was opened in 1888; further parts of the building in 1894, and the west wing by King Edward in 1906. The royal free grammar school, founded in 1525, occupies modern buildings in Jesmond. There should be mentioned also Allan's endowed schools, founded in 1705, and reorganized by the charity commissioners in 1877; and Rutherford College and the Commercial Institute, providing technical and commercial education. The Laing Art Gallery was erected and presented to the city by Alexander Laing, and opened in 1904. Among clubs and similar institutions are the Literary and Philosophical Society, founded in 1793, the Newcastle Anti-quaries, founded in 1813, with a museum in the castle; the Natural History Society and museum; the Tyneside Geographical Society; the Tyneside Naturalists' Club, established in 1846; the Mechanics' Institution, 1824; the North of England Institute of Mining Engineers, 1852; the Fine Arts Society; the Farmers' Club; the Northern Counties' Club; the Union Club; and the University Club. Several clubs for working men form a note-worthy social feature. There is a public library and newsroom. The Royal Victoria Infirmary on the Castle Leazes is a memorial of the Diamond Jubilee of Queen Victoria, and was opened in 1906. The benevolent institutions also include: the dispensary (1777), fever house (1803), lying-in hospital (1760), eye infirmary (1822), children's hospital, Trinity almshouses (1492), hospital of the Holy Jesus (1682), hospital (1791) for keelmen, i.e. coal-barge men; and institutions for the blind, dumb and orphans.

Newcastle is well supplied with public parks and recreation grounds. To the N. of the city is the Castle Leazes ornamental park of 33 acres, and beyond this the Town Moor and racecourse, an extensive common, the survival of the pasture land of the township. Eastward from Town Moor is Brandling Park, and westward Nunn's Moor. The picturesque grounds of Armstrong Park N.E. of the city extend to about 50 acres, the larger half of which was presented by Sir W. G. Armstrong, who also presented the beautifully wooded grounds of Jesmond Dene. Elswick Park in the south-west of the city, extending to 83 acres, includes Elswick Hall. There are several others. Jesmond, N.E. of the city, is the chief residential suburb. It takes name from "Jesus Mount," and was formerly a place of pilgrimage, possessing a hospital dedicated to St. Mary the Virgin.

Both the Northumberland and Durham banks of the river are open, and open manufacturing towns or suburbs. Of these the most important is Gateshead (g.r.) immediately opposite Newcastle; while those adjacent to Newcastle on the same bank are Benwell and Fenham (pop. in 1901, 18,316) on the west, and Walker (13,330) on the east. The last-named two (formerly urban districts), together with part of Kenton, were incorporated with Newcastle in 1904. Newcastle is connected with the south bank of the Tyne by four bridges—two high-level bridges, an hydraulic swing bridge and a suspension bridge. The old high-level bridge carries the North-Eastern railway, with a road and footway beneath it. It was opened by Queen Victoria in 1849. The new high-level bridge, carrying the railway only, was opened by King Edward VII. in 1906; it consists of four steel spans on granite piers. The hydraulic swing bridge, on the low level, was built to replace a stone structure erected in 1781 on the site of a bridge dating from 1250, and destroyed by a flood in 1771. The Roman bridge, the Pons Aeli, is said to have spanned the river at the same point. The hydraulic bridge (1876) consists of one large centre pier, two midstream piers and two abutments; and its foundations are iron cylinders resting on the solid rock, 60 ft. below the bed of the river. Two spans, the swing, are simultaneously by machines impelled by two non-allow 103 ft. of waterway for vessels going up and down the river. About half a mile farther up the stream is the Redheugh bridge (1871). The central station of the North-Eastern railway is an extensive and handsome structure built on a sharp curve. An underground line connects it with the Blyth and Tyne station. The suburban line of the North-Eastern company from the central station to Jesmond, Gosforth and Benton was the first standard line to carry passengers by electric traction (1904).
NEWCOMB

Newcastle owes its prosperity to its convenient situation on a tidal river, and to the immense stores of coal in the neighbourhood, which, besides being largely exported, stimulate a great variety of industries which are dependent on their use. It began to export coal about the end of the 13th century, but the trade received a severe check by the act of Edward I. which made the burning of coal in London a capital offence. In the reign of Edward III. licence was granted to the inhabitants to dig coals and export them, and the export continued without intermission. The clay thereof in the place called the Castle Field and the Forth. The quay in front of the town, extending from the hydraulic bridge to the Ouseburn, forms a fine thoroughfare of about a mile in length; and by means of dredging a depth of water has been obtained at the shore permitting vessels of large tonnage to approach, although the berths of the ocean steamers are a little farther down the river. The quay is supplied with the most improved mechanical appliances, and has direct communication with the North-Eastern railway. There is a large grain warehouse at the E. end of the quay. Exports include coal, chemicals, pig-iron, iron-work, steel, iron bars, plates and castings, machinery, fire-clay goods and copper. The chief imports are fruits, wheat, maize, oats, barley, iron and steel, petroleum, sulphur ore, timber and wood hoops, iron ore and potatoes. Steamers carrying passengers serve the principal English ports, Cardiff, Leith, &c.; also Baltic ports and New York; while Newcastle is one of the chief ports for the extensive Norwegian tourist traffic, the ships of the combined Bergenske and Nordenfjeldske companies regularly staying Stavanger, Bergen, Trondhjem and intermediate ports. To the industries of Newcastle indicated by the exports may be added glass lead and iron; tallow, earthenware, tool, rope end ships' fitting manufactures, and most important of all, shipbuilding. The celebrated Elswick works, founded by Messrs Armstrong in 1837, and amalgamated with those of Mitchell & Co., are among the most important in the world. The construction of ships of all sorts, including the largest ironclads with all their armour and guns, is carried on. Elswick is the name of the western part of the borough of Newcastle. The borough returns two members to parliament. It is the largest undivided parliamentary constituency in the United Kingdom. The city is governed by a lord mayor (the title was conferred in 1606), 19 aldermen and 57 councillors.

Area, 8,453 acres.

History.—Newcastle owes its origin to its position on the great Roman wall and on the estuary of the river Tyne. Its Roman occupation is proved by existing remains, most important among which are the foundations of a bridge, attributed to the emperor Hadrian. Before the Conquest little is known of the town except that it was called Monkchester, and that it was destroyed in the 9th century by the Danes. After the defeat of Edgar Ætheling and Earl Waltheof on Gateshead Fell, it was again destroyed by William the Conqueror, but Robert of Normandy is said to have raised a castle there in 1080 on his return from an expedition against Malcolm, king of Scotland, and from that time the town was called Newcastle. Shortly afterwards it was fortified by Robert de Mowbray in his rebellion against William Rufus, but it was taken by the king in 1095. In the reign of Stephen it was seized by David, king of Scotland, and after its restoration to the English in 1157 Henry II. rebuilt the castle and established a mint. The walls surrounding the town are attributed to Edward I. During the 14th century Newcastle was three times defended successfully against the Scots, but in 1640 it was occupied for a year by the Scottish Covenanters under Leslie. It was then garrisoned by royalists, but again surrendered to the Scots in 1644 after a siege of about six weeks, and Charles I. was taken there in 1646 when he had yielded himself to the Scottish army. Theburgesses are said to have held the borough at a fee-farm rent under a grant from William Rufus. The title of mayor was conferred by Henry III., while Henry IV. in 1400 made the town a county of itself with a charter, and the burgesses power to elect 6 aldermen. Queen Elizabeth incorporated the town in 1589 under the title of mayor and burgesses, and Philip and Mary in 1596 granted 4 additional aldermen, while the charter of James I. in 1604 appointed 24 common councilmen.

NEWCOMB, SIMON (1835-1909), American astronomer, was born in Wallace, Nova Scotia, on the 12th of March 1835. He became a resident of the United States in 1853, and graduated at the Lawrence Scientific School of Harvard University in 1858, having paid special attention to mathematics and astronomy. He assisted in the preparation of the American Nautical Almanac for 1857. In 1861 he became professor of mathematics in the United States navy, and was put in charge of the great 26-in. equatorial erected at Washington Observatory in 1873. In 1877 he was appointed director of the American Nautical Almanac office, a post which he held until March 1897. In 1884 he became professor of mathematics and astronomy at the Johns Hopkins University, continuing, however, to reside at Washington. He was also editor of the American Journal of Mathematics for many years. In view of the wide extent and importance of his labours, the variety of subjects of which he treat, and the unity of purpose which guided him throughout, Simon Newcomb must be considered as one of the most distinguished astronomers of his time. A study of his works reveals an unusual combination of skill and originality in the mathematical treatment of many of the most difficult problems of astronomy, an unfailing patience and sagacity in dealing with immense masses of numerical results, and a talent for observation of the highest order. On assuming the directorship of the Nautical Almanac he became very strongly impressed with the diversity existing in the values of the elements and constants of astronomy adopted by different astronomers, and the injurious effect which it exercised on the precision and symmetry of much astronomical work. Accordingly he resolved to "devote all the force which he could spare to the work of deriving improved values of the fundamental elements and embodying them in new tables of the celestial motions." The formation of the tables of a planet has been described by Cayley as "the culminating achievement of astronomy," but the gigantic task which Newcomb laid out for himself, and which he carried on for more than twenty years, was the building up, on an absolutely homogeneous basis, of the theory and tables of the whole planetary system. The results of these investigations have, for the most part, appeared in the Astronomical Papers of the American Ephemeris, and have been more or less completely adopted for use in the nautical almanacs of all countries. A valuable summary of a considerable part of this work, containing an account of the methods adopted, the materials employed, and the resulting values of the various quantities involved, was published in 1895, as a supplement to the American Ephemeris for 1897, entitled "The Elements of the Four Inner Planets and the Fundamental Constants of Astronomy." In 1886 Newcomb had published an important memoir on the orbit of Neptune, which was followed in 1879 by a similar investigation of the orbit of Uranus. About twenty-five years later the tables of these planets were revised by him in view of all the observations which had accumulated in the meanwhile at Washington, Greenwich, Paris and Cambridge. In the meantime the theory of Jupiter and Saturn had been thoroughly worked out by G. W. Hill, Newcomb's distinguished collaborator in the Nautical Almanac office, and thus was
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completed one important section of the work projected by Newcomb in 1877.

Among Newcomb's most notable achievements is his research in conjunction with the theory of the moon's motion. His first work on this abstruse subject, entitled Théorie des perturbations de la lune, qui sont dues à l'action des planètes, is remarkable for the boldness of its conception, and constitutes an important addition to celestial dynamics. For some years after the publication of Hansen's tables of the moon in 1857 it was generally believed that the theory of that body was at last complete, and that Newtonian prediction could be practically as accurate as that of the other heavenly bodies. Newcomb showed that this belief was unfounded, and that as a matter of fact the moon was falling rapidly behind the tabular positions. With the view of examining this question, he undertook the reduction of every observation made before 1750 which appeared to be worthy of confidence. In an elaborate memoir he showed that the ancient solar eclipses described by Herodotus, Thucydides, and others, which seemed to require an increased value of the secular acceleration of the moon's mean motion to bring them into line with modern views, were not really due to an ambiguity of the accounts in each case rendering uncertain either the totality of the eclipse or the place from which it was visible. In his investigation he employed the eclipses of the moon recorded in the Almagest, the Arabian eclipses between A.D. 800 and 1004, extracted from Caussin's translation of Ibn Junis, the eclipses and occultations of Buhlaldus, Gessendi, and Herelius, of the French astronomers at Paris and St Petersburg, and of Flamsteed at Greenwich, and deduced a secular acceleration of 0.89, agreeing well with the theoretical value.

On taking charge of the 26-in. equatorial at the United States Naval Observatory, Newcomb devoted it almost exclusively for the first two years to observations of the satellites of Uranus and Neptune, being of opinion that it was better to do one thing well than many things indifferently. The results of these skillfully conducted observations were published in a memoir on The Uranian and Neptunian Systems. From this research it appears that the orbits of all but four satellites of Uranus are sensibly circular, and although no special search was made, he concludes that none of Sir William Herschel's supposed outer satellites can have any real existence. From the motion of the satellites he finds that the mass of Uranus is, roughly, the weight of one half of the sun, while for the planet Neptune he finds a mass equal to \(1.4 \times 10^{27}\)th of the sun, agreeing with the view previously found by him from the perturbations of Uranus within \(10^{-29}\)th of its amount. As early as 1866 Newcomb communicated an important memoir to the American Academy, On the Secular Variations and Mutual Relation of the Orbits of the Asteroids, in which he discussed the two principal hypotheses to account for the origin of these bodies—one, that they are the shattered fragments of a single planet (Olbers' hypothesis), the other, that they have been formed by the breaking up of a revolving ring of nebulous matter.

In the Astronomical Papers of the American Ephemeris will be found a large number of contributions from Newcomb's pen on some fundamental and most important questions of astronomy. Among these are papers on The Recurrence of Solar Eclipses, A Transformation of Hansen's Lunar Theory, Development of the Perturbative Function and its Derivatives. His memoir On the Motion of Hyperion, a New Case in Celestial Mechanics, is in some respects one of his most original researches. He discussed the transits of Venus of 1761 and 1769, and those of Mercury from 1677 to 1884. At the International conference, which met at Paris in 1856 for the purpose of elaborating a common system of constants and fundamental stars to be employed in the various national ephemerides, Newcomb took a leading part, and at its suggestion undertook the task of determining a definite value of the constant of precession, and of compiling a new catalogue of standard stars. The results of these investigations were published in 1895, and have been in use since the beginning of 1901. In the intervals of these immense labours, on which his reputation as an astronomer rests, he found leisure for works of a lighter character, e.g. his Popular Astronomy (1878) which has been translated into German, Russian, Norwegian, Czech, Dutch and Japanese, his Astronomy for Schools and Colleges (1880), written in conjunction with Professor E. S. Holden, and Astronomy for Everybody (1905). After his retirement from official life he published an excellent popular treatise on the subject. More recondite work is his Compendium of Spherical Astronomy (1906). He also wrote on questions of finance and economy.

He received the honorary degrees of D.C.L., Oxford, and Sc. D., Cambridge and Dublin. In 1872 he was elected an associate of the Royal Astronomical Society, receiving its gold medal in 1874. In 1877 he was elected a foreign member of the Royal Society, which in 1890 awarded him the Copley medal. He also received the first Bruce medal of the Astronomical Society of the Pacific, awarded by the directors of the Berlin, Greenwich, Harvard, and Heidelberg Observatories. Of more recent date, Benjamin Franklin was the only American to become an Associate of the French Institute. He died at Washington on the 14th of July 1900, and was given a military funeral, having been made a rear-admiral by Act of Congress in 1906.


NEWCOMEN, MATTHEW (c. 1610-1669), English nonconformist divine, was born about 1610 and educated at St John's College, Cambridge, and was afterwards tutor at Emmanuel College, Cambridge, and lecturer at Dedham in Essex, and was the leader of the church reform party in that county. He assisted the elder Calamy in writing Smetymnuus (1641), and preached before parliament in 1643. He was a man of many gifts, excelling alike in preaching, in debate and in friendship, and declined many offers of more remunerative service. He protested against the extreme democratic proposals called "The Agreement of the People" (1647), and was one of the commissioners at the Savoy Synod of 1658. On the passing of the Act of Uniformity in 1662, Newcomen lost his fellowship at Oxford, but was invited to the pastorate at Lodi, where he was held in high esteem not only by his own people but by the university professors. He died of the plague in 1669.

NEWCOMEN, THOMAS (1663-1729), English engineer, one of the inventors of the steam-engine, was born at Dartmouth in 1663. While employed as an ironmonger in his native town, he corresponded with Robert Hooke about the previous investigations of Denis Papin and the marquis of Worcester as to the applicability of steam-power for the purpose of driving machinery, and in conjunction with John Calley (or Cassley), said to have been a grazier or glazier in Dartmouth, and Captain Thomas Savery (1650?-1715), a military engineer, he constructed in 1715 a "fire-engine," now known as the "atmospheric steam-engine." He died in 1729, probably in London. (See STEAM-ENGINE.)

NEWDIGATE, SIR ROGER (1719-1856), English antiquary, was born on the 30th of May 1719. He was the 5th baronet of Harfield (in Middlesex) and Arbury (in Warwickshire), and grandson of Sir Richard Newdigate, an English chief justice during the time of Richard Cromwell's protectorate. He was educated at University College, Oxford. From 1741 to 1747 he was M.P. for Middlesex, and from 1750 to 1758 M.P. for the University of Oxford. In 1752 he spoke in parliament on behalf of the repeal of the Plantation Act, and during the debates on the land tax in 1767 he opposed the duke of Grafton's administration and the proposed grant to the royal princes. Being the owner of extensive collieries near Bedworth in Warwickshire, he actively promoted the Coventry, Oxford and Grand Junction canal, cutting also a canal from his collieries to Coventry, and interesting himself in the construction of the turnpike road from

1 Lisaible, t. xvi. (1871), pp. 1-45.
2 Washington Observations, 1875, Appendix II.
3 Ib. 1873, Appendix I.
4 Memoirs Amer. Acad. of Arts and Sciences, v. 124-152.
NEWEL—NEW ENGLAND

Coventry to Leicester. But it is as an antiquary and the founder of a prize at the Oxford university that he is chiefly remembered. His interest in old architecture dated from a tour in France and Italy which was undertaken while he was a young man. He filled two folio volumes with sketches of ancient buildings. His collection of antiquities included marbles, casts of statues and vases. Two marble candelabra found in Hadrian's villa at Rome have been preserved, and presented them be the Radcliffe Library at Oxford. Among his other generalities to the university were a chimney piece, for the hall of University College, and the sum of £2000 for the removal by Flaxman of the Arundel collection of marbles to the Radcliffe Library. The "Newdigate" prize of twenty-one guineas for English verse, which is open for competition each year to the undergraduates of Oxford University, was founded by him and was first awarded in the year of his death. He died at Arbury on the 23rd of November 1806. His portrait was painted by Kirkby for University College, Oxford, and at the age of sixty-three he also sat to Romney.

NEWEL (O. Fr. nouvel or, modern noyau, properly a kernel, from Lat. max, nut; other foreign equivalents are Ital. albero, Ger. Spindel), the term given in architecture to the central shaft of a semicircular or winding staircase, which is built up or consists of the narrow ends of the steps standing one over the other. In stone, both newel and steps are cut out of the same block; when in wood, the newel becomes a vertical post into which the steps are housed. The term is also given to the vertical post at the foot or the angles of a square staircase, into which the steps are housed or turned. In its usual application it is more than half the height of the staircase. The Newels, New England, a general name for the north-east section of the United States of America, embracing the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut. It has an area of 66,424 sq. m. (4448 sq. m. being water); and in 1910 its population was 6,552,681, more than one-half of which was in Massachusetts, although that state contains less than one-eighth of the total area. The region is traversed by the broken mountain ranges which form the N.E. continuation of the Appalachian system; the soil is rather sterile, except in the river valleys; and the climate of the long winters is often severe. But the picturesque scenery and delightful summer climate have made New England a favourite resort. When the commerce of New England was interrupted as a consequence of the Napoleonic wars, the abundance of water power afforded by the rivers encouraged manufacturing, and the region rapidly acquired prominence in this industry, especially in the manufacture of textiles, of boots and shoes, and of paper and wood pulp; in 1905 the value of the textile products of New England (excluding flax, hemp and jute) alone was $522,821,440 (more than 45% of that of the entire country), the value of boots and shoes was $132,197,623 (more than one-quarter of the entire country), the value of paper and wood pulp was $99,813,133 (more than one-quarter of the entire country), and the value of all factory products amounted to $2,925,908,437 (nearly one-seventh of the total for the entire country).

Northmen very probably visited this region at the beginning of the 11th century. (See VINLAND). To Europeans who visited it in the 16th century it was included in "Norumbega," and some of the early explorers searched here for the mythical city of that name. Title to the territory was claimed by the English on the basis of its alleged exploration by the Cabots in 1498, and by the French on the basis of its exploration by Giovanni da Verrazzano in 1524. It was made favourably known to the English by the explorations of Bartholomew Gosnold in 1602, of Martin Pring in 1603 and of George Weymouth in 1605, and was at this time called North Virginia. In 1606 King James I. granted it to the Plymouth Company with a view to encouraging settlement, and in the next year a colony was planted at the mouth of the Sagadahoc (now Kennebec) river, but this was abandoned in 1608; the efforts of the French to establish settlements along the Maine coast were likewise unsuccessful. In 1624-1616 Captain John Smith traversed the coast as far east as the mouth of the Penobscot river and as far south as Cape Cod, gathered much information from the Indians, wrote an attractive descript-

of the country, prepared a map of it, suggested its present name, New England, and made another unsuccessful attempt to found a settlement. A new charter of 1626 conveyed to the New England Council, the successor of the Plymouth Company, all the territory in North America between latitudes 46° and 48° N., under the name of New England, and in the same year a permanent settlement was established at Plymouth by a band of dissenters, who, although they were defeated in their invasion of Virginia, were prevailed upon by the captain of their vessel to land in New England. During its existence of fifteen years the New England Council made numerous grants of territory, and from three of these grew three of the present states: Massachusetts, from a grant to the Massachusetts Bay Company in 1628; Maine, from the grant to Sir Ferdinando Gorges and John Mason (the two most influential members of the council) in 1622; and New Hampshire, from the grant to John Mason in 1629. The Council attempted to establish a general government over its entire domain, but the scheme was one of its many failures in supporting such a government with contributions from each member in return for an allotment of land was a failure, and although Robert Gorges, the second son of Sir Ferdinando Gorges, was sent over as governor-general in 1623, he accomplished nothing and returned in the next year in disgust. In 1635, when the Dutch were hemming in its domain on the west and the French on the north, the Council made a final allotment of its remaining territory among its members and surrendered its charter. Connecticut was founded in the same year by emigrants from Massachusetts without any other authority than that of the Council. New Haven was granted to John Davenport and 20 others under a charter from England, and it was settled at New Haven in 1638 by emigrants from England who had stayed for a time in Boston and other Massachusetts towns, but this was annexed to Connecticut in 1664 under the Connecticut charter of 1662. Rhode Island was founded in 1636 by exiles from Massachusetts who had no authority whatever from a superior government. Plymouth was a separate colony until its union with Massachusetts under the charter of 1691. New Hampshire was a part of Massachusetts from 1641-1643 to 1679. Maine, having passed under the jurisdiction of Massa-

chusetts in 1652, did not regain its independence until 1820. Vermont was settled largely by emigrants from New Hampshire, but New York claimed the territory and the dispute was not settled until the new state was erected in 1791.

Massachusetts, Plymouth, Connecticut and New Haven constituted in their early years a group of neighbouring colonies, substantially independent of the mother country, and possessing a unity of purpose and similar institutions but in need of mutual protection from the Indians, the Dutch and the French, and also needing an arbiter to whom they might refer their own disputes, especially those relating to boundaries and trade. To meet these needs they organized, under Articles of Confederation signed in 1643, the first form of colonial union in America; they called it The United Colonies of New England, but it is more commonly known as the New England Confederacy. The confederate authority was vested in a board of eight commissioners, two from each colony chosen annually by its General Court.

This board was to meet annually in September, two years of every five at Boston, one year of every five at Hartford, one at New Haven, and one at Plymouth; special meetings also might be called to consider questions relating to the four colonies. The commissioners chose their president at each meeting, but this officer had only the powers of a moderator. An agreement of six commissioners was necessary to pass any measure, but if there was an agreement of less than six the measure might be referred to the General Courts and become a law of the Confederacy if all of those courts approved. The most important powers of the Confederacy were those relating to the capture and destruction of hostile vessels, and the raising of an army of 100 men from Massachusetts and 45 men from each of the other colonies (or some other proportion which the commissioners might agree) to march out if so requested by three magnates, or any two magistrates of a town in distress. The experiment of a defensive war which the commissioners declared to be just were to be defrayed by the several colonies in proportion to their number of men and boys between the ages of sixteen and sixty. Other matters within the jurisdiction of the commissioners were such as related to disputes
between two or more colonies and the return of escaped servants, prisoners and fugitives from justice. As the commissioners had no means of enforcing their orders, their function was chiefly advisory, but occasionally of considerable importance on special occasions. Although the number of commissioners from each of the colonies was the same, those from Massachusetts exerted the dominant influence.

The commissioners met regularly until 1684—annually until New Haven submitted to Connecticut in 1664, and triennially from 1664 to 1684, when Massachusetts lost its first charter. Upon the restoration of Puritan government in the country (1660) numerous grievances were presented to King Charles II. against the Puritan governments of New England, among them Massachusetts' extension of its jurisdiction over the towns of Maine and New Hampshire, the persecution of the Quakers, and the denial of the right of appeal to the crown, and in 1604 a royal commission, consisting of Richard Nicolls, Samuel Maverick, Robert Carr and George Cartwright, was sent over to settle disputes and secure some measure of imperial control, but Massachusetts, the chief offender, successfully baffled all attempts at interference, and the mission was almost a complete failure. The grievances of English merchants arising from the violation of the navigation laws by the colonies continued, however, to receive the attention of the home government.

In 1676 the Lords of Trade and Plantations sent over Edward Randolph to investigate and gather information which would show the justice and expediency of imposing imperial control, and two years later Randolph was appointed Collector and Surveyor of Customs in New England. Randolph sent back many charges, especially against Massachusetts, with the effect that, in 1684, the charter of that colony was annulled by a decree in Chancery on a writ of quo warranto. This done, the home government set to work to organize the royal domain which should be known as New England, or the Dominion of New England, and its plan for this provided for the annulment of the charters of Rhode Island and Connecticut, and the inclusion in the Dominion of these colonies, and New Hampshire, Maine, New York and the Jerseys, thereby restoring to New England all the territory, with the exception of Pennsylvania, that was included in the grant to the New England Council in 1620. A temporary government was established at Boston in May 1686, with Joseph Dudley as president, and in December of the same year Edmund Andros arrived with a commission and instructions which were a copy of those to the governor of New York and made him governor of all New England except Rhode Island and Connecticut. Rhode Island offered no resistance to the writ against its charter and Andros extended his authority over it immediately after his arrival. Connecticut successfully baffled the royal servants for a time, but when threatened with a division of its territory agreed not to resist the royal purpose, and on the last day of October 1687 it passed under the general government of New England. Finally, a new commission to Andros, issued in April 1688, extended his jurisdiction over New York and the Jerseys, and the whole region over which he was made governor by this instrument was named "Our Territory and Dominion of New England in America." But the English Revolution of 1688 inspired a revolt in New England by which Andros was deposed in April 1689. Under William and Mary no attempt was made to preserve the Dominion of New England, but Rhode Island and Connecticut were permitted to resume government under their old charters, Massachusetts received a new one, and New Hampshire again became a separate royal province.

New England is prominent in American colonial history as the "Land of the Puritans" and the home of the corporate colony. The chief motive of its founders in coming to the New World was the establishment of a new Christian commonwealth, but subordinate to this there was from the first an economic motive. So long as the religious motive remained dominant, "blue laws" were a prominent feature of the administration, but by a slow transition the economic motive became the dominant one, and, as a consequence of this transition and of the corporate form of government, European institutions were transformed into American institutions and new political ideas were generated more rapidly in New England than in either the Middle or the Southern colonies. Owing to its geographical position, nearer to Canada than any other group of colonies, New England had to stand the brunt of the fighter during the wars between the English and the French (aided by their Indian allies) in America, terminating with the conquest of Canada by the English in 1759-1760, and a sense of common danger helped to create a certain solidarity, which made easier the unity of the colonies for common action against the mother country at the time of the War of American Independence. After that war, New England was long the most essentially commercial and industrial group of states, and was a stronghold of Federalism; and in the period immediately before and during the War of 1812, when its commercial interests suffered terribly, first from the restrictive measures of the general government and then from warfare, New England was a centre of that opposition to the policy of the National Administration (then Democratic), which culminated in the famous Hartford Convention in 1814-1815 (see HARTFORD).


NEW FOREST, one of the few woodland regions left in England covering about 93,000 acres in the south-west of Hampshire, between the Solent, Southampton Water and the river Avon. About two-thirds of it is crown property, and is preserved more or less in its natural condition as open woodland interspersed with bogs and heaths. The trees principally represented are oak and beech, with some newer plantations of Scotch fir. The trees were formerly felled for building the ships of the navy and for feeding the iron furnaces of Sussex and Hampshire. Pigs and a hardy breed of ponies find a good living in the forest; and in the woods of an early date for extermination or removal, a few red deer still survive. Foxes, squirrels, otters, snakes (smooth snake, grass snake and adder), butterflies (some of them peculiar to the district), and an occasional badger range the forest freely. The tract derives its name from the extensive aorestation carried through in this region by William the Conqueror in 1079; and the deaths of two of his sons within its confines—Richard killed by a stag, and William Rufus by an arrow—were regarded in their generation as a judgment of Heaven for the cruelty and injustice perpetrated by their father when appropriating the forest. Rufus's stone, near Lyndhurst, marks the supposed spot where the monarch fell. About one-fourth of the area is under cultivation by private owners and tenants. The principal village within the forest is Lyndhurst (pop. 2167 in 1901); its church contains a fresco by Lord Leighton, and here is held the verderers' court, which since 1887 has had charge of the crown portion of the forest. On the western outskirts lies the town of Ringwood (g.v.). Brockenhurst and Beaulieu are the villages next in importance. Beaulieu, at the head of the picturesque estuary of the Beaulieu river, which debouches into the Solent, is famous for the ruins of Beaulieu Abbey, founded by the king, for Carlton House, the gatehouse is restored as a residence, and the Early English refectory as a church. There are considerable remains of the cloisters, chapter house and domestic buildings. The New Forest gives name to a parliamentary division of the county.

The New Forest is one of the five forests mentioned in Domesday. It was a hunting-ground of the West Saxon kings, but, as already stated, was aforested by the Conqueror, whose cruelty in the matter is probably exaggerated by the traditional account. One of the chief sources of the wealth of the forest in early times was the herds of pigs fed there. The New Forest,
being under the forest laws, was affected by the forest clauses of Magna Carta and by the Forest Charter (1217), which mitigated their severity. The chief officer of this, as of other forests, was the justice in eyre who held the justice seat, the highest forest court and the only court of record capable of entering and executing judgments on offenders; the lower courts were the Swimwear and Wardenage, the former of which is still held in a modified form, in the Verderers' Hall of the King's House at Lyndhurst. The circuit of the justices in eyre, or their deputies, continued down to 1635; they were virtually ended by the Act for the Limitation of Forests (1640), though Charles II. attempted to revive them, and they were not legally abolished until 1817. The lower officers of the forest, who held merely local appointments, were the verderers, the warders (one of whose duties was that of seeing to the expediency of "great dogs"), the foresters, the woodwards and the agisters. There was also a lord warden, who was usually a gentleman having no judicial functions. The Deer Removal Act (1831) resulted in the almost total extinction of the forest deer. Under the act of 1877 the forest is administered rather as a national park than for the growing of timber on commercial principles.


NEWFOUNDLAND, a large island, forming a British colony, and occupying an important and commanding position off the eastern coast of North America, is not dissimilar to that occupied by Great Britain towards Europe. It is situated directly across the entrance of the Gulf of St. Lawrence, to which access is afforded at both the northern and the southern extremities of the island. In the south-west its distance from Cape Breton is less than 60 m., while only 1640 m. separate its most easterly point from the coast of Ireland. It is situated between 46° 36' 50" and 51° 39' N., and between 51° 37' and 39° 24' 30" W. The total area of the island is about 40,000 sq. m., or one-sixth larger than Ireland; its maximum length from Cape Race, Newfoundland, 7017 m., its maximum breadth from Cape Spear to Cape Anguillae, 5386 m. It consists of a triangular, three extensive peninsulas, which project from the north (Petit Nord) and south-east (Avalon), assisting the conformation, although the latter, the most populous region of the island, is joined by a very slender isthmus, at one place only 3 m. wide. A further division of the Avalon peninsula is wrought by the two bays of St. Mary's and Conception. St. John's, the capital, is situated on the eastern side of Avalon.

Physical Features.—VIEWED from the ocean the coasts of Newfoundland appear bleak, rocky and barren. The brown wall of rock, sometimes broken by high cliffs, and Rendered higher by the deep fjords and large bays running in some instances 80 to 90 m. inland, and throwing out smaller arms in all directions. For this reason the circumference of the island, which, measured from headland to headland, is about 1000 m., is actually doubled. The fjords resemble those of Norway; islands are numerous, some of them clad with vegetation; and picturesque scenery is not uncommon.

Near the coasts the surface of the country is of a hilly, rugged character, and diversified by ranges of low hills, valleys, woods, lakes, ponds and marshes. Much of this is a savanna country, giving sustenance to large herds of caribou. All the principal hills have a N.E. and S.S.W. trend, as have also the other great physical features of the island, such as the bays, larger lakes, rivers and valleys, a conformation doubtless shaped by glacial action during the ice period. The most important range of mountains is the Long Range, beginning at Cape Ray and extending along the western side of the island for some 200 m., and having peaks more than 2000 ft. high. Parallel to this but nearer the west coast is the Anguille Range, running from Cape Anguille to the north-east point of Bay of St. George. Some of the summits of the Blomidon Range, extending along the south shore of the Humber and Bay of Islands, attain a height of 2081 ft., most of the highest on the island. Avalon peninsula is also very hilly, being crossed by the extinct volcano of Conception Mountain, from which sixty-seven lakes are visible on a clear day. Over the interior are spread a number of detached sharply-pointed summits, springing abruptly from the great central plateau, bearing the local name of "tolls," and servicios as small islands.

In comparison with the island's size large rivers are few, owing to the broken, uneven character of most of the country, and the fact that the ponds and lakes find a convenient vent in the numerous two branching streams from the heart of the island to empty into three considerable streams, the Exploits, the Humber and the Gander. The first-named rises in the extreme S.W. angle of the island, close to the southern extremity of the Long Range, and after a course of about 80 miles into the sea at St. John's, forms the Gander River, a mile wide at its mouth; its channel is studded with islands, the largest being Thwart Island, 9 m. in length. Fourteen miles from St. John's, a succession of cascades known as Bishop's Falls, and farther inland, are the picturesque Grand Falls. The Exploits drains an area of between 3000 and 4000 m., much of it fertile land, and densely wooded with pine, spruce, birch and poplar. The Humber, rising on the west side of the island, is about 30 m. long, and at its mouth is at least 100 sq. m. wide. The Exploits flows, through which the Humber flows, is 15 m. After these Miché Sandy Lake, Victoria's, Terra Nova and George IV. The next in importance are the two large inlets where the railway and lumbering camps have invaded them the shores of these lakes are still primitive wilderness.

The coasts of the island, intersected by many great bays, have been successively opened to French, Spanish and English fishermen, and their small craft have been augmented into a host of fishing vessels. An extensive fishery results from the warm trades currents, which, after flowing south from the Gulf Stream, turn towards the coast of Newfoundland. The greatest part of the catch is salmon, which are usually caught with hand nets, the catches usually amounting to about 100,000 lbs. These fisheries are only of recent origin, being established in the early part of the 19th century. The fishing industry is now the largest in the world, and is carried on in a manner which results in the greatest loss of fish. The greater part of the fishery is carried on in the Gulf of St. Lawrence. In 1813 the whole fisheries of the island with the exception of the Grand Banks, were purchased by the British government, and the fisheries are now carried on under the direction of the government.

The islands of the Grand Banks, which extend from the island of Newfoundland to the Gulf of St. Lawrence, form a large area of shallow water, which is a great nursery, and provides a home for a large number of fish. The banks are occupied by fishermen from England, Ireland, Scotland and the United States, and are used for the fisheries of the Grand Banks. The catches of the fisheries are mainly salmon, cod, haddock, halibut, mackerel, herring and capelin. The fisheries are of great importance to the economy of the island, and the catches of fish are of great value as fish food, and as a source of employment for the fishermen and their families.
of the intermediary system have been ground down to the Laurentian gneiss, and, subsequently, the submarine valley thus formed has been filled up with a new set of sediments, the remains of which are still to be found skirting the shores of the bay and forming the islands in it.

Rocks of the Silurian age are most extensive on the peninsula of Cape St Mary, and around the head of Trinity Bay. These belong to the Primordial Silurian group. The Lower Silurian rocks have a large development, and in them the metallic ores occur which seem destined to render the island a great mining centre. The Lauzon division of the Quebec group, which is the true metalliferous zone of North America, has an immense spread in the island. It consists of serpentine rocks associated with dolomites, diorites, &c., and is well known throughout North America to be usually more or less metalliferous. The Newfoundland rocks are no exception, but give evidence of being rich in metallic ores. The Middle Silurian division of rocks is also widely spread; and the most fertile belts of land and the most valuable lands are nearly all situated on the country occupied by this formation. The great valley of the Exploits and Victoria rivers, the valley of the Gander and several smaller tracts belong to it.

The Carboniferous series occupies a large area on the western side of the island, in the neighborhood of Bay St George and Grand Lake. There is also a wider spread of the same series along the valley of the Humber and round the shores of Deer Lake and the eastern half of Grand Lake, and as far as Sandy Lake. "Coal," says Mr J. P. Howley, F.R.G.S., head of the survey, "is known to exist at several places in this series; and seams, apparently of workable thickness, judging from their out-crops, occur on the Middle Barachois and Robinson's Brook, in St George's Bay."

It will thus be seen that the Carboniferous series is confined to the western side, while the middle, eastern and southern portions are occupied by Silurian, Huronian and Laurentian formations. From the extent to which the Lauzon division of the Quebec group, the true metalliferous zone of North America, prevails in the island, its yet undeveloped mineral wealth must be very great.

Climate.—The climate is more temperate than that of most portions of the neighbouring continent. It is but rarely, and then only for a few hours, that the thermometer sinks below zero in winter, while the summer range rarely exceeds 80° F., and for the most part does not rise above 70°. The Arctic current exerts a chilling influence along the eastern coast, but as a compensation it brings with it the enormous wealth of commercial fishes and seals which has rendered the fisheries the most productive in the world. The Gulf Stream, while it creates fogs, modifies the cold. The salubrity of the climate is evidenced by the robust healthy appearance of the inhabitants.
Open fireplaces are sufficient to warm the houses, and free exercise in the open air is attainable at all seasons. The average mean temperature in January is 41 °F, in July it is 74 °F, and the minimum 37 °F. Of the minimum barometer is 29.37 in. The average rainfall is 58-30 in. Winter sets in, as a rule, in the beginning of December and lasts through the year, generally the first snow falling in the month of April, and the last not until early November. There is nothing in the climate to interfere with agriculture. Tornadoes are unknown, and thunderstorms are very rare. Fogs, of which so much is said in connexion with the coast line, are confined to the shores and bays of the south-eastern and southern coasts.

Flora.—Among the well-known wild animals indigenous to the colony are the caribou, black-throated blue warbler, kingfisher, and the great auk. The caribou are found in all the districts, and migrate regularly between the south-eastern and north-western portions of the island. The winter months are passed in the south, where "browse" is plentiful, and the snow is too deep to prevent them from reaching the lichens on the lower grounds. In March they begin their spring migration to the barrens and mountains of the north-west. In May or June they bring forth their young. As soon as the frost of October begins to nip the vegetation a turn south. September and October are the best months for stalking. In addition to the caribou, the wolf and black bear are found in the interior; the fox (black, silver, grey and red), beaver, otter, arctic hare, snowshoe hare, musquash or musk-rat are abundant. The famous Newfoundland dog is still to be met with, but good specimens are rare, and he appears to thrive better elsewhere. The common dogs are a degenerate race. There are very few inhabitants on the island, and many species of birds in the island, most of them being migratory. Among them may be enumerated the eagle, hawk, owl, woodpecker, swallow, kingfisher, finch, robin, thrush, partridge, snow-bunting, and warblers and swallows in great variety, finches, ravens, jays. The ptarmigan or willow grouse is very abundant, and is the finest game bird in the island. The rock ptarmigan is found in the highest and most barren mountain ridges. The American golden plover, various species of sandpipers and curlews, the brent goose, ducks, petrels, gulls and the great northern diver are met with everywhere. The great auk, now extinct, was once found in myriads around the island. The puffin and loon, and razor-beak auk are abundant. No venomous reptiles occur. Frogs have been introduced and thrive well. Of molluscan animals the common squid, a cephalopod about 6 or 7 in. in length, visits the coasts in immense shoals in August and September, and supplies a valuable bait. A gigantic species of cephalopod was discovered in 1873, which excited much interest among naturalists: the body varies from 7 to 15 ft. in length, with a circumference of 5 ft. to 10 ft.; the head, arms and tentacles (two) being from 24 to 40 ft. in length, and covered with suckers at their extremities; the other eight arms vary from 6 to 10 ft., and on the underside are entirely covered with suckers. Professor Vartholomew, of Trinity College, Dublin, has named this species—One he named Architeuthis Harveyi, after the discoverer, and the other Architeuthis monachus. Of the birds, juniper and larch of the forests of the interior furnish ample materials for a large timber trade as well as for shipbuilding purposes. The white pine grows to the height of 70 or 80 ft. in some places, and is 3 1/2 ft. in diameter. The yellow birch is found in the most remote parts, and in 1906–1907 a London company, with Lord Northcliffe (of the Daily Mail) at its head, acquired large tracts for this purpose, and operations were begun in 1910. The mountain ash, balsam, maple and aspen thrive well. Evergreens are in great variety. The berry-bearing plants cover large areas of the island. The maidenhair or capillare yields a saccharine matter which is luciscent sweet. Flowering plants and ferns are in vast varieties, and wild grasses and clover luxuriant. Garden vegetables of all kinds, and strawberries, raspberries, gooseberries, currants, &c., thrive well.

Population.—By the earliest computation made in 1654 the number of permanent inhabitants in the island was 1750. Twenty-six years later the resident population was stated to be 2580; in 1763, 7000; in 1804, 20,000. In 1832 the population had risen to 60,000; in 1836 to 75,004; in 1857, 124,288; and in 1874, 161,374. By the census of 1901 the total population of Newfoundland was 217,037, that of Labrador being 3947. The capital, St. John's, which contains a population of 5,000 in 1835, has in 1891 31,884. The rate of increase for the island for the ten years ending in 1901 is 3.7%, as compared with the rate of increase 1874–1884, which was 22.30%. Certain districts such as Carbonear, Harbour Grace and Ferryland, as well as Labrador, showed a steady decline, the largest increase being in St. George's district and on the west coast, where it is not less than 40%.
October, when the cod fishery closes. The cod are taken by the hand line, or herring, and are bought for the most part by the bulk. Newfoundland exports cod to Brazil, Spain, Portugal, Italy, Great Britain, Greece, the West Indies and the United States. Brazil and Spain are the largest consumers.

Cod are of great importance. The industry was begun about 1740, when the value of the seal oil exports was £1000. In 1904-1905 seal skins and seal oil to the value of £370,261 and £357,000 respectively were exported, and the price of cod at St. John’s £90 to £125. This shows a considerable falling off. The number of men employed is about 4000. Steamers were first used in 1863. They are from 350 to 500 tons burden, most of them carrying from 200 to 250 tons fish, and maintained by an English captain and his wife. In one instance 41,900 seals were brought in by a single steamer, the “Neptune,” the weight being 874 tons and the value £135,750. In bad years the catch may not exceed 200,000-in 1877 the catch was nil. On sealing voyage until the 12th of March, and no seal may be killed before the 1st of March. The young seals are born on the ice between the 1st and 15th of March, and become fit for slaughter about six weeks after they are born. If the weather is bad, they are killed as they are born. There is a well-known rule that “wherever the young seal appears, there the old seal will be found.”

There is a wealth of seals. After the bones and blubber have been removed, the seals are not valued by the natives. In 1904-1905 the value of seal blubber was £80,000, of seal oil £125,000, and of seal meat only £2000.

Of more recent origin is the lobster fishery, their packing for export having begun in 1873. By 1888 the value of the lobster export had risen to £358,007. 1904-1905, while the catch had somewhat diminished as compared with 1895, the value had increased to £512,662. A vigorous effort has been made to establish the herring fishery on a scale commensurate with the abundance of the fish in these waters. In 1885 the total quantity exported was 32,042 barrels, with a value of £91,357. In 1905 there were 175,633 barrels, valued at £722,329. The cod-fishing industry began in the Bay of Islands, Placentia, Bay St. George and Bay of Islands, and the whole coast of Labrador, which furnishes the finest kind of herring. Besides the herring exported, at least £150,000 worth is sold to the French and Americans at Baltimore.

The export of preserved salmon, of which the island has an abundant supply, does not form a large or important item, seldom reaching £50,000. Salmon is taken for the most part in nets in the coves and bays and at the mouths of rivers. The season for taking is brief, six or seven weeks, beginning at the end of May. The proper preservation of the salmon waters has been for generations neglected, and reckless practices had flagrantly to exterminate the fish.

In 1888, however, a fisheries commission was appointed, and river wardens were charged with the stringent enforcement of the new laws. The best salmon fisheries are in Bonavista Bay, Gander and St. John’s islands and in the west coast.

Mackerel formerly frequented the Newfoundland coasts, but disappeared about the middle of the 19th century; and few halibut or haddock are caught. Sea trout and brook trout, however, abound, and latterly Loch Leven and Californian rainbow trout have been introduced with success.

The most extraordinary increase concerns the whaling industry. Before 1734 the cod were the only fish caught. Thereafter the whale fishery was carried on, but it then suddenly ceased and has only recently been revived. The revival is due to the invention of a harpoon-gun which kills the whale effectually and with dispatch. The whaling industry had four factories at the first, and the present factory is the only one remaining in the province. The oil is distilled, the bone and oil. While in 1829 the value of the oil reached only £700 and the bone £100, a decade later the values were £384,062 and £34,835 respectively; and in 1905 the net value of the oil was £630,000, the bone £240,000, and the whale teeth £80,000, a sum representing the cost of manufacturing the carcases into a fine guano, and utilizes the by-products, thus adding £600,000 to the industry.

On the whole the aggregate value of the Newfoundland fisheries for 1900-1905 was nearly £2,000,000 sterling, including the fish consumed in the colony.

Agriculture.—Until recent years little attention has been paid to agriculture, the belief being current that the interior of the island was a desert. The reports of the geological survey dispelled this fiction, it being conclusively shown that out of the 28,000 sq. m. of dry land over one-sixth or 7000 sq. m. is available under suitable conditions for cultivation. The better lands are situated in the Codroy valley, which is rich in alluvial soil. That in the Bay St. George district is very fertile, and in the Humber valley, Exploits valley and elsewhere many thousands of farmers could be established if the British Government adopted a liberal policy in land cultivation. In 1901, 215,579 acres were occupied, of which 55,833 acres were actually under cultivation, producing chiefly hay, oats, potatoes and beans. There has been a notable increase, especially in sheep. Newfoundland seems especially adapted for a sheep-grazing country.

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America in this period showed an increase of 128.5% and that with Canada 76.1%.

Rocks and Railways.—Railways play a unique part in the modern history of the island. Not until 1825 was the first road made; it was 9 m. in length, from St John’s to Portugal Cove. When representative government was established in 1853 an annual grant was voted for roads and bridges, and of late years not less than $100,000 per annum has been expended on this head. There are now over 2,500 m. of postal roads, and over 2000 of district roads. In 1880 after much agitation the legislature finally agreed to raise a loan of £1,000,000 for the construction of a railway from St John’s to Halls’s Bay, with branches to Brigus and Harbour Grace, the distance being estimated at 340 m. In November 1884 the line was completed for traffic as far as Harbour Grace. In the following year the construction of a line, 27 m. in length, from Whitbourne to Placentia, the old French capital, was begun and finished in 1888. Shortly afterwards it was decided to resume the line northwards from St John’s to Halls’s Bay (which, owing to the state of the contractors, had been discontinued) with a view ultimately to a transinsular railway. The tender of a well-known contractor, Mr R.G. Reid of Montreal, was accepted, and the work was begun in October 1890. But before the contractor had proceeded far with the Hall’s Bay line a new survey was made and another route determined for the proposed transinsular railway, westwards from the valley of the Exploits, which was regarded as much more favourable than the one originally contemplated. It traversed the Exploits and Humber valleys, passing through the most fertile parts of the island. The line of the Railway ran from St John’s to the west coast; hence it skirted Bay St George and the Codroy valley and terminated at Port-aux-Basques, a commodious harbour 93 m. distant from Sydney, Cape Breton. The new route was chosen, and a contract signed on the 16th of May 1893, whereby the contractor was to be paid $15,600 per mile in Newfoundland bonds, the whole line to be completed in three years. At the same time, in order to provide for the working of the line, it was agreed between the colonial government and Mr Reid that the latter should maintain and work it, as well as construct a system of telegraphs, for a period of ten years from the 1st of September 1893, at his own expense, in consideration of a “grant in fee simple to the contractor of 5000 acres of land for each one mile of mail line or branch railway to be operated.” Should the line, therefore, be 900 m. in length the land grant would be 2,500,000 acres, to be situated on each side of the railway in alternate sections of 1 or 2 m. in length with the railway, and 8 m. in depth, the colony also retaining an equal amount of land with the contractor along the route. Much hostile criticism was subsequently directed towards this arrangement. In 1898 a new proposal was made by Mr Reid, under the terms of which he undertook to work all the railways in the island for a period of fifty years, free of cost to the government, provided that, at the termination of the said period, the railways should become his own property. He was also to receive a further concession of land to the extent of 2,500,000 acres on terms similar to those contained in the former contract. Mr Reid agreed to build and run seven steamers, one in each of the large bays, and one to ply in Labrador in summer, to provide an electric street railway for St John’s, and also to pave a certain portion of the capital. The colony was to part with the telegraph system to the contractor, who was to acquire at a fixed price the government dry-dock at St John’s. On the other hand, to complete the bargain, $1,000,000 in cash was to be paid by the contractor to the government within a year after the signing of the contract. This remarkable covenant, which was afterwards characterized by Mr Chamberlin, secretary of state for the colonies, as a transaction “without parallel in the history of any country,” was nevertheless ratified by the legislature, and submitted to the governor, Sir Herbert Murray, for his approval. The governor declined to append his signature to the instrument, but upon its being referred to the imperial secretary of state, it was decided that the arrangement was one relating exclusively to the colony, and this being the case, that it would be an unwarrantable interference with the rights of a self-governing colony to disallow the measure. The Reid contract was therefore signed by Sir Herbert Murray before relinquishing his post early in 1898. Meanwhile considerable feeling had been manifested in the colony; numerous public meetings in support of the governor’s action were held; and several petitions were despatched to England; but it was not until the spring of 1899, when the colonists were forced to resign on account of the opposition which had been engendered. The general election brought a Liberal, Mr (afterwards Sir) Robert Bond, into power; and he had hardly assumed office when the contractor approached the ministry with further proposals to convert his property into a limited liability company with a capital of £5,000,000 sterling, for which proceeding the consent of the legislature was necessary, under the terms of 1898. Mr Bond refused unless a modification of the contract was agreed to. The modifications demanded were—that the telegraphs should revert to the government, and that the land grant, which included a large amount of private property, should be readjusted so as to conserve the rights of those whose holdings had been confiscated; also, that it should be optional for the colony to take over the railways at the end of fifty years by paying back the sum of $1,000,000 with interest, the amount paid by Mr Reid to the colony; and a sum to be arrived at by arbitration for all improvements that may have been made on the property within the fifty years. After considerable dispute these terms were substantially agreed to, and the conversion into a company took place.

The Discovery. John Cabot, sailing from Bristol in 1497, appears to have made landfall at Bonavista and claimed the whole country for Henry VII. Three years later Gaspar Corte-Real, ranging the North American coasts, discovered and named Conception Bay and Portugal Cove, and was appointed Portuguese governor of Terra Nova. The long series of annual trans-Atlantic expeditions followed upon the voyages of Cabot and Corte-Real, and their reports in England, Portugal and France concerning the multitude of fish in Newfoundland. For a long time it was supposed that the English fishermen did not avail themselves to any extent of these advantages until the middle of the 17th century, but this is now shown to be erroneous. Mr Prowse states that the trade during the first half of the century was both extensive and lucrative. In 1537 the little Devonshire fishing ships were unable to carry home their large catch, so “sack ships” (large merchant vessels) were employed to carry the salt cod to Spain and Portugal. An act of 1541 classifies the Newfoundland trade with the Irish, Shetland and Iceland fisheries. Hakluyt, writing in 1588, mentions that the number of vessels employed in the fishery was 400, of which only one-quarter were English, the rest being French and Spanish Basque. But in the same year, according to Anthony Parkhurst, “the English are commonly lords of the harbours where they fish and use all help in fishing if need require.” Shortly after England awoke to the importance of Cabot’s great discovery, and an attempt was made to plant a colony on the shores of the island. Sir Humphry Gilbert, provided with letters patent from Queen Elizabeth, landed in St John’s in August 1583, and formally took possession of the country in the queen’s name. The first attempt at colonizing was frustrated by the loss of Gilbert soon afterwards at sea. In 1610 James I, granted a patent to John Guy, an enterprising Bristol merchant, for a “plantation” in Newfoundland; but no marked success attended his efforts to found settlements. In 1615 Captain Richard Whithorne of Exmouth in Devonshire was despatched to Newfoundland by the British admiralty to establish order and correct abuses which had grown up among the fishermen. On his return in 1622 he wrote a “Discourse and Discovery of Newfoundland Trade,” which King James, by an order in council, caused to be distributed.
among the parishes of the kingdom "for the encouragement of adventures unto plantation there." A year after the departure of Whitbourne, Sir George Calvert, afterwards the first Lord Baltimore, obtained a patent conveying to him the lordship of the whole southern peninsula of Newfoundland, and the right of fishing in the surrounding waters. He planted a colony at Ferryland, 40 m. north of Cape Race, where he built a handsome mansion and resided with his family for many years. The French so harassed his settlement by incessant attacks that he at length abandoned it.

In 1650, or about a century and a half after its discovery, Newfoundland contained only 350 families, or less than 2000 individuals, distributed in fifteen small settlements, chiefly along the eastern shore. These constituted the resident population; but in addition there was a floating population of several thousands who frequented the shores during the summer for the sake of the fisheries, which had now attained very large dimensions. So early as 1626, 150 vessels were annually despatched from Devon and the shipowners and traders residing in the west of England sent out their ships and fishing crews early in summer to prosecute these lucrative fisheries. The fish caught were salted and dried on the shore; and on the approach of winter the fishermen re-embarked for England, carrying with them the products of their labour. Hence it became the interest of these traders and shipowners to discourage the settlement of the country. In order to retain the exclusive use of the harbours and fishing coves for their servants, and also a monopoly of the fisheries. They were also envious of the British government of the day in their project, and stringent laws were passed prohibiting settlement within 6 m. of the shore, forbidding fishermen to remain behind at the close of the fishing season, and rendering it illegal to build or repair a house without a special licence. The object of this short-sighted policy, which was persisted in for more than a century, was to preserve the island as a fishing station and the fisheries as nurseries for British seamen.

There was, however, another element which retarded the prosperity of the country. The French had early realized the immense value of the fisheries, and strove long and desperately to obtain possession of the asylum. Their constant attacks and encroachments harassed the few settlers, and rendered life and property insecure during the long wars between England and France. When at length, in 1713, the treaty of Utrecht ended hostilities, it did not deliver Newfoundland from the grasp of France, as it yielded to her the right of catching and drying fish on the western and northern sides of the island. Though no territorial rights were conferred on the French, and the sovereignty was secured to England, the practical effect was to exclude the inhabitants from the fairest half of the island.

In spite of the restrictive regulations, the number of the resident population continued to increase. The sturdy settlers clung to the soil, and combated the "adventurers" as the merchants were called, and after a lengthened conflict obtained freedom of settlement and relief from oppression. But the contest was severe and prolonged. The merchant-adventurers strenuously opposed the appointment of a governor; but at length, in 1728, the British government appointed Captain Henry Osborne first governor of Newfoundland, with a commission to establish a form of civil government. This constituted a new epoch in the history of the colony. In 1753 the fixed inhabitants had increased to 8000, while 5000 more were summer residents who returned home each winter. In 1765 the coast of Labrador, from Hudson's Strait to the river St John opposite the west end of the island of Anticosti, was attached to the government of Newfoundland. The population in 1785 had increased to 10,000. During the wars between England and France which followed the French Revolution, Newfoundland attained great prosperity, as all competitors in the fisheries were swept from the seas, and the markets of Europe were exclusively in the hands of the merchants of the country. The value of fish trebled, wages rose to a high figure, and in 1814 no less than 7000 emigrants arrived. The population now numbered 80,000. In 1832 representative government was granted to the colony, and provision was made for education. In 1846 a terrible fire destroyed three-fourths of St John's and with it an enormous amount of property; but the city rose from its ashes improved and beautified. In 1855 the system of responsible government was inaugurated. In 1856 the first Atlantic cable was landed by Bulloch.

Unproductive fisheries, causing a widespread destitution among the working classes, marked the first eight years of the decade between 1860 and 1870. A system of able-bodied pauper relief was initiated to meet the necessities of the case but was attended with the usual demoralizing results. The necessity of extending the cultivation of the soil in order to meet the wants of the growing population was felt more and more as the pressure arising from the failure of the fisheries showed their precarious nature more sensibly. In 1864 copper ore was discovered in the north, and mining opened there to be successfully initiated. In 1869 a series of successful fisheries began which enabled the government to terminate the injurious system of able-bodied pauper relief.

In 1871 the revenue rose to $831,160. In 1873 direct steam communication with England and America was established.

By the treaty of Utrecht of 1713 a right was reserved to French subjects to catch fish and to dry them on that part of Newfoundland which stretches from Cape Bonavista to the northern part of the island and from thence coming down by the western side reaches as far as Cape Ray. By the treaty of Versailles of 1783 France renounced the fishery from Bonavista to Cape St John on the east coast, receiving in return extended rights upon the west coast as far as Cape Ray. Neither treaty purported to grant exclusive right, but there was annexed to the treaty of Versailles a declaration to the effect that "His Britannic Majesty will take the most positive measures for preventing his subjects from interrupting in any manner by their competition the fishery of the French during the temporary exercise of it which is granted to them upon the coasts of the island of Newfoundland, and he will for this purpose cause the fixed settlements which shall be opened there to be removed." Upon this declaration the French founded a claim to exclusive fishing rights within the limits named. A convention was entered into with a view to defining these rights in 1854, but it remained inoperative, the consent of the Newfoundland legislature, to which it was made subject, having been refused. Meanwhile the French government granted a bounty to the French fishermen which enabled them to undersell the colonists.

In 1884 a convention which had been arranged between the British and French governments was submitted to the colonial administration by its promoters Sir Clare Ford and Mr E. B. Pennell, C.M.G., but without obtaining the support of the Newfoundland government. In the year following, on a change of ministry in the colony, the Ford-Pennell convention was again offered to the Newfoundland legislature in a slightly amended form, but the joint committee of the colonial house of assembly and the council absolutely refused to ratify the arrangement unless the French government would consent either to annul or to amend the system of bounties paid upon French-caught fish in Newfoundland waters. At the same time, to counteract the effect of these bounties, which pressed very hardly upon the British competition, a Bait Act was framed and carried in 1886, empowering the executive to prohibit the capture in Newfoundland waters for exportation or sale of bait fishes, except under special licence to be issued by the colonial government. The consequence of this measure, were its provisions properly enforced, would be to place an embargo upon the local supply of bait requisite to the French fishermen—the so-called "metropolitan fleet"—on the Grand Banks. Upon being apprized of this enactment, the French government immediately demanded that Great Britain should deny its sanction to this Newfoundland Bait Act, and pressed their objections with such persistence as to induce Lord Salisbury
to disallow the measure. Nevertheless, the despatch of the governor, Sir William des Voeux, to the colonial secretary, Sir H. Holland, was so entirely in favour of the principle of the bill that the Newfoundland authorities became imbued with a fixed determination to urge forward the measure for imperial acceptance. In 1887, therefore, a delegation, consisting of Sir Robert Thorburn, the premier, and Sir Ambrose Shea, visited England at a moment most propitious for obtaining the sympathy and support of the imperial government and the press and people of the mother country, it being the jubilee year of Queen Victoria’s accession to the throne. A conference of colonial premiers was one of the notable events distinguishing that happy period, and the subject was argued before the conference at considerable length. The claim set up by the senior colony “to control and legislate for her own fisheries” met with general approval, the single dissentient being the representative of Canada, who feared that Canadian fishermen would suffer under the bill. When an assurance was tendered that Canada’s fishermen would be placed upon the same footing with those of Newfoundland, the British government somewhat reluctantly sanctioned the Bait Act. The stipulation was made, however, that it should not be enforced until the spring following (1888). In the meantime the chargrin of the French Foreign Office at the failure of the Ford-Pennell negotiations, and the hostile attitude taken up by the Newfoundlanders in what they deemed to be the conservation of their interests, induced M. de Freycinet to devise retaliatory measures. Instructions were issued “to seize and confiscate all instruments of fishing belonging to foreigners resident or otherwise, who shall fish on that part of the coast which is reserved to our use.” Lord Rosebery, then foreign secretary, protested to the French ambassador against the spirit of these instructions, which he insisted were in direct contravention of the treaty, inasmuch as they ignored the concurrent as well as those sovereign rights of Great Britain which France solemnly undertook by the treaties never to question or dispute. Nor were other opportunities soon wanting to the French to revert severely upon the Newfoundland authorities for their passage of the Bait Act, as well as to repair in large measure the injury which that act promised to inflict upon the French industry. About 1874 a Nova Scotian named Rumkey had established the first factory for the canning of lobsters on the west coast of Newfoundland. This concern proved profitable, and others sprang up, until, at the close of the season of 1887, Captain Campbell, R.N., reported that twenty-six factories were at work, employing about 1,100 hands. It was at that time understood that this was an industry which, by the very nature of the process and the permanent shore structure it involved, the French were disqualified from pursuing. So clearly was this recognized that in 1886, when Commander Browne of H.M.S. “Mallard” reported the existence of a French lobster factory at Port-aux-Choix, a substantially-built structure, roofed with corrugated iron, the French authorities conceded that the establishment was in violation of the treaties, and issued orders for its removal. But this conciliatory policy was of brief duration. The year of the Bait Act’s first successful application was marked by the stoppage, by order of the French government, of Messrs Murphy and Andrew’s lobster factory, and by their contention that the lobster-canning industry formed a part of the privileges conceded under the treaties to the French, whose participation by the British fishermen would be forcibly resisted.

An exchange of notes took place between Lord Salisbury and M. Waddington, the French ambassador, in which the latter expressed an opinion which evoked a spirited protest on the part of the British Foreign Office. “France,” it was then declared, “preserved the exclusive right of fishing she always possessed. This right of France to the coast of Newfoundland reserved to her fishermen is only a part of her ancient sovereignty over the island which she retained in ceding the soil to England, and which she has never weakened or alienated.” This claim of the French to an exclusive fishery was held to be wholly untenable, and their classification of the lobster-canning and canning industry as amongst the “fishing” privileges granted them by the treaty was denounced as contrary to both letter and spirit of that instrument. Notwithstanding this, the French agents on the treaty shore clamoured for the removal of several of the British factories, which (it was declared) interfered with the exclusive fishing rights of the French. The French government also voted (1888) a special bounty for the establishment of lobster factories by their subjects on the treaty coast. Pending a settlement, the British foreign office deemed it expedient, therefore, to issue to their naval officers a modus vivendi, sanctioned by the French, which were in existence on the 1st of July 1889, were to continue for the present. Instantly the colony took alarm, and a deputation consisting of the island’s leading men was sent to England to protest against both the principle and practice of such an arrangement. On their return they learnt that it was the intention of the imperial government to re-enact verbatim et literatim the act for the enforcement of the treaties which had expired fifty-nine years previously. To prevent such an occurrence, delegates from both parties in Newfoundland visited London in April 1891, and, appearing at the bar of the House of Lords, protested that if the measure which was then on the eve of being introduced into that body were withdrawn, a temporary measure would be passed by the Newfoundland legislature which would answer the same purpose of enabling Great Britain to carry out her treaty obligations with France. The hope then generally entertained was that the whole question of French rights in the colony would soon be the subject of definite negotiations looking to their total extinguishment. That hope was, however, not speedily realized. For a number of years the Modus Vivendi Act was annually passed by the legislature, each year under protest, the conviction gaining strength in the colony that the imperial government was averse from renewing negotiations with France.

In 1898 the secretary of state, Mr Chamberlain, yielding to the urgent request of the senior colony, despatched a commission consisting of Sir J. Bramston and Sir James Erskine, with Lord Westmeath as secretary, on a tour of investigation along the treaty shore; and the report which the royal commissioners made (though not published) touched all points of the unhappy dispute. Again, in 1901, on a suggestion put forward by the colony, Mr Chamberlain summoned Sir Robert Bond, the Newfoundland premier, and a colleague, Sir E. P. Morris, to London, for a new conference on the French shore question, in which Lord Lansdowne, the foreign secretary, participated. Nothing coming of this, the Modus Vivendi Act continued to be passed annually. In 1909 a fresh attempt was made to effect a settlement, but the negotiations were again unsuccessful, as the colony declined to make concessions in regard to the sale of baih unless the French system of bounties on the sale of fish by their citizens were abandoned or at least modified in important
particulars. Later in the same year negotiations were begun between the British and French governments for a general treaty, in which all outstanding matters of dispute between the two countries should be for ever settled. As regards Newfoundland, the discussion of the French fishery question on the basis of arrangement in the matter of bate and bounties having proved unavailing, it was proposed not to persist further in it, but to put before the French government an arrangement which would terminate the rights of French fishermen to land and dry their fish on the shores of the island, but leave a concurrent right of fishery, the regulation and policing of which would be in the manner provided in the North Sea Fishery Convention of 1881 and the convention of 1887.

On the 8th of April 1904 the Lansdowne-Cambon Convention was signed, which effected a final settlement of the French shore question. For the total abandonment of the French rights compensation was clearly not only due to the individuals actually engaged in the fishing industry, but to the French nation at large. Territorial concessions were therefore made consisting of a modification of the Anglo-French fisheries in the Niger and Lake Chad district, and a re-arrangement of the Gambia-Senegambia line, giving Yarbatenda to Senegambia. The Los Islands opposite Konakry Island were likewise ceded to France. Provision was made for the reciprocal recognition, on the convention coming into force, of a British consul at St Pierre and a French consul at St John's. Claims for indemnity were duly submitted to an arbitral tribunal, composed of an officer of each nation; and at length what is known as the Lyttelton Award, was made as follows:

| General award for French rights | $255,750 |
| Loss of occupation | 226,813 |
| Effects left by the French on treaty coast | 28,936 |

So far as concerned the French, an end was thus put to a situation on the treaty shore, which for nearly two hundred years had given rise to difficulties and anxieties.

Scarce, however, had a year elapsed from the signing of the convention, when another international disagreement connected with the fisheries assumed grave importance. There had long been intense dissatisfaction in the colony over the attitude of the American government and American fishermen towards the British. The action of the American Senate in rejecting the Bond-Hay treaty negotiated in 1902 stirred the colonial government to retaliatory measures. By virtue of the treaty of 1818 American fishermen enjoyed the following rights: (1) to take fish of every kind on that part of the southern coast of Newfoundland which extends from Cape Ray to Ramea Islands; (2) to take fish of every kind on the western and northern coasts of Newfoundland from the said Cape Ray to the Quirpon Islands; and (3) to take fish of every kind on the coasts, bays, harbours and creeks from Mount Jolly to the southern coast of Labrador, to and through the straits of Belle Isle, and thence northward indefinitely as far as the coast. Subject to these limitations American fishermen have a right in common with British fishermen to prosecute their industry within those areas.

The foregoing embraces the whole of their fishing privileges. Every other right that they ever possessed they renounced under the treaty in the following language: "The United States hereby renounce for ever any liberty heretofore enjoyed or claimed by the inhabitants thereof, to take, dry or cure fish on or within the three marine miles of any of the coasts, bays, creeks or harbours of His Britannic Majesty's dominions in America, or the New-England coast, the coast of Maine, or any other coast of the New-England coast, however far extended, or of any other portion of the coast. This renunciation contained but one qualification: "that American fishermen shall be permitted to enter such bays or harbours for the purpose of shelter and of repairing damages therein, of purchasing wood, and of obtaining water and for no other purpose whatever."

Under the Newfoundland Foreign Fishing Vessels Act of 1893 the governor in council was authorized to issue licences to foreign fishing vessels, enabling them to enter any port on the coast of the island to purchase bait, ice, supplies and outfits for the fishery, and to ship crews. In 1905 this act was repealed and another passed by the colonial legislature imposing certain restrictions on American vessels, and a further more stringent act in 1906, preventing Newfoundlanders from joining American vessels. These acts were resisted by the American government, which, through Mr Secretary Root, called upon the British government to allow such interferences on the part of the Newfoundland legislature. Lord Elgin's reply was to suggest a modus vivendi, and during the following winter the two parties arrived at an agreement, which at the colony's energetic protest, a modus vivendi was agreed to in October 1906, whereby the Foreign Fishing Vessels Act of 1906 was held in abeyance, and the act of 1905 was held not to apply to American fishing vessels, and light dues were waived, while on the other hand American vessels were to report at the custom house on entry for clearance, and their fishermen were to comply with colonial fishery regulations. As regards Sunday fishing by the Americans, which was an important colonial grievance, the American government consented to waive it, if the use of purse seines was abated. All American vessels engaged on the coast were considered to be an interference with the internal affairs of the colony and great public indignation was aroused. Retaliatory measures were resolved upon, Newfoundland fishermen being declared liable to fine and imprisonment for selling bait to the Americans or for joining American vessels. The legislature voted an address to the imperial government, protesting against the modus vivendi, and this was carried to England in 1907 by Sir Robert Bond, the premier of the colony, but without avail. The matter was referred to the Hague tribunal for arbitration, and pending this the modus vivendi (agreed to in 1906) continued in force.

The tribunal gave its award in September 1908, the two main points at issue being decided as follows: (a) Great Britain had the right to make regulations as to the fisheries without the consent of the United States, subject to the provisions of the treaty of 1818. (b) The "three-mile limit" in bays (subject to special judgment in individual cases) was to be taken from a line across the bay at the point, nearest the entrance, where a width of ten miles is not exceeded. Among other provisions it was decided that American vessels might employ foreign hands (but these received no benefit under the treaty) so that the fishermen were required to report to customs houses if facilities to do so existed.

Commerce received a shock, but derived a salutary lesson from bank failures which occurred in December 1894. The Union and Commercial banks suspended payment, followed by the suspension of three other banks. The insolvency act was replaced by the Canadian Bank Act. The Union Bank was reorganized in 1895. Many persons lost money, but the financial panic soon passed. The colony was able to meet its obligations, and the financial condition was now so sound that the government was able to wisely to reduce the expenditure of the public service. A grant of $1,000,000 was received from the Imperial government in 1898, a deposit of $1,000,000 was secured from the Yukon, and the amount of debts was reduced to $2,000,000. The government was able to retire its first mortgage in 1902.

In politics, apart from the matters already alluded to, there occurred in 1893 the appointment of Mr. Dufresne as Minister of Finance in the Whiteway government. Mr. Dufresne was vigorous in his policy of economy, and in reducing the government's expenditure. The chief difficulty arose as to the acknowledgment of the Imperial Reserves Act under which they were enrolled. The colony was asked to bear the cost; its refusal was followed (1902) by the enactment of
NEW GLARUS—NEW GUINEA

NEW GRANDA (Span. Nueva Granada), the title under Spanish colonial administration of that part of South America now known as the republic of Colombia, which at one time was extended to include Venezuela and Ecuador. It also was for a time the title of the united territories of Panama and Colombia under republican auspices. The Bogotá plateau, then inhabited by a partly civilised Indian nation bonded to the Spaniards as "men", was invaded from the Caribbean coast and conquered in 1537 by Gonzalo Jiménez de Quesada, who, in honour of his native province, called it the "Nuevo Reino de Granada." The title at first applied only to the plateau regions of Colombia, as the coast provinces had been previously occupied and named. In 1550 an "audiencia real" under the viceroyalty of Peru was established at Santa Fé (Bogotá), but in 1564 this isolated group of Spanish settlements was transformed into a presidency. In 1718, owing to the unmanageable size of the viceroyalty of Peru, it was divided and a new viceroyalty was created from the various provinces lying in the north-western angle of the continent, extending from Tumbez northward to the northern limits of Panama, and eastward to the Orinoco, to which the name of Nueva Granada was given. The first viceroy was Pedro de Guzman y Guerrero, but his successor, Jorge Villalonga, resumed the title of president, and it was not until 1739 that the title of viceroy was definitely established. The new viceroyalty included the provinces of Tierra Firma (now the republic of Colombia, with the exception of Chibchas, or Mayas, and the Guayais, which were included in Venezuela); Cartagena, Santa Marta, Rio Hacha, Antioquia, Pamploa, Socorro, Tuna, Santa Fé, Neiva, Mariquita, Popayan and Pasto (now included in Colombia); and Quito, Cuenca and Guayaquil (now included in Ecuador). In 1777 the provinces of Maracaibo, Caracas, Cumana and Guayaquil were detached from the viceroyalty to form the captaincy-general of Caracas; otherwise it remained as above until the termination of Spanish rule in South America.

For the republic of Colombia (1819-1830), the republic of New Granada (1831-1861), the United States of Colombia (1861-1886), and the republic of Colombia (1886 to date), see COLOMBIA.

NEW GUINEA, the largest island (excluding Australia) in the world, lying between the equator and 15° S. and 150° 50' and 151° 30' E., separated from Australia by Torres Strait and having the Arafura Sea on the south-west. It is divided politically between Britain (south-east), Germany (north-east) and Holland (west), the Dutch territory occupying about 48.6% of the whole area, the German 26.5% and the British Territory of Papua 23.1%. The total area is estimated to be 312,325 sq. m. New Guinea was probably in Miocene times, if not later, united to the northern part of Queensland. The deeply indented shore of the Gulf of Papua forms the boundary of the subside area between the two countries, and from it the land stretches out for 200 to 300 m. north and west on both sides of the Fly river in vast plains, little elevated above sea-level. From Cape Buru westwards precipitous limestone cliffs, several hundred feet high, face the sea and rise into forest-clad mountains behind. The northern extremity of New Guinea is all but severed from the mainland by the deep MacCluer Inlet, running eastwards towards Goroka, and divided from the south-eastern coast by the Geelvink Bay. The south-east coast is more regular than the south-western. Off its coast-line, on the parallel of 6° S., lies the vast Biamarck Archipelago, of which New Pomerania (Neu Pommern) is the most important member; and, on the parallel of 10°, the d'Entrecasteaux Islands, with the Marshall Bennett group to their north-east; while stretching out from the south-east promontory of the mainland is the Louisiade Archipelago. The Great Barrier Reef of Australia can be traced more or less continuously round the Gulf of Papua and along the south-east coast to the extremity of the Louisiades. In a general way it may be said that on the west coast of New Guinea, from Cape Buru to the Louisiades, the sea is shallow, while on its steep eastern side the water close in-shore is often too deep
for safe anchorage. The islands on the southern margin of the Louisiade Archipelago are raised coral reefs, but the majority are mountainous, rarely, however, exceeding 3000 ft.; all of them are richly forested, but of little agricultural value. The volcanic d'Entrecasteaux Islands are mostly larger, more elevated (the highest being 3000 ft.), and stand in deeper water than the Louisiade group. To the east of Kiriwina (Trobriand) lies a small group of uniquely formed islets, each of which is completely surrounded by a steep forest-clad marginal rampart of coral 300 to 400 ft. high, concealing a depressed inhabited central plateau.

Starting in the southern extremity of New Guinea from an abrupt face some 3000 ft. high, and traversing its centre nearly parallel to both coasts, run high ranges of mountains, which, if not continuous, merge into each other in the same general direction. The Owen Stanley range—its highest summit, named by Huxley, in 1850, Mount Owen Stanley, 13,120 ft.—the Albert Victor Mountains, the Sir Arthur Gordon range, and the Bismarck Mountains form a backbone united probably with the Snelieu (Snowy) Mts., where perpetual snow was found by Dr. Lorentz in 1909 at 14,635 ft., and the height of Mt. Wilhelmina was fixed at 15,580 ft. This height may be exceeded by Mt. Carstensz. Other ranges, mostly of lower altitude, run parallel mainly to the east and west coasts. The most important and best-known rivers are the Amberno, in the north, discharging by a wide delta at Point d'Urville; the Kaiserin Augusta, which, rising in the Charles Louis range, and entering the Pacific near Cape della Torre, is navigable by ocean steamers for 180 m.; the Otilien, a river of great length, which discharges into the sea a short distance south of the last named; and the Mambare, navigable by steam-launch for 50 m. which drains the eastern aspect of Waggororo Mountains and enters the sea near the Anglo-German boundary. Below 8° S. the narrowness of the country precludes the existence of any very important rivers on either coast. The Purari, however, whose delta is 20 m. long by 20 broad, is navigable for 120 m. by steam-launch, while the Fly has been traversed by the same means for 500 and by a whale-boat for over 600 m. The latter drains an enormous tract of country, which is so little elevated above the sea-level that it can never be of any agricultural or commercial value. West of 142° E. the geographical features of the coast, except in the region of MacCluer Inlet and Geelvink Bay, are very little known, and those of the interior even less.

**Geology.**—The geology of British New Guinea is best known from the report of A. Gibb Mainland (Ann. Rep., British New Guinea, 1891–1893, Fort. Papers, Queensland, 1893, C.A. 1895, with 3 maps and 3 plates; bibliography, p. 85), which shows that the axis of the territory is a high range, composed of slates and schists of undetermined age, with intrusive plutonic rocks. The district around Port Glasgow, on the south coast of the eastern peninsula, are the Boirotor limestones, also of unknown age; they are lead-coloured, brecciated limestones with interbedded dolerites. Some Cretaceous or Upper Jurassic rocks occur in the basin of the Fly river. The Port Moresby beds are Cainozoic. They are highly inclined, and occupy a large range of country along the south coast, and include the Macgillivray Range, to the north-east of Beagle Bay. They are marine and probably Miocene; and range up to the height of 800 ft. above the sea, approximately the same limit as in Victoria. The Kevori griss, and the raised coral reefs are upper Cainozoic, and perhaps Pleistocene; but the reefs occur inland to a height of 2000 ft. and their range back in time has not been fixed. The volcanic series include the rhyolite of Nell Island, some obsidian, and the sheets of basalts which form the Cloudy Mountains, Mount Mountau and Mount Trafalgar (an active volcano), and also cover wide areas to the south and west of the Owen Stanley Range. Most of western British New Guinea consists of recent superficial deposits in the basin of the Fly river. The Louisiade and the d'Entrecasteaux Islands consist of the same slates and schists as form the main axis of the eastern peninsula, and they are auriferous. The geology of the rest of New Guinea is imperfectly known. It appears to consist in the main of a continuation of an axis of old schists and slates, with granite intrusions, and flanked by coastal plains with Cretaceous or Jurassic, and Miocene beds, with Pleistocene sands and clays and volcanic rocks. In the north-west coast deposits occur. Ferguson Island clearly shows remains of extinct craters, and possesses numerous hot springs, saline lakes and solfataries depositing sulphur and alum. In Murua (Woodlark I.) are quarries of the banded quartzite from which the best stone adzes found throughout south-east New Guinea are made. In Rossel Island (Roua or Arova) occur crystalline schistose and volcanic rocks; and in Misima (St. Aignan) limestones and laves in addition. Nearly all the rivers in New Guinea yield "colours" of gold, but only in the Louisiade Archipelago has enough been discovered to constitute the district a goldfield. No auriferous reefs have been found. Black magnetic iron sand covers the shore in Milne Bay. Coal has been observed in the Purari sandstones. In the Gia river the valuable alloy omiridium has been discovered. Earthquakes are rare on the mainland, but not infrequent in Bismarck and d'Entrecasteaux archipelagoes.

**Climate.**—Since the mountains as a rule traverse the island parallel to its coasts, the eastern shores have far less rain than the western. The amount which falls, chiefly at night, varies from 30 in. on some parts of the coast to 130 at others, and to a far greater but unknown amount in the mountains. Throughout the dry or cool season the wind blows steadily and almost uninterruptedly (except for an hour or so forenoon and afternoon) from the south-east. The temperature
has an extreme range of from 72° to 95° F., with a mean of about 89°. At an elevation of 3000 ft. the climate is pleasantly cool; at 1500 ft. there is a pleasant rapidity, with bright sunshine. The sun. No snow is known certainly to fall, though it is alleged to have been seen from the sea lying on the summits of the Charles Louis range. Fever is very prevalent on the coast, and is said, in some instances, to be incurable. Though generally a mild character, it is persistently recurrent, and slowly saps and wears out the constitution; too often it is virulent and rapidly fatal. The flora includes representatives of the Australian and New Guinea subtropical. Monotremes (2 species) and marsupials (4 families and 44 species) predominate, but are not abundant. Among the latter genera, Distichurus and Dorsopas are peculiarly abundant in the Papuan peninsula. The butterfly fauna (of which Chiruwony is a peculiar genus), a few squirls, and a considerable number of Chiroptera (bats) inhabit the country. The birds are also numerous, and characteristic; many of its birds. The most recent lists record over 500 species as found in the Papuan area, and of these between 50 and 60 genera are peculiar to it. The birds of paradise, which are confined to the sub-region, give special celebrity to its fauna. Between 70 and 80 species have already been described, many of them the most gorgeously adorned, and others, such as the Pteridophora alberris, the most wonderful of feathered creatures. They are absent from the Louisiades, but species occur in the D'Entrecasteaux Islands which have not been seen on the mainland opposite. The zoology of the Bismarck Archipelago is little known. The species of birds so far described from these islands, 73, 74 are peculiar to it, though closely allied to Papuan forms. It contains, however, no Paradisidae. The Amphibia, to which the sea is a barrier, are almost exclusively of Australian affinities. The natural flora, which is of European origin, consisting of the Fly river, a chelion peculiar to New Guinea, is remarkable in having its nearest affinities (as have the Papuan tortoises) with South American species. Of the lizards, 3 of the 6 species of Varanus, Geckonidae, 16, 10 Scincidae, etc., 18, and 8 out of the 11 Agamidae are peculiar. Salmonanders, toads and frogs are numerous, and crocodiles abound. Only 4 genera and 5 species of snakes are peculiar to New Guinea, but some, them poisonous, interfide. moths and bees are very abundant, the former being remarkable for their size and splendid coloration; but these groups have not been investigated exhaustively enough to afford a correct idea of their affinities. In the list of birds, the list of families is already known is long, it represents only a fraction of the species remaining to be discovered. The land molluscs show relationship with those of the other parts of the Malay Peninsula, the Malayans, and the Pacific islands.

Flora.—Most of the foreshores of New Guinea are eucalyptus dotted grasslands; in the interior dense forests prevail to a height of many thousand feet. Vast tracts of the country have been, however, deforested by fire, and these are covered by the tall ineradicable grass, Imperata arundinacea. So far the highest altitudes yet been reached, and it is likely that those will be by means of the mountains in Kaiser Wilhelms Land, but of the flora of the highest range of all—the Charles Louis mountains—nothing is known. There are many species of the tropical rain-forests of the large and many forms have here their centre, and have spread hence into Australia and the Pacific islands.

The New Guinea flora includes representatives of the Papuan, Australian and Polynesian forms. There are, according to Müller, twice as many palms known from New Guinea as from Australia and New Holland; besides 1500 species. The flora is characterized by its rhododendrons, pines (Araucaria and Libocedrus), and palm, by numerous superb species of Agave (Erichaeeae), and on the summits by an extraordinary association of species characteristically European (Rubus, Rhamnus, Centaurea, Aspidium), Himalayan, New Zealandian (Veronica), Antarctic and South American (Drymuss, Libocedrus). Good pasture grasses are numerous, but pasture lands are limited. The usual tropical food-plants are cultivated. Tobacco has been found growing in the interior, and may be indigenous, as in some districts the Kava pepper (Piper methysticum). At Darey a cotton plant (G. vitifolium) grows wild, and is a very important cultivated species.

Natives.—So large an area of New Guinea remains unexplored that it is impossible, except approximately, to state the number of its inhabitants, but probably 600,000 is under rather than over the mark. The New Guinea peoples show general differences, differing greatly in feature, colour and language. Ethnically they belong as a whole to the Melanesian division of the Indo-Pacific races. The New Guinea tribes range from the lowlands to the coast, and are found here in their greatest racial purity and occupy practically the whole island except its eastern extremity. The New Guinea tribes are usually of a negroid type with fine physique, but in the Arfak mountains in the north-west the races differ considerably. On the north coasts and adjacent islands, the very degraded and stunted Karons are found, with hardly the elements of social organization (primarily based on family and village life), and are practically aboriginalized, with foreign elements), and resembling the Aetas or Negritos of the Philippine Islands. In the interior of New Guinea the kindred tribes in the Malay Archipelago. On the banks of the Fly river d'Albertis observed at least two widely differing types, those on its upper course bearing some resemblance to the tribes of the eastern coast. Here, wedged in among the ruder Papuans, who reappear at the extremity of the peninsula, a very different-looking people, a high type, appears, neither aboriginalized nor mixed, arguing from appearance, language and customs, assert to be a branch of the fair Polynesian race. But they are obviously of mixed blood. On the west coast there is a smaller civilization due to intermarriage with Malays and Bugis, who have settled at various points, and carry in their trade the district, a mixture of the inhabitants, some of which, while the coast population is Malay or mixed, that of the interior is identical with that of the Papuans. The culture of the Papuans. The frequent hostility and mistrust of strangers are partly due to slave-hunting raids and ill-treatment by traders, but the different tribes vary in their wants, with the exception of the Manarines who are in the interior of New Guinea. At Humboldt Bay the people are ready to trade, as are the tribes at Astrolabe Bay; here the Russian Miklucho Maclay lived for some time, and was favourably impressed by the natives. Still further east, the plateau of the Finisterre ranges are highly cultivated and artificially irrigated by a comparatively fair people. In the east coast they have introduced the Papuan dog. The Marianne Strats tribes much wilder than those farther west, naked and painted, swarm like monkeys in the trees, the stems of which are submerged at high tide. But the Torres Straits islanders are eminently peaceful, and it is probably that they were the first in the list. It appears that the Kei and Aru Islands Papuans form ordely Christian communities. The people of the south-east peninsula are generally far from ferocious. Englishmen, wandering inland and losing their way, have been found and brought back to them. Their manners are more courteous, their women better treated, than is usual with Papuans, but they show perhaps less interest in European manners. Their children, in the mission schools, show much intelligence.

Exploration and Annexion.—Though probably sighted by Antonio d'Abreu, 1511, New Guinea was apparently first visited either by the Portuguese Don Jorge de Meneses, driven on his way from Goa to Ternate in 1526 to take shelter at "Isla Versaja" (which has been identified with Warsia, a place on the N.W. coast, but may possibly be the island of Waigiu), or by the Spanish Alvaro de Saavedra two years later. The name of "New Guinea" was probably given by Ortiz de Retes, or Roda, who in 1546 first laid down several points along the north coast. In the same and the two following centuries, though the coast was visited by Spanish, English, Dutch and French explorers, nothing was recorded until in 1641, 1662, 1667, and 1673, the coast was visited by English and Jacob Lemaire, Abel Tasman, William Dampier, L. v. de Torres, L. A. de Bougainville and James Cook, little additional knowledge was gained. This was due first to the difficulties of the navigation, next to the exclusiveness of the Dutch, who, holding the Spice Islands, prevented all access to places east of them, and lastly to the stream of enterprise being latterly diverted to the more temperate regions farther south. The Dutch barrier was broken down by the arrival of Dampier and other "interlopers" from the east, and of emigrants from the (English) East India Company in search of spice-bearing lands. The voyage of Thomas Forrest (1774) in the "Tartar galley" of 10 tons, and his account of New Guinea (Yvogue to New Guinea and the Moluccas, London, 1780), are still full of interest. New Guinea was actually annexed in 1793 by two commanders in the East India Company's service, and the island of Manavari in Geelvink Bay was kept for some months by its troops. After the peace of 1815 Dutch surveying expeditions to the west coast became numerous, and in later times scientific explorers penetrated many of the unknown parts of Dutch New Guinea, such as captured by 1884 the settlement of Mania (1875, and 1876), and Maria d'Alberta (1871-1878). Important expeditions were those of P. van der Crab, J. E. Teissmann, J. G. Coorengel, A. J. Langeveldt van Hemert and P. Swaan, undertaken for the Netherlands Indian government 1871-1872, 1875-1876 (reports published at The Hague in 1879); and of C. B. H. von Rosenberg in the Geelvink Bay districts in 1860-1870 (report published at The Hague in 1875). Subsequently to the visits of J. A. d'Entrecasteaux (1793) and Dumont d'Urville (1827-1840), the eastern coasts were surveyed by Captains F. P. Blackwood (1839),
Owen Stanley (1848), Charles B. Yule (1864), and other British officers, including J. Moresby (1874). Among other explorers in this period the following may be mentioned: Nicholas von Miklouho Maclay in 1870, 1877 and 1879-1881, in the Astrolabe Bay district, &c.; the missionary, Rev. S. Macfarlane (1875, Fly river, &c.); about 1876-1880 the north-east coasts and adjacent islands were explored by the Rev. G. Brown and by Wilfred Powell, and in 1882 Dr Otto Finsch, whose name is well known in connexion with scientific work in New Guinea, made valuable explorations in the neighbourhood of Port Moresby and the Loluki river.

The surveys and reports of Captain Moresby in 1874 brought home to Queensland (and Australia generally) the danger possible to her commerce were the coasts opposite to Torres Strait and the entrance to the splendid waterway inside the Barrier Reef to fall into the possession of a foreign power. By authority, therefore, of Queensland, the mainland of New Guinea, opposite her shores east of the 141st meridian, was annexed to that colony in 1883. But this action was disallowed by the British government as Yule’s and Moresby’s had been. Finally, however, in 1884 a British protectorate was authoritatively proclaimed by Commodore Erskine over the region “lying between the 141st meridian eastward as far as East Cape, with the several islands and archipelagoes extending southward to the meridian of 145° East.”

New Guinea was annexed on the 16th of November 1884, when the German flag was raised in Friedrich Wilhelmshafen and a trading company was established on the north-east coast, and in 1885 the two countries agreed to fix their boundaries through the then neutral areas of the country. The result of this was the assignation to Great Britain of the portion now known as the Territory of Papua (British New Guinea), lying between the extreme limits of 5° and 12° S. and 141° and 155° E. To Germany were assigned all the territory and islands to the north of the British, with the name of Kaiser Wilhelms Land, while all to the west of the 141st meridian remained under its old flag as Dutch New Guinea.

Since this period explorers and investigators have been almost constantly at work. There may be mentioned the work of the Rev. J. Chalmers on the coast of the Gulf of Papua (1893), and of officers of the German New Guinea Company in the ship “Yasabel” on the coasts and among the islands of the German territory; the expedition which crossed the southernmost peninsula from Huon Gulf of the New Guinea coast, to which both the leaders, O. Ehlers and M. Piering, lost their lives (1895); the work of Commodore von Lauterbach (1896), and the various explorations carried out by or at the instigation of Sir William MacGregor, including a crossing of the island from mouth of the Wilhelm river to the Victoria river, and the second crossing in the reverse direction (1897). Ethnographical researches have been prosecuted by Messrs C. G. Seligmann and W. Merk Strong, and others. The reports of travellers and of various missionary societies have thrown a great deal of light on the natural history of the island, on its resources, and the islanders.

British New Guinea

The British Territory of Papua has an area of about 90,540 sq. m. and a population estimated at 400,000, of whom about 600 are Europeans. The Protectorate, as declared in 1884, with its seat of government at Port Moresby, was subsidized by the three Australian colonies of Queensland, New South Wales and Victoria, and lasted, under the administration of two successive special commissioners (Major-General Sir Peter Scratchley and the Hon. John Douglas), till the 4th of September 1888, when it was proclaimed by the first Administrator—afterwards Lieutenant-Governor—Sir William MacGregor, a possession of Queen Victoria. Its constitution was that of a crown colony in association with Queensland; but in 1901 the federal government took control of the territory and in 1906 a proclamation by the governor-general of the commonwealth gave it the name of the Territory of Papua. The lieutenant-governor is elected by an executive and a legislative council, and advised by a native regulation board. Justice is administered by petty sessions in the six magisterial districts into which the possession is divided, with a central court at Port Moresby (which, however, sits elsewhere as necessary) having the jurisdiction of a supreme court, from which in certain cases an appeal lies to the supreme court of Queensland.

Order is maintained by an armed constabulary force, under a European officer, of about 150, almost all natives from different districts, whose members are found to be very efficient and trustworthy. The expenditure is about £8,000 annually, and the revenue, mainly derived from customs duties, is rapidly increasing. Only £5110 in 1895, it was £11,683 in 1900 and £19,197 in 1905.

Commerce and Trade.—The making of mats, fishing-nets, shell ornaments, decorated gourds, and stone implements, and the manufacture of pots, canoes, and so forth, constitute the chief native industries, which are the subject of barter between different regions. European industries include gold mining, in which 500 Deutscher Kolonisten, cornbes natives, are engaged (chiefly in the Louisiade and Belgian Archipelago), and the bêche de mer and pearl-shell fisheries, which were formerly more productive than at present. Copra is naturally largely prepared, as coco-nut palms are very numerous, and are sometimes cut and dried on the tree. The forest is still studded with herds of cattle. The rubber industry is, according to Sir W. MacGregor, “important and promising.” Species of Palmaquum, the genus from which, in the Indian Archipelago, the best gutta-percha is obtained, occur on the hills, and from their cultivation there might in time be obtained a large revenue independently of European labour. Timber of economic value is scarce. Red cedar (Cedrela) abounds in the surface flats, but the quality is poor and commercially valueless; and oak is plentiful, but the wood is coarse. Small quantities of ebony and sandal-wood are exported. “There can be no reasonable doubt that the sugar-cane, which is native and present in a few districts, when properly grown and prepared, will be found exceptionally fine quality, will eventually be valuable” (MacGregor).

The trade of British New Guinea is exclusively with the Australian colonies. Imports were valued at £72,286 in 1899-1900 (an increase of £7,540 in the year), and exports (including the gold mines) at £56,167, while in 1905 the figures were £75,188 for imports and £75,669 for exports, and in 1906 £79,671 and £80,290 respectively.

German New Guinea

The German protectorate of New Guinea, so called after the island which contributes the greatest area, comprehends, besides KaiserWilhelms Land, the islands which are now commonly called the Bismarck Archipelago—viz. New Pomerania, New Mecklenburg, with New Hanover and the Admiralty Islands and the Solomon Islands (Bougainville and Buka). There are besides nearly 200 smaller islands and islets scattered among their greater neighbours. In 1884 New Guinea was absolutely wild, not a single white man living on what is now the German part. On the islands New Pomerania and Miklo only two trading firms had their establishments; and on New Lauenburg (West New Guinea) the владелец derived his income from the fisheries, which in 1896, and after the annexation of a commercial enterprise set in at once, hand in hand with political administration. Now on the mainland and in the islands plantations have been established and tobacco and cotton have been successfully grown. Three German mission societies formed settlements on New Guinea, with a branch one on the Gazelle peninsula. The protectorate is included in the Universal Postal Union; each harbour has its post office, also a leading official with a number of assistants to control the natives and the revenue. It is divided into two districts with separate administrations, New Guinea and the Bismarck Archipelago; over both presides an imperial governor, the seat of government being Herbertshöhe in New Pomerania. A small police force of natives has been formed. In each district there is a registry of deeds and a court of law, and in New Guinea a court of appeal, of which the governor is president. A line of steamers plies between New Guinea, the Bismarck Archipelago and Singapore. A special silver coin of rupee value has been introduced. The area of Kaiser Wilhelms Land is approximately 70,000 sq. m. It is impossible to speak with any precision of the number of the native population, but the white population in 1906 was 140.

The revenue of German New Guinea is derived from taxes, duties and licences, and amounted on the 31st of March 1892 to about £3,000; on the same rate, 1901, to £7,750. The annual revenue is 60,000 rupees, and the expenditure, £2,400. The New Guinea Company was to receive £20,000 for transferring proprietorship to government, which took over the administration in 1899. In 1905 imports into Kaiser Wilhelms Land were valued at £33,316, and exports at £7,702, and the estimated expenditure for 1907-1908 of £76,000 included an imperial subvention of £57,656. The chief harbours are Friedrich Wilhelmshafen and Konstantinhaven.
**Dutch New Guinea**

Dutch New Guinea comprises all the western portion of the island. The boundary on the east, separating it from British New Guinea and German New Guinea, was finally settled in 1895. Starting from the south coast, it follows 141° 1' 48" E. up to the Fly river, which is mounts until 141° 1' is reached, when it once more follows the meridian up to the north coast. The area of the territory is 151,789 sq. m., and the inhabitants have been reckoned to number some 200,000. A few missionaries have established themselves, but otherwise the Dutch have scarcely occupied their possession, which at present merely forms part of the residency of Ternate in the Moluccas. Dutch New Guinea, however, has better natural advantages than either the British or German possessions in the island, and should eventually prove of real value to the Netherlands. The claims to superiority over New Guinea on the part of the rulers of some of the small neighbouring islands date at least from the spread of Islam to the Moluccas at the beginning of the 17th century, and were maintained by the Malay rulers both of Bachian and of Gebeh and afterwards by the sultan of Tidore. When the Dutch first came to these islands it was their policy to ally themselves with certain chiefs, and support their claims over various islands, so as to extend their own commercial monopoly; and they therefore supported the claims (admitted by Great Britain in 1814) of the sultan of Tidore over both the Raja Ampat (i.e. the four Papuan kingdoms, Waigeo, Salawatti, Misol and Waigmaima on Misol Island) and certain islands or points on the north-west coast of New Guinea. Namely the sultan of Tidore is still the suzerain of western New Guinea, but his authority is scarcely recognized, except on some few shores and adjacent islands, and practically Dutch New Guinea used to be administered partly from Ternate and partly from Timor, upon more peaceful lines than was the case when the rule of the Dutch in New Guinea largely consisted of the sending of a warship now and again to some distant island or bay to burn a kampong, to punish rebellious villagers, and thus assert or reassert Dutch authority, or that of the sultan, who is their vassal. In 1901, however, a more serious effort was made to establish some kind of government in the southern province of Dutch New Guinea, at Merawakay, where a small Dutch-Indian garrison was stationed with the professed object of preventing raids by bands of savages into the British territory near by. Such raids had been rather frequent, the invaders attacking the natives who live under British protection, burning their huts, murdering the men, carrying off the women and children as slaves, and returning to their haunts laden with booty. There is an assistant Resident at Merawakay, whose immediate chief is the Dutch Resident at Ternate, and who is the civil administrator of the province of southern Dutch New Guinea. Assistant Residencies have also been established at Manokvar in northern Dutch New Guinea, which has been formed into a province, under Ternate, and at Fakfak, in western Dutch New Guinea, likewise erected into a province, also under Ternate. By 1902, therefore, Dutch New Guinea formed a government, with its headquarters at Ternate, divided into the three provinces named. At regular intervals the steamers of the Dutch Royal Steam Packet Company call at Dorey and other points, while administrative posts have been established elsewhere in lieu of others previously attempted but abandoned.

A curious discussion arose in the Dutch states-general when the government was seeking legislative sanction for the above measures, with a provisional credit to cover the first establishment expenses. It was seriously contended in one part of the house that, as eminent men of geographical and ethnographical science had settled the question whether New Guinea belongs to Asia or Polynesia in favour of the latter, a New Guinea colonization scheme could not properly be proposed and decided upon in a section of the Dutch-Indian budget. This budget concerned only the Asiatic possessions of Holland, not the Polynesian ones, and Dutch New Guinea must, consequently, have its own budget. Finally, the majority of the states-general, backed by government, decided that New Guinea must still be reckoned to belong to Asia.


**NEW HAMPSHIRE,** a North Atlantic state of the United States, one of the New England group, and one of the Original Thirteen, lying between latitudes 42° 40' and 45° 18' 23" N., and between longitudes 70° 37' and 72° 37' W. It is bounded N. and NE. by Maine, E. by the Atlantic Ocean, S. by Massachusetts, and W. and N.W. by Vermont (from which it is separated by the Connecticut river—low water mark on the W. bank of the Connecticut is New Hampshire's W. boundary), and by Halls Stream which separates it from Quebec. The state has an area of 9341 sq. m., of which 310 sq. m. are water surface.

**Physical Features.**—The delightful scenery of mountains, lakes, streams and woodlands gives to the greater part of New Hampshire, which is in the New England physiographic province, the appearance of a companion state of New York. This is the favourite summer resort. In the N. central portion, the White Mountains, a continuation of the Appalachian system, rise very abruptly in several short ranges and in outlying mountain masses from a base level of 700-1500 ft. to generally rounded summits, the heights of several of which are nowhere exceeded in the eastern part of the United States except in the Black and the Unaka mountains of North Carolina; seventy-four rise more than 3000 ft. above the sea, twelve more than 5000 ft., and the highest, Mount Washington, attains an elevation of 6293 ft.

The widest ranges, the Presidential, the Franconia and the Carter-Moriah, have a north-eastern and south-western trend. The Presidential, in the north-eastern part of the region, is separated from the Franconia on the south-west by the Crawford, or White Mountain Notch, about 2000 ft. in depth, in which the Ammonoosuc and Saco rivers find a passage, and from the Carter-Moriah, parallel to it on the east, by the Glen-Ellis and Peabody rivers, the former of which has a beautiful fall of 100 ft. in height, about 20 m. in length, are Mount Washington and nine other peaks exceeding 5000 ft. in height: Mount Adams, 5805 ft; Mount Jefferson, 5725 ft; Mount Sam Adams, 5855 ft; Mount Clay, 5768 ft; Mount Notch, 5784 ft; Mount Adams Peak, 5384 ft; Mount Madison, 5380 ft; and Mount Franklin, 5028 ft. On the Franconia, a much shorter range, are Mount Lafayette, 5209 ft.; Mount Lincoln, 5092 ft.; and four others of less than 5000 ft. Mount Carrigain, in the White Mountains, is Carter Dome, 4860 ft., but seven others exceed 4000 ft. Lowest of the isolated mountains is Moosilake noted for its magnificent view-point 4810 ft. above the sea. Separating Franconia and Pemigewasset ranges is the romantic Franconia Notch, overlooking
which from the upper cliffs of Profile Mountain is a remarkable
human profile, The Great Stone Face, immortalized by Nathaniel
Hawthorne; here, too, is the Franconia Flume, a narrow uprift
fissure, similar to the Beeches. The Franconia, Long and
Mount Monadnock are the principal peaks of the White
Mountains. Mount Monadnock, 3,186 ft. high, near the S.W.
corner of the state and lenticular hills, or drumlins, but having a
general S.E. slope toward the sea, extends from the intervals of the Connecticut
river valley, and the sea is the only low surface in the state; a
considerable portion of this region is less than 500 ft. above the sea,
but some of the drumlins are ridges of considerable height and a
small drumlin. The seashore, about 18 m. in length, is for
the most part a sandy beach; here and there, however, especially
to the northward, it is somewhat rocky, and to the southward are
two bluffs. The only harbor is at Portsmouth near the mouth of
the Piscataqua. About 9 m. from the shore are the bleak and
nearly barren Isles of Shoals, nine in number, a part of which belong
to New Hampshire and a part to Maine.
The Merrimac, Winnipesaukee, and Cheshire, the S.W. corner
county, to the headwaters of the Connecticut river in the N.E.
corner is a water-parting, W. of which the state is drained southward
into the sea; the Connecticut, E. of which is drained south-eastward into the Atlantic
Ocean principally by the Merrimac in the S., the Saco and the headwaters
of the Merrimac in the White Mountain region, and the Androscoggin
in the western part of the state. The Salmon Falls, Lamprey and Exeter rivers.
The headwaters of the rivers are for the most part mountain streams or elevated lakes;
and on their swift and winding currents—flowing sometimes
between wide intervals, sometimes between rocky banks—are marked
by numerous falls and fed by lakes.
The lakes and ponds, numbering several hundred, were formed by
glacier action, and are the most notable of many in the state is Lake Winnipesaukee, which
is attractive than that of the mountains. The largest and most
widely known is Lake Winnipesaukee on the S. border of the White
Mountain region; this is about 20 m. long and from 1 to 8 m. wide, is
shaped like a crescent, is very clear, and in the center is a
rather level shore, back of which hills or mountains rise on all sides.
Among the more prominent of many others that are admired for
their beauty are Squam, Newfound, Sunapee and Ossipee, all
with a radius of a few miles from Winnipesaukee; Massabesic
farther S.; and Diamond Ponds, Umbagog and Connecticut lakes,
N. of the White Mountains. The rivers with their numerous falls and
the lakes with their high altitudes furnish a vast amount of
water power for manufacturing, the Merrimac, in particular, into
which many of the larger lakes, including Winnipesaukee, find an
outlet, is one of the greatest power-yielding streams of the world;
and the Merrimac is navigable for 100 m. The
Winnipesaukee, a larger mountain stream than the Merrimac was
originally an unbroken forest of which the principal trees were the white pine, hemlock, sugar maple, yellow birch, beech, red oak, and white oak in the S., red spruce, white
birch in the S.E., and spruce, hemlock, and red, white, and sugar maple, white spruce and white cedar in the other parts of the N. The
pine forests have nearly disappeared, but
much of the N. third of the state, many abandoned farms in the S. have become reforested with much the same trees, except that on
the lower levels in the N. yellow birch, sugar maple and beech have
to a considerable extent supplanted spruce, white pine and hemlock, and where forest fires have occurred is a
bird cherry, yellow birch and aspen. The butternut, hickory and
dehervines are common nut-bearing trees in the S. Among indigenous
fruit-bearing trees, shrubs and vines the state has the bird
cherry, blueberry, cranberry, raspberry, gooseberry, strawberry, grape and black currant; and conspicuous among a very great variety of shrubs and flowering plants are the
dogwood, rose, rhododendron, azalea, anemones, arbutus, violets, azaleas, eglantine, clove gents, orange lilies, orchids, asters and golden rod. The summits of some of the mountains are too high for trees and above belts of
hemlock and white birch, the woods are of cornel, oak, alders, willows, aspen, maple, moose, caribou, deer, wolf, bear, lynx, otter, beaver, fox, sable, mink, musk-rat, porcupine, wood-chuck, ruffed grouse and pigeon. These were rapidly reduced in number by the white man, the wild pigeons and woodchucks, and the ruffed grouse and the beaver have become rare, but, under the protection of laws enacted
since the latter part of the 19th century, deer and ruffed grouse are more plentiful. Rabbits, squirrels, skunks and quail are also abundant game. Many of the lakes and rivers have been stocked with trout and salmon or bass; some, with
smelt; the fresh waters of the state also contain pickerel, perch,
smelts, eels, suckers, dace, sunfish and shiners. In the S. half of the state there are many song birds belonging to the Allegheny
faunal area; in the N. part many others belonging to the Canadian
faunal area.
The climate is temperate and favorable for agriculture. The
wild flowers, bunting, warbler and wren are among the song birds of the forests.
Agriculture.—The winters are usually long and severe, and the summers
cool and salubrious, but the diversity of surface together with unequal
distances from the sea cause marked variations for the different
regions. The mean annual temperature ranges from about 42°F.
in the S.E. of the state to only 37°F. in the N.W. of the state, and
farther N. to 47°F. at low altitudes in the S.E. The greatest extremes of temperature occur in the deep mountain valleys where
it sometimes rises to 102°F. or above, in summer, and falls to 38°F. or below in winter; higher up on the mountains it is never
warm and along the sea-coast both extremes are considerably less.
The highest recorded winter mean is 25°F., at Nashua in the lower
valley of the Merrimac, and at Durham near the sea-coast; the
lowest recorded winter mean is 18°F. at Bethlehem 1470 ft. above
the sea in the White Mountain region; the highest recorded summer mean is 69°F. at Nashua, and the lowest recorded summer mean is 64°F. at Bethlehem. The mean annual precipitation for the entire
state is about 46 in.; it is 43 in. at Nashua, 45 in. at Durham, and
perhaps still more on the E. slopes of the mountain ranges, but
it is only 37 in. at Bethlehem in the N.W. part of the mountain
region, and only 35 in. at Stratford in the upper valley of the
Connecticut. The distribution is quite even throughout the year,
but summer and autumn are slightly more wet than winter and
spring. A fair estimate of the annual fall of snow is from 7 to 8 ft., but in the S.E. corner it is little more than one-half that amount. The prevailing winds are
generally N.W., but in the vicinity of the sea they are S.E. during summers.
increased from 23,746 acres to 25,694 acres (3000 acres in 1900), but that of the South from 26,533 acres to 27,264 acres (4000 acres in 1900). That of wheat decreased from 26,272 acres to 27,131 acres (none reported in 1900), and that of barley decreased from 4934 acres to 5566 acres (2000 acres in 1900), that of buckwheat decreased from 16,946 in 1890 to 15,333 in 1898 and 1908 (2000 acres in 1900). That of potatoes decreased from 460 acres in 1890 to 350 acres (none reported in 1900). With the exception of dairy cows and horses there was likewise a corresponding decrease in the number of livestock. The number of cattle decreased from 58,585 in 1890 to 56,970 in 1900 (51,000 in 1910); of sheep, from 211,825 in 1880 to 105,702 in 1900 (74,000 in 1910); and of neat cattle other than dairy cows, from 3,154 in 1890 to 1,626 in 1908. The number of horses increased from 52,458 in 1890 to 77,233 in 1900 (59,000 in 1910), and the number of dairy cows from 90,654 in 1890 to 115,036 in 1900 (122,000 in 1910). The value of the poultry and eggs increased from $1,747,000 in 1890 to $2,350,000 in 1900. This represented a significant increase in the relative value of the cereal grains in the state and nearly one-third of that of the hay and forage. The potato crop of the same year was grown on 19,422 acres and valued at $1,000,000. The wheat crop, which was sold, increased from $1,014,000 in 1890 to $3,265,000 in 1899 or 110.8%. Although the crop of orchard fruits was not greater in 1899 than in 1889 the number of apple trees increased during the decade from 7,144,779 to 8,034,958, the number of peach trees being, respectively, 10,877 and 9,155, and the number of cherry trees 10,151 to 18,137; in the number of pear trees and of cherry trees there was a slight decrease. The fruit crop of 1890 included 1,300,000 peaches, 1,640,000 plums, 10,345,000 cherries, 42,243 of peaches, 4942 bushels of plums, 1185 bushels of cherries, 487,900 lb. of grapes, 586,640 qts. of strawberries, 124,760 qts. of raspberries and 105,290 qts. of blackberries and dewberries. The valuation of the fruits was $32,575. The number of acres devoted to timber culture and fruits and dairy products. In the bottom lands of the Merrimack and of the Connecticut, south of the White Mountains, a large part of the Indian corn and potatoes grown here, however, are grown in large quantities north and west of the White Mountains and this district leads in the number of cattle and sheep, and in the production of all the cereals except Indian corn. Apples, pears and grapes are grown through the year in the southern parts of the state but peaches and cherries chiefly south of Lake Winnipesaukee. Hillsboro and Rockingham counties, in the south-east, lead in the production of poultry and eggs.

Manufactures.—The heavy precipitation on the elevated central and northern parts, and the hundreds of lakes and ponds which serve as reservoirs, give to the lower southern part of the state on the Merrimack and other rivers such an abundant and constant water-power that southern New Hampshire has become an important manufacturing district, and manufacturing has become the leading industry of the state. During the last two decades of the 19th century the number of inhabitants engaged in agricultural pursuits decreased from 45,122 to 38,782; and the number engaged in manufacturing increased from 57,283 to 75,945. Many farmers abandoned their sterile farms and made new homes in the West, where soil yielded larger returns for labour, and a foreign-born population, consisting largely of French Canadians, came to the cities in response to the demand for labour in factories.

From 1850 to 1860 the value of the manufactured products increased 62.3%; in the decade of the Civil War they further increased in value 80%; from 1890 to 1900 the increase was from $107,590,803 to $123,610,904, or 14.9%; and from 1900 to 1908 the value of the factory products increased from $107,590,803 to $123,610,904, or 14.9%. Textiles, and boots and shoes represented...
in 1905 more than one-half the total value. Cotton goods, the manufacture of which was introduced in 1804, increased in value only slightly during the last decade of the 19th century, from $2,018,310 in 1890 to $2,186,445 in 1900; but the value of boots and shoes was 21.8% in 1905; and in 1905 it was 18.7% of the total value of all factory products, and in no other state was the degree of specialization in this industry so great as in New Hampshire. Woolen goods, third in rank, decreased from $2,107,381 in 1890 to $1,960,041 in 1900, but the factory product increased in value from $7,524,622 in 1900 to $11,013,828, in 1905, or 45.5%. Paper and wood pulp, for the manufacture of paper, in both the state and New England, were third in value and increased, in value in $1,082,022 in 1890 to $7,244,733 in 1900, or 465.1%, and to $9,830,891 in 1905; and this industry rose from ninth in rank in 1890 to fifth in 1900 and to fourth in 1905. The manufacture of lumber and timber products, one of the oldest industries of the state, ranked fifth in 1905; these products had increased in value from $5,041,445 in 1890 to $2,218,310 in 1900, or 63.4%, but decreased to $7,510,431 in 1905, the decrease being largely due to the great lumber & paper mill at Atkinson and in the manufacture of paper and pulp mills. And machine shop products, hosiery and knit goods, wooden boxes, flour and grist mill products, and malt liquors were all important in manufacturing, their values increasing from $979,758 in 1900 to $2,565,612 in 1905, or 161.9%, and the value of hosiery and knit goods increased during the same period from $959,829 to $3,974,290, or 353%. As combatant in the manufacture of boots and shoes, the state of New Hampshire, ranked fifth in the manufacture of factory-made boots and shoes, and in woolen goods, sixth in cotton goods, and seventh in paper and wood pulp, in the state as a whole, in the domestic and finishing of textiles. In 1905 the value of the products in the eight cities of Manchester, Nashua, Concord, Dover, Rochester, Laconia, Keene, and Portsmouth, all of which are south of Lake Winnipesaukee, was 59.5% of that for the entire state. Moreover, the cotton goods were manufactured in Manchester. Boots and shoes were manufactured chiefly in cities near the southern border. Dover led in the manufacture of woolenens; Laconia in the manufacture of woolenens; Keene, in the manufacture of paper and wood pulp; and Manchester, in the manufacture of paper and wood pulp.

Transportation.—With the exception of a Grand Trunk line in the northern part of the state the several steam railways are owned or leased by the Boston & Maine. Up the steep slope of Mount Washington runs a cog railway. The first steps in railway building were taken in 1835, when the Boston & Maine, the Concord, and the Nashua & Lowell railways were incorporated. The Boston & Maine was opened from Boston, Mass., to Dover, N.H., in 1842. In 1850 there were in operation 487 m.; this mileage had increased to 1,677 m. in 1890. By 1905 the Portsmouth, the only port of entry, has a very small foreign trade, but there is a considerable traffic in coal and building materials here and on the Cochecho, which is navigable to Dover.

Population.—The population of the state was 334,188 in 1800; 68,746 in 1815; 141,184 in 1820; 269,238 in 1830; 284,754 in 1840; 317,976 in 1850; 326,973 in 1860; 318,300 in 1870; 346,091 in 1880; 376,630 in 1890; 411,588 in 1900; and 430,572 in 1910; the per cent of increase was 93.1 from 1800 to 1900 and 4.6 from 1900 to 1910. Of the total in 1900, 88,107 were foreign-born; 58,697, or 66.9%, were natives of Canada (44,426 French and 14,547 English), 13,547 of Ireland, 5100 of England, 2019 of Scotland, 2006 of Germany, and 2632 of Sweden. Of the 323,481 native-born, 86,435, or 27%, were born of other New England states. Of these, 50,213 were of those who were the children of other New England states, and 7502 were of foreign birth. At the same time there were 124,661 natives of New Hampshire numbered among the inhabitants of other states, principally Massachusetts, Vermont, Maine, New York, Illinois, Connecticut, Rhode Island, Minnesota, Iowa, Wisconsin, Michigan, Pennsylvania, Ohio, New Jersey, Kansas, and Nebraska, and to these latter to return for a holiday season to their native state the "Old Home Week" festival, now held throughout New England, was established in 1895 by Frank W. Rollins (b. 1850), who was the son of a merchant of Nashua. The New Hampshire Catholic church in 1906 had more members than any other religious denomination (115,863 out of 190,298 communicants of all denominations); in the same year there were 19,070 Congregationalists, 15,974 Baptists, 12,529 Methodist Episcopalians (North) and 4892 Protestant Episcopalians. Of the total population in 1800 the rural constituted 59.7% and the urban 37.6%; but in 1900 the rural constituted only 53.3% of the total and the urban 46.7%. The eleven cities having a population in 1900 of 5000 or more were: Manchester (56,987); Nashua (23,898); Concord (19,632); Dover (13,207); Portsmouth (16,657); Keene (9163); Berlin (8886); Rochester (8466); Laconia (8043); and Merrimack (7002). These eleven cities had 30.4% of the population of the state.

Administration.—New Hampshire was the first of the original thirteen states to establish a government wholly independent of Great Britain. This was designed to be only temporary, but was in operation from the 6th of January 1776 to the 2nd of June 1784. The constitution which then went into effect provided for a General Court consisting of a Senate and a House of Representatives and made the Council a body advisory to the state president; the 1784 instrument was much amended in 1792, when the title of president was changed to governor, but with the amendments adopted in that year it is in large measure the constitution of to-day. For sixty years there was no change whatever, and only three amendments, those of 1852 (removing the property qualifications of representatives, senators and the governor), were adopted until 1877, when twelve amendments were adopted,—the most important being those providing for biennial (instead of annual) state elections in November (instead of March), and those doing away with the previous requirement that representatives, senators and the governor "be of the Protestant religion." Five amendments were ratified in 1889 and four in 1902. New Hampshire is the only state in the Union in which amendments to the constitution may be proposed only by a constitutional convention, and once in seven years at the general election a popular vote is taken on the necessity of a revision of the constitution. A radical revision of the constitution is rendered especially difficult by a provision that no amendment proposed by a convention shall be adopted without the approval of two-thirds of the electors who vote on the subject when it is referred to them. Prior to 1902 every male inhabitant of a town who was twenty-one years of age or over, a citizen of the United States, and not a pauper or excused from paying taxes at his own request, had a right to vote, but an amendment adopted in this year made able to read English and to write additional qualifications, except in the case of those physically unable to read or to write, of those then having the franchise, and of persons 60 years of age or more on the 1st of January 1904. Various other amendments have been proposed from time to time, but have been defeated at the polls. By an act approved on the 9th of April 1909 provision was made for direct nominations of candidates at primaries conducted by regular elections.

There is a governor's council of five members, one from each county district, which has advisory duties and shares with the governor most of his powers. There is no lieutenant-governor. The governor and the councilors are elected for a term of two years, and a majority of the votes cast is necessary to a choice. Where no candidate receives such a majority the Senate and the House of Representatives by joint ballott choose one of the two having the greatest number. No person is eligible who at the time of his election is not at least thirty years of age and has been an inhabitant of the state for seven years next preceding; a councillor must be an inhabitant of the district from which he is chosen. The governor and council appoint all judicial

1 The constitution of 1776 provided that the Congress which framed it "assumed the name, power and authority of a House of Representatives", and that the "House of Representatives shall be a single and distinct branch of the legislature by the name of a Council"; that the Council appoint a president; that civil officers for the colony and for each county (except clerks of court, county treasurers and recorders) should be appointed by the taxed houses; and that "if the present unhappy dispute with Great Britain should continue longer than this present year, and the Continental Congress should require it, the Council be elected by the people of each respective county in such manner as the Council and House of Representatives shall order." 2 A constitution framed by a Convention which met in Concord on the 10th of June 1776 was rejected by the people in 1779.
officers, the attorney-general, auditor, important administrative boards, coroners and certain naval and military officers; they have power to pardon offences; and they may exercise some control over expenditures and the keeping of accounts of the treasury. In case of default or refusal to pay a warrant for drawing money from the treasury. The governor may veto within five days, besides Sunday, after it has been presented to him, any bill of resolution of which he disapproves, and within the same time. If the governor vetoes the bill, the houses are required to pass over his veto.

A Senate and a House of Representatives, which together constitute the General Court, meet at Concord on the first Wednesday in January, and are elected for one year. Each member is elected by the qualified electors in his district. The qualifications for persons from the county district, and these districts are formed so as to be approximately equal with respect to the number of inhabitants. The Senate consists of 390 representatives, which has the large membership of 390, representation is on the basis of population, but is so arranged to favor the rural districts; thus every town or ward of a city having 600 inhabitants is allowed one representative, but, although for every additional representative 1200 additional inhabitants are required, any town having less than 600 inhabitants is allowed a representative for such proportionate part of the inhabitants as the number of the town bears to 600. Senators and representatives are elected for a term of two years. A representative must have been an inhabitant of the state for at least two years preceding election. The right to be elected a senator or representative shall be in every case the right of the citizen of the town, parish or ward he is chosen to represent; a senator must be at least thirty years of age, must have been an inhabitant of the town for at least seven years preceding his election, and must have been a qualified elector in the town at least one year. The Constitution of New Hampshire places scarcely any restrictions on the powers of the legislature. By an amendment of 1877, however, it is forbidden to authorize any town to lend money or give credit for the benefit of any corporation whose object is profit. Although money bills may originate only in the House of Representatives the Senate may propose amendments. In 1909 the office of auditor was abolished.

For the administration of justice the state has a supreme court and a superior court, each county has a probate court, and some towns as well as the cities have a police court. The supreme court and the superior court each has jurisdiction throughout the state, and has the final jurisdiction in all civil and criminal cases, except as to admiralty jurisdiction. The superior court holds one general term each year at Concord and on the first Tuesday of every month except July and August sits to hear arguments, make orders and render decisions; the superior court holds one or two sessions a year in every county. Both of these courts have extensive jurisdiction. Each probate court, consisting of a single judge, has jurisdiction within its county of the probate of wills, of the granting of administration, in insolvency proceedings, and in relation to the adoption of children; it may appoint and remove guardians of minors, insane persons and spendthrifts, and, upon application, may change a person's name. The superior court has jurisdiction for misdemeanor cases, and may try cases where only the punishment is by fine not exceeding twenty dollars, or by imprisonment not exceeding six months, or by both, and in civil cases only where the title to real estate is not involved and the damages do not exceed two hundred dollars. The probate court has jurisdiction in all cases where such conviction, treatment seriously injuring the health or endangering the reason, willful desertion for three years, or joining a religious sect or society which professes to believe the relation of wife to husband unlawful, and conduct in accordance therewith for six months.

TheHomesteadlawofNewHampshireexemptsforsiezeorforsalefortheenforcementofamortgageuponit,forthecollectionofdebtsincurredinmakingrepairsorimprovements,orforthecollectionoftaxes.Betwillexemptsthatwhereamortgageisgiven asthesecurityforpaymentofthepurchase money, the homestead right of a married person shall not be encumbered or affected without the consent of both husband and wife. The surviving wife or husband and the minor children, if any, may occupy the homestead right of the deceased, and, if the surviving wife or husband is entitled to the right during the remainder of her or his lifetime.

Since 1854 to 1903 the liquor law was essentially prohibitory, but in the latter year an act licensing the traffic was passed. However, some option still remains with each town and city. Once every four years in cities and once in two years in towns the citizens of licensed and unlicensed places of public resort and of the electorate, and in a no-license town or city no bar-room or saloon is to be permitted; in such a town or city, however, malt liquor, cider and light wines may be sold at a railway station and an inn-keeper may serve liquors to his bona-fide registered guests.

Capital punishment for murder in the first degree is inflicted only upon men of the age of twenty-one years or above. The general superintendence of railways is vested in a board of three commissioners appointed by the governor and council for a term of three years, one each year. The board is specially directed to make an annual report, and to keep accounts, to examine these accounts from time to time, to examine the railways at least once a year, to investigate the cause of
all accidents and upon the petition of an interested party to fix rates
for the transportation of persons and freight. In 1909 an anti-pass
law was enacted.

Education.—New Hampshire formed a part of Massachusetts
when, in 1647, the General Court of that province passed the
famous order requiring every town in which there were fifty
householders to maintain a school for teaching reading and
writing, and every town in which there were one hundred house-
holders to maintain a grammar school with an instructor capable
of preparing young men for college. Although not much en-
forced, this, with some slight changes, continued to be the school
law until the close of the colonial era. The beginning of the new
era was marked by the founding of Phillips Exeter Academy
(1781), and later several other similar schools were opened.
Their excellence aroused a much greater interest in the common
schools, and in 1828 the General Court created a commissioners
for improving it were tried; among them were the
division of towns into districts, the appointment of county
school commissioners, and the establishment of a state board
of education. These, however, have been abandoned, and the
system is now administered chiefly by towns and a few special
districts under the general supervision of a state superintendent.

Each town is constituted a school district, and some special
districts are organized under special acts of the legislature. Some
of these are made up of a number of towns near by, and
have special purposes, such as the New Hampshire College of
Agriculture and Mechanics at Keene, the New Hampshire
College of Agriculture and Mechanic Arts, organized as a
department of Dartmouth College in 1866, but removed to Durham,

Strafford county, as a separate institution in 1891. The normal
schools are managed by a board of trustees consisting of the governor,
the superintendent of public instruction and five other
members appointed by the general court. Each school has a board
of managers, one member of which is appointed by the governor,
and one non-resident member is appointed by the general court.
The members of the board of managers are to hold office for
a term of years, and it is the duty of the board of managers to
hold and operate the school for the purpose of providing instruc-
tion in the several schools. The school is maintained by
the state, and is supported in part by tuition, and in part
by contributions from the state.

The state charitable and correctional institutions consist of
the New Hampshire School for Feeble-minded Children, at Laconia;
the New Hampshire School for the Blind, at Concord; the
Sanatorium, at Jackson; the New Hampshire Industrial School, at Manchester;
the New Hampshire Hospital for the Insane, and the State Prison, at Concord;
and the New Hampshire State Reformatory for convicts (1890) near Warren
Summit, about 75 m. north of Concord. The state also makes
annual appropriations for the care and education of blind and
dumb and deaf and dumb persons in institutions outside of the state. Each county
carries out the house and house of correction, and in addition there are
inmates of the state were entirely relieved of this care, and the insane
were removed to the state hospital. Within the state are also sixteen
facilities for the care and treatment of mental and physical disease, but
one of them is county, and one of them is city. Each of the state institutions
is under the management of an officer appointed by the governor, and in
1895 the legislature established a State Board of Charities and
Correction. This consists of five members appointed by the governor
and council for a term of five years, one each, and its duties
are to investigate the condition of the state and county charitable and correctional
institutions, except the state prison and the state hospital, to recommend such changes
to the state government as may seem desirable, and to have a special
jury in the several residential institutions whether in institutions or placed in
permanent homes.

Finance.—The income of the state, counties and towns is derived
mainly from property and personal taxes, but in the larger towns
the income includes also the town's share of the state of the
amount of twenty-one and seventy, on stock in public funds, on stock
in corporations or stock in benefit societies; this is subject
to the conditions of the schools, to make sug-
gestions and recommendations for improving them, to meet upon
the rights of trustees of educational institutions, and to
it is its duty to prescribe the form of register to be kept in the
schools, to investigate the condition of the schools, to make sug-
gestions and recommendations for improving them, to meet upon
the rights of trustees of educational institutions, and to

All children between the ages of eight and fourteen and those
between the ages of twenty-one and seventy are enrolled in a school;
for this purpose 5% of the legal voting age are required to attend either a public or an approved
private school for the full term unless excused by the school board on account of physical or mental infirmity. The schools are maintained
chiefly out of the proceeds of a district school tax, which must not
be less in any district than seventy and fifty dollars for every
dollar of public taxes apportioned to the town or district, a por-
tion which has gradually increased from five to one in 1879 and
from ninety to one in 1817. To this is added a "Literary Fund"
(designed originally for foundings a college) which is derived from
the proceeds of a state tax on the deposits, stock, &c. of savings
banks, obtained from the savers and associations and other similar corporations not residing in the state, and a portion of the proceeds of a dog tax, both of which are dis-
tributed among the several districts according to the number of
children between the ages of twenty years of age who have attended school at
least two weeks. The state also makes appropriations for the pay-
ment of a portion of the tuition in high schools and academies
distributing it among the districts in proportion to the rate of school
tax in each, appropriations for paying a portion of the salary of
school superintendents where two or more districts unite to form a
supervising district, and appropriations for general school pur-
poses. In 1879 the legislature authorized a number of teachers trained in normal schools and to average school attendance.

The plan of 1821 to use the Literary Fund for founding and main-
ung a state college for instruction in the higher branches of
science and literature was abandoned in 1828 and the only state
institutions of learning are the Plymouth Normal School (1870) at Plym-
outh, the Dane Normal School (1870) at Keene, and the New
Hamphire College of Agriculture and Mechanic Arts, organized as a
department of Dartmouth College in 1866, but removed to Durham.
NEW HAMPSHIRE

However, and by the beginning of the Civil War the state was almost free of debt. During that war the state incurred an indebtedness of about $4,236,000; but the reconstructed war debt of the towns and cities, making its total indebtedness again $4,138,124. On the 1st of September 1908 the funded debt of the state was $706,700.

History.—Martin Pring was at the mouth of the Piscataqua in 1603 and, returning to England in the same year, gave an account of the New England coast from Cape Race to Cape Cod Bay. Samuel de Champlain discovered the Isles of Shoals and sailed along the New Hampshire coast in 1605, and much more information concerning this part of the New World was gathered in 1614 by Captain John Smith, who in his Description of New England refers to the convenient harbour at the mouth of the Piscataqua and praises the country back from the rocky shore. Under the leadership of Sir Ferdinando Gorges there was formed in 1620 the Council for New England, which procured from King James I. a grant of all the country from sea to sea between 40° and 48° N. latitude, and which made the following grants: 

The 1628, short is 1623 1630. the house 1639, consisting of rivers November and Salem Maines. The 1629, of Long Island, New Hampshire, having been removed in 1614 to the Merrimac, had been founded for the purpose of debt. Ferdinando Mason, who had been a factor of New England, was the leader of the Puritan faction. Puritan Massachusetts was naturally hostile to the Antinomians at Exeter as well as to the Anglicans at Strawberry Banke. Although Exeter, in 1639, Dover, in 1640, and Strawberry Banke, not later than 1640, adopted a plantation covenant, these settlements were especially weak from lack of a superior tribunal, and appeals had been made to Massachusetts as early as 1633. Moreover, the grants of Massachusetts and Mariana were clearly in conflict. Under these conditions Massachusetts discovered a new claim for its northern boundary. The charter of 1648 stated that the river Merrimac flowed east for its entire course, but now an investigation was in progress which was to show that its source in Lake Winnipesaukee was several miles north of any of the four settlements in New Hampshire. Accordingly, Massachusetts resolved to make the most of the clause in the charter which described the northern boundary as three English miles north of the Merrimac river, “or to the northward of any and every part thereof,” to ignore the conflicting grants to Mason and to extend its jurisdiction over the offending settlements. Dover submitted in 1641, Strawberry Banke (Portsmouth) soon after, and Exeter in 1643.

The heirs of Mason protested, but little was done about the matter during the period of Puritan ascendancy in the mother country. Immediately after the resignation of Richard Cromwell, however, Robert Tufton Mason (a grandson of the original proprietor), who had become sole heir in 1655, began petitioning for a patent and later for title. The attorney-general, to whom the petition to the king was referred, reported that the petitioner had a “good and legal right and title to the lands.” The commission appointed by the king in 1664 to hear and determine complaints in New England decided that Mason’s lands were not within the jurisdiction of Massachusetts, and made an attempt to set up a government under which his claims could be tried, but this was a failure. In 1674 Mason offered to surrender his rights to the Crown in return for one-third of the customs, rents, fines, and other profits derived therefrom, but although the offer was at first favourably considered it was finally declined. Mason then petitioned again, and this time Massachusetts was requested to send agents to England to answer his complaints. They arrived in December 1676; and the case was tried before the Lords Chief Justices of the King’s Bench and Common Pleas in April 1677. Mason presented no claim to the right of government, and as to the title to the lands claimed by him the court decided that this was a question between him and the several tenants to be determined by the local court having jurisdiction in such matters. Thereupon Mason, in January 1679, petitioned the king to appoint a governor who should have jurisdiction over all the lands which he claimed, and on the 18th of September of this year New Hampshire was constituted a separate province with a government vested in a president and council appointed by the king and an assembly chosen by the people. This was the principal outcome of Mason’s persistent efforts to establish his rights to

mately a failure, the company sent over colonists who occupied the house left standing by Thomson, and, not far away, built “Mason Hall” or the “Great House” In what is now Portsmouth, a name (for the entire settlement) that replaced “Strawberry Banke” in 1653. Edward Hilton with a few associates appears to have established a settlement on Dover Point about the time of Thomson’s arrival at Little Harbor, and in the Hilton grant of 1630 it is stated that he had already built houses and planted there; as early as 1639 this settlement was named Dover. In 1638 the Rev. John Wheelwright, an Antinomian leader who had been banished from Massachusetts, founded Exeter on land claimed to have been bought by him from the Indians. In the same year Massachusetts encouraged friendly Puritans to settle Hampton on the same purchase, and about a year later this colony organized Hampton as a town with the right to send a deputy to the General Court. Serious dissensions had already arisen between Puritan and Anglican factions in Dover, and Captain John Underhill, another Antinomian, was at a time a leader of the Puritan faction. Puritan Massachusetts was naturally hostile to the Antinomians at Exeter as well as to the Anglicans at Strawberry Banke. Although Exeter, in 1639, Dover, in 1640, and Strawberry Banke, not later than 1640, adopted a plantation covenant, these settlements were especially weak from lack of a superior tribunal, and appeals had been made to Massachusetts as early as 1633. Moreover, the grants of Massachusetts and Mariana were clearly in conflict. Under these conditions Massachusetts discovered a new claim for its northern boundary. The charter of 1648 stated that the river Merrimac flowed east for its entire course, but now an investigation was in progress which was to show that its source in Lake Winnipesaukee was several miles north of any of the four settlements in New Hampshire. Accordingly, Massachusetts resolved to make the most of the clause in the charter which described the northern boundary as three English miles north of the Merrimac river, “or to the northward of any and every part thereof,” to ignore the conflicting grants to Mason and to extend its jurisdiction over the offending settlements. Dover submitted in 1641, Strawberry Banke (Portsmouth) soon after, and Exeter in 1643.

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the land; for although he succeeded in procuring the appointment of officers who supported his claims, and although decrees were issued in his favour, the tenants, who contended that they had profited nothing from what his grandfather had done or that they were on lands which Wheelwright had bought from the Indians, resisted the enforcement of those decrees. The contest, however, especially for the waste lands, was continued by Mason, his heirs and assigns until near the close of the 18th century. From 1686 to 1689 New Hampshire formed a part of the Dominion of New England, which, after the first few months, was under Sir Edmund Andros as governor-general. There being no provincial authority in New Hampshire at the close of this period, a convention of the leading citizens of its four towns attempted to establish one. Upon the failure of this attempt, a temporary nominal union with Massachusetts was formed, but in 1692 Samuel Allen, the assign of Mason, caused a royal government to be established with his son-in-law, John Usher, as lieutenant-governor, and during the remainder of the colonial era New Hampshire was separate from Massachusetts except that from 1699 to 1741 the two had the same governor. The boundary between the two provinces was yet to be determined. Massachusetts proposed to confine New Hampshire to less than one-fourth its present area; that is, on the west to a line drawn 3 m. east of the south course of the Merrimac and on the north-east to a line drawn north-west from the source of the Salmon Falls river. New Hampshire claimed for its southern boundary a line drawn west from a point 3 m. north of the mouth of the Merrimac and for its upper eastern boundary a line drawn south-east by slightly west from the source of the Salmon Falls river. Both provinces granted townships within the disputed territory; Massachusetts arrested men there who refused to pay taxes to its officers, and sought to deprive the settlement of the dispute. New Hampshire, being on the more friendly terms with the home government, finally petitioned the king to decide the matter, and in 1737 a royal order referred it to a commission to be composed of councillors from New York, Nova Scotia and Rhode Island. This body agreed upon the present eastern boundary but evaded deciding the southern one. Both parties then appealed to the king, and in 1741 the king in council decided the division of the common from Megaloch to the eastern boundary and decided that the southern boundary should be a line corresponding to the course of the Merrimac from 3 m. north of its mouth to 3 m. north of Pawtucket Falls, at its most southerly bend, and thence due west to the next English province. This gave New Hampshire much more territory on the south than it had claimed. But the western boundary was not yet defined, and as early as 1749 a controversy over that arose with New York. New Hampshire asked for the territory west to within 20 m. of the Hudson river, or as far as the western boundaries of Massachusetts and Connecticut, while New York claimed east to the Connecticut river. Within a few years the governor of New Hampshire granted in the disputed territory 138 townships which were rapidly settled by those whom it was the duty of the province to protect. But there was a reluctance to incur the expense of a contest with so powerful a neighbour as New York, and in 1764 that province procured from the king in council a royal order declaring the western boundary of New Hampshire to be the western bank of the Connecticut river. The controversy, however, continued for some years thereafter (see VERMONT). From 1676 to 1759 New Hampshire suffered greatly from the Indians, and the fear of them, together with the boundary disputes and Mason's claims, retarded settlement. But where these troubles were removed the population increased rapidly, and at the outbreak of the War of Independence the province had about 80,000 inhabitants, the great majority of whom were with the patriot or Whig party during that struggle. By June 1775 the once popular governor, Sir John Wentworth, was a refugee; on the 5th of January 1776 the fifth Provincial Congress established a provisional government; on the 18th of the following June the first Assembly elected under that government declared for independence; and on the 16th of August 1777 the important victory at Bennington was won by New Hampshire and Vermont troops under the command of General John Stark, who had a commission from New Hampshire. Six states had ratified the Federal constitution when the New Hampshire convention met at Exeter on the 13th of February 1788, to accept or reject that instrument, and so great was the opposition to it among the delegates from the central part of the state that after a discussion of ten days the leaders in favour of ratification dared not risk a decisive vote, but procured an adjournment in order that certain delegates who had been instructed to vote against it might consult their constituents. Eight states had ratified when the convention reassembled at Concord on the 17th of June, and four days later, when a motion to ratify was carried by a vote of 57 to 47, adoption by the necessary nine states was assured. The War of Independence left the state greatly burdened with debt and many of its citizens threatened with a debtor's prison. As a means of relief a number of citizens demanded of the legislature the issue of paper, but the approach of the War of the Revolution made it necessary to renounce this plan. The state was left without a standing army, and the debt was incurred by the necessity of raising troops to serve in the army. At the close of the War the state was left with a debt of $1,200,000. 

National elections in New Hampshire were carried by the Federalists until 1816, except in 1804 when President Thomas Jefferson was returned by a small majority; he emerged, however, from the Federalist supremacy in national politics the Democrat-Republicans elected the governor from 1805 to 1812 inclusive except in 1809. In 1816 the Democrats won both state and national elections; and out of the transition from Federalist to Democrat control, which was effected under the leadership of William Plumer (1759-1830), a prominent politician in New Hampshire for half a century, a United States senator from 1802 to 1807 and governor of the state in 1812-1813 and 1816-1819, arose the famous Dartmouth College Case. As the trustees of this institution were Federalists with the right to fill vacancies in their number, the Democrats attempted to gain control by converting it into a state university and increasing the number of trustees, but when the case reached the Supreme Court of the United States that body pronounced (1819) the charter a contract which the Federal constitution forbade the state to violate. Heretofore the Federalist régime had taxed the people to support the Congregational Church, but now the Baptists, Methodists and Universalists joined the Democrats, and in 1819 this state support was abolished by the "Toleration Act." Because of Daniel Webster's arguments in the Dartmouth College Case, and because his party had favoured the support of the Congregational Church by public taxation, he became very unpopular in this his native state. Accordingly, his denunciation of President Andrew Jackson's bank policy added strength to the Jacksonian Democracy, and, later, his Whig connections were the greatest source of the Whig party's weakness in New Hampshire. John Quincy Adams was an intimate friend of William Plumer, the Democratic leader, and carried the state both in 1824 and 1828, but a Jackson man was elected governor in 1827, 1829, 1830 and 1831. The Whigs never won a national or state election, and often their vote was only about one-half that of the Democrats. But the Democrats broke into two factions in 1846 over the question of slavery (see HALE, JOHN PARKER); the American or "Know-Nothing" party elected a governor in 1855 and 1856; and then control of the state passed to the Republican party which has held it to the present. After 1890 the railway corporations were charged with a corrupt domination of the legislature and the courts, and in 1906 a "Lincoln Republican" movement was organized under the leadership of the well-known novelist Winston Churchill (b. 1874), with the object of freeing the state from this influence.
NEW HARMONY

The governors or presidents of the province and state have been:

Province.

John Cutt, president 1679-1681
Richard Waldron, president 1681-1682
Edward Cranfield, lieutenant-governor 1682-1685
Walter Barefoot, deputy-governor 1685-1686
Joseph Dudley, president of Council for New England 1686-1687
Edmund Andros, governor-general of New England 1687-1689
Without a government 1689-1690
Norman Chamberlain, governor 1690-1692
Samuel Allen, governor 1692-1693
Richard Coote, earl of Bellamont, governor 1693-1697
Joseph Dudley, governor 1697-1698
Samuel Stoughton, governor 1698-1700
John Wentworth, lieutenant-governor 1701-1705
William Burnett, governor 1705-1709
Jonathan Belcher, governor 1709-1710
Benning Wentworth, governor 1710-1714
John Wentworth, governor 1715-1717

Transition from Province to State.
Matthew Thornton, president of the Provincial Convention 1775

State Presidents.

Meshech Weare 1776-1785
John Langdon 1785-1786
John Langdon 1786-1789
Joseph Martin 1789-1790
Josiah Bartlett 1790-1792

State Governors.
Josiah Bartlett 1792-1794 Federalist
John Taylor Gilman 1794-1796 Federalist
John Langdon 1796-1799 Federalist
Jeremiah Smith 1799-1800 Federalist
John Langdon 1800-1802 Federalist
William Plumer 1802-1803 Federalist
John Taylor Gilman 1803-1816 Federalist
William Plumer 1816-1819 Federalist
Samuel Bell 1819-1823 Federalist
Levi Woodbury 1823-1824 Federalist
David Lawrence Morrill 1824-1827 Federalist
Benjamin Pierce 1827-1828 Federalist
John Bell 1828-1829 Federalist
Benjamin Pierce 1829-1830 Federalist
Matthew Harvey 1830-1831 Federalist
Joseph Morrill Harper (acting) 1831
Samuel Dinsmoor 1831-1834 Republican
William Badger 1834-1836 Republican
Isaac Hail 1836-1839 Democratic
John Page 1839-1842 Democratic
Henry Hubbard 1842-1844 Democratic
John Hardy Steele 1844-1846 Democratic
Anthony Colby 1846-1847 Democratic
Jared Warner Williams 1847-1849 Democratic
Samuel Dinsmoor 1849-1852 Democratic
Noah Martin 1852-1854 Democratic
Nathaniel Bradly Baker 1854-1855 Democratic
Ralph McCafferty 1855-1857 Know-Nothing
William Hale 1857-1859 Republican
Ichabod Goodwin 1859-1861 Republican
Nathaniel Springer Berry 1861-1863 Republican
Joseph Albee Gilmore 1863-1865 Democratic
Frederick Smyth 1865-1867 Republican
Walter Harriman 1867-1869 Republican
Onslow Stears 1869-1871 Republican
James Adams Weston 1871-1872 Democratic
Ezekiel Albert Straw 1872-1874 Republican
James Adams Weston 1874-1876 Republican
Person G. Cheney 1876-1877 Republican
Benjamin Franklin Prescott 1877-1879 Republican
Natt Head 1879-1881 Republican
Charles Henry Bell 1881-1883 Republican
Samuel Whitney Hale 1883-1885 Republican
Moody Currier 1885-1887 Republican
Charles Henry Sawyer 1887-1889 Republican
David Hare Goodell 1889-1891 Republican
Hiram American Tuttle 1891-1893 Republican
John Butler Smith 1893-1895 Republican
Charles Albert Biel 1895-1897 Republican
George Allen Ramsdell 1897-1899 Republican
Frank West Rollins 1899-1901 Republican
Chester Bradley Jordan 1901-1903 Republican
Nathaniel Goodrich 1895-1900 Republican
John McLane 1905-1907 Republican
Charles M. Floyd 1907-1909 Republican
Henry B. Quinby 1909-1911 Republican
Robert P. Bass 1911- Republican

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NEW HARMONY, a village in Posey county, Indiana, U.S.A., on the Wabash river, about 22 m. N.W. of Evansville. Pop. (1900) 1341; (1910) 1229. It is served by the Illinois Central railway, and has regular steamboat connexion with the river cities. New Harmony had its beginning in 1814-1815, when a group of religious societies, known variously as the Harmonists, Harmonites and Rappites, founded in Germany towards the end of the 18th century by George Rapp (1757-1847), a native of Ipingen in Wiirttemberg. Rapp and his followers, who sought to form a community after the manner of the primitive Christian Church, were persecuted in Germany, and in 1803-1804 emigrated to Butler county, Pennsylvania. There they established in 1805 a community known as Harmony, consisting of some 600 persons, who held their property in common and in 1807 adopted celibacy. In 1814 Rapp sold most of his Pennsylvania land and bought about 24,735 acres (in the next ten years more than 14,000 acres in addition) on the Wabash river in Indiana Territory. In 1814-1815 Rapp and a thousand of his followers settled on the Indiana tract, their headquarters being established at New Harmony, or Harmonie as they called it. The settlers, mostly Germans, devoted themselves to agriculture, weaving and leather-working so industriously that they prospered from the start. Rapp, however, in 1825 disposed of his lands and property to Robert Owen, having returned with part of his followers to Pennsylvania, and founded a new community in the eastern part of the county, in Beaver county, where he died in 1847. Intent on founding a socialistic community, Owen went to the United States in 1824, and purchased Rapp's lands and live stock for $182,000. He interested several well-known scientists in his settlement, and with them came to New Harmony in the spring of 1826. Within six months the community numbered over 1000. Among its most notable members were Robert Owen's sons, Robert Dale Owen (1801-1877), a political leader and diplomat; David Dale Owen (1807-1860) and Richard Owen (1810-1896), both geologists; and William Maclure (1763-1817), founder of the Academy of Natural Sciences at Philadelphia; Thomas Say (1787-1834). "the father of American Zoology"; Charles Lesueur, a scientist and antiquarian; and Gerard Troost (1776-1850), a well-known geologist. The greater part of the settlers, however, were impractical theorists or adventurers. Constitution after constitution was adopted, and with the adoption of each new constitution and with each new religious discussion a group would secede and form a separate community—in 1825 there were ten—the best known and most successful being Maclura (like the others, occupying a part of W. Owen's land), named after William Maclure, who directed its founding. The whole organization broke up in 1827, and Owen left New Harmony in 1828. New Harmony has a Working Men's Institute Public Library, founded in 1838 by William Maclure,
and having in 1907 18,000 volumes; the collection is rich in works dealing with socialism.


NEW HAVEN, the largest city of Connecticut, U.S.A., the county-seat of New Haven and the seat of Yale University. It is co-extensive with the township of New Haven (though there is both a township and a city government), and lies in the south-western part of the state, about 4 miles from Long Sound, at the head of New Haven Bay, into which empty three small streams, the Quinnipiac, the Mill and the West rivers. Pop. (1890) 81,268; (1900) 108,027, of which 30,802 were foreign-born, including 10,491 Irish, 5262 Italians, 4743 Germans, 3193 Russians and 1376 Swedes; (1910 census) 133,605. Land area (1900) 17½ sq. m., of which more than one-half was annexed since 1900. New Haven is served by the main line and five branches of the New York, New Haven and Hartford railway, by three inter-urban electric lines and by two steamship lines connecting with foreign countries. The city is built on a sandy plain, in the rear of which is a line of hills terminating in two spurs, East Rock and West Rock, respectively 360 and 400 ft. high and 2 m. and 2½ m. distant from the Green. On East Rock is a monument to the Connecticut soldiers who fell in the War of Independence, the War of 1812, the Mexican War and the Civil War; on the West Rock is a cave, "Judges' Cave," in which the regicides William Goffe and Edward Whalley are said to have concealed themselves when sought for by royal officers in 1661. The central and older portion of the city is laid out in squares surrounding a public Green of 16 acres, which was in former days the centre of religious and social life. New Haven is popularly known as the "City of Elms," because of the number of these trees. Besides the Green there are 12 other parks, ranging from 6 to 300 acres in area, four of them being on the water front, along the harbour. On the west side of the city is Edgewood Park (120 acres); on the north is Beaver Pond Park (100 acres); and East and West Rocks, mentioned above, have been made into suburban parks.

Among the public buildings and places of interest are the three churches on the Green, built in 1814; Centre Church (Congregational), in the rear of which is the grave of John Dixwell (1685–1850), one of the regicides; United (formerly known as North Church (Congregational)), and Trinity Church, which belongs to one of the oldest Protestant Episcopal congregations in Connecticut. On the north-western side of the Green are the buildings of Yale University (q.v.); the "college" campus is the square enclosed by College, Chapel, High and Elm streets, with Battell Chapel at its eastern corner, Farnam, Lawrence, Phelps, Welch and Osborn halls on its south-eastern side, Vanderbilt Hall, Connecticut (or South Middle) Hall, the oldest of the Yale buildings (1750), and the Art School on the southern side, the Library, Dwight Hall and Alumni Hall on the north-western and Durfee Hall on the northern side; farther north of the Green are the Divinity School, the University Campus, on which are the Bicentennial Buildings and Memorial Hall, and, lying between Grove Street and Trumbull Street and Prospect Street and Hillhouse Avenue, the buildings of the Sheffield Scientific School. In the vicinage is the Grove Street Cemetery, in which are the graves of many famous Americans. Besides the University Library, there are a Public Library (1889), containing about 60,000 vol., the library of the Young Men's Institute (1826) and the collection of the New Haven Colony Historical Society. The city contains a State Normal School and a number of hospitals and charitable institutions.

Among the newspapers of New Haven are the Morning Journal and Courier (1832, Republican), whose weekly edition, the Connecticut Herald and Weekly Journal, was established as the New Haven Journal in 1766; the Palladium (Republican; daily, 1840; weekly, 1828); the Evening Register (Independent; daily, 1840; weekly, 1812); and the Union (1873), a Democratic evening paper. At New Haven also are published several weekly English, German and Italian papers, and a number of periodicals, including the American Journal of Science (1818), the Yale Law Journal (1890) and the Yale Review (1892), a quarterly.

In 1900 New Haven was the most important manufacturing centre in Connecticut, and in 1905 it was second only to Bridgeport in the value of its factory product. In 1903 its establishments numbered 490. The principal manufactures are hardware, foundry and machine shop products, ammunition and fire-arms (the Winchester Company), carriages and wagons, planes, doors, boxes and corsets. Meat packing is also an important industry. In 1905 the total capital invested in manufacturing was $71,412,715 and the total product $39,666,118 (a gain of 13.7% since 1900). Commercially, New Haven is primarily a distributing point for the Atlantic seaboard, but the city is a port of entry, and foreign commerce (almost exclusively importing) is carried on to some extent, the imports in 1906 being valued at $404,805. In 1906 the assessed valuation of real and personal property was $179,592,508, the net debt was $3,854,498 and the rate of taxation was 14 7½ mills on the dollar.

Under a charter of 1899, as amended afterwards, the city government, which has almost entirely superseded the town government, is in the hands of a mayor, who holds office for two years and appoints most of the administrative officers, except a board of aldermen (of whom each has a two-year term, six are chosen from the city at large and the others one each from each ward, the even-numbered wards electing their representatives one year and the odd-numbered the next), a city clerk, controller, sheriff, treasurer and tax collector, all chosen by popular vote, and an assistant clerk, appointed by the board of aldermen.

The first settlement in New Haven (called Quinipiac, its Indian name, until 1640) was made in the autumn of 1637 by a party of explorers in search of a site for colonization for a band of Puritans, led by Theophilus Eaton and the Rev. John Davenport, who had arrived at Boston, Massachusetts, from England in July 1637. In the following spring a permanent settlement was made. It was governed under a "plantation covenant" until the 4th of June 1639, when, at a general meeting, the "free planters" adopted the fundamental principles of a new government. They agreed that the Scriptures should be their guide in civil affairs, and that only approved church members should be admitted to the body politic; twelve men were appointed to choose seven men ("seven pillars") who should found the church and admit to its original membership such planters as they thought properly qualified. This having been done, the first General Court of which there is record met on the 25th of October. At this court the members of the new church, together with six members of other approved churches, were admitted to citizenship; a magistrate, four assistants, a secretary and a constable were chosen as the civil officers; annual elections and an annual session of the General Court in the last week of October were agreed upon; English statute and common law were expressly excluded; and the "word of God was adopted as the only rule to be attended unto in ordering the affaires of government in this plantation." As thus founded, New Haven was town and colony combined. In 1643–1644 the colony was expanded into the New Haven Jurisdiction, embracing the towns of New Haven, Guilford, Milford, Stamford and Branford in Connecticut, and, on Long Island, Southold; but this "Jurisdiction" was dissolved in 1664, and all these towns (except Southold) passed under the jurisdiction of Connecticut, according to the Connecticut charter of 1662. The government of the Jurisdiction was of the strictest Puritan type, and although the forty-five "blue laws" which the Rev. Samuel Peters, in his General History of Connecticut, ascribed to New Haven were much confused with the laws of the other New England colonies and some were mere inventions, yet many of them, and others equally "blue," were actually in operation as enactments or as court decisions in New Haven.
NEWHAVEN—NEW HEBRIDES

Among those in the Pater's list which are wholly or substantially true are the following: "The judges shall determine controversies without a jury." "Married persons must live together in harmony." "A wife shall be good evidence against her husband." "No minister shall keep school." "The selectmen, on finding children ignorant, may take them away from their parents and put them in the hands of the publicschools." "No person shall be a candidate in the same list which are wholly or in part spurious:" "No woman shall kiss her child on the Sabbath or fasting day," and "No one shall travel, cook victuails, make beds, sweep house, cut hay or do any work on the Sabbath day.

One of the most important events in the history of New Haven was the removal hither in October 1716 from Saybrook of the Collegiate School of Connecticut, which developed into Yale University. The period of greatest material prosperity of New Haven in the colonial period began about 1750, when a thriving commerce with other American ports and the West Indies developed. As a port it was notorious for its smuggling and illicit trade. New Haven also had extensive shipbuilding interests. All attempts to enforce the British commercial regulations were ineffectual. On the 22nd of February 1765 a town meeting of the citizens voted to purchase a vessel and arm her to refrain from importing from England hats, clothing, leather, gold and silver lace, buttons, cheese, liquors, &c. Two years later Jared Ingersoll (1722-1781), who had been sent to England to protest against the Stamp Act, but had accepted the office of Stamp Distributor on the advice of Benjamin Franklin, was forced to resign his office. In 1770 most of the merchants agreed not to import goods from England and transferred their trade with New York City, where Loyalist influence was strong, to Boston and Philadelphia. When news of the embryo of the Revolution first arrived at New Haven, a committee of correspondence was at once formed; and in the War of Independence the people enthusiastically supported the American cause. On the 5th of July 1779 the place was invaded by a British force under General William Tryon, who intended to burn the town, but met so strong a resistance that he withdrew before the next day. New Haven's commerce suffered severely during the war, but by the close of the first decade of the 19th century it had regained its former importance. When the War of 1812 opened there were fully 600 seamen in the city, practically all of whom were engaged in privateering or in the regular naval service of the United States. Among them was Capt. Isaac Hull. In 1815 the Fulton, the first steamboat on Long Island Sound, made its first trip to New Haven. The second quarter of the 19th century was the period of development of railways and manufactures. New Haven, and the Civil War has been marked by a diversification of industries. To that conflict New Haven contributed approximately $30,000,000, and 3900 men, 900 of whom were killed. From 1761 until 1833 New Haven was the joint capital (with Hartford) of Connecticut. New Haven was incorporated as a city in 1784; new charters were secured from the General Assembly of the state in 1860, 1881 and 1899. Fair Haven was annexed to New Haven in 1897. See Leonard Bacon, Thirteen Historical Discourses (New Haven, 1839); J. W. Barber, History and Antiquities of New Haven (3rd ed., New Haven, 1870); C. H. Levermore, Town and City Government of New Haven, and The Republic of New Haven (Baltimore, 1885); E. S. Bartlett, Historical Sketches of New Haven (New Haven, 1897); Edward E. Attwater, History of the Colony of New Haven in its Abstention from Colonization, New Haven, 1630-1784 (New Haven, 1876); History of New Haven Green (New Haven, 1898); Records of the Colony of New Haven 1638-1685 (2 vols., Hartford, 1857-1858), edited by C. H. Headly; and the Papers and other publications (1865 sq.) of New Haven Colony Historical Society.

NEWHAVEN, a seaport in the Eastbourne parliamentary division of Sussex, England, 56 m. S. from London by the London, Brighton & South Coast railway, on the English Channel at the mouth of the Ouse. Pop. of urban district (1901) 6772. The church of St Michael has a Norman square embattled tower surmounted by a spire, and an apsidal chancel. The port is protected by fortifications. A harbour was first granted to Newhaven in 1743, and during the early part of the 18th century it possessed a large shipping trade. This afterwards declined, but it is now one of the principal points of communication between England and France, the railway company maintaining a daily service of fast steamers to Dieppe in connexion with the Chemin de fer de l'Ouest. The tidal harbour, which is owned by a company, is enclosed by two piers and a breakwater, the area being about 30 acres, and the quayage 1400 yds. The roadstead is one of the finest on the coast of England. With France there is a large traffic in wines, spirits, silk, fruit, vegetables and general provisions. The. coasting trade consists chiefly of imports of coal and provisions, the exports being principally timber for saw-mills and fluting for the Staffordshire potteries. Some shipbuilding is carried on.

NEW HEBRIDES, a chain of islands in the western Pacific Ocean, between 166° and 171° E., and 15° and 21° S., included in Melanesia, and under the joint influence of Great Britain and France. (For map, see PACIFIC OCEAN.) From New Caledonia to the S.W. they are separated by a deep channel; but a comparatively shallow sea indicates their physical connexion with the Santa Cruz group (q.v.) to the N. The chain lies S.E. and N.W., but the main islands are arranged somewhat in the form of the letter Y. The south-easternmost island is Aneteau; N.W. from this the main islands are Tanna or Alipere, Eromanga, Efate,1 the Shepherd Islands and Api or Epi. At this point the arms of the Y divide, the western comprising the large islands of Malekula or Malicollo and Espiritu Santo,2 the eastern consisting of Ambrym, Arag and Maiwo or Aurora, with Aob or Leper Island between the two arms. Espiritu Santo, the largest island, has an area of 375 sq. m. Irregularly disposed to the N. of the Y are the lesser islands composing the Banks group—Gaua, Vanua Lava, Mota, Valua, &c., and the Torres Islands. With their rugged outline and rich vegetation, the islands as seen from the sea are very beautiful. Extending the small Torres group, which are low-lying and perched on reefs, but without lagoons, all the islands are of volcanic, not coral, formation, the larger ones lying on both sides of the line of volcanic activity. The coasts are almost free from reefs and the shores rise abruptly from deep water. Old coral is sometimes found elevated to a considerable height. The islands are formed chiefly of basalt and recent eruptive material; earthquakes and submarine eruptions are not infrequent; and some of the islands themselves have active craters. All have considerable elevations, the loftiest being the isolated cone of Lopevi, near the junction of the arms of the Y; its height is 3142 ft. The volcanic soil is very rich. Numerous clear streams water the islands, but some debouch upon flat ground towards the sea, and form unhealthy marshes there. Copper, iron and nickel are the most important minerals known in the group, and sulphur is of some commercial importance.

The climate is generally hot and damp, but there is a season (November to April) which is specially distinguished, as such, and is somewhat unhealthy. The trees—Casuarina, candle nut (Aleurites triolea), kauri pine (or Tanna), various species of Ficus, Myrtaceae and many others—are magnificent. The coco-nut is not confined to the coast, but grows high up the valleys on the hill-sides. Sandal-wood is also found. Besides the breadfruit, sago-palm, banana, sugar, yam, taro, arrowroot and several forest fruits, the orange, pine-apple and other imported species flourish; and European vegetables are exported to Sydney. Land mammals are scarce; they include bats, rats and pigs which have run wild. There are some lizards and turtles; birds include pigeons, parrots, ducks and swallows; locusts, grasshoppers, butterflies and hornets are numerous, and the sea abounds in fish, which, however, are generally inferior as food. The islands are inhabited by the Melanesian races.

The native population is estimated at 50,000; in 1904 the British population was 212, the French 401. The island of Efate contains the seat of the joint government, Vila or Port Vila (formerly Franceville), and the majority of the French population. There are several British and French trading companies, and a considerable area is cleared and worked by settlers. The chief exports are copra, coffee, maize, bananas, timber, &c.

1 Efate, Vaté, Paté, Efate or Sandwich island.
2 Abbreviated to Santo; native Martina.
The nature of the New Hebrides are Melanesian of mixed blood, and differ much in different islands. On Efate and some others Polynesian immigration has produced a taller, fairer and less savage people. In some parts, as on Aoba, isolated Polynesian communities exist. Melanesians in all parts are tall, with low, receding forehead, broad face, flat nose and thick lips. The natives decorate themselves with nose-rings and ear-rings and bracelets of shells. The men are constantly fighting; their weapons are bows and poisoned arrows, often beautifully designed, clubs of elaborate patterns and spears. Their houses are either round huts, or rectangular with pitched roofs resting on three parallel rows of posts. The villages are scrupulously clean and neat, ornamented with flowering shrubs, crotons and dracenas, and are often fortified with stone walls. In character the New Hebrideans are ferocious and treacherous, though most of their unhospitality is due to the fact that the trade of traders and labour agents. The women occupy a degraded position, and in some islands widows are buried alive with the bodies of their husbands. There is a great belief in sorceries and omens; but prayer and offerings (usually of shell money) are addressed mainly to the spirits of the (recently) dead, and there is another class of spirits, called Vai, who are appealed to when incorporeal in certain stones or animals; of one of two such the divinity is generally recognized. By the villages a shadow shaped as a great banyan tree is often set apart for dances and public meetings. A certain sanctity attaches also sometimes to the Casmarina and the Cyrtis theca, the Casmarina a very large house, in which are various grades, whereas a man's rank and influence mainly depend, his grade being recognized even if he goes to another island where his language is unintelligible. In like manner a division into two and French, a division depending on degrees of rank and in the New Hebrides; The subsequent visits of several explorers, the exploitation of the sandal-wood and other products by traders and the arrival of missionaries helped to open up the islands and to give them a certain commercial importance by the middle of the 19th century. Trade was mainly with New Caledonia, and France was thus indicated as the dominant power in the New Hebrides; even British planters pressed France to annex the islands in 1876, but in the following year some of the missionaries urged the same course on England. In 1878 the islands were declared neutral by Great Britain and France. The presence of British and French interests under a single administration was unsatisfactory administration, especially in regard to the settlement of civil actions and jurisdiction over the native population. As to the establishment of commercial supremacy, French interests clashed with Australian, and in 1882 M. John Higgison of New Caledonia (d. 1904) consolidated the former by founding the trading society which afterwards became the Société française des Nouvelles-Hébrides. In 1886 one of the most serious of many native outbreaks occurred, necessitating a French demonstration of force from New Caledonia. An Anglo-French convention of the 16th of November, 1891, provided for the surveillance of the islands (protection of life and property) by a mixed commission of naval officers. The Anglo-French agreement of 1904 had a clause providing for an arrangement as to proper jurisdiction over the natives and for the appointment of a commission to settle disputes between British and French landed proprietors. In this and the following year there was much unrest among the natives, and a joint punitive expedition was necessary. Strong feeling was aroused meanwhile in Australia owing to the disabilities suffered by British settlers in the islands. British annexation, or at least a division of the group into British and French spheres, was urged. But on the 20th of October 1906 a convention was signed in London, confirming a protocol of the preceding 27th of February, and providing that “the group of the New Hebrides, including the Banks and Torres Islands,” should form “a region of joint influence,” in which British and French subjects should have equal rights in all respects, and each power should retain jurisdiction over its own subjects or citizens. The claim of other powers to share the joint influence was excluded by the provision that their subjects resident on the islands must be under either British or French jurisdiction. A British and a French high commissioner were appointed, each assisted by a resident commissioner; provision was made for two police forces of equal strength, and the joint naval mission of 1887 was retained for the purpose of keeping order. The high commissioners were given authority over the native chiefs. A joint court was established, consisting of two judges, appointed respectively by Great Britain and France, and a third, to be president, and not a British subject or French citizen, appointed by the king of Spain. Its jurisdiction covers all sorts of cases (including breaches of contract) between non-British and non-French subjects, and all offenses against the provisions of the convention. The sale of arms and intoxicants to natives is forbidden; and the convention regulates the recruitment of native labour. Provision was made for community of interests in regard to public works, finance and the official use of the English and French languages. The creation of municipalities on the application of groups of not less than thirty non-native residents was provided for, municipal votes being given to both sexes. The convention provided against the establishment of a penal settlement and the immigration of prisoners. This convention was bitterly criticized in Australia on the ground that many of the provisions which nominally established equality between British and French would operate in practice to the advantage of the French; and there was no little dissatisfaction on the ground that the Australian government was neither represented at the preliminary conference, nor fully consulted during the negotiations.

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See Parliamentary Papers, France, No. 1 (1888 and 1906), and "Colonial dependence relating to the Convention . . ." (Cd. 3288), (1907).

NEW IBERIA, a city of Louisiana, U.S.A., capital of Iberia parish, on the Bayou Teche, in the southern part of the state, about 125 m. W. of New Orleans. Pop. (1890) 3447; (1900) 6815 (3309 negroes); (1910) 7496. It is served by the Southern Pacific, the Franklin and Abbeville, and the New Iberia & Northern railways. Lumber, sugar, cotton and rice are produced in the neighbourhood. At the village of Avery Island, about 10 m. S.E., there are deposits of rock salt. The municipality owns and operates the waterworks and the electric lighting plant. New Iberia was laid out in 1835 and was chartered as a town in 1847.

NEW JERSEY, one of the Middle Atlantic states of the American Union, lying between 41° 21' 22°-6" and 38° 55' 40" N. lat., and 75° 35' and 73° 53' 39" W. long. It is bounded, N., by the state of New York; E., by the Hudson river, which separates the state from New York, and by the Atlantic Ocean; and S. and W. by the Delaware Bay and river, which separate New Jersey from Delaware and Pennsylvania. All the boundaries except the northern are natural. New Jersey has an extreme length, N. and S., of 166 m., an extreme width, E. and W., of 57 m., and a total area of 8224 sq. m., of which 710 sq. m. are water.

Physiography.—There are within the state four distinct topographic belts—the Appalachian, the Highlands, the Triassic Lowland and the Coastal Plain. The folded Appalachian belt crosses the N.W. corner of the state, and includes the Kittatinny Mountain and Valley. The mountain has a north-east-south-west trend, crossing the Delaware river at the Delaware Water Gap and continuing S. into Pennsylvania. In width the range varies from 1 to about 2 m. in the S. Its western foot lies along the Delaware river, which for some distance flows parallel with the range, and has an altitude of about 400 ft. above the sea level; while the Delaware, when it reaches the Water Gap, where it leaves it. Where the crest of the ridge enters the state its elevation is 1535 ft.; at High Point, its highest point, the ridge attains a height of 1803 ft., the highest point within the state. A large distance relating to the Delaware river is 40 m. N.W. of the state. At this point the width of the river, while it is 1570 ft. Beyond Culver's Gap the river narrows again to a ridge, and for a portion of its length it is double-crested. On the eastern side the slope is abrupt as to make ascent difficult and at places impossible, but the western slope, or account of a dip of the rock to the N.W., is more
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great. The eastern foot has a very uniform altitude of from 900 to 1000 ft. above the sea. The crest of the ridge is from 600 to 1200 ft. W. of the foot, and from 450 to 600 ft. above it. At the base of this ridge half a mile out through the Hudson is a gap, through which the river flows. This gap, 900 ft. wide at the base and 4500 ft. wide at the top, with sides rising abruptly to a height of 1200 ft. and more, is an impressive sight. The Kill van Kull, a branch of the river, extends about 40 m. long and 12 m. wide, and has an average elevation of 700 ft. Its western margin is from 900 to 1000 ft. above the sea, and its eastern border is from 400 to 500 ft. lower. The floor of the valley where the Hudson crosses the ridge is about 25 m. below sea-level, whose divides are from 700 to 900 ft. above the sea. South-east of the Kittatinny Valley, and parallel with it, lies the second topographic line of the ridge, an abrupt escarpment of 900 sq. m., having a length, N.E. and S.W., of 60 m., and a width varying from 9 to 18 m. It consists of an upland plateau now dissected by streams into a series of hills and ridges, and corresponds to lower waters, farther the S.W. and to the upland region of southern New England. The average elevation of the Highlands is about 1000 ft.; the highest point, between Canisteer and Vernon, in Sussex county, being 1496 ft. The third ridge, called the Triassic Lowland, occupies about one-fifth of the surface of the state. Its N.W. border is marked by a line drawn S.W. across the state through Pompton, Morristown, Lebanon and Highbridge to the Delaware; its S.E. corner is drawn from the highest point of the Highlands to the Hudson. Its surface is irregular, with altitudes ranging from above sea-level to 900 ft. A noteworthy feature of this area is the series of trap rock ridges, between which the Passaic river makes its irregular way through the valley. Along the bottom lastmentioned ridge, at Passaic, in the Hudson river for about 25 m. and is known as the Palisades Ridge, or simply the Palisades, because of the scenic effect produced by the long line of cliffs joining the shoulders of this river. To the W. the slope of the river is very gentle. The Palisades extend from a point N. of the New York boundary as far S. as Weehawken, the line thus being approximately the 40th parallel of latitude. A slight ridge occurs at the E. base of the Palisades Ridge, but the summit is covered with trees. The trap formation extends from the Kill van Kull Channel, and includes, among other ridges, the so-called First and Second Palisades of Bergen county, known as the "Oranges," or "Orange County."

The fourth and final ridge of the state is the S.W. or Ridged River, more properly the S. of the Ridged River, a gap 200 ft. in altitude. S. of the Ridged River the topography of this belt is similar to that of the previous portion, but much of the area is over 200 ft. above the sea. South-east of the Triassic Lowland lies the fourth topographic belt, the Coastal Plain, containing an area of 4400 sq. m., or slightly more than one-half the entire surface of the state. This belt, bordered on the E., S. and W. by water, is highest near its centre and lowest along its margins. It is free from mountainous ridges, but there are rounded drumlins, the oldest of the series. As a whole, this is a plain, except for a small ridge, the Breakneck Ridge, (250 ft.) in Monmouth county. One-third of the Coastal Plain is below 50 ft. in altitude; two-fifths are between 50 and 100 ft. and more than a fourth of the area is over 100 ft. above sea-level. The total area of the belt as high as 200 ft. and more does not exceed 15 sq. m. About one-eighth of the area consists of tidal marsh, lying chiefly between the long sandy ridges or barrier beaches. The ridges and the marshes are wide apart, and the marshes vary from 1 to 6 m. being least in the extreme N. and S. and greatest near the mouths of streams. There is also a marsh along Delaware Bay, unprotected by a beach. The waters between these beaches and the mainland are very full and part of the state, and changing into tidal marsh. In addition to the stretches of marsh along the coast, the coastal-flowing rivers of the Coastal Plain are fringed with large areas of swamp land, some of which is well forested.

For the entire state the average elevation is 250 ft., with 4100 sq. m. below 100 ft.; 2100 sq. m. between 100 and 500 ft.; 1400 sq. m. between 500 and 1500 ft.; and 400 sq. m. between 1500 ft. and 3500 ft. The four topographic belts of the state correspond very closely to the outcrops of its geological formations; the rocks of the Appalachian belt being of Palaeozoic age; the formation of the Highlands are of Mesozoic, and that of the S.W., or Ridged River, are of Tertiary age. The Great terminal moraine of the glacial epoch crosses the N.E. and S.W. line of the state, forming an irregular line running W. and N.W., from Staten Island, N.Y.

The effect of the glacial scour is seen in the irregular course of the streams, the numerous lakes and freshwater marshes and the falls that are a feature of the rivers. These streams have been shaped by man and changed by the various types of forest cover which have grown on the same ground. As the waters of the stream have been diverted into mill races, the river very seldom makes this leap in its natural channel. The power thus generated has been largely instrumental in creating the city of Paterson (p. 51.)

The Passaic is a great forest area of the state; it contains about 1200,000 acres of woodland, practically continuous, and portions of it still sparsely inhabited. The woods are chiefly of hardwoods and in the best part of the forest of the same species, chiefly pitch pine with a variety of oaks, replaces it. Within "The Pines," immediately north of the Passaic river, lies an area of about 20,000 acres called "The Plains." These are very much inferior to the forest, and the trees are less evenly distributed. Tree forms are entirely absent. The cause of this condition is still undetermined. Along the streams in this section are many swamps, valuable for the white cedar that they produce, or when cleared, for cranberry bogs. The northern part of the state is much more rugged, as the waters of the stream have been diverted into mill races, the river very seldom makes this leap in its natural channel. The power thus generated has been largely instrumental in creating the city of Paterson (p. 51.)

The total length of the Passaic is about 100 m., but its course is so circuitous that it is hard to give a straight line from its source to its mouth which is only about 15 m. See G. B. Hollister and M. O. Leighton, The Passaic Flood of 1902 (Washington, 1903), and M. O. Leighton, The Passaic Flood of 1902, New Jersey State Water Supply and Irrigation Papers of the U.S. Geological Survey.
and the forests are chiefly of chestnut and various species of oak. Though much broken by farms and other elements of culture they aggregate about 740,000 acres. New Jersey's forests have suffered much from fire, but with the exception of 'The Plains,' the soil everywhere is rich and the climate and good market facilities increase the potential value of the whole woodland area. The state maintains a Forest Commission whose chief concern is to control the fires and thereby give value and stability to the remaining stands. In this it is having considerable success. The state is also acquiring, and maintaining as demonstration acres and public parks, forest reserves in various parts of the state. The five reserves now held are in Atlantic, Burlington and Warren counties.

Climate.—Between the extreme northern and southern sections of the state there is a greater variation in climate than would naturally be expected in a state so narrow in latitude. This is due to the climate of the ocean in the S., and to the relatively high altitudes in the N. Near Cape May fruit trees bloom two or three weeks earlier than in the Highlands. The mean annual temperature ranges from 49° to 51°, except the extreme N.W. district, where it is in the order of 50°. The average date of the first killing frost at Dover is the 4th of October, and of the last, the 10th of May; at Atlantic City, on the sea-coast, these dates are respectively the 4th of November and 11th of April. At Dover the mean annual temperature is 49°; the mean for the winter is 28°, with an extreme minimum recorded of −13°; and the mean for the summer is 70°, with an extreme maximum recorded of 102°. At Camden the mean annual temperature is 52°; for the winter it is 34°, with an extreme of −7°; and for the summer, 70°, with an extreme of 96°. At Vineland, a southern interior town, the mean annual temperature is 53°; for the winter 31°, with an extreme of −6°; and for the summer, 74°, with an extreme of 105°. These records of temperature afford a striking illustration of the moderating influence of the ocean upon the climate. The average wind direction along the coast is from the sea. New Jersey has a more equable climate than some of the states in the same latitude farther west. During the summer months the general course of the wind along the sea-coast is interrupted about midday by an incoming current of air, the "sea breeze," which gradually increases until about three o'clock in the afternoon, and then gradually lessens until the offshore wind takes its place. As the heat is thus made less oppressive along the coast, the state has more habitable space for cities and cities that have become popular summer resorts—among the best known of these are Long Branch, Asbury Park, Ocean Grove, Atlantic City (also a winter resort) and Cape May. Among the interior resorts are Lakewood, a fashionable winter resort, and Lake Hopatcong, and Greenwood Lake and surrounding regions, much frequented in the summer. In the summer the prevailing winds throughout the state are from the S.W.; in the Winter, from the N.W. The normal annual precipitation is 47.7 in., varying from 46-6 in. on the sea-coast to 49.1 in. in the Highlands and the Kitta- tawa. Very slight precipitation is fairly common in the summer than in the other seasons, which differ among themselves very little in the average amount of rainfall. From December to March, inclusively, part of the precipitation is in the form of snow. In the northern part of the state snow is more common in winter. In no part of the state is free from snow storms. In the summer thunder storms are frequent, but are generally local in extent, and are much more common in the afternoon and early evening than in the morning.

Soils.—The soils of the state exhibit great variety. Those of the northern and central sections are made up in part of glacial drift; those of the southern sandy or loamy, and are locally enriched by deposits of marl. The most fertile soils of the state lie in the clay and marl belt, a region from 10 to 20 m. wide extending across the state in a general south-western direction from Long Branch to Salem. South of this belt the soils are generally sandy and are not very fertile except at altitudes of less than 50 ft., where they are loamy and of alluvial origin.

Agriculture.—In 1900 very little more land was under cultivation than in the year 1890, the average for these years being respectively 2,849,966 and 2,752,946. The number of farms, however, increased from 23,905 to 34,294, and the average size of the farms decreased from 115.2 acres to 82.2 acres, an indication that agriculture gradually became more intensive. In 1900, 22% of the farms contained from 20 to 50 acres, 48.3%, 50-175 acres and only 7.8% contained over 175 acres. Farms were smallest in Hudson county, where the average size was 77.9 acres; largest in Warren county, where the average size was 143.4 acres. The counties with the largest total acreage were Burlington (343,996), Sussex (256,866) and Hunterdon (248,773). Between 1890 and 1900 the percentage of farm-accounts and acreage increased from 75.4 to 70.1; the per- 1 The amount of timber cut within the state is very small. Before the appearance of forest-products, lumbermen cut only small quantities of timber. The cutting of young trees for the manufacture of charcoal was a profitable industry. Since 1860 the forest area has only slightly diminished, and the production of the timber has improved, but large trees are still scarce. 2 centage of cash tenants increased from 10.5 to 13.2; and that of share tenants remained about stationary, being 12.4 in 1880 and 14.6 in 1900. In this last year 27.5% of the farms derived their principal income from live stock, 20.5% from vegetables, 17.2% from dairy produce, 7.8% from fruits and 7.8% from hay and grain.

In 1907, according to the report of the United States Department of Agriculture, the principal crops were: hay, 634,000 acres, value $3,447,708; potatoes, 78,000 acres, value $320,704; Indian corn, 8,757,000 bushels ($5,177,000); wheat, 1,998,000 bushels ($1,958,000); rye, 1,372,000 bushels ($1,043,000); oats, 1,770,000 bushels ($991,000). The number and value of each of these crops are not surpassed by any other state. Asparagus, the older vegetable crop, and China capsicums, were surpassed in 1908 by tomatoes, for which the acreage in 1898 was as follows: horses, 102,000 ($11,526,000); mules, 5,000 ($765,000); milk cows, 190,000 ($8,170,000); other next cattle, 38,000 ($558,000); sheep and lambs, 1,254,000 ($1,555,000). In 1899, 5,959 farms were classified as dairy farms, i.e. they derived at least 40% of their income from dairy products; and the total value of dairy products was $8,456,566, the larger portion of which was from the sale of milk, butter and cheese at $6,110,000. Poultry raising also is an important agricultural industry: poultry in the state was valued at $1,300,853 on the 1st of June 1900; and for the 1st 9 months of 1901 the value of all poultry raised was $2,256,316, and the value of eggs $1,938,304. In the production of cereals the state has not taken high rank since the development of the wheat fields of the western states; but in 1899 the acreage in cereals was 1,432,000 acres, valued at $1,682,576, and the yield was 57-5% of that of all crops. Of the total acreage in cereals in 1907, 278,000 acres were in Indian corn; 168,000 in wheat; 78,000 in rye; and 60,000 in oats. The chief cereal-producing counties in 1900 were Burlington, Cumberland, and Warren. The acreage in the valuable fallow field crop in 1907 was hay and forage, consisting mostly of clover and cultivated grasses; in 1899 the value of this crop was $2,300,375.

Since 1830 market gardening in New Jersey has become increasingly important, especially in the vicinity of large cities, and has proved more profitable than the growing of cereals. In the total average devoted to the raising of vegetables in marketable quantities New Jersey in 1900 was surpassed by only two other states. The value of the marketable vegetables in 1899 was $1,610,658, and the value of the total vegetable crop, $3,425,596, or 30.7% of that of all crops. These vegetables are of great importance; in 1907 there were 70,000 acres in potatoes, yielding 8,400,000 bushels, valued at $6,216,000. Between 1899 and 1907 the value of the potato crop more than doubled. In 1899 the Jersey potato was also grown and the potato crop was valued at $2,594,061; of small fruits the largest crop is that of cranberries, which in 1899 was valued at $47,500, but in 1907 $89,100, and in 1908 $113,372. Other important crops are strawberries, which were cultivated on 974 acres in 1908, and the value of the strawberry crop was $3,210. Strawberries and cranberries of the Jersey type are characteristic of the state. The cranberry crop is valuable in the vicinity of the Delaware river and in the vicinity of Palmyra; and the Woodmanse, area in Ocean county. As the clay pits contain only small amounts of any one kind of clay, it has proved more profitable for manufacturers to buy their raw materials from a number of miners than for them to operate the mines themselves, and consequently clay mining and the manufacture of clay products are largely done in other states. The clay yields of New Jersey are doubtless more important than in any other state, the amount mined and sold in 1902 being a third of the entire output of the United States, and the amount in 1907 (440,130 tons) being more than one fifth of all clay produced in the United States. The clay products are: brick and tile, $6,019,834, and pottery, $6,985,626. New Jersey was uncontrolled only by Ohio and Pennsylvania, and lead and silver are also mined in the state. The manufacture of Portland cement, an industry that has attained importance since 1892, is of value in the state; it is the value of its product in 1907 ($4,715,516) New Jersey was surpassed only by Pennsylvania. In the manufacture of Portland cement, an industry that has attained importance since 1892, is of value in the state; it is the value of its product in 1907 ($4,715,516) New Jersey was surpassed only by Pennsylvania.
...section; and limestone and trap rock are important mineral resources. In 1907 the total value of stone quarried in the state was $1,532,312, of which $905,436 was the value of trap rock, $274,422 of limestone, $177,760 of sandstone, and $66,876 of granite and marble. Some roofing slate is produced in Sussex county; in 1907 the output was valued at $8000. The mining of natural fertilizers—white and greensand marl—is a long established industry; the output in 1907 was $33,795. Of mineral ores the most important are iron, zinc and copper. The manufacture of iron in New Jersey dates from 1764, when the metal was reduced from its ores at Shrewsbury, Monmouth county. This industry was largely worked up to 1870 by the three chief in Morris, Passaic, and Sussex counties, form the basis of the present industry. Bog ores were mined until about 1840; since that date they have had no market. The chief iron-mining districts are Passaic valley, where iron was being nearly 1,000,000 tons of ore in 1892, 257,235 tons in 1897; and $49,770 tons in 1907, when the output was valued at $1,815,586, and was about nine-tenths magnetite and one-tenth brown ore. The chief places of production are Hibernia (Morris county) and Mt Pleasant (Hunterdon county); in 1907 four mines in the state produced 316,236 tons. In the production of zinc New Jersey once took a prominent part; in 1907 the only producer was The New Jersey Zinc Company's mine at Franklin Furnace, Sussex county, with an output of 15,577 short tons, valued at $1,601,614. The chief deposits consist of red oxide, silicate and franklinite, and the average value of the ores is about $15 per ton. Zinc from each of the several mines was smelted, rolled into sheets and worked to a small extent in colonial days. One of the brass cannon used at Yorktown was made of copper taken from the Watchung Mountains during the War for Independence. These mountains are still a source of copper ore, and the ores of copper, lead, zinc, chalcedony and chrysocola, are also found in various parts of the Piedmont region. In the years following 1900 there was renewed interest in copper mining, and in 1907 eleven springs (three in Bergen and eight in Passaic county, in Morris, Camden and Somers county) reported to the U.S. Geological Survey the sale of 682,445 gallons (mostly table water), valued at $6,334. Other minerals, which are not found in commercial quantities, are lead in the form of galena, in Sussex county; graphite, in the crystalline schistose rocks of the Highlands; molybdenum, in the form of a sulphide, in Sussex county; and barytes in Monmouth and Sussex counties. In Bergen, Warren, and Morris counties there are numerous bogs containing peat of a good quality.

Manufactures.—After 1890 New Jersey made rapid progress in manufacturing. In 1900 factories and manufactory of New Jersey, 7.7 % of the population were employed as wage-earners in manufacturing establishments; in 1900, 12.8 %. The value of the product in 1890 was $305,821,256; in 1900, $354,573,571; in 1900, $611,748,033. Such figures of the census of 1900 are as comparable with those of the special census of 1905, when the only establishments under the factory system were enumerated, show that between 1900 and 1905 the number of factories increased 9.3 %, the capital, 49.5 %, the labor engaged, 9.0 %, and the value of products (in 1900 to $774,390,092). This rapid development is due to the excellent transportation facilities, and to the proximity of large markets and of raw materials. Among the mining districts were those (in Chester and Salem counties) for the production of coal and iron of Pennsylvania. The chief manufacturing centres in 1905, as judged by the value of their products, were Newark ($160,045,377), Jersey City ($75,760,593), Bayonne ($50,633,761), Paterson ($49,138,200), Elizabeth ($40,046,575), and Trenton ($32,719,945). In 1905, 67.1 % of the factories were in municipalities having a population of at least 8000 in 1900, and their product was 74.1 % in value of the total. There are indications, however, that industries are slowly shifting to the smaller towns. The textile industries taken together are the most important of the manufacturing industries, having a greater output in 1900, $81,910,850; in 1905, $96,040,034), employing more labourers and capital, and paying more wages than any other group. Among the various textiles silk takes the first place, the value of the factory products increasing from $66,666,021 to $101,043,496, and the value of the silk output from $31,161,433 in 1900 to $62,804,602 in 1905. The chief silk manufacturing centres in 1905, as judged by the value of their products, were Elizabeth ($50,666,500), Paterson ($49,138,200), Jersey City ($75,760,593). In 1900 the value of the silk output was 48.8 % of the total value of the textiles, and silk manufacturing was more important than any other industry (textile or not); in 1905, however, owing to the great production of cotton goods, silk occupied only 33.6 % of the value of the silk goods manufactured in 1907, of which 51 % was worth $11,979,947, being 23.3 % of the total for the country) and in 1908 (value, $15,692,167, being 23.6 % of the total for the country). The greatest gain made by any of the textiles. In this industry New Jersey was manufactured only by Massachusetts, Rhode Island and Pennsylvania. During this five-year period there was an increase of 113.5 % in the value of the cotton goods manufactured in New Jersey; of 12.6 % (from $3,441,516 to $3,441,516) in that of linen goods; of 43.3 % (from $7,482,148 to $10,450,178) in that of hosiery and knit goods, and of 14.8 % (from $1,795,157 to $2,077,140) in that of ready made wearing and bedding. Silk goods increased from $1,537,689 in 1901 to $2,441,516 in 1905. The manufacture of cotton goods is carried on in Trenton, Somers county; Paterson is the centre of this industry in New Jersey.

In the manufacture of clay products, including brick, tile, terra cotta, and fire-clay products, the value of the pottery product, terra cotta and fire-clay products increased from $8,482,723 in 1900 to $11,717,103 in 1905; in 1905 the most valuable pottery product was sanitary ware, valued at $5,006,406; and in that year New Jersey furnis...
important artificial waterway. Its main channel (opened for traffic in 1838) extends from Bordentown, Burlington county, on the Delaware to New Brunswick, on the Raritan, 44 m. by the canal; 35 m. by the Delaware River; 50 m. by the Passaic; 100 m. by the Raritan. The canal cuts across the state, discharging it into the Raritan at New Brunswick. It is 40 ft. wide, at the bottom, 80 ft. at the top and 9 ft. deep; it has a navigable feeder (30 ft. wide at the bottom and 60 ft. long) in the Delaware trench for 30 m. from the Delaware at Bull’s Head to Trenton. The canal passes through Trenton (the highest point—50 ft. above mean tide), and Griggstown, Westen and Boughton Brook, and has one lock (or more) at each of these places. It is used chiefly for the transportation of Pennsylvania coal to New York, and is controlled by the Pennsylvania railway. The total cost up to 1896 was $513,749, including $227,017 for the canals proper, $24,760 for the feeder, 30 ft. wide at the bottom and 5 ft. deep, and (excluding 4 m. of feeders) 102-38 m. long, beginning at Jersey City and passing through Newark, Bloomfield, Paterson, Little Falls, Boonton, Kinnelon, Dover, Fort Oran, Lake Hopatcong, Hackentor, and Washington to Phillipsburg on the Delaware; it is practically in two sections, one east and the other west of Lake Hopatcong (Sussex and Morris counties; about 928 ft. above sea-level; 9 m. long from N.E. to S.W.; maximum width, 1 m.), which is a reservoir and feeder for the canal’s eastern and western branches, and which was enlarged considerably when the canal was built. There is another feeder, the Pompton (a 30-ft. m. long) which crosses the Passaic and Pompton rivers on aqueducts. The canal (the Morris Canal Banking Company) was leased in April 1871 to the Lehigh Valley Railroad Company for 999 years. It is no longer used independently. The Morris Canal connects with an important coal carrying canal (lying almost entirely in Pennsylvania), the property of the Lehigh Coal and Navigation Company, 100 ft. wide, 60 ft. deep, extending the 42 m., and which follows the Lehigh river toCoalport (Carbon county, Pennsylvania), penetrating the coal regions of Pennsylvania. 

Population.—The population of the state in 1880 was 1,131,116; in 1890, 1,444,933; in 1900, 1,883,660 (431,884 foreign-born, and 69,844 negroes); in 1905 (census) 2,144,134; in 1910, 2,510,145. Of the native-born white population in 1900, 594,004 were of foreign parentage, and 825,973 were of native parentage.

Among the various elements comprising the foreign-born population were 119,508 Germans; 94,844 Irish; 45,428 English; 41,865 Italians; 10,745 Russians; 14,013 Hungarians; 14,728 Austrians; 14,372 Poles; 14,211 Scotch; and 10,261 Dutch.

In 1800 barely 2% of the population was urban; in 1900 80% of the inhabitants either lived in cities or were in daily communication with Philadelphia or New York. The rural population is practically stationary. The chief cities in 1910 were New York, 3,447,982; Jersey City, 313,947; Trenton (96,815), Camden (94,538) and Hoboken (79,324). Owing to its milder climate and its larger number of cities New Jersey has a negro population somewhat larger than that of the states of the same latitude farther west. The rate of increase of this element, which is greatest in the cities, is about the same as that for the white inhabitants. Since 1881 colonies of Hebrews have been established in the southern part of the state, among them being Alliance (1881), Rosenhyn (1882), Carmel (1883), and, most noted of all, Woodbine, which owes its origin to the liberalism of Baron de Hirsch, and contains the Baron de Hirsch Agricultural and Industrial School. As regards church affiliation, in 1906 Roman Catholics were the most numerous, with 444,432 members out of a total of 877,548 communicants of all denominations; there were 122,511 Methodists, 79,612 Presbyterians, 65,248 Baptists, 53,921 Protestant Episcopalians, 32,290 members of the Reformed (Dutch) Church in America, and 24,147 Lutherans.

The Morris Canal & Banking Company was chartered in 1831 to build the Morris Canal, which never proved a financial success, partly because of the competition of the Delaware Raritan, which soon commanded the coal trade, and partly because of physical and mechanical defects. It was exempted from all taxation by the state for seventy years. The cost of the canal was $2,474,132; the company was not authorized to issue stocks or bonds; the company was not allowed to make a fair price, in 1833, without making any payment, to succeed to the actual ownership in 1873 upon the expiration of the charter. The idea of utilizing the Mississippi, through the Gulf of Mexico, failed of materialization, the company was defunct. A peculiar feature of the canal was a system of inclined planes or railways on which there were cradles, carrying the canal boat up (or down) the incline; these were devised by Pro- fessor John Winterbotham. Length of the canal, 75 m. in the eastern division raised boats altogether about 720 ft., and 11 of them in the western division lowered the boats about 690 ft.—the remainder of the grade was overcome by locks.

1 The Pennsylvania railway has constructed tunnels under the Hudson river, and has erected a large terminal station on Manhattan Island.

2 In William Winterbotham’s An Historical, Geographical, Commercial and Philosophical View of the American United States, &c. (London, 1795) there was a discussion of the feasibility of a canal between the Delaware and the Raritan. In 1804 a company was chartered to build such a canal; in 1816 a route was surveyed; in 1819 a company was appointed which recommended a route and suggested that the state take part in building the canal; in December 1826 a canal company was incorporated with a monopoly of the Delaware river, a grant of 300,000 acres in Pennsylvania; the company was authorized, but Pennsylvania refused permission to use the waters of the Delaware, and the charter lapsed; in 1830 the Delaware and Raritan Canal Company was incorporated by an act which foreclosed the right of the company to the 300,000 acres of land, and which provided that the canal be a 40-ft. m. wide, and that the company should pay the state 500,000 m. for the use of the Delaware and the Raritan, and which reserved to the state the right to take the waterway 30 years (changed in 1831 to 50 years); and in 1831 the canal was completed. In 1831 it was opened for traffic, and contributed greatly to its financial success. In 1831 it was combined with the Camden & Amboy railway.
Administration.—The state is governed under the constitution of 1844, with subsequent amendments of 1875 and of 1897. The only other constitution under which the state has been governed was that of 1776 (see History below). The right of suffrage is conferred upon all men, twenty-one years of age and over, who have resided in the state for one year and in the county for five months preceding the election.1 Paupers, idiots, insane persons and persons who are convicted of crimes which exclude them from being witnesses and who have not been pardoned and restored to civil rights, are not eligible. The executive power is vested in a governor, who is elected for a term of three years and may not serve two successive terms, though he may be re-elected after he has been out of office for a full term. He must be at least thirty years of age, and must have been a citizen of the United States for at least twenty years, and a resident of the state seven years next preceding his election. He may not be elected by the legislature, during the term for which he is elected as governor, to any office under the state or the United States governments. He receives a salary of $10,000 a year. If the governor die, resign or remove himself from office during the term for which he is elected, the secretary of the Senate, who serves until another governor is elected and qualified. The governor's powers under the constitution of 1776 were greatly limited by the constitution of 1844. His appointive power is unusually large. With the advice and consent of the state Senate he selects the secretary of state, attorney-general, superintendent of public instruction, chancellor, chief justice, judges of the supreme, circuit, inferior and district courts, and the so-called "lay" judges of the court of errors and appeals, in addition to the minor administrative officers who are usually appointive in all American states. The governor may make no appointments in the last week of his term. The state treasurer, comptroller and the commissioners of deeds are appointed by the two houses of the legislature in joint session. The governor is ex officio a member of the court of pardons, and his affirmative vote is necessary in all cases of pardon or commutation of sentence (see below).

The legislative department consists of a Senate and a General Assembly. In the Senate each of the 21 counties has one representative, chosen for a term of three years, and about one-third of the membership is chosen each year.1 The members of the General Assembly are elected annually, are limited to sixty (the actual number in 1900), and are apportioned among the counties according to population, with the important proviso, however, that every county shall have at least one member.

The arrangement of senatorial representation is very unequal; and the densely populated counties are under-represented. The members of the house of assembly must be at least twenty years old, and must have been a citizen and inhabitant of the state for four years and of his county for one year immediately preceding his election; and an assemblyman must at the time of his election be at least twenty-one years old, and must have been a citizen and inhabitant of the state for two years, and of his county for one year, immediately preceding his election. The annual salary of each senator and of each member of the General Assembly is $100. Money bills originate in the lower house, but the Senate may propose amendments. The legislature may not create any debt or liability "which shall, single or in aggregate with any previous debt, involve the liabilities, at any time except $600,000," except for purposes of war, to repel invasion or to suppress insurrection, without specifying distinctly the purpose or object, providing for the payment of interest, and limiting the liability to thirty-five years; and the measure as thus passed must be ratified by popular vote.

The constitution as amended in 1875 forbids the legislature to pass any private or special laws regulating the affairs of towns or counties, or to grant any money, funds or property to any corporation, priest, religious or ministerial societies, and prescribe in imposing taxes the assessment of taxable property shall be according to general laws and by uniform rules, and levied only to support and maintain the public schools. The constitution also prohibits the amendment prohibiting the legalization of lotteries, of pool-selling or of other forms of gambling. The governor may (since 1875) veto any item in any appropriation bill, but any bill (or item) may be passed over his veto by bare majorities of (all members elected) in both houses, and to this vote there shall be added no more than one vote of (all members elected to each house), and then be ratified by the voters at a special election, and no amendment or amendments may be submitted by the legislature to the people oftener than once in five years.

The judicial system is complex and is an interesting development from the English system of the 18th century. At its head is a court of errors and appeals composed of the chancellor, the justices of the supreme court and six additional "lay" judges. The supreme court consists of a chief justice and eight associate justices, but it may be held by the chief justice alone or by any one of the associate justices. The state is divided into nine judicial districts, and each supreme court holds circuit courts within each county of a judicial district, besides being associated with the president "judge of the court of common pleas of the county in holding the court of quarter sessions, the court of oyer and terminer and the orphans' court. One of five additional judges may hold a circuit court in the absence of a justice of the supreme court, or the "president" judge of a court of common pleas may do so if the supreme court justice requests it. In each township there are from two to five justices of the peace, any one of whom may preside over the "small cause court," which has jurisdiction of cases in which the matter in dispute does not exceed $200 and is not an action of replevin, one in which the charge is slander, trespass, trespass assualt and battery, or imprisonment, or in which the title to real estate is in question.

The court of common pleas, which may be held either by the "president" judge or by a justice of the supreme court, may hear appeals from the "small cause court," and has original jurisdiction in all matters, except those arising out of divorce or annulment proceedings, or proceedings for the recovery of debts or money or profits, and proceedings for the appointment of guardians, and for the administration of property, and proceedings for the guardianship and administration of the affairs of insane persons.

The court of common pleas, which may be held either by the judge of the court of common pleas or by a justice of the supreme court, has jurisdiction over all criminal cases except those of treason or murder. The court of oyer and terminer is a higher criminal court, and has cognizance of all crimes and offences whatever. Except in counties having a population of 300,000 or more, a justice of the supreme court must preside over it, and the judge of the court of common pleas may or may not sit with him; in a county having a population of 50,000 or more the judge of the court of common pleas may sit alone. Writs of error in cases punished in the court of common pleas may be obtained by either defendant or plaintiff. Appeals in error may be had from the court of appeals in either of the courts named, or from either of those courts to the supreme court. Appeals are permitted in criminal cases. The orphans' court may be held either by the judge of the court of common pleas or by a justice of the supreme court; and it has jurisdiction over matters arising out of divorces, and proceedings for the appointment of guardians, and proceedings for the determination of the nature, quality and extent of the property of insane persons;

Brevity in argument and the absence of technicalities are characteristic of the New Jersey court of nisi prius, but the language of the law is precise and the rules of evidence are strictly adhered to.

1 The constitution of 1844 limited the suffrage to white males, and although this limitation was annulled by the fifteenth amendment to the Federal Constitution, it was not until 1875 that the state was entirely freed from it. (Adopted in 1897.) (Adopted in 1897.) The word "white" from its suffrage clause. At the same time another amendment was adopted providing that sailors and soldiers in the service of the United States in time of war might vote although absent from their election districts.
than 5000 inhabitants may be incorporated as a town, with its government vested in a mayor and council. Any township or part thereof with less than 4 sq. m. of territory, and less than 5000 inhabitants, may be incorporated as a borough, with its government vested in a mayor and council.

In 1903 a law (revised in 1908) was passed providing for the conduct at public cost of primary elections for the nomination of new town school board candidates and for the nomination of party nominating conventions; nominations for primary elections are made by petitions signed by at least ten voters (except in very small election districts) who make affidavit as to their party affiliation and will file a letter of endorsement. Under this act a "political party" is one which polled at least one-twentieth of the total number of votes cast in the next preceding election at the time the petition is made; there must be one delegate from each election district, and one delegate for each 200 votes cast by the party in the next preceding gubernatorial election.

An act approved on the 12th of April 1908 authorized a Civil Service Commission of four members appointed by the governor, who choose a chief examiner and a secretary of the commission. Civil service rules adopted by this commission went into effect in the same year for certain state employees. In 1919 that part of the law permitting municipalities to adopt these rules through their governing bodies was declared unconstitutional; but municipalities may adopt them by vote.

A state Board of Railroad Commissioners (three appointed by the governor), created in 1907, became in 1910 a Board of Public Utility Commissioners with jurisdiction over all public utilities (including electric, telegraph, telephone, and banking) for the issue of stock or bonds, but it has no power to fix rates.

The state acts concurrently with New York in preserving the natural scenery of the Palisades on the Hudson river; and in 1908 the Palisades Interstate Park, with a width of 13 m. on the Hudson, from Fort Lee to Piermont, was dedicated.

The homestead exempt from sale under seizure is limited to the house and lot, not exceeding $1000 in value, of a debtor having a family. To entitle the property to exemption, it must be registered as a homestead in the office of the county clerk, and it may be sold, then, only with the consent of the husband and wife, and the proceeds must be used to remove a debt or to purchase the purchase of another homestead. The exemption does not extend to a sale for unpaid taxes, for labour done on the homestead, materials furnished therefor, or for a debt incurred in the purchase thereof, or prior to the recording of the notice. The exemption inures to the benefit of the widow and family of the holder of the homestead under the laws in force, and the age of the homestead before the age of 18.

The homestead is by electrocution. A law of 1902 provides the death penalty for any murderous assault on the president of the United States, the chief executive of any state, or the heir to any foreign throne.

The ground in an absolute divorce are only: adultery and "willful, obstinate refusal to live with a spouse in accordance to their mutual consent". The grounds in a divorce or annulment are the same: that the continuance of a marriage is a cause of action arose and has continued to reside there, no suit for a divorce can be begun until one of the parties shall have resided in the state for the two years next preceding. Furthermore, the cause of action must be recognized in the jurisdiction in which the petitioner resided at the time it arose.

No child less than fourteen years old is permitted to work in any factory, workshop or mill; and the penalty for each offence is $50.

The employment of children under sixteen years of age in any mercantile establishment for more than 10 hours a day, or 55 hours a week, or between 6 o'clock in the evening and 6 o'clock in the morning, is prohibited, except one evening each week when 8 hours may be permitted to work until 9 o'clock, and except in the evenings from the 15th to the 25th of December when they may be permitted to work until 10 o'clock. There are strict provisions for the protection and welfare of farm children, apprentices, and in sweat-shops.

A state law (1899) requires the payment of wages in lawful money at least every two weeks to its employees on the part of every firm, association or partnership doing business in the state.

Education: During the colonial period there were schools maintained by churches, a few town schools of the New England type, and, in the latter part of the era, a number of private schools. But the schools of colonial New Jersey, especially the private schools, were usually taught by incompetent masters, and many children were permitted to grow up without any schooling whatever. Public interest in education, however, began to awaken soon after the close of the War of Independence. Under the encouragement of an act of the legislature passed in 1794 several academies were established. A public school fund was established in 1817. Three years later townships were authorized to levy taxes for maintaining schools for poor children.

The division of townships into school districts and the election of three trustees were provided for in 1829. In 1846 each township was required to raise as much money for school purposes as the state contributed. In 1855 a normal school for training teachers was established at Trenton. And in 1867 a school law was passed which established the main features of the present school system, although it was four years later before a state school tax was imposed and schools were made free to all children in the state. The public school system is administered under the direction of a superintendent of public instruction selected by the board of education.

Controversies arise under the school law, and exercises a general supervision over the public schools; the latter has the control of a number of special state educational institutions, appoints the county superintendents and supervises the execution of the school laws of the state. In general each city, town and township in the state constitutes a separate school district, although two or more of these may unite to form a single district. Each district is required to furnish free textbooks. All children between the ages of 7 and 13 are required to attend school for the full school year. Those whose parents or guardians fail to cause the grammar school course to continue are subject to fines.

Funds for the support of the public schools are derived from various sources: the state aid (except surplus revenue ($795,670), deposited with New Jersey by the Federal government in 1836; (2) the income from the state school fund, consisting largely of receipts from the sale and rental of riparian lands; (3) a state tax on real property; (4) a special tax; (5) the state law to supplement the school tax, so that the two combined will form a sum equal to a tax of two and three-fourths mills on each dollar of taxable property; and (6) local taxes. At the close of the fiscal year 1899-1900 the tuition in the public schools was $29,418,322. The income for the year was $224,233,56 and the disbursements were $373,095,76. The income from the state school fund is divided among the counties on the basis of the total number of days of attendance of the public school pupils; the legislative appropriation, however, is apportioned among the counties according to their assessed property values. Each county also received 90% of the state school tax it has paid, the remaining forming a reserve fund to be distributed among the counties at the discretion of the state board. The state will duplicate any yearly sum between $2500 and $5000 which a school district may raise to maintain a school or purchase apparatus; and a school district or a county may purchase for $20 for a library will receive the same amount from the state, which will also contribute $10 each year thereafter for maintenance, and the state legislature will increase the amount to $50. The state in the public schools in 1908 was 10,279; the total school enrollment was 402,866, with an average daily attendance of 288,176; and the average length of the school term was nine months and two days. For the benefit of veteran and invalid public school teachers there is "a retirement fund," which owes its origin to voluntary contributions by teachers in active service. The state has taken official recognition of this fund and administers it on behalf of the contributors through a board of trustees appointed by the governor.

In addition to the regular public schools, the state maintains a normal and a model school at Trenton, a normal school at Montclair, the State Normal School at East Orange, Girls' High School, the Training and Industrial School for Colored Youth at Bordentown, and an agricultural college and experiment station, maintained in connection with Rutgers College, at New Brunswick. There are preparatory schools in Newark, Hoboken, and Trenton, which the state made an appropriation of $20,000 in 1908. Among the prominent institutions not receiving state aid are Princeton University, Rutgers College (excluding its agricultural school); New Brunswick State Teachers College; New Brunswick State University; Stevens Institute of Technology, at Hoboken. Among the denominational institutions are the Theological Seminary (Presbyterian) at Princeton; the Drew Theological Seminary; Union Theological Seminary and Hall College (Roman Catholic), at South Orange; St Peter's College (Roman Catholic) at Jersey City; St Benedict's College (Roman Catholic) at Newark; the German Theological School of Newark

The state's title to its riparian lands was established, after a long controversy, in 1887 by the Supreme Court of New York and Newark R. R. Co. (5 Vroom's Reports 532). Since that date, with the exception of the period of Governor Abbott's second administration (1890-1893), the proceeds from the sale and rental of these lands have been regularly applied to the school fund.
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(Presbyterian) at Bloomfield; and the Theological Seminary of the (Dutch) Reformed Church in America, at New Brunswick. There are many private academies and secondary schools, sectarian and non-sectarian.

The state supports the following charitable and correctional institutions all under the supervision of the State Department of Charities and Correction (1903); hospitals for the insane at Trenton and Morristown, a penal and reformatory prison at Trenton (partly supported by the state) and a home for feeble-minded women at Vineland; a sanatorium for tuberculous diseases at Glen Gardner; a village for epileptics, with a farm of 700 acres, near Skillman, Somerset county, on land purchased by John (now owned by the state) Jamesburg, Middlesex county, and for girls in Ewing township, near Trenton; a state reformatory for criminals sixteen to thirty years of age, at Somerville, near Trenton; a home for disabled soldiers at Kearney; Hudson county; a home for disabled soldiers, sailors and their wives at Vineland; and a school for the deaf at Trenton. There is no institution for the blind, but the state pays the expenses of blind children who are sent to New Jersey or the New York State School for the Blind. A State Board of Children's Guardians, with an office in Jersey City, cares for destitute children. A convict parole law went into operation in 1891.

Finance.—The revenues for state and for local purposes are derived from separate sources. The expenses of the state government are met chiefly by special taxes on railway and canal corporations; taxes on railroad corporations; a collateral inheritance tax and taxes of riparian lands. The counties and municipalities derive their revenues chiefly from taxes on real and personal property. Real and personal property is free from a state tax, except for school purposes. The school tax is apportioned among the counties in proportion to their taxable property.

A large part of the state's revenue comes from the tax on railways and canals, which is levied on the property actually employed in their operation. Any property of railways other than the "main stem" (i.e. the road-bed with the rails and sleepers not over 100 ft. in width), is that employed in operating the road or canal is taxed by the state for local purposes. Counties and municipalities may tax the property which they are authorized to tax by law. There are also railroad taxes actually used for railway purposes. Domestic telegraph, telephone, express, cable, parlour- and sleeping-car, gas- and electric-lighting, oil and pipe line companies, and several classes of insurance companies, are taxed on the amount of their gross receipts. Other domestic corporations are taxed on the amount of their capital stock. The rate of this tax decreases as the amount of capital stock increases, thus favouring large corporations. On all capital stock up to $3,000,000, the rate is one-tenth of 1%; on all amounts between three and five million dollars, the rate is one-twentieth of 1%; and on all above five million dollars, thirty dollars per million, or 1% on $1,000,000.

The inheritance tax is levied on all bequests in excess of $500 to persons other than specially exempted classes; and in 1907 the receipts from the "collateral inheritance tax" were $214,486. County and municipal revenue are derived from the state on account of property and personal property belonging to railroads and other corporations, which devote the proceeds to roads and schools. The fees received for issuing charters to corporations are another source of revenue.

The corporations policy of New Jersey has always been liberal; there is no limit fixed either to capitalization or to bonded indebtedness; the tax rate, as already indicated, is lower for large than for small corporations; and so many large combinations of capital have been incorporated under the laws of the state that it is sometimes called "the home of the trusts. For the fiscal year 1907 the fees collected from corporations by the secretary of state amounted to $204,454, the receipts from the tax on corporations other than railways amounted to $2,584,363-60, and the receipts from the tax on railway corporations were $807,780. It is the revenue from these sources that has enabled New Jersey to hold her position as the wealthy state of the Union, and to carry on the necessary public service a very large part of the expenses of the state, and a large part of the expenses of localities for the support of railroads, (tyrant taxes, pending litigation). In the state fund, the total

1 Also receives Federal aid.
2 Idem.
3 Idem. 4 In 1907 six depot buildings were included as part of the "main stem" until 1906, when their exclusion gave considerable added revenue to the municipalities.

The tax on railway corporations collected by the state for local purposes, and paid over to the local governments in 1907 amounted to $591,704.

5 The only state debt is state certificates for $116,000 issued to the commissioners of the Agricultural College.

Receipts for the year were $4,602,100, and the total disbursements, $5,366,813.

History.—Bones and implements have been found in the Quaternary gravels at Trenton, which have been held by some authorities to prove the presence of Palaeolithic man; but the earliest inhabitants of New Jersey of whom there is any certain record were the Leni-Lennapé or Delaware Indians, a branch of the Algonquian family. They were most numerous in the southern and central portions of the state, preferring the river valleys; but their total number, perhaps, never exceeded a thousand. They were conquered by the whites, and in the few wars that occurred between the Indians and the English, their only weapons were clubs, and they seldom any manifestations of acute hostility, though each race feared and distrusted the other. Many Indians were enslaved, and intermarriage between them and negro slaves became common. During the 18th century the Indian title to the soil was rapidly extinguished, and at the same time the vices and diseases of the stronger race were gradually reducing their numbers. In 1758 an Indian reservation, said to have been the first established within the present limits of the United States, was established at Edgepelick, or Brotherton (now called Indian Mills), and a reservation of 1,000 acres was granted to these Indians in 1809. In the following year Eustace Gomez, a Portuguese sailor in the service of the emperor Charles V., in his reputed voyage southward from Labrador, is said to have made note of the Hudson and Delaware rivers. It is very probable, also, that French traders soon afterward penetrated the region along the lower Hudson. Voyages to this region for exploration, trade and settlement, however, may be said to have really begun with the year 1609, when Henry Hudson explored the region between Sandy Hook and Raritan Bay and sailed up the river which now bears his name. After this voyage came Dutch traders who established themselves on Manhattan Island and soon spread across the Hudson river into what are now Hudson and Bergen counties. In 1614 Cornelis Jacobsen Mey explored the lower Delaware, and two years later Cornelis Hendrickseon more thoroughly explored this stream. In 1623 the first party of permanent home-seekers arrived at New Amsterdam, and a portion of these formed a settlement on the eastern bank of the Delaware and built Fort Nassau near the site of the present Gloucester City. In 1631 Samuel Godyn and Samuel Blommaert secured a patent from Peter Minuit, the director of New Netherland, authorizing them to plant a settlement near Cape May, but it was soon abandoned. A trading hut built at Paulus Hook in 1633 was the beginning of the present Jersey City. On the western bank of the Hudson the trading post of Hobocan-hackings, on the site of the present city of Hoboken, was established at an early date. From these places and from New Amsterdam the Dutch spread into the Raritan Valley. During the rule of Governor William Kieft, the Indians, disturbed by the encroachments of the settlers, assumed a hostile attitude.

The actual occasion of the Indian outbreak was the massacre of a number of Tappan Indians in 1643 by soldiers acting under Kieft's orders. From the Connecticut to the Delaware Indians rose in arms, laid waste the farms, massacred the settlers and compelled those who escaped to take refuge on Manhattan Island. The Dutch engaged the services of about fifty Englishmen under Captain John Underhill, a hero of the Pequot War, and in 1644 the Indians were defeated in several engagements, but a general peace with them was not established until the 30th of August 1645.

In the meantime colonists of another nationality had set foot on the shores of the lower Delaware. To found a colony
the new world was long the desire of Gustavus Adolphus of Sweden, but incessant European wars prevented the establishment of any settlement until after his death. In 1638 fifty colonists landed on the western bank of the Delaware and built Fort Christina on the site of the modern Wilmington. Five years later, on the eastern bank a triangular fort, called Elsaborgh, was constructed near the present Salem. But the Swedish rule was short-lived, as in 1655 the settlements surrendered to Peter Stuyvesant and passed under the control of the Dutch. Upon the surrender of the region between New Jersey and Holland and Sweden at colonization had very little influence. The Dutch and Swedes between the Delaware and the Hudson were mostly traders, and therefore did not make many permanent settlements or establish forms of government.

By the English of New England and Virginia the Dutch and Swedes were regarded as intruders, and were repeatedly warned against trespassing on English soil.1 As early as 1634 a patent had been issued to Sir Edmund Powden, appointing him governor over New Albion, a tract of land including the present states of New Jersey, Delaware, Maryland and Pennsylvania. In spite of repeated efforts by Sir Edmund and his adherents to plant a colony, it failed. In 1634 a party of English from Virginia, having ascended the Delaware and occupied Fort Nassau, which the Dutch had abandoned, were promptly captured by the Dutch, taken to New Amsterdam, and thence sent home, arriving just in time to prevent the departure of a second English expedition up the Delaware. In 1641 English colonists from New Haven migrated southward and planted a settlement on the eastern bank of the Delaware river, declaring it to be a part of the New Haven jurisdiction. In the following year Governor Kieft, the successor of the Swedes, arrested the English and sent them back to New Haven.

Many years elapsed before an English sovereign made any effort to oust the Dutch from the dominions he claimed by virtue of the discovery of the Cabots. On the 13th of March 1664 Charles II. bestowed upon his brother James, duke of York, all the lands between the Connecticut river and the eastern side of Delaware Bay, as well as all the islands between Cape Cod and the Hudson river. An expedition was sent from England in May, under the command of Richard Nicolls, and in the following August the English flag floated over New Amsterdam. In October Sir Robert Carr took possession of the settlements on the Delaware, and terminated the rule of the Dutch. The few inhabitants of what is now New Jersey acquiesced in the new order. While the expedition commanded by Nicolls was still at sea, the duke of York, by deeds of lease and release, transferred to Lord John Berkeley, baron of Stratton, and Sir George Carteret (q.v.), all that part of his new possessions extending eastward from the Delaware Bay and river to the Atlantic Ocean and the Hudson river, and northward from Cape May to a line drawn from the northernmost branch of the Delaware, "which is 42° 40' lat.," to the Hudson river in 41° N. lat. To this tract the name of New Caesarea, or New Jersey, was given, as the same name had been given in a patent to Carteret issued in 1659, to "a certain island and adjacent islets" near Virginia, in America, which were never settled—in honour of Carteret, who governed the isle of Jersey in 1643-1651 and there entertained Prince Charles during his exile from England. The

1 As early as 1613, Captain Samuel Argall, on his way to Virginia, after breaking up some Jesuit settlements at Port Royal, and Mount Desert, passed through the Narrows near the mouth of the Hudson, and finding a group of Dutch traders, made them haul down their flag and replace it with that of England. In the spring of 1620 Thomas Dermer, an English ship captain, on his way from Monhegan to England, visited Manhattan island, and told the Dutch traders that they would not be allowed to remain. In 1627 Governor William Bradford of Plymouth protested by letter to the Dutch against their occupancy, and this warning from the Pilgrims was repeated at least twice.

2 As late as 1784, Charles Varlo, an Englishman who had purchased one-third of the grant from the heirs of Sir Edmund Powden, came to New Jersey and sought to substantiate his claim. Failing in a suit in chancery to obtain redress, he returned to England, and nothing further was heard of the claimants to New Albion.

grant conferred upon Berkeley and Carteret all the territorial rights which the royal charter had conferred upon the duke of York; but whether or not the rights of government went with these soon became a vexed question. In order to attract immigrants, the proprietors in February 1665 published their "Concessions and Agreement," by which they made provision for a governor, a governor's council, and an assembly chosen by the freemen and having the power to levy taxes. Special inducements in the way of land grants were offered to persons embarking for America, and by a separate act, William of Orange, or the governor of New York, ignorant of the grant to Berkeley and Carteret, had approved certain Indian sales of land to settlers within New Jersey, and had confirmed their titles to tracts in what later became Elizabethtown, Middletown and Shrewsbury. In this way he unconsciously opened the way for future trouble. Moreover, when he had learned that the duke had parted with New Jersey he convinced him that it was a great loss, and in the effort to save what was possible, Staten Island was taken from the proprietors on the plea that one arm of the Hudson flowed along its eastern border.

In August 1665 Philip Carteret, a relative of Sir George, arrived in the province as its first governor. In May 1668 he convoked the first assembly at Elizabethtown. At the next session, in the following November, the towns of Shrewsbury and Middletown declared that they held their grants from Governor Nicolls, and that they were consequently exempt from any quit-rents the proprietors might claim. They refused to pay their share of the public expenses; and their deputies, on refusing to take the oath of allegiance and fidelity, were expelled from the assembly. The dissolution soon spread and led to the so-called "disorganizing" assembly in 1672, which went so far as to make James Carteret, a landgrave of Carolina and presumably a natural son of Sir George, as "President." Philip Carteret returned to England and laid the case before the proprietors; they ordered President Carteret to continue on his way to Carolina and confirmed as governor John Berry, whom Governor Carteret had left behind as deputy. The duke of York declared that the grants made by Nicolls were null and void; the king enjoined obedience to the proprietors, and quiet was restored. Another change was impending, however, and in August 1673, when a Dutch fleet appeared off Staten Island, New Jersey for a second time became a part of New Netherland. The settled region was called "Achter Koll," or "Back Bay," after Newark Bay, whose waters, lying behind the bay of New York, had to be crossed in order to reach Elizabethtown. The period of Dutch rule was short, and by the treaty of Westminster, of the 9th of February 1674, the territory was restored to England. The crown lawyers decided that the rights of the proprietors of New York and New Jersey had been extinguished by the conquest, and that by treaty the lands had been reconveyed, not to the proprietors, but to the king. On the 13th of June 1674 Charles II. accordingly wrote a letter confirming the title and power of James Carteret in the eastern half of New Jersey. No similar grant was made to Berkeley, as on the 18th of March he had sold his interest in the province to John Fenwicke, sometime major in the Parliamentary army and later a member of the Society of Friends, and Edward Bllingy, (d. 1677), a Quaker merchant. On the 29th of June the duke of York received a new patent similar to that of 1664, and he at once (on the 28th and 29th of July) confirmed Carteret in all his rights in that portion of New Jersey N. of a line drawn from Barnegat Creek to "Rankokus Kill," the name a little to the west of the site of the present Paramus, which was considerably more than one-half of the province. The duke of York commissioned Sir Edmund Andros as governor of his dominions, including "all ye land from ye West side of Connecticutt River to ye East side of Delaware Bay." Sir George Carteret again sent over his kinsman Philip Carteret to be governor of the eastern part of New Jersey, and the two governors arrived in October 1674 in the same ship. A disagreement arose as to the extent of the grant, and as the season was ending, they agreed to meet the following summer. They did meet, and in May 1675, after transacting many matters, they agreed that the eastern line of their boundary should be the river Delaware, and concluded the following agreement and truce.

2 It has been supposed that Fenwicke and Bllingy intended to establish in America a retreat for those who desired religious and political freedom.
the respective interests of Fenwicke and Byllynge in the western portion of the province, and they chose William Penn, a new member of the Society of Friends, as arbitrator. To Byllynge Penn awarded nine-tenths of the territory and to Fenwicke one-tenth. Financial embarrassment a short time afterward caused Byllynge to assign his shares in trust for his creditors to three Quakers, William Penn, Gawen Lawrie and Nicholas Lucas. Later they acquired control of Fenwicke's share also. In 1675 Fenwicke with his family and a company of settlers reached the Delaware in the ship "Griffith" from London, and on the eastern side of the Delaware they formed the settlement of Salem, the first of the Jerseys. This was the first permanent English settlement in this part of New Jersey. Refusing to recognize Fenwicke's jurisdiction, Governor Andros of New York attempted to secure his peaceful recognition of the duke's authority, and, failing in this, he sent a military force into this district in December 1676 and made Fenwicke a prisoner. In January, however, he was released on his promise not to act in a public capacity until he should receive further authority. Meanwhile the trustees of Byllynge were seeking a division of the province more to their advantage. At this time John Lawrie, chosen by the trustees of the Jersey, surrendered his grant of July 1674, the so-called "quintipartite deed" was executed on the 9th of July 1676. This instrument defined the interests of Carteret, Penn, Lawrie, Lucas and Byllynge, by fixing a line of partition from Little Egg Harbor to a point on the Delaware river, in 41° 40' N. lat., and by assigning the province east of this line (East Jersey) to Carteret and the province west of this line (West Jersey), about five-eighths of the whole, to the Quaker associates. The Quakers' title to West Jersey, however, still bore the cloud resulting from the Dutch conquest, and the duke of York had desired to recover all of his original grant to Berkeley and Carteret ever since Governor Nicolls had protested against it. But at this time his own right to the crown of England was threatened with the Exclusion Bill, and under these conditions instead of pressing his case against the Quakers he not only permitted it to be decided against him but in August 1680 confirmed their title by a new deed. A very liberal frame of government for West Jersey, drafted presumably by William Penn, and entitled "the Concessions and Agreements of the Proprietors, Freeholders and Inhabitants of West Jersey in America," was adopted in March 1677. This vested the principal powers of government in an assembly of one hundred members, who were to be chosen annually and to be subject to instructions from their constituents. In the intervals between sessions of the assembly, affairs were to be managed by ten commissioners chosen by that body. Religious toleration was assured. In August 1677 the ship "Kent" arrived in the Delaware, with 230 Quakers from London and Yorkshire. These founded a settlement, which became the modern Burlington, and in the next few months several hundred more colonists arrived. But the new colony was never actually governed under "the Concessions and Agreements"; for from the beginning until the first assembly was called in November 1681 its affairs were managed by commissioners named by the proprietors, and when in 1680 the duke of York confirmed the title to the land to Byllynge and his associates he conveyed the right to govern to Byllynge alone. Although he was one of the signers of "the Concessions and Agreements" Byllynge now commissioned Samuel Jennings as governor of the province, and the other proprietors acquiesced, appointing Byllynge governor and promising Jennings to serve as his deputy. Jennings immediately called the first assembly, and this body passed a number of fundamental laws which provided for a governor and council, but were in other respects much like the clauses relating to government in "the Concessions and Agreements." When, as if to test his authority, Byllynge, in 1682-1683, removed Jennings, who had been a popular governor, the assembly, by the advice of William Penn, passed a series of resolutions in the form of a protest, and in 1684 two agents were sent to England to negotiate with Byllynge. There the dispute was finally submitted for arbitration to George Fox and other Quakers, and they decided that, as the government of the province was legally vested in Byllynge by the duke's conveyance to him, he had the right to name the deputy governor. Fenwicke, after his release by Andros, endeavoured to re-establish a government at Salem with himself as "Lord and Chief Proprietor" of West Jersey, but the duke's officers further contested his claims and in 1682 Penn effected a peaceful settlement with him. In East Jersey, after the return of Governor Carteret, there was a period of quiet, until the death of Sir George Carteret in 1680 gave the zealous Andros another chance to further the supposed interests of his master. He managed to extend his authority over New Jersey by the terms of his commission, and on February 26, 1681, he issued a proclamation in March 1680 ordering Philip Carteret and his "pretended" officers to cease exercising jurisdiction within the duke's dominions unless he could show warrant. To this Carteret made a spirited reply, and on the 30th of April a detachment of soldiers dragged the governor of East Jersey from his bed and carried him prisoner to New York. Here he was confined for four weeks, and was released only on his promise not to exercise any authority until the matter could be referred to English arbiters for adjudication. When the assembly of East Jersey met in June, Andros had already issued a proclamation, which demanded such measures as he deemed advisable, but the deputies refused to pass them. In England, too, his conduct was disavowed, and he was called home to answer charges that had been preferred against him. Philip Carteret assumed the duties of his office, but his administration, now that Andros was no longer feared, was again marked by much friction with the assembly. Sir George Carteret had bequeathed his province to eight trustees, who were to administer it for the benefit of his creditors, and for the next two years the government was conducted in the name of his widow and executrix, Lady Elizabeth. Early in 1682, after several unsuccessful attempts to effect a sale by other means, the province was offered for sale at public auction, and was purchased by William Penn and eleven associates for £3,400. Later each of these twelve sold one-half of his share to another associate, thus making twenty-four proprietors; and on the 14th of March the duke of York confirmed the sale, and gave them all the powers necessary for governing the province. Robert Barclay, one of the proprietors, was chosen governor for life, with the privilege of performing his duties by deputy, and as his deputy he sent over Thomas Rodyard. In 1683 Rodyard was succeeded by Gawen Lawrie, who brought over with him a curious frame of government entitled "the Fundamental Constitutions." This instrument, which was designed to replace the Concessions, provided for the government of the province by a governor chosen by the proprietors, a common council consisting of the proprietors or their proxies together with 12 freemen, and a great council consisting of the proprietors or their proxies together with 144 freemen chosen by a mixed system of elections and a casting of lots. But the new system was to apply only to those who, in return for the greater privileges which it was alleged to ensure, would agree to a resurvey of their lands, arrange to pay quit-rents and provide for the permanent support of the government, and as Governor Lawrie found the colonists generally unwilling to make the exchange on the proposed terms, he discreetly refrained from any attempt to put the Fundamental Constitutions in operation and thereby avoided the confusion which must have resulted from two sets of laws. The government of the twenty-four proprietors, however, was liberal. Recognizing the necessity of some one in the province with full power "to do all things that may contribute to the good and advancement of the same," they directed the appointment of the American Board of Proprietors—a body of men identified with the province, who with the deputy-governor were to look after the proprietary interests in such matters as the approval of legislation and the granting of lands, and thereby prevent the delay caused by the transmission of such matters to England for approval. In 1686 another effort was made to put the Fundamental Constitutions in force, but when the deputies and the council rejected the instrument, the proprietors did not force the matter. In 1686 Perth Amboy,
the newly created port of East Jersey, became its seat of government.

After his accession to the throne in 1685, James II. showed an unyielding determination to annul the privileges of the colonies, and to unite New York, New Jersey and the New England colonies under a single government. In order, therefore, to save their rights in the soil, the proprietors of East and West Jersey offered to surrender their claims to jurisdiction, and to this arrangement the king consented. Andros, previously appointed viceroy of New England, thereupon received a new commission by his authority over New York and the Jerseys, and in August 1688 he formally annexed these provinces to the Dominion of New England. The seizure of Andros by the people of Boston in April 1689, following the news of the revolt in England against James II., gave the Jersey proprietors an opportunity to resume their rights, but the proprietary governments regained their former footing very slowly. The proprietors were widely separated—some being in America, some in England and others in Scotland—and unity of action was impracticable. For three years there was little or no government in the Jerseys, and the measures taken by local officers for preserving the peace.

In 1692 an important change occurred in the administrative system through the appointment of Andrew Hamilton (d. 1703) as governor of both East and West Jersey. In 1697 a faction opposed to Hamilton secured his removal and the appointment of their partisan, Jeremiah Basse. The opposition in the two colonies to Basse became so formidable that he was removed in 1699 and Hamilton was reappointed. Certain disaffected elements thereupon refused to recognize his authority, on the ground that his appointment had not received the required approval of the crown, and for a time the condition of the provinces bordered on anarchy. These disorders, and especially complaints against the Jerseys as centres of illegal trade, were brought to the attention of King William and his lawyers, who contended that as only the king could convey powers of government exercised by the Jersey proprietors, derived as they were from the duke of York, were without sufficient warrant. Moreover, the inhabitants sent petitions to England, praying that they might be placed under the direct control of the crown. The proprietors of East Jersey had already offered to surrender their jurisdiction, and returned for certain concessions by the royal government, but no action had been taken. In 1701 the proprietors of both provinces made another proposal, which was accepted, and in April 1702 all rights of jurisdiction were transferred to the crown, while the rights to the soil remained in the proprietors. The provinces of East and West Jersey were then united under a government similar to that of the other royal provinces. Until 1738 the governor of New York was also governor of New Jersey; after that date each colony had its own governor. The legislature met alternately at Burlington and Perth Amboy, until 1790, when Trenton was selected as the capital of the state.

The next four decades were years of development disturbed, however, by friction between the assembly and the royal governors, and by bitter disputes, accompanied by much rioting, with the proprietors concerning land-titles (1744-1749). Independence of the absentee landlords was again claimed by virtue of the grants made by Nicolls nearly a century before. Agriculture at this time was the main pursuit. The climate was more temperate and the soil more fertile than that of New England; but there were similar small farms and no marked tendencies towards the plantation system of the southern colonies. Slavery had been introduced by the Dutch and Swedes, and from the time of the earliest English occupation had been legally recognized. East Jersey had a fugitive slave law as early as 1675. With the exception of laying an import duty no legislative effort was made—nor is it likely that any would have been allowed by the crown—to restrict the importation of slaves during the colonial period. In addition to African and Indian slaves there was the class known as "redemptioners," or term slaves, consisting of indentured servants, who bound themselves to their masters before leaving the mother country, and "free willers," who allowed themselves to be sold after reaching America, in order to reimburse the ship captain for the cost of their passage. Between East and West Jersey certain political and religious differences developed. The former, settled largely by people from New England and Long Island, was dominated by Puritans; the latter by Quakers. In East Jersey, as in New England, the township became a vigorous element of local government; in West Jersey the county became the unit. Important events in the period of royal government were the preaching of George Whitefield in 1739 and the following year, the founding of the College of New Jersey (now Princeton University) in 1746, and of Queen's (now Rutgers) College in 1766. The colony gave many proofs of its loyalty to the mother country: it furnished three companies of troops for Admiral Vernon's unfortunate expedition against Cartagena in 1741; in King George's War it raised £2000 for supplies, furnished troops for the capture of Louisburg and sent over six hundred men to Albany; and in the French and Indian (or Seven Years') War its militia participated in the capture of both Quebec and Detroit. The colony itself was the principal point of embarkation for the American troops entering the service of the Hanoverian at the outbreak of the war. During the Revolution the Jersey people opposed the rising tide of Americanism, and were for a time in occupation by Hessian troops. The cession of New Jersey to the United States in 1783 was made amid profound sorrow and regret. The state of the state of opinion in that city, put in at Greenwich and stored his tea there in a cellar. It remained undisturbed till the night of the 29th of November, when a band of about 40 men, dressed as Indians, in imitation of the Boston party, broke into the cellar and made a bonfire of the tea. All attempts to punish the offenders were futile.

1 Greenwich then had some importance as a port on Cohancey Creek. Washington's house there during the winter of 1774-1775 was used as a hospital. On the 23rd of December, 1774, the captain of the ship "Greighound," bound for Philadelphia, was seized by the men on account of the state of opinion in that city, put in at Greenwich and stored his tea there in a cellar. It remained undisturbed till the night of the 29th of November, when a band of about 40 men, dressed as Indians, in imitation of the Boston party, broke into the cellar and made a bonfire of the tea. All attempts to punish the offenders were futile.
inhabitants of the Raritan Valley from British foraging parties.

General Benjamin Lincoln with 500 men was by Washington's orders stationed at Bound Brook, but on the 13th of April 1777 Lincoln was surprised by a force of about 4,000 men under Cornwallis, and although he escaped with small loss it was only by remarkably rapid movements. When the British had gained possession of Philadelphia, in September 1777, their communications between that city and the ocean through the Lower Delaware was obstructed by the New Jersey side by Fort Mercer, commanded by Colonel Christopher Greene, at Red Bank; three battalions of Hessians under Colonel Karl Emil Kurt von Donop attacked the fort on the 22nd of October, but they were repulsed with heavy loss. The fort was abandoned later, however. In 1778, the British army under General Clinton was retreating, in June from Philadelphia to New York, the American army engaged it in the battle of Monmouth (June 28, 1778); the result was indecisive, but that the British were not badly defeated was ascribed to the conduct of General Charles Lee. Before daylight on the 19th of August 1779 was approached by Major Henry Lee with a force of about 400 men surprised the British garrison at Paulus Hook, where Jersey City now stands, and although sustaining a loss of 20 men, killed 50 of the garrison and took about 160 prisoners. In 1779-1780 Morristown was again Washington's headquarters. The Congress of the Confederation met in Princeton, in Nassau Hall, which still stands, from June to November 1783.

After the war New Jersey found its commercial existence threatened by New York and Philadelphia, and it was a feeling of weakness from this cause rather than any lack of power that caused the state to join in the movement for a closer Federal Union. In 1786 New Jersey sent delegates to the Annapolis Convention, which was the forerunner of the Federal Convention at Philadelphia in the following year. In the latter body, on the 15th of June, one of the New Jersey delegates, William Paterson (1745-1806), presented what was called the "New Jersey plan" of union, representing the wishes of the smaller states, which objected to representation in a national Congress being based on wealth or on population. This merely federal plan, reported from a Conference attended by the delegates from Connecticut, New York and Delaware, as well as Major from New Jersey (and by Luther Martin of Maryland), consisted of nine resolutions; the first was that "the Articles of Confederation ought to be so revised, corrected and enlarged as to render the federal Constitution adequate to the exigencies of government and the preservation of the Union"; and the actual plan was for a single legislative body, in which each state should be represented by one member, and which should elect the supreme court and have power to remove the executive (a Council), to lay taxes and import duties, to control commerce, and even, if necessary, to make requisitions for funds from the states. Madison opposed the plan, on the ground that it would not prevent violations by the states of treaties and of laws of nations. On the first resolution only there was a definite vote; on the 19th of June it was voted to postpone the consideration of this resolution and to report the resolutions (the Virginia plan) formerly agreed upon by the committee of the whole. The New Jersey plan left its impress in the provision of the Constitution (approved in the Convention on the 7th of July) for equal representation in the national Senate. The Federal Constitution was ratified by an unanimous vote in the state convention which met at Trenton on the 18th of December 1787.

The state's own constitution, which had been adopted in 1776 and amended in 1777, retained, like other state constitutions framed during the War of Independence, many features of colonial government ill-adapted to a state increasingly democratic. The basis of representation, each county electing three members to the assembly and one member to the legislative council, soon became antiquated. The property qualifications were abolished, the county took thousands its proclamation money, of real and personal estate, in the same county; and, for members of the assembly, "five hundred pounds proclamation money, in real and personal estate, in the same county." These and the property qualifications for suffrage, which was granted to "all inhabitants of this state, of full age, who are worth fifty pounds proclamation money, clear estate in the same," etc., were soon considered undemocratic; and the democratic tendency of certain election officers may be seen from their construing the words "all inhabitants of full age" to include women, and from their permitting women to vote. The result was aggravated by the joint vote of the council and assembly; he was president of the council, with a large salary. In 1787, he was chancellor, captain-general and commander-in-chief of the militia; he had three members of the legislature to act as a privy-council; and he, with the (of which seven formed a quorum), constituted the "Court of Appeals in the last resort in all causes of law, as heretofore," which, in addition, had the power of granting pardons to criminals, after condemnation, in all cases of treason, felony or other offences.

In 1838 the opposition to the governor's extensive powers under the constitution was greatly increased in the "Broad Seal" or "Great Seal" War. After a closely contested election in which six members of Congress were chosen on a general ticket, although there was an apparent Democratic majority of about one hundred votes (in the old manner, 120,000 votes), the returns from townships to elect five Whig candidates to whom the state board of canvassers (mostly Whigs and headed by the Whig governor, William Richardson) gave the badge of seal of the state. Excluding these five members from New Jersey the House of Representatives contained 119 Democrats and 118 Whigs, so that the choice of a Whig speaker could be secured only by a vote of the Democrats, and by a vote of the Democrats only by a vote of the Whigs. In the ensuing struggle the Democratic Whigs and Republicans were divided, and the result was decided by the Democrats. It was decided that only members whose seats were not contested should vote for speaker, and Robert M. T. Hunter, of Virginia, a Democrat and a compromise candidate, was appointed to the position; and on the 26th of February 1839 the Democratic candidates were admitted to their seats, to which a congressional committee, reporting afterwards, declared them entitled.

Agitation for constitutional reform resulted in a constitutional convention, which met at Trenton from the 14th of May to the 29th of June 1844 and drafted a new frame of government, introducing much in the nature of radical changes. This instrument was ratified at the polls on the 13th of August. The election of the governor was taken from the legislature and given to the people; the powers of government were distributed among legislative, executive and judicial departments; representation in the assembly was based on population; and the property qualification for membership in the legislature and for the suffrage was abolished.

The constitution of 1844 declared that "All men are by nature free and independent, and have certain unalienable rights, among which are the right of enjoying and defending life and liberty, of acquiring and pursuing safety and happiness." A similar clause in the constitution of Massachusetts had been interpreted by the courts as an abolition of slavery, and an effort was made to give the same ruling applied in New Jersey, where the institution of slavery still existed. The courts, however, declared that the clause in the constitution of New Jersey was a general proposition, not applying to man in his private, industrial or domestic capacity. An attempt at abolition had previously been made in 1804 by an act declaring that every child born of a slave should be free, but should remain the servant of its mother's owner until twenty-five years of age. The act was based on the supposition that after some time, if a minor child was a male the father, and the owner of the mother, however, might abandon the child after a year, and it then became a public charge. This last provision proved a heavy check to the adoption of a heavy check to the adoption of negro children that in 1811 the statute was repealed. In 1846 an act was passed designating slaves as apprentices bound to service until discharged by their owners, and providing that children of

1 The election to the U.S. Senate in 1865 of John Potter Stockton (1826-1900), a great-grandson of Richard Stockton, a signer of the Declaration of Independence, created hardly less excitement than the "Broad Seal" War. William S. Couper, who as a senator did so by a plurality vote, having previously passed a resolution changing the vote requisite to choose a senator from a majority, to a plurality vote. He took his seat in the Senate and his election was upheld by the Senate committee on the judiciary, whose report was adopted (26 March 1866) by a vote of 22 to 21, his own vote casting the tie; but, because of the objection of Charles Sumner, he withdrew his vote on the 27th of March, and was thereupon unseated by a vote of 23 to 21.
such apprentices should be free at birth, but were to be supported by the masters of their parents for six years. There were consequently a few vestiges of the slavery system in New Jersey until the adoption of the Thirteenth Amendment to the Federal Constitution.

Toward the political questions that disturbed the American people immediately before the Civil War the attitude of the state was conservative. In 1832 the Free-soil candidate for the presidency received only 350 votes in New Jersey; and in 1856 the Democratic candidate received a plurality of 18,605 votes, even though William L. Dayton, a citizen of the state, was the Republican nominee for the vice-presidency. In 1860 three of the state's electoral votes were given to Douglas and four to Lincoln. During the Civil War New Jersey furnished 89,936 men for the Union cause and incurred extraordinary expenditures to the amount of $18,904,717. The state readily consented to the Thirteenth and Fourteenth Amendments to the Federal Constitution, but in 1868 withdrew its consent to the latter. The Fifteenth Amendment was rejected by one legislature, but was accepted by its successor, in which the Republican party had obtained a majority.

Industrially the early part of the 19th century was marked in New Jersey by the construction of bridges and turnpikes, the utilization of water power for manufactures, and the introduction of steam motive power upon the navigable waters. The secret treaty with England interrupted this progress, and at its beginning was so unpopular, especially with the Quakers, that the Federalists carried the elections in the autumn of 1812. But the attempt of this party to retain control by a "gerrymandering" process was unsuccessful. The Democrats were triumphant in 1813, and the Federalist as well as the Democratic administration responded with aid for the defence of New York and Philadelphia. The state also contributed several hundred men to the service of the United States. Material progress in New Jersey after the war is indicated by the construction of the Morris (1824-1836) and the Delaware & Raritan (1828-1838) canals, and the completion of its first railway, the Camden & Amboy, in 1834.

The years following the Civil War were marked by great industrial development. The numerous projects, good and bad, that were inaugurated in 1866-1875, and the various kinds of laws and charters conferring special privileges that were secured, led to the constitutional prohibition of special legislation already mentioned. In this same period there was a bitter railway war. The Delaware & Raritan Canal Company and the Camden & Amboy Railroad Company, both chartered in 1839 and both monopolies, had been practically consolidated in 1831; in 1838 these joint companies gained control of the Philadelphia & Trenton railway; in 1867 these "United New Jersey Railroad & Canal Companies" consolidated with the New Jersey Railroad & Transportation Company (which was opened in 1836 and controlled the important railway link between New Brunswick and Jersey City), and profits were to be divided equally between the four companies; and in 1871 these entire properties were leased for 990 years to the Pennsylvania Railroad Company. This combination threatened to monopolize traffic, and it was opposed by the Atlantic Central Railroad of New Jersey, the Atlantic & Lackawanna & Western and a branch of the North Pennsylvania (from Jenkintown to Yardley; sometimes called the "national" or "air-line"), and by the general public; and in 1873 the state passed a general railway law giving other railways than the United New Jersey holdings of the Pennsylvania the right to connect New York and Philadelphia. In 1876 the "national" line was extended to Bound Brook (as the Delaware & Bound Brook) and this road, the North Pennsylvania & Central Railroad of New Jersey, were operated under a tripartite agreement as a through line between New York and Philadelphia; but in 1879 these three lines were leased for 990 years to the Philadelphia & Reading railway. The state itself then became engaged in a struggle with the railways in order to secure from them their full portion of taxes, as the property of individuals was then taxed many times as heavily as that of railways. In 1884 the state gained the victory by securing the passage of a law taxing the franchises of railway corporations.

A reform movement in politics, called the "New Idea," and led by Everett Colby (b. 1874), then a Republican member of the Assembly and in 1906-1908 a state senator, began in 1904; it did much to secure the passage of acts limiting public service franchises to 20 years (unless extended to 40 years by the voters of the municipality concerned), the increase of taxes on railways, the increase of franchise tax rates by 1 1/2% each year up to 5%, the adoption of direct primary elections, and the modification of the system of railway promoters' liability law.

Before 1880 the state was dominated by the Federalist party; from that date until 1886 it was generally controlled by the Democrats, and from 1896 to 1911 by the Republicans.

The governors of New Jersey have been as follows:

**GOVERNORS: UNDER THE PROPRIETORS**

- Philip Carteret
- John Pownall

**GOVERNORS OF EAST JERSEY AND THEIR DEPUTIES**

- Philip Carteret
- Robert Barclay
- Thomas Ruyrdar

**GOVERNORS OF NEW JERSEY**

- Edward Byllngye
- Samuel Jennings
- Thomas Olive
- John Skene
- Daniel Coxe
- Edward Hunkole

**GOVERNORS OF WEST JERSEY AND THEIR DEPUTIES**

- Edmund Andros
- Andrew Hamilton

**UNDER THE ROYAL GOVERNMENT**

**GOVERNORS OF NEW YORK AND NEW JERSEY**

- Edward Hyde, Lord Cornbury
- Jonathan Belcher
- Richard Ingoldsby, Lieut.-Governor
- Robert Hunter
- William Burnet
- John Montgomerie
- Lewis Morris, 4th Council
- William Cosby

**GOVERNORS OF NEW JERSEY EXCLUSIVELY**

- Lewis Morris
- John Hadlock
- John Anderson, 4th Council
- John Hamilton, 4th Council

**GOVERNORS OF NEW JERSEY ONLY**

- Lewis Morris
- John Hadlock, Pres. Council
- John Reading, Pres. Council
- Jonathan Belcher
- Thomas Powll, Lieut.-Governor
- John Reading, Pres. Council
- Francis Bernard
- Thomas Boone
- Josiah Hardy
- William Franklin

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1 In 1864 a bill was introduced in the Federal House of Representatives making the Camden & Atlantic (now the Atlantic City) railway and the Raritan & Delaware Bay (now a part of the Central of New Jersey) a post route between New York and Philadelphia and authorizing these railways to carry passengers and freight between New York and Philadelphia. Thereupon the governor and legislature of New Jersey protested that such a measure was an infringement of the reserved rights of the state, since the state had contracted with the Camden & Amboy not to construct nor to authorize others to construct within a specified time any other railway across the state to be used for carrying passengers or freight between New York and Philadelphia.
NEW JERSEY CHURCH

GOVERNORS OF THE STATE

<table>
<thead>
<tr>
<th>Governor</th>
<th>Term</th>
<th>Political Party</th>
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<tbody>
<tr>
<td>William Livingston</td>
<td>1793-1797</td>
<td>Federalist</td>
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<td>William Paterson</td>
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<td>Joseph Bloomfield</td>
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<td>Woodrow Wilson</td>
<td>1912-1916</td>
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For the period of the Dutch rule, see E. B. O'Callaghan's History of New Netherlands (New York, 1846); and John Romeyn Brodhead's History of the State of New York (2nd vol., New York, 1853, 1871); E. P. Tannen, The Province of New Jersey (New York, 1898), the most thorough study of the period from 1664 to 1783; Samuel Smith's History of the Colony of New Caesarea, or New Jersey (Burlington, 1765; 2nd ed., Trenton, 1877), still one of the best accounts of the colonial period, and particularly valuable on account of its useful extracts from the sources, many of which are no longer accessible; see also, William A. Whitehead's "The English in East and West Jersey, 1664-1689" in vol. iii. of Justin Winsor's Narrative and Critical History of America. Among the monographic contributions are Austin Scott's Influence of the Protestant Baptists in the Founding of the State of New Jersey (Baltimore, 1885) and H. S. Cooley's Study of Slavery in New Jersey (Baltimore, 1896). Other useful contributions are D. H. Nichols, Story of Old Farm; or, Life in New Jersey in the 18th Century (Somerville, New Jersey, 1889), full of interesting details; F. B. Lee and others, New Jersey as a Colony and as a State (4 vols., with an additional biographical volume, New York, 1912), giving life, politics, and literature, as well as the results of an investigation into the legal status of negroes; W. J. Mills, History of New Jersey (Philadelphia, 1902); William Nelson, The New Jersey Coast in Three Centuries (2 vols., New York, 1902); Isaac S. Nesbit, Civil and Political History of New Jersey (Philadelphia, 1851); W. A. Whitehead, East Jersey under the Proprietary Governments (New Jersey Historical Society Collections, vol. i., Newark, 1875); W. S. Stryker, Official Register of the Officers and Men of New Jersey in the Revolutionary War (Trenton, 1872); W. E. Sackett, Modern Battles of Trenton (Trenton, 1898), a political history of New Jersey from 1680 to 1894, dealing especially with the railway controversies; John E. Stillwell, Historical and Genealogical Miscellany (2 vols., New York, 1903-1906), containing data relating to the settlement and settlers of New York and New Jersey; R. S. Field, The Provincial Courts of New Jersey; L. Q. C. Elmer, The Organization and Government of New Jersey (vols. i. and ii. of New Jersey Historical Society Collections, Newark, 1849, 1872); and David Murray, History of Education in New Jersey (No. 23 of Circulars of Information issued by the United States Bureau of Education, Washington, 1899).

NEW JERSEY CHURCH, or New Church, the community founded by the followers of Emmanuel Swedenborg (q.v.). Swedenborg himself took no steps to found a church, but having given a new interpretation of Scripture, it was inevitable that some who accepted his doctrine should form a society and organize a church in accordance therewith. Those who received them fully during Swedenborg's lifetime were few and scattered, but courageously undertook the task of disseminating, and gave themselves to translating and distributing their master's writings. Two Anglican clergymen were conspicuous in this work: Thomas Hartley (d. 1754), rector of Winwick, and John Clowes (1743-1831), vicar of St John's, Manchester. Hartley translated Heaven and Hell (1756) and True Christian Religion (1781); Clowes, who taught New Church doctrine in the existing church of the Church of England. They set up new organizations, translated 17 volumes, including the Arcana Coelestia, and published over 50 volumes of exposition and defense. Through his influence Lancashire became the stronghold of the Swedensborgians, and to-day includes a third of the congregations and more than half the members of the New Church in the United Kingdom.

In 1782 a society for publishing Swedenborg's writings was formed in Manchester, and in December 1783 a little company of sympathizers with similar aims met in London and founded "The Theosophical Society," among the members of which were John Flaxman, William Sharples, the medical men, and F. H. Barbédouleem the composer. In the early days most of them worshipped at the Female Orphan Asylum, St George's, whose chaplain, Rev. Jacob Duche, like Clowes at Manchester, preached the doctrines from his own pulpit. In 1785 and 1787 J. W. Salmon and R. Mather conducted an open-air missionary tour in the Midlands and the North with some success. Five prominent Wesleyan preachers adopted the new teaching and were cut off from their connexion, a step which led, in spite of remonstrance from Clowes and others, to the formal organization of the New Jerusalems under the supervision of W. W. Sanderson. Many of the members met in private houses, but in January 1788 began worship in a church in Great Eastcheap with a liturgy specially prepared by the Rev. James Hindmarsh and Isaac Hawkins. "The Theosophical Society" was now dissolved. In April 1789 a General Conference of British Swedensborgians was held in Great Eastcheap Church, followed by another and by the publication of a journal, the New Jerusalem Magazine, in 1790. Since 1815 conferences have been held every year. A weekly paper, the Morning Light, is published, as well as monthly magazines for adults (the New Church Magazine) and youth. The literature (containing five services for Morning and Evening, together with the order of Baptism, Holy Supper, Marriage, &c.) was prepared in 1828, revised and extended in 1875; the hymn book of 1825 was revised and enlarged in 1880.

In the provinces the first church was at Birmingham (1797), followed by one at Manchester and another at Liverpool (1793). The Accrington church, the largest in Great Britain, was founded in 1802. Many of the early converts to the New Church were among the most fervent advocates of the abolition of slavery, and it was the medical officer of the first batch of convicts sent to Botany Bay; from the house of another, William Cookworth of Plymouth, Captain Cook sailed on his last voyage. Others were pioneers of elementary education, establishing free day schools long before they were thought of by the state.

In 1815 the conference took up the question of home missionary work, and its agents were able to found many branches of the church. In 1813 the Manchester and Salford (now the North of
ENGLAND. Missionary Society was founded, chiefly to provide preachers for the smaller churches in its area; in 1857 a National Missionary Institution was founded and endowed, to which most of the local ones have been affiliated. Other denominational agencies have been concerned with the printing and circulation of Swedenborgian literature, a training college for the ministry (founded in 1852), and a Ministers' Aid Fund (1834), and an Orphanage (1881). The centenary of the New Church as a spiritual system was celebrated in 1857, as an external organization in 1883. A few Swedenborgians still hold to the non-separating policy, but more from force of circumstances than from deliberate principle. The constitution of the New Church is of the Independent Congregational type; the conference may advise and counsel, but cannot compel the obedience of the societies. The returns for 1909 showed 45 named, 5 recognized leaders, 10 recognized missionaries, 70 societies, 6665 registered members, 7907 Sunday scholars. There are also five or six small societies not connected with the conference.

The New Church in Europe.—In Sweden the Philanthropic Ecclesiastical Society was formed by C. F. Nordenskiöld in 1796 to connect the Swedish congregations of Swedenborgian worship. The introduction of alchemy and mesmerism led to its dissolution in 1799, but its work was continued by the society "Pro fide et charitate" (1830). For many years the works of Swedenborg and his followers were proscribed, and receivers of his writings fined or deprived of office, but in 1866, when religious liberty had made progress, the cause was again taken up; in 1875 the Works of Swedenborg (in English) was published in Stockholm, and since 1877 services have been regularly held. There is also a church in Gothenburg, and lectures are given from time to time in most of the towns of Sweden. In Norway there is no New Church organization; in Denmark a church was founded in Copenhagen in 1871. In Germany Prelate Oetinger of Württemberg translated many of Swedenborg's writings between 1765 and 1786, but his work was not published until 1863, when the Tübingen, who not only edited, translated and published, but in 1848 founded a "Union of the New Church in Germany and Switzerland" which held quarterly meetings. There is a church in Berlin, but otherwise active societies in Germany are the "Tiba" in the Swedish-German Society with headquarters at Stuttgart. In Switzerland, on the contrary, there is an organized body of the New Church; divine service being held in the Society at Zurich and by circles at Berne, Hirnsau and Nessau. The Zürich pastor is a member of the American Convention, and has oversight also of the Austrian societies at Vienna and Trieste. In Hungary there are societies at Buda Pesth and Györkony, in France there were early Swedenborgians of rank and learning, and much translation was accomplished before 1800. About 1838 J. F. E. Le Boys de Guays began his masterly translation of all Swedenborg's theological works and in 1852, when work which was carried on at his house for thirty years. Sunday worship is now held in the New Church Temple on the Rue Thouin. In Italy (Rome), Holland (The Hague), Belgium (Antwerp and Bruges), there are small societies, and nearly every European country has some known adherents.

In America.—About 1784 James Glen, a London Scot, delivered lectures "For the Sentimentalists." on the new doctrine in Philad- elphia and Boston and circulated some of Swedenborg's works. Francis Bailey, state printer of Pennsylvania, was attracted by them and became active in their promulgation. During the next ten years a number of prominent men gave their support to the teaching, which gradually spread inland and southward. The first society for worship was formed in Baltimore in 1792 (reorganized 1798), though a short-lived one had preceded it at Halifax, N.S., in 1791. Other churches were formed in Philadelphia, New York, and the General Convention, which meets annually, was formed at Philadelphia in 1817. In 1907 there were 102 ministers and 103 societies with a membership of 6500. Of these, 4 societies and 140 members are in Canada, while the German Synod counts for 11 societies and 325 members.

In Australia, etc.—The formation of societies in Australia began at Sydney in 1817, and Newcastle early in 1820. In Brisbane in 1865, Rodborough, Vic., in 1878. There is a circle in Pерт. New Zealand has a church at Auckland (1883) and scattered members of other churches. Australia has a national conference; Melbourne in 1881 and has continued to meet in alternate years. There is a church at Mauritius, and correspondents in various parts of South and West Africa, India, Japan, the West Indies and South America.


(N. J. G.)

NEW KENSINGTON—NEW LONDON

New Kensington, a borough of Westmoreland county, Pennsylvania, U.S.A., on the Allegheny river, 18 m. N.E. of Pittsburgh. Pop. (1900) 4065 (1042 foreign-born and 86 negroes); (1910) 7727. It is served by the Pennsylvania railroad and by electric railways to neighbouring towns. There is a variety of manufactures. The borough was founded in 1891 and was incorporated in the following year.

Newlands, John Alexander Reina (1838-1898), English chemist, was born in 1838. He was one of the first, if not quite the first, to propound the conception of periodicity among the chemical elements. His earliest contribution to the question took the form of a letter published in the Chemical News in February 1863. In the succeeding year he showed, in the same journal, that if the elements be arranged in the order of their atomic weights, those having consecutive numbers frequently either belong to the same group or occupy similar positions in different groups, and he pointed out that each eighth element starting from a given one is in this arrangement a kind of repetition of the first, like the eighth note of an octave in music. The Law of Octaves thus enunciated was at first ignored or treated with ridicule as a fantastic notion unworthy of serious consideration, but the idea, subsequently elaborated by D. I. Mendeleeff and other workers into the Periodic Law, has taken its place as one of the most important generalizations in modern chemical theory. Newlands, who was of Italian extraction on both sides, was a pupil of the Cape Colony and Italian freedom under Garibaldi in 1860, died in London on the 29th of July 1898. He collected his various papers on the atomicity of the elements in a little volume on the Discovery of the Periodic Law published in London in 1884.

NEW LONDON, a city, port of entry, and one of the county seats of New London county, Connecticut, U.S.A., coextensive with the township of New London, in the S.E. part of the state, on the Thames river, about 3 m. from its entrance into Long Island Sound. Pop. (1890) 13,757; (1900) 17,548, of whom 10,445 were foreign-born (1910 census 19,659). It is served by the New York, New Haven & Hartford, and the New London Northern (leased by the Central Vermont) railways, by electric railway to Norwich, Wethersly, Groton, Stonington and East Lyme, by a daily line of passenger steamboats to New York City, and by two lines of freight steamers, and in the summer months by daily steamboats to Sag Harbor and Greenport, Long Island, and Watch Hill and Block Island, Rhode Island. New London's harbour is the best on the Sound. The city is the headquarters of a United States artillery district, embracing Fort H. G. Wright Barracks, New London, Fort Miech on Gull Island, New York, Fort Terry, New London, Fort Griswold, New London, and is a station of the New York Yacht Club; the boat races between Harvard and Yale universities are annually rowed on the river near the city. Among the places of interest are the Town Hall, built in 1850 by John Winthrop, Jr., in co-operation with the town; the Hempstead Mansion, built by John Hempstead about 1678; the old cemetery, north-east of the city, laid out in 1653; a school house in which Nathan Hale taught; and a court house built in 1785. There is a public library (about 39,000 volumes), and the New London County Historical Society (incorporated 1850) has an historical library. There are two endowed high schools, the Bulkeley School for boys and the Williams Memorial Institute (1861) for girls, and an endowed Manual Training and Industrial School (1872), all offering free instruction. In the 18th century New London had a large trade in lumber, flour and food supplies with the West Indies, Gibraltar
and the Barbary States; but this trade declined after the War of 1812, and the whaling and sealing industries, once very lucrative, have also declined in value. The imports in 1806 were valued at $54,872, and the exports at $60,522; in 1809 their respective values were $10,870 and $10,295. Manufacturing is the principal industry; among the products are silk goods, cotton goods, printing presses, foundry and machine shop products. The total value of factory products was $4,700,628 in 1905, an increase of 11.6% since 1900.

New London was founded in 1646 by John Winthrop, the younger. It was known by its Indian name "Nameaug" until 1658, when the General Court of Connecticut approved the wish of the settlers to adopt its present name from London, England, the river Monhegan in the same time becoming the Thames. During the War of Independence it was a rendezvous for American privateers. In 1776 the first naval expedition authorized by Congress was organized in its harbour, and there in the next three years twenty privateers were fitted out. On the 6th of September 1781, 800 British troops and Loyalists under General Benedict Arnold (who was born in New London county) raided New London, destroyed much private property, and at Fort Griswold killed 84 American soldiers, many of them after their surrender. The massacre is commemorated by an obelisk, 134 ft. high, on Groton Heights. The city was incorporated in 1784. In 1798 there was an epidemic of yellow fever. From the 7th of November 1812 until the close of the second war with Great Britain the harbour was blockaded by a British fleet.


NEWLYN—NEWMAN, a village in the St Ives parliamentary division of Cornwall, England, on the shore of Mount's Bay, 1 m. S.W. of Penzance. It is a small fishing port, with narrow paved lanes and old-fashioned cottages. Near the parish church of St Peter stands an ancient cross of granite, discovered in a field close by. The harbour, one of the safest for small craft in the west country, is sheltered by two long and picturesque stone piers. A more ancient pier, originally constructed in the reign of Henry VI., was renewed in that of James I. Tin mining and smelting have been largely carried on in the neighbourhood, and several galleries were worked far under the sea. The principal modern industry, however, is fishing, especially for pilchard. The picturesque appearance of the village, with its quays and little harbour, and the grandeur of the cliffs and moorland scenery towards Land's End, make Newlyn an attractive spot. Between 1886 and 1890 an artistic coterie grew up here, the leaders of which were Edwin Harris, Walter Langley, Fred Hall, Soutch Bensley, T. C. Gotch, Mr and Mrs Stanhope Forbes, Chevalier Taylor and H. S. Tuke. The earlier artists at Newlyn were said to have selected it as their centre, because a greyness in the atmosphere helped their depiction of subtleties in tone, part of their creed being subordination of colour to tone-gradation. In later times, the element of a common ideal tended to disappear, but the interest of the "Newlyn school" attracted a regular art- colony, who in various ways assimilated and expressed the picturesque influences of the place (see PAINTING: Recent British). There is a permanent Art Gallery, containing examples of the work of the Newlyn artists.

NEW MADRID, a city and the county-seat of New Madrid county, Missouri, U.S.A., on the right bank of the Mississippi river, about 35 m. S. by W. of St. Louis, Ill. Pop. (1900) 4,899; (1910) 8,882. It is served by the St Louis South-western railway and by river packets. The city is a shipping point for a rich grain, cotton, livestock and lumber region. Among its manufactures are lumber, staves, and hoops. The municipality owns its water-works. Owing to the encroachments of the Mississippi river, the site of the first permanent settlement is now about 11 m. from the E. bank of the river, in Kentucky. This settlement was made in 1788, on an elaborately laid out town site, and was named New Madrid by its founder, Colonel George Morgan (1742–1810), who, late in 1787, had received a grant of a large tract of land on the right bank of the Mississippi river, below the mouth of the Ohio, from Don Diego de Garroqui, Spanish minister to the United States. The tract lay within the province of "Lousiana," and the grant to Morgan was a piece of Garroqui's "map," made at Oxford, where the western American settlements, Morgan being required to establish thereon a large number of emigrants, whom he secured from New Jersey, Canada and elsewhere. Governor Estevan Miro of Louisiana, however, disapproved of the grant, on the ground that it would cause the province to be overrun by Americans; the settlers became restive under the restraints imposed upon them; Morgan himself left; and in December 1811 and January 1812 a series of severe earthquake shocks caused a general emigration. New Madrid was occupied by Confederate troops under General Gideon J. Pillow, on the 8th of July 1863, and after the surrender of Fort Donelson (February 16, 1862) the troops previously at Columbus, forming the Confederate left flank, were withdrawn to New Madrid and Island No. 10 (in the Mississippi about 10 m. S.). There were Confederate batteries on the left bank of the Mississippi opposite Island No. 10, and along the same bank from a point opposite New Madrid to Tiptonville, Tennessee. Behind these batteries were Reelfoot Lake and over-flowed lands. Retreat by land was thus virtually impossible. Early in March, Major-General John Pope and Commodore A. H. Foote proceeded against these positions; New Madrid, then in the hands of the Confederates, was captured by the 14th (Admiral) Henry Walke (1808–1866), commanding the "Carondelet," ran past the batteries of Island No. 10 and the shore batteries on the 4th of April, and Lieut.-Commander Egbert Thompson, commanding the "Pittsburgh," on the 7th; meanwhile the Federals under the direction of Colonel Josiah W. Bissell (b. 1818), of the engineer corps, had, with great difficulty, constructed an artificial channel to New Madrid across the peninsula (swamp land) formed by a great loop of the Mississippi; troops were conveyed by transports through this channel below the island, Federal batteries having been established on the right bank of the river; the retreat of the Confederates down stream was effectually blocked; they evacuated the island on April 7th, and on the 8th the garrison and the forces stationed in the shore batteries, a total of about 7000, under General W. W. Mackall (who had succeeded General Mcgowen on the 31st of March) was surrendered at Tiptonville. The island was subsequently washed away, a new one being formed in the vicinity.

NEWMAN, FRANCIS WILLIAM (1805–1887), English scholar and miscellaneous writer, younger brother of Cardinal Newman, was born in London on the 27th of June 1805. Like his brother, he was educated at Eton College, and at Trin. Coll., Cambridge, where he had a brilliant career, obtaining a double first class in 1826. He was elected fellow of Balliol in the same year. Conscientious scruples respecting the ceremony of infant baptism led him to resign his fellowship in 1830, and he went to Baghdad as assistant in the mission of the Rev. A. N. Groves. In 1833 he returned to England to procure additional support for the mission, but rumours of unsoundness in his views on the doctrine of eternal punishment had preceded him, and finding himself generally looked upon with suspicion, he gave up the vocation of missionary to become classical tutor in an unsectarian college at Bristol. His letters written home during the period of his mission were collected and published in 1836, and form an interesting little volume. Newman's views matured rapidly, and in 1840 he became professor of Latin in Manchester New College, the celebrated Unitarian seminary long established at York, and the parent of Manchester College, Oxford. In 1846 he quitted this appointment to become professor in University College, London, where he remained until 1869. During all this period

1 Morgan had been made Indian agent at Fort Pitt (Pittsburgh) in 1779, and was commissioned a colonel in the Continental Army in 1782. In 1806 he was Warden of N. Y., and near Pittsburgh by Aaron Burr, who told him something about his famous "conspiracy" scheme in the West, which Morgan reported to Jefferson—"the very first intimation I had of the plot," Jefferson afterward wrote to Morgan.
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he was assiduously carrying on his studies in mathematics and oriental languages, but wrote little until 1847, when he published anonymously a History of the Hebrew Monarchy, intended to introduce the results of German investigation in this department of Biblical criticism. In 1849 appeared The Soul, her Sorrows and Aspirations, and in 1850, Phases of Faith, or Passages from the History of my Creed—the former a tender but searching analysis of the relations of the spirit of man with the Creator, the latter a religious autobiography detailing the author's passage from Calvinism to pure theism. It is on these two books that Professor Newman's celebrity will principally rest; having in both to describe his personal experience, his intense earnestness has kept him free from the eccentricity which marred most of his other writings, excepting his contributions to mathematical research and oriental philology. There was, indeed, scarcely a crotchet, except "spiritualism," of which he was not at one time or another the advocate. His versatility was such that he wrote on logic, political economy, English reforms, Austrian politics, Roman history, diet, grammar, the most abstruse departments of mathematics, Arabic, the emendation of Greek texts, and languages as out of the way as the Berber and as obsolete as the dialect of the Iguvine inscriptions. In treating all these subjects he showed signal ability, but, wherever the theme allowed, an incurable crotchettiness; and in his numerous metrical translations from the classics, especially his version of the Iliad, he betrayed an insensibility to the ridiculous which would almost have justified the irreverent criticism of Matthew Arnold, had the poem been conveyed in more seemly fashion. His miscellaneous essays, some of much value, were collected in several volumes before his death: his last publication, Contributions chiefly to the Early History of Cardinal Newman (1891), was generally condemned as deficient in infantile feeling. He was far from possessing his brother's subtlety of reasoning, but he impresses by a transparent sincerity and singleness of mind not always displayed by the more celebrated writer; his style is too individual to be taken as a model, but is admirable for its simplicity and clearness. His character is vividly drawn by Carlyle in his life of Stere. In the early days of Newman's career, as a man of fine attainments, of the sharpest-cutting and most relentlessly advancing intellect and of the mildest pious enthusiasm." It was his great misfortune that this enthusiasm should have been correlated, as is not unfrequently the case, with an entire insensibility to the humorous side of things. After his retirement from University College, Professor Newman continued to live for some years in London, subsequently removing to Clifton, and eventually to Weston-super-Mare, where he died on the 7th of October 1897. He had been blind for five years before his death, but retained his faculties to the last. He was twice married, by

T. G. Sieveking, Memoir and Letters of Francis W. Newman (1909).

NEWMAN, JOHN HENRY (1801-1890), English Cardinal, was born in London on the 21st of February 1801, the eldest son of John Newman, banker, of the firm of Ramsbottom, Newman and Co. The family was understood to be of Dutch extraction, and the name itself, spelt "New man" in an earlier generation, further suggests Hebrew origin. His mother, Jemima Fountaine, was of a Huguenot family, long established in London as engravers and paper manufacturers. John Henry was the eldest of six children. The second son, Charles, a man of ability but of impracticable temper, a professor of Theology, and a rector, died in 1834. The youngest son, Francis William (q.v.), was for many years professor of Latin in University College, London. Two of the three daughters, Harriett Elizabeth and Jemima Charlotte, married brothers, Thomas and John Mozley; and Anne Mozley, a daughter of the latter, edited in 1892 Newman's Anglican Life and Correspondence, having been entrusted by him in 1883 with an autobiographical written in the third person to form the basis of a narrative of the first thirty years of his life. The third daughter, Mary Sophia, died unmarried in 1883.

At the age of seven Newman was sent to a private school conducted by Dr Nicholas at Ealing, where he was distinguished by diligence and good conduct, as also by a certain shyness and aloofness, taking no part in the school games. He speaks of himself as having been "very superstitious" in these early years. He took great delight in reading the Bible, and also the novels of Scott, then in course of publication. At the age of fifteen, during his last year at school, he was "converted," an incident that throughout life remained to him "more certain than that he had hands or feet." It was in the autumn of 1816 that he thus fell under the influence of a definite creed, and received into his intellect impressions of dogma never afterwards effaced. The tone of his mind was at this date evangelical and Calvinistic, and he held that the pope was anti-Christ. Matriculating at Trinity College, Oxford, 14th December 1816, he went into residence there in June the following year, and in 1818 he gained a scholarship of £60, tenable for nine years. But for this he would have been unable to remain at the university, as in 1810 his father's bank suspended payment, and the year his name was entered at Lincoln's Inn. Anxiety to do well in the final schools produced the opposite result; he broke down in the examination, and so graduated with third-class honours in 1821. Desiring to remain in Oxford, he took private pupils and read for a fellowship at Oriel, then "the acknowledged centre of Oxford intellectualism." To his intense relief and delight he was elected on the 12th of April 1822. E. B. Pusey was elected a fellow of the same society in 1824.

On Trinity Sunday, 13th June 1824, Newman was ordained, and became, at Pusey's suggestion, curate of St Clement's, Oxford. Here for two years he was busily engaged in his small work, but he found time to write articles on "Apolloius of Tyana," on " Cicero" and on "Miracles" for the Encyclopaedia Metropolitana. In 1825, at Whately's request, he became vice-principal of St Alban's Hall, but this post he held for only one year. To his association with Whately at this time he attributed much of his "mental improvement" and a partial conquest of his shyness. He assisted Whately in his popular work on logic, and from him he gained his first definite idea of the Christian Church. He broke with him in 1827 on the occasion of the re-election of Peel for the University, Newman opposing this on personal grounds. In 1826 he became tutor of Oriel, and the same year R. H. Froude, described by Newman as "one of the acutest, cleverest and deepest men" he ever met, was elected fellow. The two formed a high ideal of the tutorial office as clerical and pastoral rather than secular. In 1827 he was a preacher at Whitehall. The year following Newman supported and secured the election of Hawkins as provost of Oriel in preference to Keble, a choice which he later defended or apologized for as having in effect produced the Oxford Movement with all its later consequences. In 1828 he was appointed preacher of St Mary's, to which the chapelcy of Littlemore was attached. He was made regius professor of Hebrew. At this date, though still nominally associated with the Evangelicals, Newman's views were gradually assuming a higher ecclesiastical tone, and while local secretary of the Church Missionary Society he circulated an anonymous letter suggesting a method by which Churchmen might practically cure Nonconformists from all control of the society. This resulted in his being dismissed from the post, 5th March 1830; and three months later he withdrew from the Bible Society, thus completing his severance from the Low Church party. In 1832 he was elected preacher before the University. In 1835, his difference with Hawkins as to the "substantially religious nature" of a college tutorship becoming acute, he resigned that post, and in December went with R. H. Froude, on account of the latter's health, for a tour in South Europe. On board the mail steamer "Hermes" they visited Gibraltar, Malta and the Ionian Islands, and subsequently Sicily, Naples and Rome, where Newman made the acquaintance of Dr Wiseman. In a letter home he described Rome as "the most wonderful place on earth," but the Roman Catholic religion as "polytheistic, degrading and debasing." It was during this course of his tour that he wrote most of the short poems which a year later were printed in the Lyra Apostolica. From Rome Newman returned to Sicily alone, and was dangerously ill with
fever at Leonforte, recovering from it with the conviction that he had a work to do in England.

In June 1833 he left Palermo for Marseilles in an orange boat, which was becalmed in the Strait of Bonifacio, and here he wrote the verses, "Lead, kindly Light," which later became popular as a hymn. In late June, Newman joined Keble on Oxford on the 9th of July, and on the 14th Keble preached at St Mary's an assize sermon on "National Apostasy," which Newman afterwards regarded as the inauguration of the Oxford Movement. In the words of Dean Church, it was "Keble who inspired, Froude who gave the impetus and Newman who took up the work"; but the first organization of it was due to H. J. Rose, editor of the British Magazine, who has been styled "the Cambridge originator of the Oxford Movement." It was in his rectory house at Hadleigh, Suffolk, that a meeting of High Church clergy was held, 27th to 29th of July (Newman was not present), at which it was resolved to fight for "the apostolical succession and the integrity of the Prayer-Book." A few weeks later Newman started, apparently on his own initiative, the Tracts for the Times, from which the movement was subsequently named "Tractarian." Its aim was to secure for the Church of England a definite basis of doctrine and discipline, in case either of disestablishment or of a determination of High Churchmen to quit the establishment, an activity that was thought not impossible in view of the States' recent high-handed dealings with the sister established Church of Ireland. The Tractarians were inspired by Newman's Sunday afternoon sermons at St Mary's, the influence of which, especially over the junior members of the university, was increasingly marked during a period of eight years. In 1835 Pusey joined the movement, which, so far as concerned ritual observances, was later called "Puseyite"; and in 1836 its supporters secured further coherence by their united opposition to the appointment of Hampden as regius professor of divinity. His Bampton Lectures (in the preparation of which Blanco White had assisted him) were suspected of heresy, and his suspicion was accentuated by a pamphlet put forth by Newman, Eulogizations of Dr Hampden's Theological Statments. At this date Newman became editor of the British Critic, and he also gave courses of lectures in a side-chapel of St Mary's in defence of the via media of the Anglican Church as between Romanism and popular Protestantism. His influence in Oxford was supreme about the year 1839, when, however, his study of the monophysite heresy first raised in his mind a doubt as to whether the Anglican position was really tenable on those principles of ecclesiastical authority which he had accepted; and this doubt returned when he read, in Wiseman's article in the Dublin Review on The Anglican Opinion, the words of St Augustine against the Donatists, "securus judicat orbis terrarum," words which suggested a simpler authoritative rule than that of the teaching of antiquity. He continued his work, however, as a High Anglican controversialist until he had published, in 1841, Tract 90, the last of the series, in which he put forth, as a kind of proof charge, to test the tenability of all Catholic doctrine within the Church of England, a detailed examination of the XXXIX. Articles, suggesting that their negations were not directed against the authorized creed of the Church of England, but only against popular errors and exaggerations. This theory, though not altogether new, aroused much indignation in Oxford, and A. C. Tait, afterwards archbishop of Canterbury), with three other senior tutors, denounced it as "suggesting and opening a way by which men might violate their solemn engagements to the university." The alarm was shared by the heads of houses and by others in authority; and, at the request of the bishop of Oxford, the publication of the Tracts came to an end. At this date Newman also resigned the editorship of the British Critic, and was thenceforth, as he himself later described it, "on his deathbed as regards correspondence with the Anglican Church." He now recognized that the position of Anglicans was similar to that of the semi-Arians in the Arian controversy; and the arrangement made at this time that an Anglican bishopric should be established in Jerusalem, the appointment to lie alternately with the British and Prussian governments, was to him further evidence of the non-apostolical character of the Church of England. In 1842 he withdrew to Littlemore, and lived there under monastic conditions with a small band of followers, their life being one of great physical austerity as well as of anxiety and suspense. To his disciples there he assigned the task of writing lives of the English saints, while his own time was largely devoted to the completion of an essay on the development of Christian doctrine, by which principle he sought to reconcile himself to the elaborated creed and the practical system of the Roman Church. In February 1843 he published, as an advertisement in the Oxford Conservative Journal, an anonymous but otherwise formal retraction of all the hard things he had said against Rome; and in September, after the secession of one of the inmates of the house, he preached his last Anglican sermon. The Littlemore land was then assigned as a convent, and still an interval of two years elapsed before he was formally received into the Roman Catholic Church (9th October 1845) by Father Dominic, an Italian Passionist. In February 1846 he left Oxford for Oscott, where Bishop Wiseman, then vicar-apostolic of the Midland district, resided; and in October he proceeded to Rome, where he was ordained priest and was given the degree of D.D. by the pope. At the close of 1847 he returned to England as an Oratorian, and resided first at Maryvale (near Oscott); then at St Wilfrid's College, Cheddle; then at St Ann's, Alcester Street, Birmingham; and finally at Edgbaston, where he remained until his death.

In 1835, through the medium of the British Critic, he began a correspondence with Newman, and in 1841 he joined him as an Oratorian. But the union was not amicable, and Newman, in a correspondence published in 1846, said: "I think it is quite impossible to reconcile a man of my宗旨 with the doctrine and practice of the Church which he became jealous of his influence, so that after four years he retired, the best outcome of his stay there being a volume of lectures entitled Idea of a University, containing some of his most effective writing. In 1838 he projected a branch house of the Oratory at Oxford; but this was opposed by Manning and others, as likely to induce Catholics to send their sons to that university, and the scheme was abandoned. In 1859 he established, in connexion with the Birmingham Oratory, a school for the education of the sons of gentlemen on lines similar to those of the school at Stockbridge, which was closed by reason of Want of funds, but which was reopened as The Westminster Oratory, and never again ceased to take the greatest interest. But all this time (since 1841) Newman had been under a cloud, so far as concerned the great mass of cultivated Englishmen, and he was now awaiting an opportunity to vindicate his career; and in 1862 he began to prepare autobiographical and other memoranda for the purpose. The occasion came when, in January 1864, Charles Kingsley, reviewing Froude's History of England in Macmillan's Magazine, incidentally asserted that "Father Newman informs us that truth for its own sake need not be, and on the whole is, a virtue of the Roman clergy." After this preliminary sparring between the two Newman's pamphlet, "Mr Kingsley and Dr Newman: a Correspondence on the Question whether Dr Newman teaches that Truth is no Virtue," published in 1864 and not reprinted, is unsurpassed in the English language for the vigour of its satire: the anger displayed was
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later, in a letter to Sir William Cope, admitted to have been largely feigned—Newman published in bi-monthly parts his Apologia pro vita sua, a religious autobiography of unsurpassed interest, the simple confidential tone of which "revolutionized the popular estimate of its author," establishing the strength and sincerity of the convictions which had led him into the Roman Catholic Church. King's accusation—that, so far as it concerned the Roman clergy generally, was not precisely dealt with; only a passing sentence, in an appendix on lying and equivocation, maintained that English Catholic priests are as truthful as English Catholic laymen; but of the author's own personal rectitude no room for doubt was left.

In 1870 he put forth his Grammar of Assent, the most closely reasoned of his works, in which the case for religious belief is maintained by arguments differing somewhat from those commonly used by Roman Catholic theologians; and in 1877, in the republication of his Anglican works, he added to the two volumes containing his defence of the via media a long preface and numerous notes in which he criticized and replied to sundry anti-Catholic arguments of his own in the original issues. At the time of the Vatican Council (1869-1870) he was known to be opposed to the definition of Papal infallibility, and in a private letter to his bishop (Ullathorne), surreptitiously published, he denounced the "insolent and aggressive faction" that had pushed the matter forward. But he made no sign of disapproval when the doctrine was defined, and subsequently, in a letter nominally addressed to the duke of Norfolk on the occasion of Mr. Gladstone's accepting the Roman Church of having "equally repudiated modern thought and ancient history," Newman affirmed that he had always believed the doctrine, and had only feared the deterrent effect of its definition on conversions on account of acknowledged historical difficulties. In this letter, and especially in the postscript to the second edition of it, Newman finally silenced all cavillers as to his not being really at ease within the Roman Church. In 1878 his old college (Trinity), to his great delight, elected him an honorary fellow, and he revisited Oxford after an interval of thirty-two years. At the same date died Pope Pius IX, who had long mistrusted him; and Leo XIII was encouraged by the duke of Norfolk and other distinguished Roman Catholic laymen to make Newman a cardinal, the distinction being a marked one, because he was a simple priest and not resident in Rome. The offer was made in February 1879, and the announcement of it was received with universal applause throughout the English-speaking world. The "creation" took place on 12th May, with the title of St George in Velabro, Newman taking occasion while in Rome to insist on the lifelong consistency of his opposition to "liberalism and a different religion." After this promotion he returned to England, and thenceforward resided at the Oratory until his death, 11th August 1890, making occasional visits to London, and chiefly to his old friend, R. W. Church, dean of St Paul's, who as proctor had vetoed the consecration of Tract 90 in 1841. As cardinal Newman published nothing beyond a preface to a work by A. W. Hutton on the Anglican Ministry (1879) and an article on Biblical criticism in the Nineteenth Century (February 1884).

Newman's influence as controversialist and preacher (i.e. as reader of his written sermons, for he was never a speaker) was very great. In the English Church his conversion secured great prestige and the dissipation of many prejudices. Within it his influence was mainly in the direction of a broader spirit and of a recognition of the important part played by development both in doctrine and in Church government. And although he never called himself a mystic, he showed in that his judgment spiritual truth is apprehended by direct intuition, as an antecedent necessity to the professedly purely rational basis of the Roman Catholic creed. Within the Anglican Church, and even within the more strictly Protestant Churches, his influence was greater, but in a different direction, viz. in showing the necessity of dogma and the indispensableness of the austere, ascetic, chastened and graver side of the Christian religion. If his teaching as to the Church was less widely followed, it was because of doubts as to the thoroughness of his knowledge of history and as to his freedom from bias as a critic. Some hundreds of clergymen, influenced by the movement of which for ten or twelve years he was the acknowledged leader, made their submission to the Church of Rome; but a very much larger number, who also came under its influence, failed to learn from him that belief in the Church involves belief in freedom. The natural tendency of his mind is often (and correctly) spoken of as sceptical. He held that, apart from an interior and unreasoned conviction, there is no cogent proof of the existence of God; and in Tract 85 he dealt with the difficulties of the Creed and of the canon of Scripture, with the apparent implication that they are insurmountable unless overridden by the authority of an infallible Church. In his own case these views did not lead to scepticism, because he had always possessed the necessary interior conviction; and in writing Tract 85 his only doubt would have been where the true Church is to be found. But, so far as the rest of the world is concerned, his teaching amounts to this: that the man who has not this interior conviction has no choice but to remain an agnostic, while the man who has it is bound sooner or later to become a Roman Catholic.

He was a man of magnetic personality, with an intense belief in the significance of his own career; and his character may be described as feminine, both in its strength and in its weakness. As a poet he had inspiration and genuine power. Some of his short and earlier poems, in spite of a characteristic element of fierceness and intolerance in one or two cases, are described by R. H. Hutton as "unequaled for grandeur of outline, power of taste and radiance of total effect"; while his latest and longest, "The Dream of Gerontius," is generally recognized as the happiest effort to represent the unseen world that has been made since the time of Dante. His prose style, especially in his Catholic days, is fresh and vigorous, and is attractive to many who do not sympathize with his conclusions, from the apparent candour with which difficulties are admitted and grappled with, while in his private correspondence there is a charm that places it at the head of that branch of English literature. He was too sensitive and self-conscious to be altogether successful as a leader of men, and too impetuous to take part in public affairs; but he had many of the gifts that go to make a first-rate journalist, for, "with all his love for and his profound study of antiquity, there was something about him that was conspicuously modern." Nevertheless, with the scientific and critical literature of the years 1850-1890 he was barely acquainted, and he knew no German. There are a few passages in his writings in which he seems to show some sympathy with a broader theology. Thus he admitted that there was "something true and divinely revealed of that which is at the bottom of things," and his articles is abstractedly the highest state of Christian conception, but was "the peculiar privilege of the primitive Church." And even in 1877 he allowed that "in a religion that embraces large and separate classes of adherents there always is of necessity to a certain extent an exoteric and an esoteric doctrine." These admissions, together with his elucidation of the idea of doctrinal development and his eloquent assertion of the supremacy of conscience, have led some critics to hold that, in spite of all his protests to the contrary, he was himself somewhat of a Liberal. But it is certain that he explained to his own satisfaction and comfort the "great principle" of "the Roman Catholic Creed" and "the Church beyond it, as in holding the pope to be infallible in canonization; and while expressing his preference for English as compared with Italian devotional forms, he was himself one of the first to introduce such into England, together with the ritual peculiarities of the local Roman Church. The motto that he adopted for use with the arms emblazoned for him as cardinal—Cor ad cor loquitur, and that which he directed to be engraved on his memorial tablet at Edgbaston—Ex umbri et imaginibus in terrissem—together seem to disclose as much as can be disclosed of the secret of a life, which, both to contemporaries and to later students, has been one of almost fascinating interest, at once devout and inquiring, affectionate and yet sternly self-restrained.
There is at Oxford a bust of Newman by Woolner. His portrait by Ouelles is at the Birmingham Oratory, and his portrait by Millais is in the possession of the duke of Norfolk, a replica being at the London Oratory. Outside the latter building, and facing Brompton Road, there is a marble statue of Newman as cardinal.

(A. W. Hu.)

The chief authorities for Newman's life are his Apologia and Correspondence, edited by Miss Mozley, above referred to. The letters and memoranda dealing with the years 1845-1890 were entrusted by Newman to the Rev. R. Neville, the literary executor. Works by R. W. Church, J. B. Mozley, T. Monceaux, and Wilfrid Ward should also be consulted, as well as an appreciation by R. H. Hutton. Adverse criticism will be found in the writings of the late Abbe' d'Agincourt in his Christian Cardinals (2 vols., London, 1892), while some minor traits and foibles were noted by A. W. Hutton in the Expositor (September, October and November 1890). See also F. Thureau-Dangin, La Renaissance catholique: Newman et le mouvement d'Oxford (Paris, 1890); Lucie Félix-Faure, Newman, sa vie et ses œuvres (ib. 1901); MacKae, Die religiöse Gewissheit bei John Henry Newman (Jena, 1898); Grappe, John Henry Newman. Essai de psychologie religieuse (Paris, 1902); William Barry, Newman (London, 1903); Lady Blennerhassett, J. H. Cardinal Newman (Berlin, 1904); Brémont, Newman. Le développement du dogme chrétien (Paris, 1903; 4th ed., 1906), Psychologie du fait (ib. 1900), and Essai de biographie psychologique (ib. 1900).

NEW MARCH, WILLIAM (1822-1882), English economist and statistician, was born at Thirsk, Yorkshire, on the 28th of January 1822. He settled in London in 1846 as an official of the Agra Bank, but resigned in 1851 on his appointment as secretary of the Globe Insurance Company. This post he held till 1862, when he became chief officer in the banking-house of Glyn, Mills & Co., in whose employ he remained until 1881. Notwithstanding the continuous pressure of an active business life he found time to contribute largely many valuable articles to the magazines and newspapers of the country. He assisted in the preparation of a series of volumes (about thirty in all) for the Royal Statistical Society (of which he was one of the honorary secretaries, editor of its journal, and in 1869-1871 president) and the Political Economy Club. He was also elected a fellow of the Royal Society. His extensive knowledge of banking was displayed in the evidence which he gave before the select committee on the Bank Acts in 1857. He collaborated with Thomas Tooker in the two final volumes of his History of Prices and was responsible for the greater part of the work in those volumes. For nineteen years he wrote an admirable survey of the commercial history of the United Kingdom, to which he was stricken in 1882. He died at Torquay on the 22nd of March 1882. After his death his friends, in perpetuation of his memory, a Newmarch Lectureship in economic science and statistics at University College, London.

NEW MARKET, a market town in the Newmarket parliamentary division of Cambridgeshire, England, 133 m. E. by N. of Cambridge on the Bury branch of the Great Eastern railway. Pop. (1901) 10,688. A part of the town is in Suffolk, and the urban district is in the administrative county of West Suffolk. Newmarket has been celebrated for its horse-races from the time of James I., though at that time there was more of coursing and hawking than horse-racing. Charles I. instituted the first cup race. For the use of Charles II., during his visits to the races, a palace, no longer extant, was built on the site of the lodge of James I. There are numerous residences belonging to patrons of the turf, together with stables, and racing and training establishments. The racecourse, which lies south-west of the town, has a full extent of 4 m., but is divided into various lengths to suit the different races. The course intersects the so-called Devil's Ditch or Dyke (sometimes also known as St Edmund's Dyke), an earthwork consisting of a ditch and mound stretching almost straight for 5 m. from Reach to Wool. It is 12 ft. wide at the top, 18 ft. above the level of the country, and 30 ft. above the bottom of the ditch, with a slope of 50 ft. on the south-west side and 26 ft. on the north-east. It formed part of the boundary between the kingdoms of East Anglia and Mercia, but is doubtless of much earlier origin. Roman remains have been found in the neighbourhood.

NEW MECKLENBURG (Ger. Neu-Mecklenburg, formerly New Ireland, native Tombara), an island of the Bismarck Archipelago, N.E. of New Guinea in the Pacific Ocean, about 3° 3', 152° E., in the administration of German New Guinea. It is about 240 m. long but seldom over 15 wide. From St George's Channel, separating it from New Pomerania, it sweeps north and then north-west along dividing New Guinea and the Outback, other extremity by Byron Strait. It is mountainous throughout, having an extreme elevation of about 6500 ft. in the north, where the prevalent formations are sandstone and limestone, whereas in the south they are granite, porphyry and basalt. There is a white population of about forty; the natives are Papuans of a less fine type than the natives of New Pomerania, and rather resemble the Solomon Islanders. Jacob Lemaire and Willem Cornelis Schouten sighted New Mecklenburg in 1616, it it only recognised as an island separate from New Guinea by William Dampier in 1699 and as separate from New Pomerania in 1767 by Philip Carteret.

NEW MEXICO, a south-western state of the United States, lying between 31° 20' and 37° N. lat., and 103° and 109° 2' W. long. It is bounded N. by Colorado; E. by Oklahoma and Texas; S. by Texas and Mexico; and W. by Arizona. It has an extreme length N. and S. of 400 m., an extreme width E. and W. of 356 m., and a total area of 122,634 sq. m., of which 131 sq. m. are water-surface.

Physiography.—New Mexico is a region of mountains and high basins. Breaking elevations, its surface is tabularly tilted toward the S. and E., and broken by parallel ranges of mountains whose trend is most frequently N. and S. About midway between the western boundary and the Rio Grande passes the Continental Divide, which separates the waters entering the Gulf of Mexico from those that flow into the Gulf of California. In the region E. of the Continental Divide, which embraces about three-fourths of the surface of the state, the general south-eastern slope is very marked. Thus, at Santa Fé, in the north central part of the state, the elevation is 7013 ft.; at Raton, in the N.E., 6420 ft.; at Las Cruces, in the S., 3570 ft.; and at Red Bluff, in the extreme S.E., 2876 ft.

The Rocky Mountain system enters New Mexico near the centre of the northern boundary; its main ridge, lying E. of the Rio Grande, extends as far S. as the city of Santa Fé. It forms the water-parting between the upper waters of the Canadian river and the Rio Grande, and contains many of the loftiest peaks in New Mexico, among them being Truchas (13,275 ft.), Costilla (12,634 ft.) and Baldy (12,623 ft.). On the E. this ridge is bounded by the region of the Great Plains, with a two thousand-foot relief of which is characterized by many broad valleys intervening. W. of the Rio Grande lies a series of lower ranges, also a part of the Rocky Mountain system, whose long mountain slopes merge almost imperceptibly with the Plateau Region. The San Juan, San Miguel and New River Mountains being the most notable in this group. South of the Rocky Mountains lies the so-called Basin Region, in which isolated, but sometimes lofty and massive, N.Mexico mountains, reared in many instances as a series of numerous parallel faults, rise from level plains like islands from the sea and enclose the valleys with bare walls of grey and brown rock. These valley plains, from 10 m. to 20 m. wide and sometimes 100 m. long, sloping gradually toward their centres, are usually covered with detritus from the neighbouring mountains, and seldom have a distinct drainage outlet. The Spaniards called them "bolsonas" (pores), a term that geologists have retained. In many of these bolsonas are ephemeral lakes, in which the waters collect during the rainy season and stand for several months. These waters are frequently impregnated with alkalii or salt, and on evaporating leave on the bed of the lake a thin encrustation of snow-white spar. Such beds, locally known as "alkali flats," are especially numerous in Valencia, Socorro, Dona Ana and Otero counties, and a number of them furnish all the salt needed by the cattle ranges in their region. West of the region of the great plains is the so-called Basin of New Mexico, lies the basin of the extinct Lake Otero, in which are found the remarkable "white sands," consisting of dunes of fine white sand or gravel, found covering the sea bottom. In this region many species of reptiles and insects are almost perfectly white—an interesting example of protective coloration. Both E. and W. of the central portion of the Basin Region the bolson plains extend on their distinctly flattish surfaces, usually level, the broader and the mountains less lofty and more isolated. East of the Pecos and S. of the Canadian rivers lies the great arid tableland known as the Great Plain, a region of vast plateaus and featureless tablelands, having with almost nothing to break the monotony of its landscape. This is a part of the Great Plains and a continuation of the high plains region of Texas. The Plateau Region includes most of the area N.
of the Gila river and W. of the Rio Grande. Fire, volcanic activity and powers of earth have combined to produce a scene of great scenic effects. The eastern border of this area is formed by the valley of the Rio Grande and the western foot-hills of the Rocky Mountains; the southern boundary overlooks the Gila river; and on the north it is formed by the mountainous boundary of Utah. Near its southern and eastern borders are many lava flows and extinct volcanic mountains, one of the most imposing of those in New Mexico is Pecos peak near Taylor. Such flows as these are surrounded by lava tables and some of the most wonderful volcanic buttes in the world.

In other portions of New Mexico there is also much evidence of former volcanic activity. A conspicuous feature of its landscape is the great many basaltic flows which were formed by differential erosion and projecting above the surrounding country like a table. A notable example is the mesa of Acoma, in Valencia county, capped with volcanic rocks; upon its summit, almost level, are large cultivated fields.

The average elevation of New Mexico is 5700 ft., with 40.20 sq. m. between 3000 and 5000 ft.; 56,680 sq. m. between 5000 and 7000 ft.; 23,550 sq. m. between 7000 and 9000 ft.; and 2000 sq. m. above 9000 ft.

For a region with such a small amount of rainfall the rivers are numerous, but none of the streams is navigable, and in many of them during the dry season (and in some of them during the stratification) the water in places disappears entirely beneath the sandy bed, and after flowing underground for some distance, breaks out at length on as a river, rivulet or spring. The most important stream in New Mexico, as its name implies, enters New Mexico through deep canyons near the centre of the northern boundary and continues southward across the entire state. During the dry season the river flows from its source to a sluggish river turgid with sand in the S. In the lowlands it loses much of its volume through evaporation and absorption by the sands, and through irrigation, and in its lower course in New Mexico it is almost perfectly dry.

The river leaves its banks and inundates the lowlands, spreading over the sand a rich deposit of silt, and on account of this characteristic it is sometimes called the Nile of New Mexico. The stream next in importance is the Pecos river, which rises in Mora county and flows southward into Texas, where it joins the Rio Grande. It has the same general characteristics as the latter river, being a mountain stream, a river of springs, and a stream without banks, sluggish and losing much of its water. Along the lower course many underground streams from the mountains break out as springs and empty into the Pecos. The Canadian river drains the eastern slope of the Rocky Mountains and flows in a general south-easterly direction through Texas into Oklahoma, where it empties into the Arkansas. Most of its course in New Mexico lies through a canyon.

The westward-flowing streams—the San Juan, Rio Puerco of the West, Zunis, Rio San Francisco and Colores—are of little importance, though their flow is perennial. In the valleys there are many small streams whose waters never reach the ocean, but drain into underground passages and springs.

Fauna and Flora.—Of native animals the species are numerous, but their numbers are small. Bison no longer roam the plains, and the elk has been driven out; but among the larger mammals still to be found are the coyote, the jack rabbit (or jackal), the bob-white, the bison and the bison, the antelope, the elk, the bear, the bear, the wolf, the coyote, the timber wolf, lynx (Lynx rufus and Lynx Canadensis) and the black and grizzly bear. Badgers, hares, and rabbits are found everywhere, and prairie-dogs are so numerous in some of the places as to be considered a pest. W. of the Rio Grande are species of aquatic birds. From time to time upon the Rio Grande may be seen ducks, wild geese, swans, cranes, herons and gulls. Eagles are often seen, and in the arid and elevated regions crows and ravens are numerous. Gambel's quail, bob-white, grouse, English phasian and wild turkeys are the most important game birds, and the mocking-bird is common throughout south-western New Mexico. Among the butterflies, dragon-flies, flies, insects and the rattlesnake, the Gila monster (Heloderma suspectum), a poisonous lizard, and the tarantula (Majgale Heintzii), which, however, are common only in certain places and at certain seasons.

The greatest range of elevations that all four of the zones of vegetation into which the South-West has been divided according to altitude are found within its limits; namely, the zone of cacti, which extends from the cactus sands to the cactus desert, the zone of greasewood and sage-brush (3500-4000 ft.), where there is little grass, and the cactus species are less numerous; the zone of the cedar (4000-6800 ft.); and the zone of the pine and fir (6800- 10,000 ft.) where there is much grass. The total area of the land in the state is estimated at 36,700 sq. m., or a little more than 19% of the land area.

The chief varieties of timber are the red fir, Engelmann's spruce and yellow pine. Up to 1910 the Federal government had created eleven forest reservations in New Mexico, embracing an area of 10,971,111 acres.

In the valleys the only trees native to the soil are cottonwood, willow and alder. Beyond the range of irrigation vegetation is limited to scanty grass, with sage-brush and greasewood in the N. and cactus and yucca in the S.

As the winds that reach New Mexico have been described while crossing the plains of Texas or the mountains of the N.W., the climate is characterized by a lack of humidity. The sandy and barren nature of the soil and the scarcity of trees is responsible for the fact that there is great daily variation in the temperature. The low humidity, high altitudes and southern latitude all combine to make the climate salubrious and especially beneficial to persons suffering with tuberculosis. The coldest temperature ever recorded was 110° F. at Roswell; the lowest, 23° at Aztec. At Santa Fé, where mountain and plain meet, the mean annual temperature is 46°; the mean for the winter is 31° and for the summer 70°; and the temperature is at all seasons remarkably uniform. The summer season lasts from May 1st to July 31st, and the winter season lasts from November 1st to February 28th.

Agriculture.—Because of the small amount of rainfall, agriculture is confined chiefly to the river valleys. In 1900 only 4.2% of the land surface was included in farms, and less than 27% of 1% was cultivated. In 1900 the land area of farms was 41,494,529 acres, including 1,784,824 acres of improved land; of this total area, 63% of it was improved between 1880 and 1890, 27% of it between 1880 and 1890, and 10% of it between 1880 and 1880.

In addition to the improved land, there were 41,695,634 acres of unimproved, including 10% of it between 1880 and 1890, 27% of it between 1880 and 1890, and 10% of it between 1880 and 1890. The average area of farms was 410 acres, and the average area of improved land was 214 acres. The average area of farms was 214 acres, and the average area of improved land was 214 acres.

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number in any state or Territory except Montana and Wyoming; and in April 1909 there were 3,200,000 sheep of shearing age in New Mexico, but this number was less than that in Montana or Wyoming at that time.

El Alto was one of the mountain valleys in the N., agriculture was long entirely dependent upon irrigation, which has been practised in New Mexico by the Pueblo Indians since prehistoric times. In 1899 the total irrigated areas of the state (value of all improved land)—an increase of 122.2% in the preceding decade. Of the total land in crops in that year 89.2% was irrigated. After the passage of the Federal Reclamation Act in 1902, a number of extensive irrigation works in New Mexico were undertaken by the Federal government. The Carlsbad reservoir and diverting dam in Eddy county and the Rio Hondo canals and reservoir in Chaves county were completed in 1907 and are capable of supplying water to 20,000 acres of farm land. In 1908 an irrigation reservoir in McKinley county for the use of the Zufi Indians and the Leasburg project (Dona Ana county; 20,000 acres) were completed. Irrigation reservoirs have been made for the storage of the flood waters of the Rio Grande near Engle, New Mexico, in order to reclaim about 155,000 acres of land in New Mexico and Texas, and to deliver to Mexico above the city of Juarez 60,000 acres (feet of water per year, as provided by a treaty (proclaimed on the 16th of January 1907) between that republic and the United States. Other systems contemplated by the government were the Las Vegas project (for reclaiming 60,000 acres, the largest in the state), Lake Otero project (26,000 acres in the Pecos Valley, and the La Plata Valley project for irrigating about 40,000 acres in the northwestern part of New Mexico, 35 m. S.W. of Durango, Colorado. A special session of the legislature created the office of Territorial irrigation engineer. Irrigation by private companies is of some importance, especially in the San Juan Valley, the Rio Grande Valley and the Pecos Valley. In 1909 it was estimated that the value of irrigated lands in New Mexico had proved a great success in New Mexico, as elsewhere in the Southwest, especially since 1900; and in 1907 it was estimated that 2,000,000 acres were under irrigation.

Manufactures.—As New Mexico is primarily a mining and stock-raising region, its manufacturing industries are of comparatively small importance. The value of the manufactured products in 1880 was $2,546,948; in 1890 it was $4,163,195; and in 1907 it was $15,587,040, an increase in the latter decade of 269.7%. In 1905 there were 199 establishments under the factory system (an increase of 14.4% over the number in 1900); the amount of capital invested was $4,059,000, and the value of products $5,795,880 (an increase of 40.5% over the value of the "factory" products in 1900). The leading industries in 1905 were the construction of cars and general railway shop and repair work by steam railway companies (value of product, $2,509,845), the manufacture of lumber and timber products (value $1,315,364) and of flour and gist mill products (value $388,124), and the printing and publishing of newspapers and periodicals (value $373,062). In 1907 the value of the manufactures was $10,528,041. Santa Fe and Socorro were valued at 39.4% of the total value of New Mexico's products.

Minerals.—The existence of valuable mineral deposits was early known to the Spaniards and Mexicans. There was some production of gold by the Mexicans, but the silver mining was unimportant until 1881, when the Lake Valley silver mines in Sierra county began to yield. Before that year all the silver produced was of the value of $25,000. In 1908 the production of silver increased from $275,000 to $3,000,000. After 1885 there was a gradual decline in the output, whose bullion value in 1908 was $250,986. The production of gold has shown a somewhat similar movement; the output in 1881 was valued at $188,000; in 1888, at $1,000,000, and in 1908 at $298,275. The leading gold- and silver-producing counties are Socorro, Grant, Sierra and Dona Ana. Only silver is mined in the last-named county. Copper has been mined for many years, and in 1906 and 1908 constituted New Mexico's most valuable metallic product, the value of the yield in these years being $1,335,533 and $658,855 respectively. Nearly all the product comes from the Don Henry mine in Grant county, which was the only copper mine in New Mexico in 1880. The output in 1908 increased to $3,000,000.

Most of the zinc comes from the Sonoita mine in Grant and Otero counties. In 1905-1908 the decrease in output was large. In the same years there was an increase in the output of zinc, which in 1906 was valued at $57,710 and in 1908 at $270,710. The total output of the state, where the mines of the Magdalena District in 1908 yielded 93% of the entire product. A small amount of lead is produced incidentally to the mining of zinc, being derived from mixed lead and zinc ores. For the most part, lead is impure metallic product, however, is coal, which is found in all forms—lignite to anthracite—and in widely distributed areas. The chief centres of production are the Raton field, in Colfax county; the Mescalero, Ruidosa, and Whiteclows fields, in Lincoln county; and the Los Cerrillos and Tejon areas, in Santa Fe county. Much of the coal is suitable for coke, of which a considerable amount is manufactured for use in the state. In 1906, $1,904,499 was made, and in 1908, $3,366,753. Iron ores are widely distributed, but have not been developed; graphite is mined in Colfax county; mica in Taos county, and to a small extent in Rio Arriba county; marble is quarried in Otero county and sandstone in Bernalillo, Colfax and San Miguel counties. Gypsum beds are widely distributed, and the supply is inexhaustible, but their great distance from centres of consumption has prevented their profitable working. In New Mexico are found turquoise and a few garnets; it seems probable that these were mined by the Aztecs. The largest of the old Spanish turquoise mines is in Socorro county, where a turquoise product between 1890 and 1900 valued at more than $2,000,000. Other mines are in Grant and Otero counties. The New Mexican turquoise is of a more delicate turquoise than the Arizona varieties. The output of precious stones in 1902 was valued at $51,100, in 1908 at $72,100.

Transportation.—The total railway mileage on the 31st of December 1908 was 2,518.02, more than twice as much as that of 1890. The length of railway per inhabitant in New Mexico in 1907 was about five times as great as that for the whole country, but the amount of line per square mile of territory was only about one-third as great as the average for the United States. New Mexico is traversed by a line of the Atchison, Topeka & Santa Fe, from Chicago to San Francisco and the Southern Pacific from New Orleans to San Francisco. The main line of the former enters the state at Las Vegas, in southern New Mexico, and thence westward into Arizona. A southward extension taps the Southern Pacific at El Paso, Texas, and Deming, New Mexico, and there are numerous shorter branches. This system also controls the Peecos Valley & North-Eastern railway, which serves the southwestern part of New Mexico. The Southern Pacific crosses New Mexico westward from El Paso, Texas. The western division of the El Paso & South-Western system, connecting El Paso and Deming, New Mexico, and southward to the Rio Grande boundary. Its eastern division (including the El Paso & North-Eastern, the El Paso & Rock Island, the Alamosagordo & Sacramento Mountains) extends from El Paso to the Rio Grande at the junction with the Rock Island & Pacific at Tucumcari; thus forming a connecting link between that system and the Southern Pacific. The Santa Fe Central, extending southward from Santa Fe to Torrance, is a connection between the Southern Pacific and the El Paso & South-Western systems. Branches of the Denver & Rio Grande serve the northern parts of New Mexico.

Population.—The population of New Mexico consists of three distinct classes—Indians; Spanish-Americans, locally known as "Mexicans"; and the English-speaking class called, in distinction from the others, "Americans." Of the Indians there are several types—by far the largest is the Pueblo, by far the second is the Apache, by far the third is the Navaho, and in the other the Navahos, in the N.W. part of the state, and their near kinsmen, the Apaches, to the south. The Pueblo Indians live in adobe houses, are quiet and usually self-sustaining, and have been converted to the forms of Christianity. They had irrigated farms and dwelt in six-storey communal houses long before the advent of the white man. By the treaty of Guadalupe-Hidalgo, in 1848, the United States government recognized them as citizens. They lived in 19 villages of pueblos, the largest of which, Zufi, is more properly called a reservation, as it has been enlarged from time to time by grants from the Federal government. Several of the Pueblo Indians, the Zufi reservation contained in 1900 a population of 1,217, and a total area of 1,471 sq. m. The pueblos are held under Spanish grants which were confirmed by the United States. The terraced architecture of the villages is very remarkable. Originally the Pueblo Indians lived in many-storied communal houses, built sometimes of stone, sometimes of adobe, and occasionally chiselled into the sides of a stone cliff, as best suited the convenience of the builders. At present there is a tendency among them to copy the one-storey huts of the Mexicans. Taos (pop. in 1900, 419) is one of the most imposing of the pueblos, consisting of three-storeyed pyramidal tenements, separated by a brook. Zufi (pop. 1,525) has a five-storied dwelling surrounded by detached huts; Acoma (pop. 492 in 1900; 566 in 1902), standing on a cliff 357 ft. high (Acoma means "people of the white rock" and Aco, the Indian name for the pueblo, means "white rock "); contains three blocks of three-storeyed terraced buildings,1 and Laguna also contains some three-storied buildings.

About 3 m. N.E. of Acoma stands the Enchanted Mesa (Mesa Encantada), a large rock formation near Katyama, about being 205 ft. long and 100 to 350 ft. wide. Upon its summit, according to Indian tradition, once stood the village of Acoma, but while the inhabitants were tending their crops in the plains a powerful storm arose, and such a tempest of lightning and thunder as could have been no earthly work was sent to destroy the village, with which the summit could be reached. According to the story, three women had been left in the village and these perished. The mesa was first climbed by white men in 1896 by Froelich Rappe (b. 1855), of Princeton University; it was climbed again in 1897 by a party led by F. W. Hodge; and pottery and stone implements were found here.
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dwellings, but the Laguna tribe, numbering, 1077 in 1900 and 1384 in 1907, now live mostly in their former summer villages on the plain. The other Indians live on reservations, of which there are three: the Mescalero Apache reservation, in Otero county, containing 554 Indians in 1900; the Jicarilla Apache reservation, in Rio Arriba county, with a population of 829; and the Navaho reservation, in Utah, Arizona and New Mexico, which contains in that part of it situated in New Mexico a population of 2450.

The inhabitants of Spanish descent have been only slightly assimilated and still retain to a marked degree their national peculiarities. As a rule, they live in small groups, build around a court, and are poor and ignorant, but hospitable. They are more Americanized in the Rio Grande Valley than among the mountains, where English is rarely spoken. Many of them have intermarried with the Indians, creating the class of half-breeds known as "Mestizos." Although the proportion of Spanish-American and Indian inhabitants is steadily decreasing with the arrival of immigrants from other parts of the United States, it was nevertheless computed by the New Mexican authorities to be about 63% in 1904. About one-tenth of the Spanish-American and Indian inhabitants use the English language.

The total population of New Mexico in 1870 was 91,874, in 1880, 119,565; in 1890, 153,593; in 1900, 190,310, and in 1910, according to the U.S. census, the figure was 327,301.

Of the native white population in 1900, 17,017 were of foreign parentage. Of the foreign-born element 66,495, or about one-half, were Mexicans, 1360 were Germans and the rest chiefly English, Irish, Canadians, Italians, Scotch and Austrians. The chief cities were Albuquerque (6289), Santa Fé (6063), Las Vegas (3552) and Raton (3540). Far the greater portion of the population (in 1900, 56½%), of the estimated population) are communicants of the Roman Catholic Church, which had in 1900 121,558 members, the total communicants of all denominations in that year numbering 137,009. Among Protestants there were 6560 Methodists, 2935 Presbyterians and 2331 Baptists.

Administration. — The executive officers until 1911 were a governor and a Territorial secretary appointed by the President of the United States, and a treasurer, auditor, superintendent of public instruction, adjutant-general, commissioner of public lands and other administrative officials appointed by the governor.

The legislative department included a council of 14 members and a House of Representatives of 24 members, chosen by popular vote. The sessions were biennial and limited to 60 days. All laws passed by the Assembly and approved by the governor had to be submitted to the Federal Congress for its approval. The Territory was represented in Congress by a delegate, chosen by popular vote, with the right to speak in the national legislature but not to vote. The judicial department included a supreme court, district courts, probate courts and local justices of the peace. The supreme court consisted of a chief justice and six associate justices appointed by the President. There were seven judicial districts, each with a court presided over by a justice of the supreme court. Each county had a probate court, and each precinct a justice of the peace.

For the purposes of local government New Mexico is divided into 26 counties, each being governed by a board of county commissioners, chosen by the people. Each county is divided by the commissioners into precincts. Municipal corporations with a population of 3000 and over are cities, and are governed through a mayor and board of aldermen; those with a population of between 1500 and 3000 are towns, and are governed through a mayor and board of aldermen.

A rather unusual institution within New Mexico is the mounted police, who numbered 11 in 1907, whose work was almost entirely in the cattle country, and who had authority to patrol the entire Territory and to make arrests or to preserve order wherever their presence was necessary, and who were answerable to the jurisdiction of local police.

A homestead not exceeding $1000 in value, and held by a husband and wife or by a widow or widower with an unmarried daughter or an unmarried minor son, may be held exempt from seizure and sale by legal process. The exemption may be claimed by either the husband or the wife, but may not be granted if each owns a home-
de Vaca into Mexico after eight years of wandering across the continent and related to his countrymen the stories he had heard of wonderful cities of stone in the north. He had not seen the cities himself, nor had he, as is frequently asserted, gone as far north as the present New Mexico, but his reports tended to confirm previous rumours and led the viceroy, Don Antonio de Mendoza, to send Fray Marcos de Niza, a Franciscan friar, on a small and inexpensive expedition of discovery.

Fray Marcos (q.v.) was the first European to enter the limits of what is now New Mexico. A glimpse of the terraced houses of an Indian village—now identified as Zuñi—enraptured him, and he had written the Friar of the Modern Cities which he submitted back with the good news. The story that he told grew in their passage from mouth to mouth until the Spaniards believed that in the north were cities “very rich, having silversmiths, and that the women wore strings of gold beads and the men girdles of gold.” Full of missionary zeal, and desirous that settlements should be planted in the new region in order that the heathen might be converted, Fray Marcos did little to refute these exaggerations. The conquest of the Seven Cities was determined upon, and a band of adventurers, led by Fray Juan de Padilla de Coronado (q.v.), set out in the fall of 1540 to follow the route of Fray Marcos de Niza. Coronado reached the first of the alleged cities, and to his great disappointment found only an Indian pueblo. An exploring party sent eastward reached Acoma, and then proceeded to Tiguex on the Rio Grande, and finally to the Pecos river. The main body of Coronado’s expedition remained in New Mexico on the Rio Grande while he pushed on to the fabled land of Quivira,1 only to meet with another disappointment.

Forty years elapsed before the Spaniards again entered New Mexico. In 1581 Fray Augustín Rodríguez, another Franciscan, explored the valley of the Rio Grande, and in 1582-1583 Antonio de Espejo made extended explorations to the E. and W. of this stream. It was about this time, apparently, that the Spaniards in Mexico adopted the term New Mexico to designate the land to the north; Rodríguez had called the country San Felipe, and Espejo had named it Nueva Andalucía. Between 1583 and 1595 several attempts at the conquest and occupation of New Mexico were made, but for various reasons they were unsuccessful. In the spring of 1595 Don Juan de Oñate entered New Mexico with about 400 colonists, and choosing the pueblo of San Juan (q.v. N.W. of the modern Santa Fé) as a temporary dwelling-place, made preparations for building a town at the junction of the Rio Chama and the Rio Grande, to be known as San Francisco. In the following year the new settlement was renamed San Gabriel. Some years later a second settlement was made at Santa Fé, which has ever since been the seat of government of New Mexico. Although the Franciscan missionaries by 1617 had built seven churches and had baptized 14,000 Indians, there were in this year only 48 soldiers and settlers in the province. The zeal of the friars in stamping out the religious rites of the natives, the severe penalties inflicted for non-observance of the rules of the Church, and the heavy tribute in kind demanded by the Spanish authorities, aroused feelings of resentment in the Pueblo Indians and led in 1680 to a general revolt, headed by a native named Popé. Over 400 Spaniards were massacred, and the remnant, after enduring a siege in Santa Fé, fled southward to a mission near the present El Paso. For a decade the natives enjoyed their independence, destroying nearly all vestiges of Spanish occupation, and venting their wrath particularly upon the churches. After several attempts at reconquest had failed, Don Diego de Vargas marched up the Rio Grande in 1692, and led the way as vanguard for Governor de Vargas, then held by the Indians. During the next four years the submission of all the pueblos was secured, and the permanency of

1 Although the Quivira story was fabricated by an Indian captive and its fraudulent character was fully exposed by Coronado in 1541, ignorant American treasure-seekers still search for this mythical region. By a strange perversion of names the deserted stone pueblo of Tabib, S. of Albuquerque in the vicinity of the Manzano Moun-

tains, has received the appellation of "Gran Quivira," thereby causing many deluded persons to make a vain search among its ruins for treasure.

European occupation was assured. The history of New Mexico in the 18th century was uneventful, being chiefly a story of petty disagreements among the pueblos, and occasional forays of the more warlike tribes, the Navahos, Apaches and Comanches. During the Mexican War of Independence (1811–21) New Mexico was tranquil and little disturbed by events farther south; but when, near the close of the year 1821, the news of independence arrived it was received with enthusiasm. Under the Mexican republic New Mexico was called a province till 1824, when it was united with Chihuahua and Durango to form the Estado Interno del Norte. Several months later, however, it was separated from these two provinces and became the Estado Interno del Sur, officially designated as a department, and remained as such until ceded to the United States by the treaty of Guadalupe-Hidalgo, in 1848. Its government during this period was only slightly changed from what it had been under Spain.

Of great importance to New Mexico during the first half of the 19th century was the development of its trade with the United States. American traders had occasionally ventured as far as Santa Fé before the independence of Mexico, but they were frequently expelled and their goods confiscated by the Spanish authorities. After the Mexican War, however, the explorations became larger and more numerous. From Missouri caravans of pack animals, and later wagon trains, set out in May of each year on the 800 m. journey to Santa Fé, along the route later followed in its general lines by the Atchison, Topeka & Santa Fé railway. The value of the products carried by these trains increased from $7,500 in 1822 to $45,000 in 1845. On their return trip the wagons often brought loads of wool, fur and blankets.

In 1841 the republic of Texas, claiming that its western boundary was the Rio Grande, sent a force of 500 men to New Mexico to enforce these claims. The Texans reached the frontier in a starved and exhausted condition, were made prisoners by the New Mexican militia, and were sent to Mexico, where a short term of confinement they were released.

In 1846 the Congress of the United States declared that war existed with Mexico, and on the 3rd of June Brigadier-General Stephen W. Kearny was ordered to undertake the conquest of New Mexico and California and to “establish temporary civil governments therein.” Kearny reached Las Vegas on the 15th of August, assured the people of protection if they remained peaceable, and three days later established a civil government and compiled a code of laws, some of which are still in force, thus exceeding his instructions and ignoring the territorial claims of Texas, out of which had grown the war. After Kearny’s departure for California and Col. Alexander William Doniphan’s (1806-1887) setting out (Dec. 1846) on his heroic expedition to join Gen. Wool at Chihuahua, some of the inhabitants revolted, and in January 1847 assassinated the governor, Charles Bent, and a number of Americans and Mexicans who had taken office under the new regime. The insurrection was quickly suppressed, but the citizens soon grew tired of a military government, and in 1848 and again in 1849 petitioned Congress for a government “purely civil in character.” In 1850 a convention met in Santa Fé and drafted a state constitution prohibiting slavery; this constitution was ratified, and state officials were chosen to act under it. The governor by military appointment, Colonel John Munroe (1796–1867), refused to surrender his jurisdiction in favour of the state officials until authorized to do so by Congress, and for a time there was much writing of pronuncia-
mentos by the military and the quasi-state officials. But finally a regular Territorial form of government, provided by Congress by an act of the 13th of December 1850 (a part of the Compromise of 1850), was formally inaugurated on the 3rd of March 1851.

As originally constituted, the Territory included, besides most of its present area, nearly all of what is now Arizona, and a small portion of the present Colorado. By the terms of the Compromise Measures of 1850 Texas surrendered all claims to the portion of New Mexico E. of the Rio Grande, and was reimbursed for this loss of territory by the Federal Government. The Gadsden Purchase (see GADSDEN, JAMES), concluded on the 30th of
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December 1853, and proclaimed by President Pierce on the 30th of June 1854, added to the Territory an area of 45,535 sq. m., and changed the southern boundary W. of the Rio Grande so that from the Rio Grande the new boundary ran due W. on the parallel of \( 31^\circ 47' \) N. lat. for 100 m., then due S. to the parallel of \( 32^\circ 20' \) N. lat., then due W. on that parallel to the point of intersection with the boundary of Colorado, and thence on the middle of the Colorado river to 20 m. below its junction with the Gila, and thence up the middle of the Colorado river to the boundary line between Mexico and California. In 1861 a portion of north-eastern Mexico was taken to form part of Colorado; and in 1863 all of the area W. of the 109th meridian was organized as the separate Territory of Arizona.

In 1850 the question whether New Mexico should have slavery was left to the decision of the inhabitants. Only a few African slaves were ever brought into the Territory, and these were usually the property of civil and military officers. There were two classes of the population, however, whose status was practically that of slaves; namely, Indian captives and peons. Before slavery was prohibited in the Territory by Act of Congress in 1862, Indian captives were regularly bought and sold, a traffic sanctioned by custom and not prohibited by law. Peons were persons held in servitude on account of debt, and thepeonage system was sanctioned both by the custom of the Mexican provinces and by the natural laws of 1855 forbade service from leaving masters to whom they were indebted, and in 1853 sheriffs were authorized in instances to dispose of the debtor’s labour to the highest bidder. Peonage remained a legalized institution until 1860, when it was abolished by an act of Congress.

At the outbreak of the Civil War the inhabitants were generally apathetic; but when the Confederates invaded New Mexico they proved loyal to the Union. In February 1862 General H. H. Sibley, commanding a force of about 3000 Texans, marched into New Mexico, fought a successful engagement at Valverde, on the Rio Grande, against Union forces under Colonel, later General, Edward R. S. Canby, and occupied Albuquerque and Santa Fe. The Union troops were reinforced from Colorado, however, and after a series of skirmishes the Confederates were compelled to retreat to Texas, leaving behind about half their original number in killed, wounded and missing. New Mexico furnished to the Union army between 5000 and 6000 men.

The period following the American occupation of New Mexico was marked by constant depredations of the Indians, chiefly the Navahos, Apaches and a few Utes, their main object being plunder. While the troops were occupied with the Confederate invaders the Navahos had a free hand, but in 1863 an energetic campaign was begun by General James H. Carleton against the Navahos, who were subdued and placed on a reservation on the Pecos river, and later removed to the north-western part of the Territory. There they grew peaceful and prosperous, acquiring large flocks of sheep and gaining a reputation as makers of blankets. The Apache Indians, the most savage of all, were placed on reservations somewhat later, but for many years bands of their warriors would escape and make raids into New Mexico, Arizona and Mexico. The most notable of the later outbreaks were those in 1879-1880 and in 1883-1886 respectively of the Apache chiefs Victorio and Geronimo (c. 1834-1909).

When the United States acquired possession of New Mexico, the best portions of the Territory were held in private ownership under Spanish and Mexican grants, which were confirmed by the treaty of Guadalupe-Hidalgo. To determine the validity of these claims, which had been complicated by transfers and subdivisions, and to fix their boundaries, which were often very vaguely described, proved a very formidable undertaking; and the slow process of confirmation greatly retarded the development of the Territory. There was but little material progress before the advent of the railroad. The first wagon road from Albuquerque to Santa Fe was opened in 1880, and the Southern Pacific railway effected a junction with it at Deming in 1881, thus connecting the Territory with the eastern and western coasts of the United States. With the railroad came a great influx, and the development of modern towns. Immigrants from the states, however, rarely settled beyond the zone of the railway, and in the remote rural regions the process of Americanization was slow.

After the Civil War numerous attempts were made to secure the admission of New Mexico into the Union as a state. In 1852 a state constitution was drafted, and it was proposed for a time to call the new state Lincoln, but the movement came to nothing. In 1889 another constitution was drafted, but it was rejected when submitted to a popular vote. On the 6th of November 1906 the question of the joint admission of New Mexico and Arizona as a single state bearing the name of the latter Territory was submitted to a vote of their citizens. The vote of New Mexico was favourable (26,195 to 14,733), but the measure was defeated in Arizona. In June 1910 the President approved an enabling act providing for the admission of New Mexico and Arizona as separate states.

The governors of New Mexico since its independence from Spain have been as follows:

**Under the Mexican Republic**

- Francisco Javier Chavez (1812)
- Antonio Vizcarra (1822-1823)
- Francisco Javier Chavez (acting)
- Bartolome Vacca (1823-1825)
- Antonio Narbona (1826-1827)
- Manuel Arnao (1827-1828)
- Antonio Vizcarra (acting)
- Jose Antonio Chavez (1828-1831)
- Santiago Abad (acting)
- Francisco Sarriceno (1833-1835)
- Juan Rafael Ortiz (acting)
- Mariano Chavez (acting)
- Juan Perez (1835-1837)
- Jose Gonzalez, revolutionary governor or pretender (1837-1838)
- Manuel Armijo (1838-1841)
- Antonio Sandoval (acting)
- Mariano Martinez de Lejanza (acting)
- Jose Chavez (acting)
- Juan Bautista Vigil y Alarid (acting)

**Under the United States**

**Governors by Military Appointment.**

- Charles Bent
- Donaciano Vigil
- John Marshall Washington
- John Munroe

**Governors by Presidential Appointment.**

- James S. Calhoun
- E. V. Sumner (Military Commander, acting)
- John Greiner (Secretary, acting)
- William Carr
- David Merriwether
- Abraham Rencher
- Henry Concho
- W. E. M. Arm (Secretary, acting)
- Robert B. Mitchell
- William A. Pfe
- Marshall Giddings
- William G. Ritch (Secretary, acting)
- Samuel B. Axtell
- Lewis Wallace
- Lionel A. Sheldon
- Edmund G. Ross
- L. Bradford Prince
- William T. Thornton
- Miguel A. Otero
- Herbert J. Hagerman
- J. W. Raynolds (Secretary, acting as governor)
- David B. Campbell
- John W. Mills


1 According to the historian H. H. Bancroft, the loyalty to the Union cause resulted "largely from the fact that the Confederate invasion came from Texas, the old hatred of the Texans being the strongest popular feeling of the natives, far outweighing their devotion to either the North or the South."

2 Under the republic until 1837 the governor was officially designated as *jefe politico*; after that date as *gobernador.*

3 Assassinated during the Mexican revolt on the 19th of January 1817.

4 Governor as Commander of the Department.
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Francisco, 1889]; A. F. Bandelier, Contributions to the History of the South-western Portion of the United States, being vol. v., American series, of the New Mexico Institute of Science (Colorado, 1890); George P. Winship, "The Coronado Expedition," in the Fourteenth Annual Report of the Bureau of Ethnology (Washington, 1896); W. H. H. Davis, The Spanish Conquest of New Mexico (New York, 1897); Publications of the Historico-Society of New Mexico and the Gaucho de Villagrá, Historia de la Nueva Mexico; reimpresa por el Museo Nacional, con un apéndice de documentos y epísculos (2 vols., Mexico, 1900), vol. i. being a reprint of the epic poem published in 1835 by Villagrá, a companion of Oñate in his expedition to New Mexico.

NEW MILLS, an urban district in the High Peak parliamentary division of Derbyshire, England, at the confluence of the rivers Goyt and Kinder, on the border of Cheshire, 13 m. S.E. of Manchester, on the Midland and the London & North-Western railways. Pop. (1901) 7772. Its ancient name was Bowden Middle Cale. The name of New Mills was given to it from a corn-mill erected on the Kinder in the hamlet of Ollersett, and is specially applied to the group of factories which have grown up round it. Formerly paper and cloth were the staple industries of the district, but the inhabitants of the various hamlets are now occupied chiefly in iron and brass foundries, cotton mills, and woollen weaving. The Midland railway lines lead to the town of Hayfield (pop. 2614).

NEW MILANS, a manufacturing town and police burgh of Ayrshire, Scotland. Pop. (1901) 4467. It is situated 73 m. E. of Kilmarnock by the Glasgow and South-Western railway. It was made a burgh of barony in 1490 by James IV., the charter being confirmed in 1566 by Sir Matthew Campbell, the laird of Loudoun, in which parish the town is situated. Muslin- and lace-curtain making and the manufacture of mosquito-nets are the chief industries. Nearly 2 m. E. lies Darvel (pop. 3070), a police burgh and manufacturing town, with a station on the Glasgow and South-Western railway; its chief manufactures are those of lace curtains, muslins and carpets. Two miles E. rises Loudoun Hill (1036 ft.) where Robert Bruce defeated the English in 1307, and about a mile farther E. the cairn is raised to commemorate one of Wallace's victories.

NEW ORLEANS, a city of Louisiana, U.S.A., situated almost wholly on the left bank of the Mississippi, 107 m. from its mouth, in that portion of the state which constitutes the river's larger delta, and lying between Lake Pontchartrain (to the north and west) and Lake Borgne (to the east and south); its latitude is 30° 10' N., its longitude 90° 10' W. (same as that of Cairo, Ill.). Pop. (1910) 339,075. The city lay originally at the angle of a deep three-sided bend in the river. Into this hollow it gradually spread, the curving river front, some 9 m. long, serving as its harbour; and hence its old appellation, the Crescent City. Long ago, however, the city filled the pocket of the bend, and spreading farther along the river, now has the form of an "S." Directly north, and still about 3 m. distant from the parts of the city proper that have advanced farthest toward it, lies Lake Pontchartrain (about 40 m. long and 20 m. wide). Lake and river are parallel to one another for many miles on the narrow alluvial strip between. The total area included within the municipal limits is 156-25 sq. m., but the city proper covers about 40 sq. m. The larger limits are coextensive with those of the parish of Orleans, and include the district of Algiers, on the right bank of the Mississippi.

The river at New Orleans varies from 1500 to 3000 ft. in width, and its broad channel often stretches almost from shore to shore, with a depth varying frequently at short intervals from 40 ft. to more than 200 ft. Around the margins a line of wharves and shipping extends for miles on each shore. Including the suburbs of Westwego, Gretna, &c., on the right bank of the stream, there is a river frontage of more than 20 m. Gretna, the seat of Jefferson parish, McDonoghville, in Jefferson parish, and Algiers, or West New Orleans, a part of the city, are industrial suburbs on the west bank of the Mississippi, connected with the east bank by a steam ferry and with one another by electric railway. At Algiers are railway terminals and repair shops of the Southern Pacific and the Texas & Pacific; and the United States Naval Station here, which was built in 1894 (though land was bought for it in 1849), and has a large steel dock, 1000 ft. long, with a 26 ft. opening, is the nearest point south of Portsmouth, Virginia, and is equipped to make all repairs.

The city site is almost perfectly level; there is an exceedingly slight slope from the river toward the tidal morasses that border Lake Pontchartrain. The elevation of the city plain is only 10 ft. above the sea, and its lower parts are as much as 10-12 ft. below the Mississippi at high flood water. About 6 m. of heavy "leves" or dykes— in some parts rising clear above the city plain, but backed by filled-in areas graded down from the shores where the traffic of the water-front is concentrated— protect it from the waters. The speed of the current reaches, in times of high water, a rate of 5 m. an hour. Along the immediate front of the principal commercial quarter, this current, losing some of its force by change of direction, deposits its alluvium in such quantities as to produce a constant encroachment of the shore upon the harbour. At its widest part this new land or batteur, with wharves, streets and warehouses following eagerly after it, has advanced some 1900 ft. beyond the water-line of the middle of the 18th century.

The climate is not marked by extremes of absolute heat or cold. Prevailing winds are the south-west and south-east, bringing moist air from the Gulf of Mexico. The temperature, however, is moderated by its great size; for example, in February 1899, while the thermometer register as high as 102° F., and on only a few days did it register above 62°; in February 1890 the temperature was 72° but it rarely falls below 25°. The average annual rainfall is about 58 in.

Canal Street, the centre of retail trade and street life, bounds on the south-west near the river the Vieux Carré—the old rect- angle within the walls of the original city, bounded by the river, Canal, Rampart and Esplanade streets—and separates the picturesque, peaceful French (or Latin) Quarter of the north-east from the bustling business and dignified residence districts of the American Quarter, or New City, on the south-west. In the latter St Charles Avenue and Prytania Street have the finest residences, and in the former Esplanade Avenue. Just below Canal Street, in the oldest part of the American Quarter, are many of the most important or imposing buildings of the city, and some of the places most intimately associated with its history. Here are the St Charles Hotel (1804), the third of that name on the present site, all famous hostries, and the first (1838–1851) one of the earliest of the great hotels of the country; and Lafayette Square, surrounded by the City Hall (built in 1850 in the style of an Ionic temple), the newly-opened Office, twoYPHRMS between St Patrick's and the First Presbyterian, Odd Fellows' Hall and other buildings. In the square are statues of Henry Clay (by Joel T. Hart) and Franklin (by Hiram Powers), and a monument to John McDonogh (1898); and in the vicinity are the Howard Memorial Library (1887; a memorial to Charles T. Howard), which was the last work of H. H. Richardson, a native of Louisiana, and the Confederate Memorial Hall (presented to the city by F. T. Howard) with Confederate relics. Two blocks away in Marguerite Place is a statue erected (1884) by the women of the city to Margaret Haughery (d. 1883), the "Orphan's Friend," a noble woman of humble birth and circumstances, who devoted a toilful but successful life to charities. In Lee Circle is a monu- ment to Robert E. Lee, and facing it is the New Orleans Public Library building (1908). Just off Canal Street, at Carondelet and Gravier Street, is the Cotton Exchange (1882–1883), and in Magazine Street the Produce Exchange. The large office buildings are on Canal, Carondelet, Common and Gravier streets; among them may be mentioned the Maison Blanche, the Hennen Building, the Tulane Newcomb Building and the Canal Louisiana Bank and Trust Company Building. But perhaps the most publicised and most popular of all is the Poydras Street Station, between Gravier and Poydras, to the south of the Picaoyne and the Times-Democrat; on Carondelet and Gravier are the wholesale cotton houses; on Poydras and Tchoupitoulas are the wholesale
grocery houses; and on North Peters and Custom House streets the sugar and rice industries are concentrated. Little of history or tradition is associated with the American Quarter, with the exception of the former site (before 1900) of the Clay statue in Canal Street where Royal Street and St Charles Avenue begin, which was the scene of popular meetings in the Italian troubles of 1891; here, in Liberty Place, a triangle at the intersection of Canal, North Peters and Tchoupitoulas streets, on the scene of the fight of the 14th of September 1874 between conservative citizens and the radical authorities of the state, is a granite memorial called the Liberty Monument. The Customs House, long renowned for its "marble room," is in the old city, just off Canal Street. The corner-stone was laid by Henry Clay in 1847. The Boston (1845) and Pickwick (1857) are the best known of the general social clubs, and the Harmony (1862) of the Jewish clubs.

It is the French Quarter in which the history, poetry and romance of New Orleans are indissolubly united. The memory of French dominion is retained in the titles, and in the foreign aspect as well, of Toulouse, Orleans, Du Maine, Conti, Bourbon, Dauphiné and Chartres streets; while even more distinctly the Spaniard has superimposed his impress on stuccoed wall and iron lattice, huge locks and hinges, arches and gratings, balconies, jalousies, inner courts with parterres, urns and basins with fountains, and statues hall hid in roses and vines. There are streets named from its Spanish governors: Unzaga, Galvez, Miro, Salcedo, Casa Calvo, Carondelet and the baron Carondelet's Baronne. The moated and palisaded boundaries of early days are obliterated by wide, new streets; but the Cabildo, the Cabildo, and the Esplanade which once lay along their course; the original "commons" outside the walls are commemorated in Common Street; and the old parade ground in the midst of the early town's river front, now laid off in flower-beds, white-shelled walks and shaven shrubbery, and known as Jackson Square, still retains its older name of the Place d'Armes. With this quaint, sunny and dusty old square is associated nearly every important event in Louisiana's colonial history. This was the place publique, associated with traffic, gossip, military muster and official acts of state. On one side is the cathedral of St Louis, first built in 1718, burned in 1728, rebuilt in 1792-1794, and largely rebuilt again in 1850. Flanking the cathedral on one side stands the cabaloose (Calabasa, 1810), and on the other the Cabildo—so named from the municipal council that sat here under Spanish rule, when it was the government house and palace of justice. Both buildings are to-day used as law courts. The Cabildo is a dignified two-storey structure of adobe and shell-lime, built in 1795; an incongruous mansard roof was added in 1850. On the 30th of November 1803, in the council room, the cession of Louisiana to the United States was consummated. From the Cabildo, the government and the people of Louisiana were absolved from their allegiance to the Spanish king; and here, only twenty days afterward, with similar ceremonies, the keys of the city passed from the hands of the French colonial prefect to those of the commissioners for the United States. In the old Place d'Armes a bronze equestrian statue (1836) of Andrew Jackson by Clark Mills is a remembrance of the ceremonies attending Jackson's triumphal entry into the city after the battle of New Orleans in 1815. In 1825 Lafayette was lodged in the Cabildo as the city's guest.

The appearance of the square was greatly changed in 1840, when the Baroness de Pontalba, in whose estate it was then comprised, cut down the ancient elms that shaded it and laid it out in its present style of a French garden. She also is responsible for the low brick "Pontalba Mansions" on the north and south sides of the square. The Babel of Tongues in the French Market (1813), on the site of an older market, immediately below Jackson Square, and at the "Picayune Tier" just adjacent, is an interesting feature of the city. Near the Cathedral, in Orleans Street, is the convent of the Holy Family, a brick building, housing a negro sisterhood founded in 1835, and formerly the scene of New Orleans's famous "quadroon balls." The archi-

episcopal palace (1730), said to be the oldest building of the Mississippi Valley, is part of the unchanged original Ursuline convent; it was used as the State Capitol in 1831, and then it was the residence, and since 1899 has been the administrative office of the archbishop, and houses a colonial museum with the ecclesiastical records. The French Opera House (1829) was the successor of various French theatres built after 1808. The carnival balls are given here. New Orleans was by far the earliest of America's and the South's to have an annual opera season.

The 18th-century fortifications about the old city were destroyed about 1804. The United States Branch Mint (1838) occupies the site of Fort St Charles (destroyed 1826), where Jackson reviewed his troops as they marched to Chalmette. Just outside the Vieux Carre is Beauregard Square, formerly known as Congo Square, because in early days the slaves were wont to gather here for their barbaric dances. The Hotel St Louis (1836), rebuilt in 1884 as the Hotel Royal, was the seat of the Republican reconstruction governments of governors Kellogg and Packard, and the prison fortress of both, respectively, in 1874 and 1877, when the whites rose against Republican rule; its rotunda was also once a famous slave mart. Many other spots in the Latin Quarter are of scarcely less interest than those mentioned, not excluding those which were made famous by the romances of G. W. Cable, and whose only title to historic consideration is that which his imagination has given them.

City Park (216.6 acres, partly water), lying between the city and the lake, is notable in the local dwelling annals of earlier days. Audubon Park (249 acres) was once the sugar plantation of de Boré and, after the yellow-bill was first successfully made granulated sugar in 1795-1796; earlier experiments had been made in 1791 by Antonio Mendes, from whom de Boré, who established the sugar industry, bought a plantation in St Bernard Parish. The park was bought by the city for $180,000 in 1871, but was little improved until 1884, when the Cotton Centennial Exposition was held here. It contains to-day a state Sugar Experiment Station, in which a part of their work in course is done by the students in the Audubon Sugar School of the State University at Baton Rouge, and Horticultural Hall, the only one of the exposition buildings now standing, with a display of tropical trees and plants; opposite Audubon Park is the campus of Tulane University. West End is a suburban resort and residential district on Lake Pontchartrain.

A noted feature of New Orleans is its cemeteries. Owing to the undrained condition of the subsoil, burials are made entirely above ground, in tombs of stuccoed brick and of granite and marble. Some of these are very elegant and costly, and many of the burial-grounds, with their long allies of these tombs of diverse designs, deeply shaded by avenues of cedars and magnolias, possess a character far more beautiful than the more bony, and the poor bury their dead underground in shallow vaults. The cemetery on the north side of St Louis No. 1, contains the graves of many persons notable in history. St Roch's Campo Santo has a wonder-working shrine, and is the most picturesque of the old burying-grounds. Metairie, on the site of an old race track, is the finest of the new. It contains a monument to the Army of the Tennessee and its commander, Albert Sidney Johnston, with an equestrian statue of Johnston by Alexander Doyle, and a monument to the Army of Northern Virginia surmounted by a statue of General T. J. Jackson in Greenwood Cemetery is the first monument erected to Confederate cause. An obelisk to T. L. D'Armond, after whom the street at Chalmette (on the Mississippi, about 5 m. E. of Canal Street), where the battle of New Orleans was fought in 1815, there is a National Cemetery, in which some 12,000 Union soldiers in the Civil War are buried.

Population.—The population in 1900 was 287,104, New Orleans.

1 In the burial vault of this tomb, with the bodies of many other soldiers, are the remains of General P. G. T. Beauregard, who was born near New Orleans.

1 At the earlier censuses the population of the city was as follows: 17; 4,442 in 1810 (when it was the sixth city in population in the United States); 27,176 in 1820 (when, as in 1830 and 1850, it was the fifth city); 45,082 in 1830; not reported separately in 1840; 116,375 in 1850; 168,675 in 1860; 191,418 in 1870; 216,090 in 1890; and 242,039 in 1890.
Orleans ranking twelfth among the cities of the United States; in 1910 it was 339,075. Of the 1900 total, 256,779 were native-born, and 30,325 were foreign-born, including 8733 Germans, 5866 Italians, 5398 Irish, 4428 French and 1262 English; and there were 77,714 negroes. In 1900 the population of foreign parentage was 108,010, of whom 78,269 had foreign fathers and foreign mothers, 27,259 being of German, 15,465 of Irish, 10,694 of Italian, 9317 of French and 1892 of English parentage. The Latin elements then came into vogue; the Mardi Gras became an elaborate affair, capital introduced, Canadians, colonists from the French and Spanish West Indies, Italian Islanders (whose descendants are still known as Isletés), and French refugees from Acadia in 1765 and the years following, and from Santo Domingo at the end of the 18th century. The earliest French immigrants were largely Bretons and Normans, and various creole words in common use (such as banquette for "side-walk") still recall these racial beginnings. The creoles of New Orleans and the surrounding delta are a handsome, graceful, intelligent race, of a decidedly Gallic type, though softened in features, speech and carriage. Their dialect has been formed from the French entirely by sound, has no established orthography, and is of much philological interest. Until very recent years the Latin races, though fusing somewhat among themselves, mixed little in blood with the Anglo-American. The Spaniards when in power at the end of the 18th century were notably different from the French in their liberalism in this respect. In social life and standards the French creoles were very conservative; the old styles of dress, e.g. of the late 18th century—wigs, silk stockings and knee-breeches— lingered longer among them, probably, than in any other part of the country. But before the pressure of American immigration on the creole enterprise and education, this creole civilization has slowly yielded ground, at last fairly beginning to amalgamate with the social system of the American nation. But the creole has stamped his influence upon wellnigh every aspect in the life of the city that has broadened out so widely on every side of his antique town. Its cuisine, its speech, its "continental" Latin Sundays, its opera, its carnival, its general fashions and manners, its intolerance of all sorts of rigour, its whole outward tone and bearing, testify to this patent Latin impress. A comparatively recent addition to the Latin element in the city has been through Italian immigration.

The coloured population, notwithstanding the presence among it of that noted quadroon class which enjoyed a certain legal freedom for generations before the Civil War, has not greatly improved since the date of emancipation. Catholicism is naturally extremely strong in New Orleans. So also are the Baptist and Methodist churches.

Carnivals.—The famous carnival displays of New Orleans are participated in very largely by the American, i.e. the Anglo-American; but they mark one of the victories of the Latin-American over North-American tastes, and probably owe mainly to the "American" their pretentious dignity and to the creole their more legitimate harlequin frivolity. Out of the simple idea of masked revelry in the open streets, as borrowed from Italian cities, the American bent for organization appears to have developed, by a natural growth, the costly fashion of gorgeous torch-lighted processions of elaborately equipped masques in tableau drawn on immense cars by teams of caparisoned mules, and combining to illustrate in a symmetrical whole some theme chosen from the great faiths or literatures or from history. Legends, fairy-tales, mythologies and theologies, literature from Homer to Shakespeare, science and pure fantasy are drawn upon for these ornate representations, which are accompanied by all the picturesque licence of street life characteristic of carnival times in other cities. They have no rival in America, and for glitter, colour and elaborateness are by many esteemed the most splendid carnival celebrations of the world. The first carnival parade (as distinguished from the Mardi Gras celebration) was held in 1827 by masked students recently rescued from the Then, 1837 and 1859 the first processions with "floats" were held in New Orleans. The regular annual pageants, almost uninterrupted save during the Civil War, date from 1852, when the "Mystic Krewe of Comus," the oldest of the carnival organizations, was formed; similar organizations, secret societies or clubs are the "Twelfth Knight Revelers" (1870), "Rex" and "Knights of Momus" (both 1872, when the carnival was reviewed by the Grand Duke Alexis of Russia), the "Krewe of Proteus" (1882), and the "Krewe of Nereus" (1895). Balls, processions and other festivities are now spread over a considerable period, culminating in those of Shrove Monday. During this time the festivities quite engross public attention, and many thousands of visitors from all parts of America are yearly attracted to the city.

Charitable Institutions.—The large Charity Hospital (1786) and the Richard Mililken Memorial Hospital for Children are supported by contributions and subscription. The Tufts Hospital (1854; controlled by the Hebrew Benevolent Association; founded by Judge A. C. Tufts, a Jew of Dutch descent, son of Isaac Tourow of Newport, Rhode Island), includes a free clinic open to the needy of all faiths. Other hospitals are: the U.S. Marine Hospital (1817); the Hotel Dieu (1856) and the St Joseph's Maternity Hospital (1865), both under the Sisters of Charity; the Sarah Goodrich Hospital (1886; Methodist Episcopal); and the Eye, Ear, Nose and Throat Hospital (1889; private). The Orleans Female Orphan Asylum (1849) and St Elizabeth's Industrial School (1845), under the Sisters of Charity; an Ursuline Orphanage (1782); the Immaculate Conception Girls' Asylum (1851); the New Orleans Benevolent Home for Boys (1824; the Sisters Maris the of the Holy Cross); the St Alphonsus Orphan Asylum (1858) and St Vincent's Home for Newsboys (1875), under the Sisters of Mercy; the Mount Carmel Orphan Asylum (1869), under the Sisters of Charity; the Sacred Heart Orphan Asylum (1849) for girls, under the Missionary Sisters of the Sacred Heart; St Joseph's Orphan Asylum (1863), under the Sisters of Notre Dame; the New Orleans Jewish Orphan Asylum (1855); the Children's Home of the Protestant Episcopal Church (1859); the Evangelical Lutheran Bethel Orphan Asylum (1881); the German Protestant Orphan Asylum (1886); the Freedmen's Asylum (Baptist); and, under private and non-sectarian control, the Asylum for Destitute Orphan Boys (1824) and the Colored Industrial Home and School (1902). The J. D. Fink Fund and the Fink Home (1874) or Asylum (for Protestant widows and their children) are the gift of an eccentric, who offered to hand marriage if refused by one preferring to marry, and who forbade that any old maid should enter the asylum. Other homes for adults are: the Sisters' Foundling Home, American Convent: Home for the Aged (1869 and 1882); a Home for Aged Women; a Sisters for Homeless Women, and the New Orleans Convalescent Home (1885). Kingsley House is modelled after Hull House in Chicago. The Louisiana Retreat, a private asylum for the insane, New Orleans, and the St Mary's Asylum for the Insane (1888); the Julius Weis Home for Aged and Infirm (1899), under the Hebrew Benevolent Association; and, under private corporations, the Maison Hôpitalière (1893) for aged women, the New Orleans Home for Incurables (1853) and St Anna's Asylum (1894) for destitute women and their children. Temporary homes are: the Convent of the Good Shepherd (1859), under the Sisters of the Good Shepherd, and a Memorial Home (1886; both for women under women); a Home for Homeless Women (1888), and the New Orleans Convalescent Home (1885). The Home Institute (1893) provides free night schooling for hundreds of students, and similar work is done on a larger scale by public and private societies, of whom the Association for the Education of the White Illegitimate (could not write), seven-tents of the illegitimates being negroes, of whom the illiterates constituted 36%.

There are various higher institutions of learning in the city. Tulane University was named for Edward Grant Tulane (1801-1887), a merchant of New Orleans, who gave $1,050,000 in 1882-1887 to a Board of Trustees for the education of "the white young persons in the city." The University was established, under

1 See William Allan's Life and Work of John McDonogh (Baltimore, 1886).
By 1900 the drawbacks which have been enumerated had been practically eliminated, and uncertainty as to the investment of capital had been removed. The southward tendency in railway traffic favours the city. Deep water to the ocean was secured by a system of jetties at the South Pass mouth of the Mississippi, built by James B. Eads in 1875-1879; but in time this ceased to maintain an adequate depth of water, and (after the report in 1900 of a board of engineers) in 1902 Congress began appropriations for an improvement of the South-west Pass by opening a channel 1000 ft. wide and at least 35 ft. deep. Steamers give direct connection with the West Indies, Central America, Europe, New York and also with Japan (for the shipment of raw cotton via Suez). Ocean steamers, loaded in large part by elevators, now bear away the exports for which a swarm of sailing-ships of much lighter draft and average freight-room once made long stays at the city's wharves. Passenger traffic on the rivers has practically vanished, and the shrunken fleet of river steamers (only 15 in 1907) are devoted to the carrying of slow freights and the towing of barges on the rivers and bayous of the lower Mississippi Valley.

The total value of all merchandise exported in the six customs years 1902-1903 to 1907-1908 averaged $154,757,110 yearly, and the imports $37,319,254. For the ten years 1890-1899 the corresponding averages were $95,056,618 and $15,921,543. Bank clearings for (1907) were $447,615,763 to $1,027,798,476 (bank clearings were $95,154,504 and $75,607,353 respectively for the calendar years 1907 and 1908). Sugar and coffee are the leading commodities in which imports and exports from Central America have similarly increased. Cotton represents roughly two-thirds of the value of all exports. As a cotton port New Orleans in 1868 was second only to Galveston, which had only recently surpassed it; and more than half of the raw cotton exports of the country passed through these two ports. The Board of Trade has maintained a cotton-inspection department since 1844, and its statistics are standard on the cotton crop. Cotton and coffee were the backbone of the following Navigation acts: $1,001,169,468 lb., valued at $104,168,824. Wheat and Indian corn, tobacco and tobacco are especially noteworthy articles of the trade. The importation of bananas is increasing, and the coffee trade of coffee has more than quintupled since 1900; the coffee comes for the most part from Brazil and grain wholly from American fields. The imports of bananas, for which New Orleans is the leading port of the country, more than doubled in the same period, and increased more than eight-fold in the twenty-five years following 1882 (1,200,000 to 10,200,000 bales). While railway traffic has grown immensely, and port facilities have been greatly improved, the river traffic had a steady fall. A belt railway owned by the city (built 1905-1907) connects all railway terminals, public wharves and many manufactories and warehouses. Public ownership protects the city's interests, and it is observed that all railways are equally and cheaply served; and new railways, which could not enter the city or have access to the water front because of the impossibility of securing individual trackage, can now make use of the municipal trackage and get through at once. The volume of imports in 1908 those of the Illinois Central system had nearly 200 m. of track; the St. Louis & San Francisco railway have 15 m. of track, a wharf almost 1 m. long, immense warehouses and grain elevators. The New Orleans Terminal Company constructed at Chalmette

1 The South-west Pass, originally the usual entrance, could not be entered by vessels drawing more than 16 ft.; the Eads jetties, aided by dredging, provided through the South Pass (500 ft. broad) a channel 160 ft. wide and 25 to 26 ft. deep. South-west Pass has always been the primary outlet of the river, varying from about half the volume of the river. Active work on its improvement was begun in 1903 and practically completed in 1909. Including the jetties, this Pass is nearly 20 m. long and has an average draft of about 16 ft.; the channel is more than 1000 ft. wide. The jetties, 4 m. long on one side and 3 m. on the other, are 6000 ft. apart at their head and 3600 ft. at the sea line. They are built on willow mats (foundation mats 200 X 150 X 2 ft.) in wooden frames, sunk with stone and surmounted above the water by a concrete wall.

2 The value of the river commerce was about $5,000,000 in 1816 and $38,000,000 in 1849. The first steamboat descended the Missis- sippi River and reached New Orleans in 1811. The first, founded boat trip up the river was made in 1817. The halycon period of river steamers was from 1850 to 1860. The luxury of the passenger boats then on the Mississippi and its tributaries had disappeared since the advent of the railway era. The best time ever made (1870) from New Orleans to St Louis (1278 m.) was 3 days, 21 hours and 25 minutes. The races of these steamers were performed without the aid of wind or tide and even in those of Europe, and they have been recorded in more than one page of literature. Steam packets replaced sailing vessels in the ocean trade about 1845.
NEW ORLEANS

(1908) splendid terminals, including an immense slip in the river (1500 x 900 ft., excavated to give 30 ft. of water below zero gauge) capable of handling large and deep-sea vessels and arranged with remarkable conveniences for the loading of grain. Steel-concrete warehouses and elevators surround the slip. The greater industrial establishments of the city cluster about the terminals, and factories, warehouses, and officer's quarters are grouped around them (and goes via Bayou St John to Lake Pontchartrain; and the New Basin Canal, built in 1837 by the New Orleans Canal & Banking Company, and state property since 1866, is 6-7 m. long, 100 ft. wide and 3 ft. 6 in. deep, and connects both of these canals with the Mississippi river as do the following primarily owned canals: the Lake Borgne Canal, from a point 10 m. below the city to the Boeuf, 7 m. long, 80 ft. wide and 6 ft. deep, shortening the water distance between Mobile and New Orleans by 60 m.; and the Barataria & Lafourche Company Canal (7 m. long, 45 ft. wide and 6 ft. deep) and Harvey's Canal (5-35 m. long, 70 ft. wide and 8 ft. deep). The Mississippi river discharges 70,000 ft. per second at New Orleans.

In 1900 the total assessed valuation of property was $221,373,362, of which $154,604,325 was realty and the remainder personalty. The bonded debt on the 30th of June 1909 was $32,524,140, and the floating debt at the end of 1908 was $1,264,030.

From 1890 to 1900 the expenditures for permanent works (including sidewalks, lights, water works, telephones, railroads, docks, &c.) aggregated $30,000,000. All the public services, nevertheless, were in 1909 in private hands, and the public income from property taxation July 1, 1909, was $1,811,000. In 1890 the street railways were consolidated in 1902 under one management. In 1869 the city bought, and nine years later sold again, the water works; municipal ownership and control, under a sewerage and water works commission, was re-established in 1909. The street railways were made to transfer the extensive markets from private lessees to direct municipal control, and in May 1901 the wharves of the city passed from private to municipal control. The municipal belt tram was in operation by 1907.

Until 1909 there were no sewers, open gutters serving their purpose. It is remarkable that the city twice granted franchises to private parties for the construction of a sewerage system, but without result. The low and extremely level character of the city site, of which nearly one-third is at or below the level of the Gulf, the recurrence of back-water floods from Lake Pontchartrain and the trade winds brings in rains from the sea, are the principal causes of the flooding. The drainage commission (merged in 1896 in a Sewerage and Water Board) devised a plan involving the sale of street railway franchises to pay for the installation of drainage canals, but the measures were never brought to a vote. In 1894, 42 years assuring a bond issue of $12,000,000 to pay for sewerage, drainage and water works to be owned by the municipality and to be carried out by a Sewerage and Water Board, was instituted. In 1900 an average of 2,500 persons died from water in the sewerage system in 1900, and in the year 1906 the legislature authorized the issue of municipal bonds for $8,000,000 to be expended on this work. Up to 1909 the drainage system was nearly complete, including 100 miles of sewers at a cost of $5,000,000; and 310 m. of sewers and nine sewerage pumping stations discharged sewage into the Mississippi below the center of the city. Garbage is used to fill in swamps and abandoned canals.7-8 The public service is secured from the river by a primary sewerage system, connected to the trade winds, and supplemented by mechanical precipitation and other means. By 1909 about 500 m. of water-mains had been laid, $7,000,000 had been expended for the water-system, and filtering plants had been established with a capacity of 3,000,000 gallons of water per day to be added. The water system makes the treatment of the sewage necessary; the public health of the city depends upon the cleanliness of the sewage. The contamination of the sewage area required the screening of aileron cisterns, formerly characteristic of the city, which were breeding-places of the yellow fever, Stagnomyia, and soon afterwards the state legislature authorized the Sewerage and Water Board to require the removal of all such cisterns. About two-thirds of the street surface in 1899 was still unpaved; the first improvements in paving began in 1890. All regards hygiene conditions have much more advanced in recent years. New Orleans was long notorious for unhealthiness. Yellow fever first appeared in 1796, and there were about thirty epidemics from 1799 to 1875. Though the first board of health and first quarantine station were in 1810, the city was one of the most pestiferous in the United States. The mortality of 1817-1827 was nearly 19 per cent. of the population. The death-rate was 59-63 per 1000; never did it fall below 25-00, which was the rate in 1827. In 1832, a cholera year, it rose to 148; in 1851-1855, 1859, and 1865, the mortality in the four choleratic years from 1852 to 1855 by cholera, it was 102, 72 and 73. During these three years there were more than 25,000 deaths. The miasmatic mortality in 1851-1865 and succeeding quinquennial periods to 1880 was as follows: 70, 45, 40, 39, 34 and 33-3. The rate reported at the 1880 census of the national census of 1890 was 28-9, the highest of any of the large separate governments; they issued paper money independently, for example. The charter of 1836 was also an extreme statement of local self-government; the municipalities were practically independent, although there was a common mayor and a general council of the entire city organizing and legislative council of the city. This organization was in large part due to the hostility of the creoles to the Americans. The charter of 1852 formed a consolidated city. That of 1856 added to and amended its predecessors. Among other things it was an attempt to secure a business-like and simplified administration. A mayor and seven "administrators," elected on a general ticket and constituting individually the different administrative departments, formed collectively a council with legislative power. All sessions of the council were public, and liberties of suggestion were freely accorded to the citizens. Tried in better times, and as a movement for reform sprung from the people and not due primarily to an external motive, the different administrative departments had not exercised great influence on other cities. The early 'seventies were marked by a great widening of the city's corporate limits. In 1862 another charter was granted by the legislature. It provided for an election of a district mayor, a district council, and a legislative branch, and executive officers chosen on a general ticket. The latter held seats in the council and could debate but not vote. This was the last

1 The charter of 1805 organized the old cité (the Vieux Carré) and the faubourgs as distinct municipalities with almost wholly

7-8 They were leased to a private company in 1891-1901, but the lease was unprofitable and was disadvantageous to trade. From 1901 to 1908 wharfage and harbour dues were reduced 25 to 85 %
cities of the United States.\textsuperscript{1} This high death-rate is often attributed in great part to the large negro population, among whom the mortality in 1860 was 42.1 per 1000; but the negro population largely comprises that large group of colored people whose failings in health and sickness in every large city swells the death-rate. A light yellow-fever epidemic occurred in 1897-1898-1899, after nineteen years of immunity, and a more serious one in 1905, when the United States had a negro epidemic too. Indeed, it is not possible to refer the city’s sanitation and attempted to exterminate the Stegomyia mosquito. The city Board of Health has done much to secure pure food, to suppress parties involved in suburban diseases, including yellow fever. In movements for the betterment of the city—in commerce, sanitation, public works and general enterprise—a leading part has been taken by an organization of citizens including the black leaders.\textsuperscript{2}

New Orleans was founded in 1718 by Jean Baptiste Le Moyne, Sieur de Bienville, and was named in honour of the then Regent of France. The priest-chronicler Charles Leveque described it in 1721 as a place of a hundred wretched hovels in a miserable wet thicket of willows and daim palmettos, infested by serpents and alligators; he seems to have been the first, however, to predict for it an imperial future. In 1722 New Orleans was made the capital of the vast province of Louisiana (q.v.). Much of the population in early days was of the wildest and, in part, of the most undesirable character—depicted as galley-slaves, trappers, gold-hunters and city scavengers; and the government’s letters are full of complaints regarding the riffraff sent as soldiers as late as Kerlerec’s administration (1753–1763). In 1788 a fire destroyed a large part of the city. In 1795-1796 the sugar industry was first put upon a firm basis. The last three years of the 18th century were especially characterized by the growth of commerce on the Mississippi, and the development of those national interests, commercial and political, of which New Orleans was the centre. The year 1803 is memorable for the actual transfer (at New Orleans) of Louisiana to France, and the establishment of American dominion. At this time the city had about 10,000 inhabitants, mostly French creoles and their slaves. The next dozen years were marked by the beginnings of self-government in city and state; by the excitement attending the Aaron Burr conspiracy (in the course of which, in 1806-1807, General James Wilkinson practically put New Orleans under martial law); by the immigration from Cuba of French planters; and by the American War of 1812.

In 1815 New Orleans was attacked by a conjunct expedition of British naval and military forces from Halifax, N.S., and other points. The American government managed to obtain early information of the enterprise and prepared to meet it with forces (regular and militia) under Maj.-Gen. Andrew Jackson. The British advance was made by way of Lake Borgne, and the troops landed at a fisherman’s village on the 23rd of December 1814, Major-General Sir E. Pakenham taking command there on the 28th. An immediate advance on the still insufficiently prepared defences of the Americans might have led to the capture of the city, but this was not attempted, and both sides remained inactive for some time awaiting reinforcements. At last in the early morning of the 8th of January 1815 (after the Treaty of Ghent had been signed) a direct attack was made on the now strongly entrenched line of the defenders at Chalmette, near the Mississippi river. It failed disastrously with a loss of 2000 out of 9000 British troops engaged, among the dead being Pakenham and Major-General Gibbs. The expedition was soon afterward abandoned; both the forts and the ironclads and fire rafts of the defence, almost all the Union fleet (except the mortar-boats) forced its way past. At noon on the 25th Farragut anchored in front of New Orleans; forts Jackson and St Philip, isolated and continuously bombarded by the mortar-boats, surrendered on the 28th; and soon afterwards the military portion of the expedition occupied the city. The commander, General B. F. Butler, subjected New Orleans to a rigorous martial law so tactlessly administered as greatly to intensify the hostility of South and North, but his administration was in many respects beneficial to the city, which was kept both orderly and healthy. Towards the end of the war General N.P. Banks held the command at New Orleans.

Throughout the years of the Civil War and the Reconstruction period the history of the city is inseparable from that of the state. All the constitutional conventions were held here, the seat of...
NEW PHILADELPHIA—NEWPORT

Johann Gottlieb Ernestus Heckewelder (1743–1832) other missionary villages were planted at Gnadenhütten (October 1772), Lichtenau (1776) and Salem (1780), all in the present county of Tuscarawas. After the massacre of Christian Indians at Gnadenhütten in 1782 the Indians removed to Michigan and in 1791 to Fairfield, Ontario; in 1798 some of them returned to Tuscarawas county and settled Goshen, where Zebsberger is buried. New Philadelphia was laid out in 1803 and was named by its founder, John Knisely, after Philadelphia in Pennsylvania; it was incorporated as a village in 1815, and was first chartered as a city in 1896.

See Ohio Archaeological and Historical Quarterly for April 1909 (Columbus, Ohio) for several articles on the early settlement by Moravian Indians.

NEW PLYMOUTH, a municipality and seaport on the west coast of North Island, New Zealand, capital of the provincial district of Taranaki, 258 m. N.N.W. of Wellington by rail. Pop. (1906) 5141. The town slopes to the ocean, with a background of forest surmounted by the snow-clad volcanic cone of Mount Egmont (8270 ft.). The district is not unjustly termed “the garden of New Zealand.” It is highly fertile, cereals and fruits growing well; and dairy products are extensively exported. In the town are leather-works, timber-works and flour-mills, with freezing-works for export dairy produce. The settlement was founded in 1849 by the Plymouth Brethren of the New Zealand Company, and chiefly consisted of emigrants from Devonshire and Cornwall. On the seashore in the neighbourhood are extensive deposits of iron sand.

NEW POMERANIA (Ger. Neu-Pommern, formerly New Britain, native Birara), an island of the Bismarck Archipelago, N.E. of New Guinea in the Pacific Ocean, about 6° S., 150° E., in the administration of German New Guinea. It is crescent-shaped, about 330 m. long, and, except where the Williamau Peninsula projects northward, nowhere more than 60 m. wide. The north-eastern extremity consists of the broad, irregular bay of the Williamau Peninsula; the latter is the site of the German town.

The total area is about 9500 sq. m. The island is in great part unexplored. The coasts are in some parts precipitous; in others the mountains recede inland, and the coast is flat and bordered by coral reefs. The formation appears otherwise to be volcanic, and there are some active craters. The greatest elevation occurs towards the west—about 6500 ft. There is a rich tropical vegetation, and a number of considerable streams water the island. The chief centre is Herbertshöhe at the north of the Gazelle Peninsula; it is the seat of the governor of German New Guinea.

The natives are Melanesians, resembling their Papuan kinsmen of eastern New Guinea, and are a powerful well-formed race. Their villages are clean and well kept. Unlike their Papuan relatives, the items of handicraft and pottery, but are cattle farmers and fishermen, constructing ingenious fishing weirs. They have a fixed monetary system consisting of strings of cowries. They perform complicated surgical operations with an obsidian knife or a shark’s tooth. The common dead are buried or exposed to sharks on the reefs; bodies of chiefs are exposed in the fork of a tree. Justice is executed, and taboons, feasts, taxes, &c., arranged by a mysterious disguised figure, the dawk-dawk. The population is divided into two exogamous classes. The children belong to the class of the mother, and when the father dies go to her village for support, and the land and fruit trees in each district being divided between the two classes. The languages are several dialects, the construction rather Fijian, as in the pronounal suffixes in singular, trial and plural; the numerals, however, are Polynesian in character.

NEWPORT, a market town and municipal borough, the chief town of the Isle of Wight, England. Pop. (1901) 16,911. It is situated near the centre of the island, at the head of the navigation of the Medina River, 5 m. S. from its mouth at Cowes. It is the chief centre of the railway system of the island. The church of St Thomas of Canterbury, rebuilt in 1854 in the Decorated style, contains many interesting old monuments; and one by Marochetti to the princess Elizabeth, daughter of Charles I., erected by Queen Victoria. The guildhall, erected in 1816 from the designs of Nash, includes the town-hall in the upper story with the market-place below. There are a corn exchange and museum. The grammar school (the scene of
negotiations between Charles I. and the parliament) was founded in 1612, and there is a blue-coat school for girls founded in 1761. The Albany barracks and Parkhurst prison lie north of the town. A considerable trade is carried on in timber, malt, wheat and flour. The town is governed by a mayor, 6 aldermen and 18 councillors. Area 504 acres.

It is supposed that Newport (Newport) was a Roman settlement, then known as Medina. There are no traces of Saxon occupation, and no evidence that it became a borough before the reign of Henry II., though it was probably used before that time as a port of entrance for the ancient capital of Carisbrooke. The first charter was granted by Richard de Redvers between 1177 and 1184, freeing the burgesses from tolls throughout the island, from hundred suits, and from being impaled without the walls, and giving them permission to choose their own reeve—privileges for which they paid 18 marks yearly. These grants, repeated and extended by the countess Isabel de Fortibus, were confirmed in 1349 by Edward III. and afterwards by successive kings, Henry VII. in 1489 granting in addition the petty customs within all ports and creeks of the island. The borough was incorporated by James I. in 1607, and a second charter of incorporation granted by Charles I. in 1637 is that by which Newport was governed until 1835. It was represented in parliament in 1295, but no return was made from that time until 1584, from which date it regularly sent two members. In 1667 the number was reduced to one, and in 1885 its representation was merged in that of the island. A fair was formerly held on Whit-Monday and the two following days, and on three succeeding Sundays. In Whit-stowe, known as "again Saturdays," there was a bixing fair for servants. There is no fair. The Saturday market dates from 1184, and there is a Wednesday cattle market. Owing to its facilities for trade, Newport early superseded Carisbrooke as the capital of the island. Its prosperity in medieval times depended upon its harbour dues and its oyster beds in the river Medina.

NEWPORT, a municipal and county borough, contributory parliamentary borough, seaport and market town in the Monmouthshire parliamentary division of boroughs, Monmouthshire, England, on the Usk, 5 m. from its confluence with the Severn, and 133 4 m. W. of London, by the Great Western railway. Pop. (1891) 54,707; (1901) 67,270. It lies chiefly on the right (west) bank of the river, and on the E., N. and W. it is sheltered by a line of lofty hills. The old parish church of St. Woollos stands finely on Stow Hill. Originally it consisted only of the present nave, a fine specimen of grand though undecorated Norman architecture; but a massive square tower (of the time of Henry III.) and a chancel were subsequently added; a large western Early English lady-chapel is interposed between the nave and the tower. The old castle, built about 1130 by Robert, Earl of Gloucester, was greatly altered in the late Perpendicular period. The remains include two towers and the river frontage. The old Dominican monastery is entirely rebuilt and occupied as a private residence; but there are a few fragments of a house of White Friars. The principal public buildings are the spacious Victoria Hall, the Albert Hall, the town-hall, county council offices, market-house, custom-house, and museum and art gallery. Newport owes a rapid increase in importance to its situation on a deep and spacious tidal river, which renders it a convenient outlet for the trade of a rich mineral district. It has extensive docks and wharves, to which large steamers have access at all tides. Three docks, the Alexandra, South and Old Docks, had together a water area of about 60 acres, besides the Alexandra graving dock and dry docks. But additional accommodation was found necessary. In 1905 the Alexandra Docks and Railway company let the contract for the extension of the docks by 50 acres of water area, and the scheme was enlarged later so as to afford an additional area of 86 acres in all. The new works, added to the old Alexandra Dock, give a total deep-water area of over 130 acres. The first part to be completed (48 acres) was filled in the autumn of 1907. The river is crossed by a transporter bridge, opened in 1906, and having a span of 635 ft. and a clear headway from high water of 177 ft., with a travelling truck worked by electricity. Iron ore, pig iron, timber and grain are among the chief imports, while coal and iron goods are exported. Besides the Great Western railway, Newport is served by the London and North-Western, the Rhyne, and the Brecon & Merthyr systems. The town possesses large iron foundries and engineering works, and among other industries are the manufacture of wagons and wheels, nails, bolts and wire, shipbuilding and the making of railway plant, tanning, and chemical works. There are also large breweries, glass and pottery works, and an extensive cattle market. Newport gives name to a Roman Catholic bishopric, but the cathedral church is at Belmont near Hereford. With Monmouth and Usk, Newport returns one member to parliament. In 1889 Maindee, a populous suburb on the left bank of the Usk, was incorporated with Newport, and constitutes one of its five wards. The town is governed by a mayor, 10 aldermen and 30 councillors. Area 4431 acres.

Newport, an ancient mesne borough and castle, occupied an important position on the Welsh marches. The town, which is not mentioned in Domesday, grew up round the castle built early in the 12th century. Giraldis Cambrensis, writing in 1187, calls it Novus Burgus, probably to distinguish it from Caerleon, whose prosperity declined as that of Newport increased. The first lord was Robert Fitz Hamon, who died in 1107, and from him the lordship passed to the earls of Gloucester and Stafford and the dukes of Buckingham. Hugh le Despenser, who held the lordship for a short time, obtained in 1323 a charter of liberties for the burgesses, granting them freedom from toll on all their goods passing into England, Ireland and Aquitaine. The earl of Stafford granted a further charter in 1385, confirmed by his grandson in 1427, which gave the burgesses the right of self-government and of a merchant gild. On the attainder of the duke of Buckingham in 1483 the lordship lapsed to the crown, of whom it was held in the 16th and 17th centuries by the Pembroke, and in the 19th by the Beaumonts. The town was incorporated by charter of James I. in 1624 under the title of "Mayor and Bailiffs." This charter was confirmed by Charles II. in 1665 and holds force at the present day. By the act of 1535-1536 Newport is entitled as an ancient borough to take part in the election of a member for Monmouth town. The commercial importance of the town dates only from the second half of the 19th century, the Old Dock being partially formed in 1842, while the Alexandra was opened in 1875. In 1801 the population of the town was only 1135. In 1835 the borough obtained a market lasting fifteen days from the vigil of St. Lawrence (August 10). The charter of 1824 granted two fairs, one on the feast of the Ascension, and a second (still held) on St. Leonard's day (November 6). Newport was the scene of a serious Chartist riot in 1839.}

NEWPORT, a market town in the Newport parliamentary division of Shropshire, England, 145 m. N.W. from London on the Stafford-Shrewsbury joint line of the London & North-Western and Great Western railways, and on the Shrewsbury canal. Pop. of urban district (1901) 3241. The church of St. Nicholas is Early English and Perpendicular. There is an ancient market cross, greatly decayed. Newport possesses a literary institute, and a free grammar school founded in 1665. Four miles S. are the beautiful ruins of Lilleshall abbey, including a fine Norman west door and part of the front, considerable remains of the church besides, and traces of domestic buildings. The abbey was founded in 1145, under charter from King Stephen, by Richard de Baumes or Blemis, dean of St. Alkmund, Shrewsbury, for Augustinian canons, who were brought from Dorchester Abbey, Oxfordshire. Ironstone, coal and limestone are worked in the parish.

Newport is not mentioned in the Domesday Survey, but at the time of the Conquest formed part of the manor of Edgmond, which William I. gave with the rest of the county of Shropshire to Roger, earl of Shrewsbury. Henry I. is supposed to have added it to the borough, after the monk had come into his hands through the forfeiture of Robert de Belesme. The site was probably chosen partly on
account of the fisheries, which are mentioned in the Domesday Survey, one of the chief services of the burgesses being that of taking fish to the king's court wherever it might be. This custom was continued after Henry III. had granted the borough with the manor of Edgmond, to Henry de Audley, but in the middle of the 13th century James, son of Henry de Audley, granted that the burgesses need not take the fish anywhere except within the county of Shropshire. The burgesses must have received certain privileges from Henry I., since Henry II. in an undated charter granted them with Edgmond, rights and customs. They had in the time of Henry I. This probably included a gild merchant which is mentioned in the Quo Warranto Rolls as one of the privileges claimed by the burgesses. Confirmation charters were granted by Edward I. in 1287 and Edward II. in 1311, while the town was incorporated in 1551 by Edward VI. whose charter was confirmed by James I. in 1604. The governing body consisted of a high steward, deputy steward, two water-balliffs and 28 burgesses, but the corporation was abolished by the Municipal Corporation Act of 1883, and a Local Board was formed, which, under the Local Government Act, passed in 1894, to an urban district council.

NEWPORT, a city of Campbell county, Kentucky, U.S.A., on the Ohio River opposite Cincinnati, Ohio, and at the mouth of the Licking River opposite Covington, Ky. Pop. (1900) 28,301, of whom 4081 were foreign-born and 424 were negroes; (1910 census) 36,309. It is served by the Louisville & Nashville, and the Chesapeake & Ohio railways, and by electric lines to Covington, Cincinnati, Bellevue, Fort Thomas and Dayton. With Cincinnati and Covington it is connected by bridges. In the highlands, about 3 m. back of the city, is Fort Thomas, a United States military post, established in 1888 to supersede Newport Barracks (1804), in the city, which were abandoned in 1894. Newport is essentially a residential suburb of Cincinnati, but it is also industrially important. In 1905 the value of the factory product was $5,231,084, Newport ranking third among the manufacturing centres of the state. Newport was settled late in the 18th century, was laid out in 1791, was incorporated as a town in 1795, and was chartered as a city in 1834. It is the county-seat of the county, and of the county-seat of Newport county, Rhode Island, U.S.A., occupying the southern portion of the island of Rhode Island at the entrance to Narragansett Bay, about 30 m. S. by E. of Providence, about 71 m. S. by W. of Boston and about 165 m. E.N.E. of New York. Pop. (1905 state census) 25,039, of whom 6111 were foreign-born, 2590 being born in Ireland; (1910 U.S. census) 27,149. It is served by the Newport & Wickford Railroad and Steamboat Line, which connects with the New York, New Haven & Hartford railway at Wickford Junction; by ferry to Bristol, and by steamboats to Providence, Fall River and New York.

The broken water-front of the island, about 17 m. long, is partly rocky and partly made up of sandy beaches. From the harbour on the south-west the land rises to a gently rolling plateau with maximum elevations of about 250 ft. The climate is notably mild and equable throughout the greater part of the year. In the newer parts of the city there are many magnificent estates of summer residents; and in the "Old Town," the greater part of which is close to the harbour, and extending up the hillside, are many 18th-century houses and Thames Street, its principal business thoroughfare, only 20 ft. wide. Near the northern end of Thames Street, Washington Square or the Parade, connects with Broadway, which extends northward and is the principal thoroughfare through a large residential district of the permanent inhabitants. From the Parade, also, Touro Street extends eastward to the upper end of Bellevue Avenue, the principal street, which extends southward to the ocean. There Bellevue Avenue connects with the southern end of the Cliff Walk, which for about 3 m. winds along the cliffs on the eastern coast of the island. North of the walk is the smooth, hard Easton's Beach, frequented for sea-bathing.

South of the Cliff Walk is Bailey's Beach, a private bathing-beach; at its western end is the Spouting Rock, through an opening in which the water, during violent south-east gales, has been thrown to a height of about 50 ft. Ocean Drive, about 9 m. long, encircles the south-western peninsula. Beyond Easton's Beach, in the town of Middletown, is Sachuest, or Second, Beach, with a heavier surf, and here is a fissure in the rocks, 150 ft. long and 50 ft. deep, and 8-14 ft. wide, known as Purgatory. North of Sachuest Beach are the picturesque Falls, the Cliff Rock and the Indian Cave.

At the head of the Parade stands the old State House (used when Newport was one of the capitals of Rhode Island); it was completed about 1745, was used as a hospital during the War of Independence, and is now the seat of the county court. In the vicinity are the City Hall and a monument to Oliver Hazard Perry. Fronting on Touro Street is a synagogue, erected in 1765-1765, and said to be the oldest in the United States; one of the early rabbis was Isaac Touro, a Jew of Dutch birth, whose name is borne by a street and a park in Newport. Near the corner of Touro Street and Bellevue Avenue is the Hebrew Synagogue; of chief historic interest along Bellevue Avenue are Touro Park and Redwood Library. In the park is the historic old Stone Mill or "Round Tower," which Longfellow, in accordance with the contention of certain members of the Society of Danish Antiquarians, ascribes, in his Skeleton in Armour, to the Norsemen, but which Benedict Arnold (1615-1678), governor of Rhode Island, repeatedly mentions in his will as "my Stone-built Wind-Mill." Opposite the park stands the William Ellery Channing Memorial Church; and in the park are monuments to Channing and to Matthew Calbraith Perry. The Channing House on Mary Street, built in 1751, is now used for a Children's Home. The Redwood Library grew out of the Philosophical Society, established in 1736, which Bishop (then Dean) Berkeley possibly helped to found during his residence here in 1729-1731; the Library was incorporated in 1747, being named in honour of Abraham Redwood (c. 1700-1788), a wealthy Friend who early contributed $500 toward supplying it with books; the building was completed in 1750. In Berkeley Avenue, north of Paradise Road, is Whitehall, which Berkeley built for his home in 1729, and which was restored in 1900. The first newspaper of Newport was published in 1732 by James Franklin, a brother of Benjamin Franklin, and in 1756 James Franklin's son, also named James, founded the present Newport Mercury.

Newport is best known as a fashionable resort during the summer and autumn; there are annual horse and dog shows, and fox-hunting is one of the amusements. The harbour is a rendezvous for racing- and pleasure-yachts. On Bellevue Avenue is the country club, the Casino. Among the great estates with magnificent "cottages" here are those of Mrs Cornelius Vanderbilt, Wm. B. Leeds, Mrs O. H. P. Belmont (the "Marble Palace," built for W. K. Vanderbilt), Mrs Ogden Goelet, Mrs Robert Goelet, Perry Belmont, and J. J. Astor—all on the Cliff Walk.

Newport has an inner and an outer harbour; the inner is landlocked, 1 m. long and ¾ m. wide, but is not deep enough to admit vessels drawing more than 15 ft. of water; the outer admits the largest vessels and is a refuge for foreign and coastwise commerce. The whole harbour is protected at its entrance by Fort Adams, at the mouth of the inner harbour, Fort Wetherill on Conanicut Island, and Fort Greble on Dutch Island. The Lime Rock Lighthouse was for many years in charge of Mrs Ida Lewis Wilson (b. 1841), famous for the many lives she saved. On Goat Island, which partly encloses the inner harbour, is Fort Walcott, with a United States torpedo station and torpedo factory, and on Coasters Harbor Island, farther north, are a United States Naval Training Station and a War College. Along the western border of the outer harbour is Conanicut Island, on which is the town of Jamestown (pop. in 1905, 1337), with the Conanicut Yacht Club and other attractions for summer visitors. Newport has little foreign trade. There is, however, considerable coastwise trade in fish, coal and general merchandise, and in 1905 the total tonnage of the port amounted to 1,770,816 tons. |
The value of the city's factory products decreased from $1,575,792 in 1900 to $1,347,104 in 1905.

Newport was governed under a charter of 1606, which is unique as an instrument for the government of a city, and aims to restore in a measure the salient features of township government. Most of the powers usually vested in a town meeting are here vested in a representative council of 195 members—30 from each of 5 wards. A candidate for councilman must secure the signature of at least 30 electors in his ward before his name can be placed on the ballot. A mayor, one alderman from each ward, and a school committee are elected in much the same manner: a candidate for mayor must have his election paper signed by at least 250 qualified electors, and an alderman or member of the school committee by at least 100. All other important officers are appointed by the council. The mayor and aldermen are for the most part executive officials corresponding to the selectmen of a town.

Newport was founded by Nicholas Easton (1503-1675), William Coddington (1601-1670), John Coggeshall, John Clarke (1603-1676), William Ironside, Michael Hazard, Henry Bull (1609-1643) and Jeremy Clarke (d. 1652), who, as Antinomians, were driven from Massachusetts Bay, and in 1638 settled at Pocasset (later Portsmouth, in the northern part of the island of Rhode Island; pop. in 1605, 2371). As radical tendencies prevailed in Pocasset they removed, and in 1639 settled Newport at the southern end of the island (called Aquidneck until 1644), which they had bought from the Indians. Most of the founders are commemorated by place-names in the city; in the Coddington Burying-Ground are the tombs of Governor William Coddington, Governor Henry Bull, and Governor Nicholas Easton; and in the Coggeshall Burying-Ground John Coggeshall was buried. At the beginning an independent government by judge and elders was established (Newport and Portsmouth being united in 1640), but in 1647 the town was united with Providence, Portsmouth and Warwick in the formation of Rhode Island according to the Williams (or, as it is commonly called, the Warwick) charter of 1644. During 1651-1654 Newport and Portsmouth were temporarily separated from the other two towns. About 1649 a Baptist Church was founded, which is probably the oldest in the United States outside the Baptist congregations in Providence; and in 1650, at nearly the same time, one of the first free schools in America was opened. In 1656 English Friends settled here. Between 1730 and 1760 great fortunes were amassed by the "Triangular Trade," which consisted in the exchange in Africa of rum for slaves, the exchange in the Barbadoes of slaves for sugar and molasses, and the exchange in Newport of sugar and molasses for rum. The destruction here on the 17th of May 1769 of the British revenue sloop "Liberty," formerly the property of John Hancock, was one of the first acts of violence leading up to the War of American Independence. The foreign trade of Newport, which in 1770 was greater than that of New York, was destroyed by the War of Independence. During the war the town was in the possession of the British from December 1776 to the 25th of October 1779; a plan to recover it in 1778 by a land force under General John Sullivan, co-operating with the French fleet under Count d'Estaing, came to nothing. Soon after the evacuation of the British, French troops, under Comte de Rochambeau, arrived and remained until near the end of the war, and Newport was a station of the French fleet in 1780-1781. The Sayer house, which was the head-quarters of Richard Prescott (1725-1738), the British general; the Vernon house, which was the head-quarters of Rochambeau, and the Gibbs house, which was for a short time occupied by Major-General Nathanael Greene, are still standing.

Newport was chartered as a city in 1784, but in 1787 it surrendered its charter and returned to government by town meeting. It was rechartered as a city in 1853; the charter of this year was much amended in 1875 and in 1906 was superseded by another. Until 1900, when Providence became the sole capital, Newport was one of the seats of government of Rhode Island.
NEW ROSS—NEW SIBERIA ARCHIPELAGO

14,720, of whom 4425 were foreign-born and 777 negroes; (1910 census) 28,867. It is served by the New York, New Haven & Hartford Railroad, and by electric railways to New York City and neighbouring places. The city is primarily a residential suburb of New York City, and has some fine colonial residences, and several beautiful residential parks, notably Rochelle, Neptune, and Beechmont Parks. Its large foreign-born population is comparatively recent and comparatively isolated. Among the prominent buildings of the city are a public library, the high school, a theatre (owned by the Knights of Columbus), a Masonic Temple, the City Bank and several churches, of which the most notable, perhaps, are the Baptist, Methodist, and Presbyterian. (1897) is the residence of the Iselin family, to whose interest in yachting is due in part the prominence of the New Rochelle and Larchmont Yacht Clubs. The Ursuline College of St Angela (1904) and the Merrill School (1906), both for girls, are in New Rochelle. The principal building of the first is Leland Castle, built in 1858–1860 by Simon Leland and finely decorated with frescoes and coloured marbles. A People's Forum, growing out of the work of the People's Institute of New York City, was established here in 1903–1904. In the road between New Rochelle and White Plains is the tomb of Thaddeus Paine, who was killed for his will, on the farm which was confiscated from a Tory by the state and was given to him at the end of the American War of Independence. On the Sound, in Hudson Park, is a monument commemorating the landing-place of the first Huguenot settlers. Immediately S. of New Rochelle, in the Sound, is Glen Island, an amusement resort; belonging to the Glen Island group, E. of Pelham Manor, is Travers Island, with the out-of-town clubhouse and grounds of the New York Athletic Club. On David's Island, 12 m. S.W. of New Rochelle, is Fort Slocum, a United States Army post. The suburban villages of Larchmont and Pelham (and Pelham Manor) lie respectively N.E. and W. of New Rochelle. The important industries are the manufacture of scales and of other instruments of precision, and printing and publishing—the Knickerbocker Press of G. P. Putnam's Sons, New York, is here. The site of New Rochelle is part of a purchase by Thomas Pell in 1654 and of a grant to him by Richard Nicolls in 1665; it was sold in 1689 to Jacob Leisler. The first settlement of importance was made in 1688 by Huguenots, some of whom were natives of La Rochelle. New Rochelle was incorporated as a village in 1812, and as a city in 1905, under the name of New Rochelle. See R. and C. W. Bolton, History of the Several Towns, Manors and Patents of Westchester County (New York, 1881), and J. Thomas Scharl's History of Westchester County (2 vols., Philadelphia, 1886).

NEW ROSS, a market-town of Co. Wexford, Ireland, on the acclivity of a hill on the E. bank of the Barrow, 2 m. below its junction with the Nore, 102 m. S.S.W. of Dublin by the Dublin & South-Eastern railway. Pop. (1901) 5847. The Barrow is crossed by an iron bridge with a swivel pillar in the centre on which a portion of the bridge is turned to admit the passage of vessels. Vessels of 500 tons can lie alongside the quays. The inland water communications reach to Dublin by means of the Barrow and the Grand Canal. The Nore is navigable to Inistioge. New Ross has breweries and tan-yards, a salmon fishery, and a brisk export trade in agricultural produce. The urban district of New Ross includes Rosbercon, on the opposite side of the Barrow. It is stated that St Alban built the abbey of Rossmactrein, which gave rise to an ancient city formerly called Rossglas. A Dominican foundation of the 13th century has left some remains in Rosbercon. According to Camden, New Ross was founded by Isabella Cusins, daughter of William de Fitton, afterwards earl of Pembroke. A charter was granted to it by Roger Bigod in the reign of Edward I., which was extended by James I. and James II. From 1374 it returned two members to parliament, but at the Union in 1800 the number was reduced to one, and the town ceased to be a parliamentary borough in 1885. In 1260 it was surrounded by walls. The fortresses were dismantled by Cromwell, but some remains are extant.

NEWRY, a seaport, market town and parliamentary borough (returning one member) of Co. Down, Ireland, on the Newry water and Newry canal at the extreme head of Carlingford Lough. Pop. (1901) 12,455. It is 5 m. N. of Dublin by the Great Northern railway. A railway owned by the London & North-Western company connects Newry with the deep-water harbour at Greencore; and there is an electric railway to Bessbrook in Co. Armagh. The western part, called Ballybot, is connected with the eastern part, or old town, by four bridges over the canal and four over the tidal water. The situation of the town is striking, the Newry Mountains and Slieve Gullion on the west, and the Mourne Mountains on the east, enclosing the narrow valley in which it lies. Newry is one of the most important ports of Ulster, and in its time had several sub-ports farther down the river the outlet for the trade of a very extensive district. The port admits vessels of 2000 tons to Victoria Docks, 3 m. from the town, but vessels drawing 15 ft. can go up the ship canal to the Albert Basin, 3 m. from the sea. The principal exports are grain, eggs, cattle, linen cloth and flax, and the imports include timber, groceries and coal. In the neighbourhood granite of a fine quality is quarried, and the town possesses rope and sail works, breweries, distilleries, flour-mills and tanneries. It is governed by an urban district council consisting of 177 electors. It was founded here by Maurice M'Loughlin, king of Ireland. The abbey of Newry was converted into a collegiate church for secular priests, and was dissolved by Edward VI., who granted it to Sir Nicholas Bagenal, marshal of Ireland. Bagenal made it his private residence, and laid the foundations of its prosperity. In 1689 Newry was set on fire by the duke of Berwick when in retreat before Schomberg. Charters were granted to the town by James I. and James II. By the charter of James I. it sent two members to parliament, but at the Union in 1800 it was restricted to one member. Until 1868 a portion of Newry was situated in Co. Armagh. A mile N.E. of the town, on the Great Northern railway, is situated the town of Crown rath from traditional single encounters between native princes in contention for the sovereignty.

NEW SIBERIA ARCHIPELAGO, a group of islands situated off the Arctic coast of Siberia, from 73° to 76° 6' N., and 135° 20' to 148° E. The name is loosely applied, covering either the northern group only of these islands, for which the name of New Siberia Archipelago, or of Anjou Islands, ought properly to be reserved, or the southern group as well, which ought to maintain its name of Lyakhov Islands. Some confusion prevails also as to the name of the largest of the islands, which is sometimes covered by the "Jeannette" expedition, ought to be included in the same archipelago, or described separately as the Jeannette Islands. The first of these three belongs geographically, and probably geologically, to New Siberia Archipelago, from which it is only 97 m. distant. As to Henrietta and Jeannette Islands, situated 200 m. N.E. of New Siberia Island, in 155° to 150° E., they can hardly be included in the same archipelago. There seems, moreover, to be land due north of Kotelny Island in 78° N., first sighted by Sannikov and described as Sannikov Land. It was also seen by Baron Toll.

The New Siberia or Anjou Islands consist, beginning from the west: Kotelny, the largest, 116 m. long (100 m. wide), having the small island Byelovlyskoy near its western shore; Thadeus (Fadéevsky), in the middle; and New Siberia (Novaya Sibir), in the east (96 m. long). A range of hills, composed of Tertiary deposits, and named Hedenström's Mountains, runs along its south-western coast, and the same rocks form a promontory protruding northwards. The so-called Wood Mountains, which
NEW SOUTH WALES

were supposed to be accumulations of floating wood, are denudations of Miocene deposits containing layers of brown coal with full stems of trees. These Tertiary deposits are characterized by a rich fauna; fully developed tree pollen, numerous fruits of the meadow sweet, tree, needles of several conifers, &c., being found in them, thus testifying to a climate once very much warmer. The only representative of tree vegetation now is a dwarf willow 1 in. high.

Baron Bunge found Bolshoy to consist of granite protruding from beneath non-feriferous deposits; while the promontory of Svyatoy Nos Siberia, Malyi Small), and Dalnyi (Farthest), to the north-west of Blizhny, and three smaller islets of the Bolshoy (Pillars), Semenovskiy and Vasilevskiy—to the west of Malyi. The climate of these islands is severe. In 1866 the winter ended only in June, to begin anew in August (21st May—5°8' F.; 16th October,—34°6'). The highest summer temperature was 52°. Flocks of geese and other birds come to the islands from the mainland. Both Toll and Tolk say the geese, which feeds chiefly on the lemming. The lemmings are very numerous, and in certain years undertake migrations to the mainland and back. Reindeer, followed by wolves, come also every year to the islands; the polar fox and polar bear, both feeding on the lemmings, are numerous. Hunters come in numbers to the Lyakhov, which must have been long known to Arctic hunters.

A Yakutsk Cossack, named Vagnin, wintered on Bolshoy in 1712, but it was a merchant, Lyakhov, who first described the two greater islands of this group in 1770, and three years later reached on sledges the largest island of the New Siberian group, which he named Kotelny. The Lyakhovs were mapped in 1777. J. Sannikov, with a party of hunters, discovered in 1805—1808 Stolbovoy, Thaddeus and New Siberia Islands, and a merchant, Byelkov, the Byelkovskiy Islands. He sighted the land to the north of Kotelny and the land to the north of New Siberia (now Bennett Island). A Russian officer named Hedenström, accompanied by Sannikov, explored the archipelago and published a map of it in 1811. Lieutenant Anjou visited it in 1821—1823. A scientific expedition under Dr. Alexander Bunge (including Baron Eduard Toll) explored it in 1835—1886. Baron Toll revisited it in 1893 with Lieutenant Shilgeko, and again in 1900 with F. G. Seeberg. Papers were found on Bennett Island showing that he left it for the south in November 1902, but he never returned home, and two relief parties in 1903 failed to find traces of him.


NEW SOUTH WALES, a state of the Australian Commonwealth. The name was given by Captain Cook, in his exploratory voyage in 1770, to the southern portion of the eastern coast of Australia, from some imagined resemblance of its coast-line to that of South Wales. The name was afterwards extended to the eastern half of Australia, but now designates a much more restricted area. New South Wales is bounded by the Pacific Ocean on the E., by Queensland on the N., by South Australia on the W. and by Victoria on the S. It lies between 28° and 38° S. lat., and 141° and 154° E. long. The coast-line, which is about 700 m. in length, extends from Cape Howe (37° 30') at the south-eastern corner of Australia to Point Danger in 28° 7' S. The colony is approximately rectangular in form, with an average depth from the coast of 650 m. and an average width from north to south of 500 m. The superficial area is estimated at 310,700 sq. m., or about one-tenth of the whole area.

Physical Configuration.—The surface of the state is divided naturally into three distinct zones, each widely differing in general character and physical aspect, and clearly defined by the Great Dividing Range running from north to south. The tableland, the summits of the range, and the coastal region, each consist of the great plain district of the interior. The main range follows the line of the coast, varying from 30 to 140 m. distant, being nearest at the south and receding the farthest at the sources of the Goulburn river, the main tributary of the Hunter. The crest of this range is, in some places, narrow; in others it spreads out into a wide tableland. The eastern slopes are, as a rule, rugged and precipitous, but the western versant falls gently to plains. The highest part of the Dividing Range is in the south, and is part of the eastern extremity of the Inland Victoria. Here some of the peaks rise to a height of over 7000 ft. Of these, Mount Kosciusco, the highest peak in Australia, attains an elevation of 7328 ft. The tableland varies greatly in elevation, but nowhere does it fall below 1500 ft., and in places it reaches an average of 5000 ft. The great plain district, lying west of the tableland, is part of a vast basin which comprises portions of Queensland, South Australia and Victoria, as well as of New South Wales. The great plains are traversed by a few rivers, whose long and uncertain courses carry their waters to the river Murray, which empties itself into the Southern Ocean through the state of South Australia, and during 3350 m. of its course forms the boundary between the states of New South Wales and Victoria. The Murray has a very tortuous course, as may be judged from the fact that the measurement along the joint boundary of New South Wales and Victoria is only 460 m. in a straight line, the river course being 1250. The chief tributaries of the Murray are the Darling and the Murrumbidgee, which is joined by the Lachlan. The Murray and the Murrumbidgee are permanent streams, but the Darling occasionally ceases to run in part of its course, and for a thousand miles above its junction with the Murray it runs very low. In its upper course the Darling receives numerous tributaries. Those on the right bank all come from Queensland and bring down enormous volumes of water in flood time; on the left bank the most important tributaries are the Gwydir, Namoi, Castleraigh, Bogan and Macquarie. Here and there along the course of the western rivers are found lagoons, sometimes of considerable dimensions. These are commonly called lakes, but are in reality shallow depressions receiving water from the overflow of the rivers in times of flood, and in return feeding them when the floods have subsided.

The coastal belt differs greatly from the other divisions of the state. The main range gives rise to numerous rivers flowing eastward to the South Pacific. Almost everywhere between the main range and the sea the country is hilly and serrated, more particularly in the southern portions of the state. In the Illawarra district, 50 m. south of Sydney, the mountains skirt the very edge of the coast, but farther north there is a wide coastal-land, with greater stretches of country available for tillage and pasture.

Along the sea-board are twenty-two well-defined headlands or capes and about a score of bays or inlets, to mark which for navigators there are thirty-four lighthouses. There are four very fine natural harbours, viz. Jervis Bay, Port Jackson, Broken Bay and Port Stephens, and several others of minor importance. Port Jackson, on which is situated the city of Sydney, is one of the six greatest ports of the British empire. The port second of commercial importance to Sydney is Newcastle, at the mouth of the Hunter river, which is the great coal-shipping port of the colony. Secondary harbours, available for coasting steamers, south of Sydney are at Port Hacking, Wollongong,
Kiama, Shoalhaven, Bateman's Bay, Ulladulla, Merimbula, and Twofold Bay. North of Sydney the secondary ports are at the mouths of the Hawkesbury, Manning, Hastings, Macleay, Nambucca, Bellinger, Clarence, Richmond and Tweed rivers. The rivers of these-board are as just enumerated, the only other of importance being the Hunter. The Richmond drains an area of 2400 sq. m. and is navigable for 60 m. The Clarence is a fine stream draining an area of 8000 sq. m.; it has a course of 240 m., navigable for 67 m. The Macleay drains an area of 4800 sq. m., and empties at Trial Bay after a course of 200 m., of which 20 m. are navigable. The Hastings and Manning are both important rivers. The Hunter is one of the chief rivers of the state and embouches at Port Hunter or Newcastle Harbour after a course of the coastal plain area of 11,000 sq. m., more than twice the area of the Thames basin. Less commercially important than the Hunter, the Hawkesbury is nevertheless a fine stream; it has a course of 330 m. of which 70 m. are navigable. South of Sydney the rivers are of less importance; the principal is the Shoalhaven, 260 m. long, draining an area of 3500 sq. m.

Climate.—The three geographical regions above described constitute three distinct climatic divisions. The coastal region, 28° to 37° S. lat., shows a difference between the average summer and winter temperatures of only 24° Fahrenheit. Sydney, which is situated immediately north of the Tropic of Capricorn (33° 51' S.), has a mean temperature of 65°, the mean summer temperature being 71° and that of winter 54°, showing a mean range of 17°; the highest temperature in the shade experienced at Sydney in 1896 was 108°-5, and the lowest 35°-9. The coastal district has an area of 38,000 sq. m., over which there is an average rainfall of 42 in. The rainfall is greatest at the sea-board, diminishing inland; the fall also diminishes from north to south. Sydney has an average fall of 50 in., while the Clarence Heads, in the north, has 58 in., and Eden, in the south, 35.5 in. The table land is the central division; this comprises an area of 67,000 sq. m., and plateau, at an elevation of 4646 ft., stands the town of Kiandra, with a mean summer temperature of 56°-8 and winter of 31°-5. Cooma, in the centre of the Monaro plains, at an elevation of 2637 ft., has a mean summer temperature of 65°-9 and winter, 41°-7; its summers are therefore as mild as those of London or Paris, while its winters are much less severe. On the New England tableland, under latitude 30° S., the yearly average temperature is 56°-5, the mean summer 67°-7 and the mean winter 43°-5. The tablelands cover an area of 85,000 sq. m. and have an average rainfall of 526 in.; there is, however, a strong rainfall gradient, the wettest parts being on the west, where precipitation is experienced. In the western division, or great plains, severe heat is experienced throughout the summer, and on occasional days the thermometer in the shade ranges above 100° Fahrenheit, but it is a dry heat and more easily borne than a much less degree of temperature at the sea-board. The mean summer temperature ranges between 75° at Deniliquin in the south and 84° at Bourke. The mean range in winter is between 48° and 54°-5, and, accompanied as this is with clear skies, the season is very refreshing. West of the tableland the amount of rainfall decreases as the distance from the Pacific increases, and in a large area west of the Darling the average annual rainfall does not exceed 10 in. For the whole western division, embracing an area of 188,000 sq. m., the average rainfall is 19 in. (T. C. A.)

Geology.—New South Wales consists geologically as well as geographically of three main divisions which traverse the state from north to south. The highlands of eastern Australia form the middle belt of the state, to the east of which are the low coastal districts and to the west the wide western plains. The highlands of New South Wales consist, geographically, of a series of tablelands, now in the condition of dissected remnants; geologically, they are built of a foundation of Archean and folded Lower Palaeozoic rocks, covered in places by sheets of more horizontal Upper Palaeozoic and Mesozoic rocks; these deposits occur along the edge of the highlands, and are widely distributed on the floor of the coastal districts. They have been lowered to this level by a monoclinic fold which has brought down the Mesozoic rocks, so that they extend eastward from the coast. The Coastal Plains contain isolated ridges of the old Archean and Lower Palaeozoic rocks; but in the main, they consist of plains of Cretaceous beds covered by Cainozoic drifts. The stratified rocks in the highlands strike north and south, as if they had been crumpled into folds, in Upper Palaeozoic times, by pressure from east to west. The weak areas of the crust carry mountain masses in turns by great masses of Devonian granites. They altered the Lower Palaeozoic rocks on their edges, and were once thought to have converted whole areas of Lower Palaeozoic rocks into schists and gneisses. Most of these foliated rocks, however, were later overthrusted. The highland rocks no doubt once extended along the whole length of the state from north to south; but they are now crossed by a large series of transverse or diagonal faults. Between Port Macquarie and the Hunter river and separate the Blue Mountains and the Southern Highlands of New South Wales from the New England tableland to the north.

Among the rock formations of New South Wales are referable to the Archean system, and consist of gneisses and schists, including the glauconite-schists of the New England tableland, and hornblende-schists and gneisses. Palaeozoic rocks are comparatively sparsely exposed in New South Wales, except along the coast, where they are being continuous with the Archean block of north-eastern Victoria. They occupy a large area in the western districts of New South Wales, where a projection from the Archean plateau of central Australia crosses into the state from South Australia; it is best exposed in the Barrier Ranges around Broken Hill. Cambrian rocks have not yet been discovered in New South Wales; but Pittman has re-rocks of the Devon in system rest unconformably upon the Silurian; but some beds of which the age is still uncertain are called Devono-Silurian. The Devonian beds are well developed in the New England tableland at lowland level, while the Lower Palaeozoic rocks of the Lambi are estimated to be 10,000 ft. in thickness. They are extensively developed along the coast river and along the slopes of Mount Canobolas. They are also developed in the New South Wales Highlands, and the New England tableland. These deposits are overlain by other formations which occur in the ranges which rise above the western plains, such as the Rankin Range on the Darling and the Kokopara Range to the north of the Murramibidgee. These deposits are sharply folded and are associated with a series of rhyolites and basic lavas. The lower part of this series is probably Lower Devonian; and it is covered by shales and volcanic rocks belonging to the Upper Devonian. In the extreme south-east of New South Wales, at the head of the Genoa river, are sandstones with Archean gneisses, which are an extension of the Lower Devonian beds of Victoria; while farther to the east, at Eden and Twofold Bay, are Upper Palaeozoic sandstones.

The Devonian system is separated from the Carboniferous by an interval, during which there were powerful earth movements; they produced a rocky mountain chain, running from the centre to the south-west corner of New South Wales. The highlands are worn down stumps of this mountain line. In Lower Carboniferous times these mountains were snow-capped, and the valleys on their flanks were occupied by glaciers.

The Lower Carboniferous beds are represented by conglomerates and sandstones with some shales and limestones. The sandstones are characterized by Lepidodendron (Bergenia) asulata. It is associated with Lycopsids and with other plants. The beds are rich in copper ores. Gravites and granodiorites were intruded at this period into the older rocks, and altered the adjacent Devonian beds into slates and quartzites, and formed gneisses in the Blue Mountains of Yalwal. The Lower Carboniferous rocks also occur in the Blue Mountains, along the Cox river and Capertee river; and a northern continuation occurs along the west coast in the New England tableland, from the Allyn river to the Queensland border. The Upper Carboniferous rocks are most important from their rich seams of coal. They occupy from 24,000 to 28,000 sq. m., which are best exposed in the Hunter river and around Newcastle.
Farther south they disappear beneath the Mesozoic sandstones, from which they are exposed along the coast of New South Wales, and near the mouth of the Shoalhaven river. The Coal Measures have been reached under Sydney, by a deep bore at Balmain, which pierced a seam of coal 10 ft. thick, at the depth of 2917 ft. The Coal Measures are classified by Professor T. W. Davie as follows:

1. Upper or Newcastle Coal Measures, containing 100 ft. of coal.
2. Dampier Series; freshwater beds, containing no productive coal. This series thins out completely in certain directions.
3. Middle Triassic Coal Measures, containing an aggregate of about 40 ft. of coal.
4. Upper Coal Measures; specially characterized by the predominance of Productus brachycephalus, and
5. Lower or Greta Coal Measures, containing an aggregate of about 20 ft. of coal.

Geologically, perhaps, the most interesting rocks in the Carboniferous are the glacial conglomerates containing re-erected blocks. Some of the boulders are encrusted by marine organisms and must have been dropped by icebergs in the sea. The northern Coal beds are claimed by some to be of glacial origin; they have been described as far north as Ashford. The Cretaceous rocks are represented by numerous sheets and beds of basalt and andesite. A syenite massif of this age occurs at Mittagong; and leucite has been developed in Cabbage Hill. The Mesozoic rocks of New South Wales begin with the Narrabeen Shales; they are covered by the Hawkesbury Sandstones, which are well exposed around Sydney; and they in turn are covered by the Wannamatta Shales. Between the Hawkesbury River and the Hawkesbury Sandstone, it is represented by the evidence of the fossil fish; though, according to Dr Smith Woodward, they may perhaps be Rhaciet. But the fossil plants of which the beds are Tripterygium denudatus and Thalassia feldia odontopteroides are regarded as Seward as Lower Jurassic. At Tallbartrar there is a bed containing Jurassic fish, which rests in an erosion hollow in the Hawkesbury Sandstone. The Tallbartrar beds, then, are the uppermost Triassic, and they underlie the Hawkesbury Sandstone may be Lower Triassic. The Cretaceous system is widely developed in the western part of the state, where it is represented by two divisions. The Rolling Downs formation is regarded as Lower Cretaceous. It consists of a thick series of shales containing marine fossils. It is covered in places by tabular sandstone and sandstone, the remnants of a sheet which doubtless once covered the whole of the Western Plains. The chief economic product of the Desert Sandstone is opal, which occurs in it at White Cliffs and Wilcannia. The opal beds contain Cretaceous fossils such as Cimodosaurus. An occurrence of Upper Cretaceous beds has been found in the region of the Riverina. The Cooee River Cretaceous rocks are best developed in the western districts, as the strata of the Darling and Murray plains. They include some Miocene, or perhaps Oligocene marine sands, formed in the northern part of the state, and most of the beds were occupied by the Lachlan basin. The most significant point in the distribution of the marine Cretaceous rocks in New South Wales is their complete absence from the coastal district. The output of alluvial gold is now increased by the employment of dredges. The gold-quartz veins are mainly in the Ordovician and Silurian rocks; but some also occur in the Devonian, and there are impregnations of gold in tulas of Devonian age. Deep lead mining is largely worked in the Lachlan district.

The silver-lead mines of New South Wales are famous owing to the importance of Broken Hill. The mines there occur in gneiss and schists, which are probably of Archean age; the lead has in places been found for a distance of 1500 ft. below the surface, and though with the silver-lead long lay unutilized, as the problem of their separation from the associated rhodochrosite has only recently been overcome. It is worked by dredging of the rivers of the New England tableland as at Vegetable Creek. The chief copper field is at Cobar in the north-western plains. Bismuth, platinum, molybdenum and antimony are obtained in small quantities.

The geology of New South Wales has been described in the Monographs, Memoirs and Records of the Geological Survey, which in the fullness and high scientific character form the most valuable contribution to Australian geology. Pittman's map of the state in two sheets is the best scale for the scale of the Survey 1:150,000. The economic geology has been admirably summarized in a work by E. F. Pittman, The Mineral Resources of New South Wales (1901). Numerous geological memoirs have appeared in the Rep. Austral. Assoc. for the Advancement of Science, the Journ. R. Soc. N.S. Wales and the Proc. of the Linnean Soc. N.S. Wales. A systematic account of the minerals has been published by A. Riversidge, The Minerals of New South Wales (1888), and to him is due a valuable chemical study of the meteorites and gold nuggets. Contributions on the palaeontology of New South Wales are contained in the Rec. Austral. Museum, Sydney. A bibliography of the geological literature in the state of New South Wales, 1851-1891, was issued by the Surveyor-General of N.S. Wales, vol. vi., 1899, and of the Cretaceous geology, also by W. S. Dun, in Journ. of Proc. Royal Soc. N.S. Wales, 1901, vol. xiii, pp. 100-152.

Artesian Water.—Before actual boring proved that the belief was well founded, it had long been scientifically demonstrated that water would probably be obtained in the Cretaceous formation which occurs in the whole of the eastern part of the state. It is probable that the artesian water-bearing basin extends much farther south than was previously supposed. It may, indeed, be yet to be found approximately along the course of the Lower Darling. Artesian water is also obtainable in other than the Cretaceous rocks. This is shown by palaeontological evidence; and some of the most successful bores, such as those at Coomamble, Moree, Gil Gil and Tallbartrar, have been in rocks of Triassic age, corresponding with the Ipswich Coal Measures.

Population.—The population on the 1st of July 1906 was 1,504,700, viz. 799,260 males and 705,440 females. The total includes 103,000 Chinese and 7500 aborigines and half-castes. Since 1860 New South Wales had added more largely to its population than any of the other Australian states. In 1860 the population was 258,456; in 1890 the number was 1,211,860. From 1890 to 1901 the population increased 228,083, or at the rate of 21.2%. By far the largest part of the increase is due to excess of births over deaths, for out of the increase of over 1,000,000 since 1860, only 350,000 was due to immigration. In 1905 there were 39,572 births and 14,880 deaths; these figures are equal to 26.78 and 10.13 per thousand respectively. The birth-rate has fallen very much, especially since 1899. In 1885-1886 it was 42.71 per 1000; in 1896-1899 it was 27.92, and in 1906 it had fallen still further to 26.78. The marriage rate for 1905 was 7.40 per thousand, and the persons married 14.86 per thousand. The mean for 20 years was 7.36. The chief cities are Sydney and suburbs, population in 1906, 513,900; Newcastle and suburbs, 66,000; Broken Hill, 30,000; in 1901, Parramatte, 12,568; Goulburn, 10,610; and Maitland (East and West), 10,085. There are nine other towns with between 5000 and 10,000 inhabitants each.

Religion.—The proportions of the leading denominations in 1901 were: Church of England, 263,905; Roman Catholic, 130,057; Presbyterian, 9,9; Wesleyan and other Methodists, 10; Congregationalist, 1; Baptist, 1; Jews, 0; others, 3.6. Sydney is the seat of Anglican and Roman Catholic archbishoprics; the Australian Presbyterian Church has a bishop and a bishopric. Education.—The state has in its employ 3135 male and 2242 female teachers, and maintains 2901 schools. The law requires that all children over six years and under fourteen years shall attend school. The attendance on 1904 was 417,030, but of 182,000 others below or beyond the school ages, were receiving instruction, making a total of 255,000. Of this number 211,000 were in state schools and 18,000 in other schools. An act in 1892 allowed the state schools to be controlled by one or other of the religious bodies. The Roman Catholic Church has 361 schools, with 1835 teachers and an attendance of 33,000 pupils. The total expenditure of the state on public instruction, science and art during the year ended 30th June 1906 was £91,100. During the calendar year 1906 a sum of £83,000 was expended on primary instruction. The fees were:
NEW SOUTH WALES

amounted to $82,000, making the actual cost of primary instruction $775,000. There are a university and a technical college in Sydney.

There are four main sources, viz. taxation; sale and lease of lands; earnings of railways, tramways and other services; and share of surplus revenue returned by the commonwealth. During 1906 the income derived from these heads was: from taxation $1,297,776; from lands $1,729,887; from railways and other services $5,856,826; from commonwealth £2,742,770; these with miscellaneous collections to the income of the state, and from receipts from the Commonwealth is the subject of the present article. The direct taxation is represented by a tax of one penny in the pound on the unimproved value of land, sixpence in the pound on the annual income derived in the state from all sources, except licence duties and occupation of land and improvements thereon. There are also various stamp duties. The land revenue is derived partly from the alienation of the public estates, either absolutely or under conditions, but mainly from the occupation of the public lands. There is also a small revenue from mining lands, timber licences, &c. The state still holds 146 million acres out of a total of 196 million acres, having alienated about 50 million acres. The principal heads of expenditure were: interest and charges on public debt, £2,291,091; public instruction, £911,177; working expenses of railways and tramways, £2,054,777; other services working expenses, £205,242; other services, £3,900,726. The public debt in 1906 was £3,641,724, equal to £56, 11s. per inhabitant; the great proportion of this debt has been incurred for works that are revenue producing, only about £11,000,000 was not so expended. The total debt in 1903 about £146,000,000 was held in private and was in excess of expenditure in 1906 amounted to nearly 3½ per cent on the whole public debt, and the interest paid averaged 3.6 per cent.

Administration.—The political constitution of New South Wales is that of a self-governing British colony, and rests on the provisions of the Constitution Act. The Governor is appointed by the crown, the term of office being generally for five years, and the salary £5,000. The Governor is the official medium of communication between the colonial government and the secretary for the colonies, but at the same time the colony maintains its own agent-general in London, who not only sees to all its commercial business but communicates with the colonial office. The powers of the state parliament have been since 1901 restricted by the transfer of certain powers to the commonwealth of Australia. In the legislative assembly there are 96 members. The principle adopted in distributing the representation is that of equal electoral districts, modified in practice by a preference given to the distant and rural constituencies at the cost of the metropolitan electorates. The suffrage qualification is a residence of twelve months and the attainment of the age of 21 years. Women are entitled to the franchise; there are the usual restrictions in regard to the pauper and criminal classes. An elector has only one vote, which is attached to the district in which he resides. Members of the Legislative Assembly are returned by a system of proportional representation. Each electoral district returns one member. The Legislative Council consists of persons nominated for life by the governor, acting on the advice of the Executive Council; the number of members is not fixed by law but in 1906 it was 55. Parliaments are triennial. Local government was extended in 1903 and 1906 to the whole state, excepting the sparsely populated western division; formerly it was confined to an area of about 2800 sq. m. There are altogether about 55,000 m. of road communications, but not more than 15,000 m. are properly formed. Each subdivision of the state, the former is the term applied to closely peopled areas of small extent enclosed with complete local government, and the latter is the designation of the more extensive districts, thinly peopled, to which a less complete system of local government has been granted.

Federal Capital.—In 1908 the Seat of Government Act provided that the federal territory and capital of Australia should be in the Yass-Canberra district of New South Wales, and that the territory should have an area of not less than 900 sq. m. and easy access to the sea. In 1909 a Board was appointed to consider the several possible sites within this district reported in favour of Canberra, on the Molonglo river, near Queanbeyan, as the site for the new city, and the basins of the Molonglo, Queanbeyan and Cotter rivers were indicated as suitable to form the federal territory. Jervis Bay was recommended as offering a site for a port for the territory. Bills were passed in 1909 by the legislative assembly of New South Wales and by the federal parliament, transferring this territory to the federation.

Agriculture.—New South Wales may be considered as essentially a pastoral country, and the cultivation of the soil has always been secondary to stock-raising. But the predominance of the pastoral industry is not by any means so marked as it was even as late as the last decade of the 19th century. The want of pastures in agriculture was not to be ascribed to defects of climate or soil, but chiefly to the great distance of Australia from the markets of the world. This difficulty has, for the most part, been removed by the establishment of numerous import lines of steamers trading between Australia and Europe, and recent years have therefore seen considerable expansion in all forms of agriculture.

In 1882 the area of land under cultivation was 733,582 acres, which is slightly less than 1 acre per inhabitant. In 1906 the total area under cultivation was 2,439,639 acres, and in 1906 it had risen to 2,838,081 acres, which is a little short of 2 acres per inhabitant.

The area devoted to each of the principal crops was as follows:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Acres</th>
<th>Bushels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>1,460</td>
<td>10-5</td>
</tr>
<tr>
<td>Maize</td>
<td>189,000</td>
<td>30</td>
</tr>
<tr>
<td>Oats</td>
<td>38,500</td>
<td>20</td>
</tr>
<tr>
<td>Sugar Cane</td>
<td>21,500</td>
<td>1 ton</td>
</tr>
<tr>
<td>Hay</td>
<td>438,000</td>
<td>185 gallons</td>
</tr>
<tr>
<td>Vines</td>
<td>8,100</td>
<td></td>
</tr>
</tbody>
</table>

The average yield per acre of crops may be set down as follows:

- Wheat 10-5
- Maize 30
- Oats 20
- Sugar Cane 1 ton
- Hay 185 gallons
- Vines

The total value of production in the year 1906 may be set down at £6,543,000, which works out at £2, 6s. 1d. per acre.

The principal crops which are derived from the soil are wheat, maize, oats, sugar, hay, and vines. There were 76,000 occupiers of rural holdings in 1905, and the area occupied by them, exclusive of land belonging to the state, is 48,081,000 acres. The great majority, 85% in 1905, of occupiers are freeholders; the practice of renting farm lands is not followed to any considerable extent, except in the dairying lands on the coast district; in New South Wales took up its position amongst wheat-exporting countries in 1900; the bulk of the grain exported goes to the United Kingdom. Hay crops and maize rank next in importance to wheat. The cultivation of fruit is receiving increased attention, but the great value of a rich soil and high rainfall has limited the production of wine, until recently so promising, are, if not declining, at least stationary, in spite of the suitability of the soil of many districts for these crops.

Grazing and Dairying.—The grazing industry still holds a chief place amongst the productive industries of the state. In 1906 the number of horses was 59,700; of sheep, 40,000,000; of cattle, 2,340,000; and swine, 311,000. There were considerable losses of sheep in 1902 owing to the drought of that year, but the flocks in 1906 were of better quality than at any previous period and little short of the number of 1898. The vast majority of the sheep are of the merino breed, but there are about 1 million of the woolly sheep and between two and three million cross-bred. Dairying made very great strides in the ten years preceding 1906, and ranks as one of the great industries of the state. There were 644,000 dairy cows in 1910 and the numbers are increasing yearly. The production of wool was 300,000,000 lb., as in the grease; tallow, 493,000 cwt.; butter, 500,000 cwt.; cheese, 42,000 cwt.; and bacon and hams, 171,000 cwt.

Mining.—The mining industry has made great strides. In 1905 there were about 38,000 men engaged in the various mines, besides 3300 employed in smelting. Of these, 10,700 were employed in gold-mining, 12,000 in coal-mining, there were 14,400; silver, 10,000; tin, 2750; and copper, 1850. The value of mining machinery may be approximately set down at £2,900,000. The following summary shows the value of the various minerals won in 1905. It is impossible to mention all that has been obtained at Broken Hill; the two metals are therefore shown together.

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Value (cwt.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold</td>
<td>14,400</td>
</tr>
<tr>
<td>Silver</td>
<td>10,000</td>
</tr>
<tr>
<td>Copper</td>
<td>2750</td>
</tr>
<tr>
<td>Tin</td>
<td>2750</td>
</tr>
<tr>
<td>Copper</td>
<td>1850</td>
</tr>
</tbody>
</table>
The value of gold won varies from year to year, but from 1904 to 1906 in only two years did it fall below £1,000,000. About one-fourth of the gold won is alluvial. The yield of gold from quartz mines is usually in the order of 11 tons per acre, which is considerably below the average for the previous ten years. The Broken Hill silver lode is the largest yet discovered; it varies in width from 10 ft. to 200 ft., and may be traced for several miles. The Broken Hill Proprietary Company owns the principal mine, and at Port Pirie in the neighbouring colony of South Australia erected a complete smelting plant; the problem of the recovery of the zinc content, until now a great deal of unsatisfactory, solved, the company can make extensive additions to the plant already erected, and in the manufacture of spelter was undertaken. From the commencement of mining operations on a large scale in 1885 to the end of 1905 the value of silver and lead ore won was £40,000,000. The production of tin rapidly declined after 1887, when the value of ore raised was £129,000; the production varies both with the price and the occurrence of rain, but the principal cause of the decreased production was the exhaustion of the shallow deposits of stream tin, from which most of the ore was obtained. The principal deposits of copper are in the central parts between the Macquarie, Bogan and Daring rivers. The copper lodes of New South Wales contain ores of a much higher grade than those of many well-known mines worked at a profit in other parts of the world, and, with a fair price for copper, the production largely increases. Iron is widely diffused, principally in the form of marcasite, brown haematite, limonite and bog iron. Coal mining is carried on in three districts. In the northern or Hunter river district there were 63 collieries, employing 10,500 men, and the quantity of coal raised in 1904 was 4,350,000 tons. The western or mountain collieries were seventeen in number, employing 540 men and raising about 418,000 tons. About 53 per cent. of the coal obtained is exported. Kerosene shale (torbanite) is abundant and is systematically worked.

Manufacturing. — There are a large and rapidly increasing number of manufactories, but in 1905 only about 250 employed more than 50 hands. The following gives a statement of factory employment for eleven years:

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of Establishments</th>
<th>Hands Employed</th>
<th>Value of Plant and Machinery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1895</td>
<td>2723</td>
<td>48,030</td>
<td>£5,255,000</td>
</tr>
<tr>
<td>1900</td>
<td>3077</td>
<td>60,779</td>
<td>5,708,000</td>
</tr>
<tr>
<td>1905</td>
<td>3700</td>
<td>72,175</td>
<td>7,920,000</td>
</tr>
</tbody>
</table>

About 53% of the males and 10-6% of the females employed are under sixteen years; the total number of male employees in 1905 was 66,117, and of females, 16,958. About two-thirds of the hands are employed in Sydney and the adjacent district. The total value of the articles produced in manufactories, and the increased value of materials after undergoing treatment, was £30,028,000 in 1905, of which £17,500,000 represented value of materials used and £12,500,000 the value of fuel. The total wages paid was £5,500,000.

Commerce. — During 1905, 2725 vessels entered New South Wales ports from places outside the state; their tonnage was 4,697,500; the value of goods imported was £29,442,008; and the value of exports was £36,757,002. The average value of imports per inhabitant was £50 and of exports £54,717. The bulk of the trade is carried on with the other Australian states; in 1905 the value of such trade was, imports, £1,949,388, and exports, £1,262,427. The British trade is also considerable, the imports direct from Great Britain being valued at £8,502,288 and the exports at £10,222,422. With all British countries the trade was, imports, £25,998,399, and exports, £25,994,563. New South Wales maintains a large trade with foreign countries aggregating £3,434,609 imports and £16,762,439 exports. France, Germany, Belgium and the United States are the principal foreign countries with which the state trades.

WOOD is the staple export, and represents, in most years, one-third the value of the exports. Gold coin and bullion form one of the principal items in the export list, but only a small portion of the product of local production, the balance being Queensland and New South Wales. A gold sent to Sydney, 9.159.475, and one third of the bullion sent to London, 1.25,000. The course of trade from 1880 to 1905 was as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>£1,175,000</td>
<td>£1,682,802</td>
</tr>
<tr>
<td>1881</td>
<td>£1,273,407</td>
<td>£1,675,107</td>
</tr>
<tr>
<td>1882</td>
<td>£1,220,700</td>
<td>£1,354,325</td>
</tr>
<tr>
<td>1883</td>
<td>£1,250,000</td>
<td>£1,159,725</td>
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<tr>
<td>1884</td>
<td>£1,250,000</td>
<td>£1,159,725</td>
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<tr>
<td>1885</td>
<td>£1,200,000</td>
<td>£1,159,725</td>
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<td>1886</td>
<td>£1,200,000</td>
<td>£1,159,725</td>
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<td>1887</td>
<td>£1,200,000</td>
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<td>1889</td>
<td>£1,200,000</td>
<td>£1,159,725</td>
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<td>£1,200,000</td>
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<td>1894</td>
<td>£1,200,000</td>
<td>£1,159,725</td>
</tr>
<tr>
<td>1895</td>
<td>£1,200,000</td>
<td>£1,159,725</td>
</tr>
</tbody>
</table>

The principal articles of export in 1905 were: Wood, £13,444,260; gold, £1,334,311; copper, £1,072,888; butter, £817,820; coal, £566,602; copper, £1,280,509; breadstuffs, £1,345,589; kather and skins, £1,559,533; meat, £761,253; tallow, £464,330; timber, £333,265; tin, £664,066.

Postal and Telegraph Service. — The postal business of 1905 was represented by the carriage of 102,292,888 letters and postcards, 44,599,104 newspapers and 23,077,994 parcels and books; the telegrams despatched numbered 3,857,962. To transact the postal business of the country, mail conveyances travelled 12,000 miles. The income of the postal and telegraph department in 1905 was £1,605,018 and the expenditure £933,121, but there were some items of expenditure not included in the sum named, such as interest charges, &c., and cost of new buildings. The administration of the post office is under the colonial government.

The railways are almost entirely in the hands of the state, the number of railway lines in 1906 was 5,462, and the total length 3,471 miles. The capital expended on the state lines open for traffic was £25,626,000, of which £4,000,000 was expended on rolling stock and equipment and £36,226,000 on construction of roads, stations and permanent ways. The net earnings amounted, in 1906 to £9,836,976, which represents a return of 4.1% upon the capital invested. The state pays, on an average, 3.5% for the money borrowed to construct the lines, and there is therefore a considerable surplus to be added to the revenue. The year 1906 was, however, a very excellent one as regards railway working, the operations of the ten previous years showing an average loss of about a quarter of 1%.

History. — New South Wales was discovered by Captain Cook on board the "Endeavour," on 26th April 1770. After he had observed the transit of Venus at Tahiti, he circumnavigated New Zealand and went in search of the eastern coast of the great continent whose western shores had long been known to the Dutch. He sighted the Australian coast at
Gippsland, Victoria, near Cape Everard, which he named Point Hicks, and sailed along the east coast of Australia as far north as Botany Bay, where he landed, and claimed possession of the continent on behalf of King George III. He then continued his voyage along the east coast of Australia, and returned to England by way of Torres Strait and the Indian Ocean. The favourable reports made by Captain Cook of the country around Botany Bay induced the British government to found a penal settlement on the south-eastern part of what was then known as New Holland. An expedition, consisting of H.M.S. "Sirius" of 20 guns, the armed trader "Supply," three store-ships and six transports, left England on 17th May 1787, and after touching at Tenerife, Rio de Janeiro, and the Cape of Good Hope, arrived at Botany Bay on the 20th of January, 1788, under the command of Captain Arthur Phillip, R.N., with Captain John Hunter, R.N., as second. The persons on board the fleet included 564 male and 192 female convicts, and a detachment of marines, consisting of Major Ross, commandant, 16 officers, 24 non-commissioned officers, an adjutant and quartermaster, 160 privates and 40 women. There were in addition five medical men and a few mechanics. The live stock consisted of one bull and four cows, a stallion and three mares, some sheep, goats, pigs and a large number of fowls. The expedition was well provided with seeds of all descriptions. The shores of Botany Bay were found to be unsuitable for residence or cultivation, and Captain Phillip transferred the people under his command to Port Jackson, half a dozen miles away, near the site of the present city of Sydney. For some years the history of the infant settlement was that of a large gaol; the attempts made to till the soil at Farm Cove near Sydney and near Parramatta were only partially successful, and upon several occasions the residents of the encampment suffered much privation. But by degrees the difficulties inseparable from the foundation of a new colony were overcome, and in 1789 Captain Phillip's ships landed their living freight on the shores of Port Jackson, and in 1793 an emigrant-ship arrived with free settlers, who were furnished with provisions and presented with free grants of land. By the end of the 18th century the inhabitants of Sydney and its neighbourhood numbered 5000. Immediately after the arrival of the first fleet, surveys of the adjacent coast were made; the existence of a strait between Australia and Tasmania was discovered by Surgeon Bass; and before the retirement of Governor King in 1806 Australia had been circumnavigated and the principal features of the continent of Australia had been studied and reported to the government by Captain Flinders, R.N. The explorations landward were, however, not so successful, and for many years the Blue Mountains, which rise a few miles back from Sydney, formed an impenetrable barrier to the progress of colonization. Penal establishments were formed at Newcastle in New South Wales, at Hobart and Launceston in Tasmania, and an unsuccessful attempt was made to colonize Port Phillip. The most noteworthy incident in the first decade of the 19th century was the forcible deportation by the officers of the New South Wales Corps, a regiment raised in England for service in the colony, of the governor, Captain Bligh, R.N., the naval officer identified with the mutiny of the "Bounty." For some time the government was administered by the senior officer of the New South Wales Corps, but in 1809 he was succeeded by Captain Macquarie, who retained the governorship for eleven years. During the régime of this able administrator New South Wales was transformed from a penal settlement to a colony. Before the arrival of Macquarie schools and churches had been erected, a newspaper, the Sydney Gazette and New South Wales Advertiser, had been started, and attempts had been made to acclimatize the drama. But he was the first governor to open up the country. He constructed permanent buildings at Sydney and Parramatta, formed roads and built bridges in the districts along the coast, and commenced a track across the Blue Mountains, which had been crossed in 1813 by Wentworth and others, and thus opened up the rich interior to the inhabitants of Sydney. It was during Captain Macquarie's administration that the first banking institution, the Bank of New South Wales, was founded. The final fall of Napoleon in 1815 gave the people of the United Kingdom leisure to think of sales of the penal lands in the Antipodes; and in 1817 free settlers commenced to arrive in considerable numbers, attracted by the success of Captain John M'Arthur, an officer in the New South Wales Regiment, who had demonstrated that the soil, grass and climate were well adapted for the growth of merino wool. But although the free settlers prospered, and were enabled to purchase land on very easy terms, they were dissatisfied with the administration of justice, which was in the hands of a judge-advocate assisted by military officers, and with the absence of a free press and representative institution. They also demanded permission to occupy the vast plains of the interior, without having to obtain by purchase or by grant the fee-simple of the lands upon which their sheep and cattle grazed. These demands were urged during the governorships of Sir Thomas Brisbane and General Darling; but they were not finally conceded, together with perfect religious equality, until the régime of Sir Richard Bourke, which lasted from 1831 to 1837. At the latter date the population had increased to 76,793, of whom 25,254 males and 2557 females were or had been convicts. Such was the rapid rate. Parramatta, Richmond and Windsor had indeed been founded within the first decade of the colony's existence; Newcastle, Maitland and Morpeth, near the coast to the north of Sydney, had been begun during the earlier years of the 19th century; but the towns of the interior, Goulburn, Bathurst and others, were not commenced till about 1835, in which year the site of Melbourne was first occupied by Batman and Fawkner. The explorations which followed the passage of the Blue Mountains opened up a large portion of south-eastern Australia. Van Diemen's Land was declared a separate colony in 1825, West Australia was formed into a separate colony in 1829, South Australia, with the title of "sister colony," was added in 1836; Tasmania, or Van Diemen's Land, was entirely detached from Australia in 1836; so that before 1840 the original area of New South Wales, which at first included the mainland of Australia and the islands in the South Pacific, had been greatly reduced. In 1840 the press was free in every part of Australia, trial by jury had been introduced, and every colony possessed a legislature, although in none of them except New South Wales had the principle of representation been introduced, and in that colony only to a very limited extent. The policy of granting land without payment, originally in force in New South Wales, had been finally substituted for a system of freehold tenure at the upset price of twenty shillings per acre; and the system of squatting licences, under which colonists were allowed to occupy the waste lands on payment of a small annual licence, had been conceded. In 1851, when separate autonomy was granted to Victoria, New South Wales had a population of 187,243, the annual imports were £2,075,338, the exports £2,909,580, the revenue was £755,704, and the colony contained 132,437 horses, 1,735,065 cattle and 13,050,244 sheep. Gold was discovered at Summerhill Creek, near Bathurst, in February 1851, by Edward Hammond Hargraves; and at the end of June the first shipment, valued at £5200, left Sydney. This discovery made an important change in the position of the colony and its transportation, which had been discontinued during the previous year, was finally abolished. The first mail steamer arrived in August 1852, and in 1853 a branch of the Royal Mint was established at Sydney. The New Constitution Bill, passed during the same year by the local legislature, provided for two deliberative chambers, the assembly to be elected and the council nominated, and for the responsibility of the executive to the legislature. The Sydney University, founded in 1850, was enlarged in 1854, and the first railway in New South Wales, from Sydney to Parramatta, commenced in 1850, was opened in 1855. In the same year the Imperial parliament passed the New Constitution Act; and in June 1856 the first responsible government in Australia was formed, during the governorship of Sir William Denison, by Mr Stuart Alexander Donaldson.
The first administration lasted only for a few weeks, and it was some years before constitutional government worked smoothly. The powers of the new parliament were utilized for extending representative institutions. Vote by ballot was introduced; the number of members in the assembly was increased to 80, and the franchise was granted to every adult male after six months' residence in any electoral area. Meanwhile the material progress of the colony was unchecked. A census taken at the end of 1857 showed that the population of Sydney was, including the suburbs, 81,327. Telegraphic communication was established between Sydney, Melbourne, Adelaide and Tasmania in 1859; and during the same year the Moreton Bay district was separated from New South Wales and was constituted the colony of Queensland.

During the regime of Sir John Young, afterwards Lord Lygon, who succeeded Sir William Denison in 1854, two important events occurred. The land policy of previous governments was entirely revised, and the Land Bill, framed by Sir John Robertson, introduced the principle of deferred payments for the purchase of crown lands, and made residence and cultivation, rather than a sufficient price, the object to be sought by the crown in alienating the public estate. This measure, passed with great difficulty and by bringing considerable pressure to bear upon the nominated council, was the outcome of a lengthened agitation throughout the Australian colonies, and was followed by similar legislation in all the colonies. In 1858, the secretary of the colony of New South Wales, Sir John Young, discovered that the distinction between the descendants of convicts and the descendants of free settlers, hitherto maintained with great strictness, was finally abandoned. In 1862, the agitation against the Chinese assumed importance, and the attitude of the miners at Lambing Flat was so threatening that a large force, military and police, was despatched to that goldfield in order to protect the Chinamen from ill-treatment by the miners. At this time, the only drawback to the general progress and prosperity of the country was the recrudescence of bushranging, or robbery under arms, in the country districts. This crime, originally confined to runaway convicts, was now committed by young men born in the colony, familiar with its mountains and forests, who were good horsemen and excellent shots. It was not until a large number of lives had been sacrificed, and many bushrangers brought to the scaffold, that the offence was thoroughly stamped out in New South Wales, only to reappear some years afterwards in Victoria under somewhat similar conditions.

The earl of Belmore became governor in 1868, and it was during his first year of office that H.R.H. the Duke of Edinburgh visited the colony. In 1870 came the visit of the "Galatea." An attempt was made upon his life, during a picnic at Clontarf, caused great excitement throughout Australia, and his assailant, a man named O'Farrell, was hanged. A measure which virtually made primary education free, compulsory and unsectarian came into operation. A census taken in 1871 showed that the population was 503,081; the revenue, £2,908,155; the expenditure, £3,006,576; the imports, £9,609,508; and the exports, £11,245,032. Sir Hercules Robinson, afterwards Lord Rousmead, was sworn in as governor in 1872. During his rule, which lasted till 1879, the first mineral wealth was discovered in New South Wales, the valuable deposits of silver were discovered at Broken Hill. In 1883 the Hon. W. B. Dalley, who was acting Premier during the absence through ill-health of Sir Alexander Stuart, made to the British government the offer of a contingent of the armed forces of New South Wales to aid the Imperial troops in the Sudan. The offer was accepted; the contingent left Sydney in March 1885, on board the "Izmir" and "Australasian," and for the first time a British colony sent its armed forces outside its own boundaries to fight on behalf of the mother-country.

In July of the same year Dr Moran, the Roman Catholic archbishop of Sydney, became the first Australasian cardinal. Lord Carrington, who was appointed governor in 1888, opened the railway to Queensland, and during the same year the centenary of the colony was celebrated. The agitation against the Chinese, always more or less intense, became intense, and the government forcefully prevented the Chinese passengers of four ships from landing, and passed laws which practically prohibited the immigration of Chinese.

In 1889 the premier, Sir Henry Parkes, gave in his adhesion to the movement for Australasian federation, and New South Wales was represented at the first conference held at Melbourne in the beginning of 1890. Lord Jersey assumed office on the 15th of January 1891, and a few weeks afterwards the conference to consider the question of federating the Australian colonies was held at Sydney, and the great strike, which at one time had threatened to paralyse the trade of the colony, came to an end. A board of arbitration and conciliation to hear and determine labour questions and disputes was formed, and by later legislation its powers have been strengthened. (For the labour movement in Australia, see Federation.) The census of April 1891 showed that the population was 1,134,207, of whom the aborigines numbered 7705 and the Chinese 12,781. In 1893 a financial crisis resulted in the suspension of ten banks; but with two exceptions they were reconstructed, and by the following year the effects of the depression had passed away. Federation was not so popular in New South Wales as in the neighbouring colonies, and no progress was made between 1891 and 1894, although Sir Henry Parkes, who was at that time in opposition, brought the question before the legislature. The Rt. Hon. Sir William Duff, who followed Lord Jersey as governor, died at Sydney in 1895, and was succeeded by Lord Hampden. In 1896 a conference of Australian premiers was held at Sydney to consider the question of federation. The then Premier, Mr Reid, was rather lukewarm, as he considered that the free-trade policy of New South Wales would be overridden by its protectionist neighbours and its metropolitan position interfered with. But his hand was to a great extent forced by a People's Federation Convention held at Bathurst, and in the early portion of 1897 delegates from New South Wales met those from all the other colonies, except Queensland, at Adelaide, and drafted the constitution which with some few modifications eventually became law. The visit of the Australian premiers to England on the occasion of Queen Victoria's Diamond Jubilee gave an additional impetus to federation, and in September 1897 the convention reassembled in Sydney and discussed the modifications in the constitution which had been suggested in the local parliaments. In January 1898 the bill was finally agreed to and submitted to a popular referendum of the inhabitants of each colony. Those of Victoria, South Australia and Tasmania agreed to the measure; but New South Wales and Queensland emphatically refused to carry the bill. The local parliament subsequently suggested certain amendments, one of them being that Sydney should be the federal capital. The general election returned a majority pledged to federation, and after some opposition to the federal Bill by the legislative council it was again referred to the electors of the colony and agreed to by them, 107,420 votes being recorded in its favour, and 52,741 against it. One of the provisions of the bill as finally carried was that the federal metropolis, although in New South Wales, should be more than 100 m. from Sydney. The Enabling Bill passed through all its stages in the British parliament during the summer of 1900, all the Australian colonies assenting to its provisions; and on the 1st of January 1901 Lord Hopetoun, the governor-general of Australia, and the federal ministry, of which the premier, Mr Barton, and Sir
William Lyne, Home Secretary, represented New South Wales, were sworn in at Sydney amidst great rejoicings. Large contingents of troops from New South Wales were sent to South Africa during 1899 and 1900. (G. C. L.)

NEWSPAPERS. The word "newspaper," as now employed, covers so wide a field that it is difficult, if not impossible, to give it a precise definition. By the English "Newspaper Libel and Registration Act" of 1886 it is defined as "any paper containing public news, intelligence or occurrences, or any remarks or observations therein printed for sale, and published periodically or at intervals not exceeding twenty-six days;" and the British Post Office defines a newspaper as "any publication "to summarize the wording" printed and published in numbers at intervals of not more than seven days, consisting wholly or in part of political or other news, or of articles relating thereto or to other current topics, with or without advertisements." In ordinary practice, the "newspapers," as distinguished from other periodicals (q.v.), mean the daily or (at most) weekly publications which are principally concerned with reporting and commenting upon general current events.

For the laws regulating the conduct and contents of newspapers see Press Laws and allied articles. The two real essentials of a "newspaper" are that it contains "news," and is issued at regular intervals. But the course of history has involved considerable changes both in the mode of issue and in the conception of what "news" is. For purposes of modern usage we have to distinguish historically between the product of a printing-press which is manifolded by that means, and a mere manuscript sheet which is only capable of being copied by hand. "News" again varies both according to the appetite and according to its method of collection and presentation. A distinction ought perhaps to be made between literary and pictorial news, but this is almost impossible in practice.

1. GENERAL CONSIDERATIONS

So far as very early forms of what we now recognize as corresponding to a "newspaper" are concerned, involving public reports of news, the Roman Acta Diurna and the Chinese Peking Gazette may be mentioned here, if only on account of their historical interest. The Acta Diurna ("Daily Events") in ancient Rome (lasting to the fall of the Western Empire), were short announcements containing official intelligence of battles, elections, games, fires, religious rites, &c., and were compiled by the actuarii officers appointed for the purpose; they were kept as public records, and were also posted up in the forum or other places in Rome, and were sometimes copied for despatch to the provinces. Juvenal speaks of a Roman lady passing her morning in reading the paper, so that it appears that private copies were in vogue. In China the Peking Gazette, as foreigners call it, containing imperial rescripts and official news, has appeared regularly ever since the days of the Tang dynasty (A.D. 618-905). Even older than it, as is alleged, is the monthly Peking News (Tsing-Poo)—now in appearance an octavo book of 24 pages in a yellow cover—which, according to M. Huart, French Consul at Canton, was founded early in the 6th century. But it is not of any real moment to do more than refer to such publications as these, which have little in common with the ideas of Western civilization. The "newspaper" in its modern acceptation can only be properly dated from the time when in Western Europe the invention of printing made a multiplication of copies a commercial possibility in any satisfactory sense.

On the point of chronology, Mr. J. B. W. Williams, in his History of English Journalism to the Foundation of the Gazette (1908), the first scholarly account of the early evolution of the Press in England, describes the Oxford Gazette of 1665 (the original of the London Gazette) as the first English "newspaper" in the precise sense, i.e. a "paper" of news; for it was a half-sheet in folio, two pages, and not a "pamphlet" as previous periodicals of news had been. A pamphlet (q.v.) was one or more unbound sheets of paper folded in quarto, and these earlier periodicals were called "news books." The term "news sheet," again, had implied, up to that time, a written letter of news—a "newsletter" as it came afterwards to be called. But it is hardly necessary to insist here on the distinction between a "news book" and a "newspaper," interesting as it is to note that the English inclusion of newspapers among "books" for the purpose of the law of copyright is strictly justified by the original nomenclature. The "newsbook" made what was for modern purposes the essential advance upon either the written letter or the printed "pamphlet" or the isolated periodical paper, first event, in being both printed and also issued in a series at regular and continuous intervals. Yet both these forms of publication were in the direct ancestry of the newspaper. The writing of "letters of news" or "letters of intelligence" was a regular profession before the printed newspaper was introduced, and lasted as such for some time afterwards, having indeed the advantage of being outside the necessity of obtaining a licence, which hampered the printed publication; and the profession of "scrivener" naturally suggested that of the later type of journalism. Of what use, again, to say, as a statement of an isolated piece of news, there are various printed examples as early as during the latter part of the 15th century. For instance, an official manifesto of Archbishop Dietrich of Cologne was printed at Mainz in 1462. A French pamphlet giving an account of the surrender of Granada to Ferdinand and Isabella—"le premier jour de janvier dernieréfé passe"—appeared in 1492.

Precisely at what point, and in what instance, it can be said that a continuous series of news-pamphlets started, which can therefore be called the earliest newspaper, is hard to decide, from the materials now available. But it was on the continent of Europe, and not in England; and probably in the Netherlands. We have, for instance, pamphlets in the British Museum, which contain news-items and suggest periodical publication, though they are not actually known to form copies of a regular series. A Neve Zeytung; Die Schlacl des turmsicheren Keyser, &c., dates from 1526; another Neve Zeytung, still more varied in its contents, contains a letter from Winchester dated July 24, 1554. In Germany alone about 800 examples of such news-pamphlets dating earlier than 1610 are known. The effect of the Mercurius Gallicanicus (1594) on English writers of "relations" is dealt with below (under United Kingdom); but this was rather a book than a newspaper. The earliest plainly periodical publication containing "news of the day" was, however, the German Frankfurter Journal, a weekly started by Egenolph Emmel in 1615. The Antwerp Nieuwe Tijdinghen followed in 1616; and in 1622 the history of English newspapers begins with the Weekly News published in London by Archer and Bourne. From this point we are on firmer ground, and the evolution of the modern Press in the different countries, as traced below, can be continuously followed. It is worth noting that a link in the history of journalism with the Roman Acta Diurna is provided by the Venetian government written gazetti (from which comes our "gazette") of the 16th century, official bulletins or leaflets dealing with public affairs, which were avowedly based on the ancient Roman model. Italy indeed originated not only the title "gazette" (probably derived from the Gr. γαζή, i.e. treasury of news), but also that of "coranto" (Fr. courant; also early Anglicized as "current," i.e. "running" relation), both of which are familiar in the history of the English and foreign Press. The art and business of journalism as now understood is, taking "journalism" here in the sense of the production of the literary contents of a newspaper, and not the production and distribution of the printed sheet itself—is a combination of the mere recording or reporting of news and of its presentation in such a way, and with such comment, as to influence the minds of readers in some particular direction. The history of the "leading article," as a great factor in the shaping of public opinion begins with Swift, Defoe, Bolingbroke and Pultney, in the many English newspapers, from the Review and the Examiner to the Craftsman, by which was waged the
keen political strife of the years 1704-1740. There is no counterpart to it in France until the Revolution of 1789, nor in Germany until 1796 or 1798. It was a Frenchman who wrote—"Suffer yourself to be blamed, imprisoned, condemned; suffer yourself even to be hanged; but publish your opinions. It is not a right; it is a duty." In England that the newspaper public described was actually taken, in the face of fine, imprisonment and pillory, at a time when in France the public had to depend upon foreign journals illicitly circulated, when its own chief writers resorted to clandestine presses, to paltry disguises, and to very poor subterfuges to escape the responsibilities of avowed authorship, and when in Germany there was no political publicity worthy to be named. When the Mercure de France (1672), after a long period of mediocrity, came into the hands of men of large intellectual faculty, they had the most cogenent reasons for exercising their powers upon topics of literature rather than upon themes of politics. True political journalism dates in France only from the French Revolution (see, for instance, Mallet du Pan), and it then had a very brief existence. It occupied a cluster of writers, some of whom left an enduring mark upon French literature. A term of high aspiration was followed quickly by a much longer term of frantic licence and of literary infamy. Then came the long rule of a despotic censorship; and cycles of licence followed by cycles of repression. In 1890 indeed the democratic government at Bordeaux issued against journals of high almas and of unspotted integrity, but opposed to prudence, the Attestation de Noce or literary marriage, which was the literary as the worst acts in that kind of Napoleon L, and unparalleled in the whole course of thegovernment of Napoleon III.

In all the other countries of Europe political journalism, in any characteristic sense, was the creation of the 19th century—somewhat earlier in the century in northern Europe, somewhat later in southern. The Ordinario Post-Tidende of Stockholm dates indeed from 1643, but until recent times it was a mere news-letter. Denmark had no sort of journal worth remark until the foundation in 1749 of the Berlingske Tidende, and that too attributed to its political, rather than its journalistic, contents. In Russia the St Petersburg—the patriarch of Russian newspapers—dating from the 16th of December 1702, is a government organ, and nearly synchronizes with the Boston News-Letter (1704), the first successful attempt at a newspaper in the British colonies in America. Journalism in Italy begins with the Diario di Roma in 1716, but in politics the Italian press remained a nullity for all practical purposes until nearly the middle of the 19th century, when the newspapers of Sardinia, at the impulse of Cavour, began to foreshadow the approach of the influential Italian press of a later day. In Spain no rudiments of journalism can be found until the 18th century; the Gaceta de Madrid started about 1726. As late as in 1826 an inquisitive American traveller recorded his inability to lay his hands, during his Peninsular tour, upon more than two Spanish newspapers. While originally the newspaper depended entirely on its own reporters and correspondents for news, and still largely does so, the widening of the field of modern journalism is largely due to collective enterprise, by which outside organizations known as "news agencies" send a common service of news to all papers which arrange to take it. The first of the great collecting and distributing agencies, founded in 1755, was the Carey (Vicemaster) of St Petersburg,—the editor of Julius Reuter, a Prussian government-messenger, who was impressed by the common interest roused by the revolutionary movements of 1848. In 1840 he established a news-transmitting agency in Paris, with all the appliances that were then available. Between Brussels and Aix-la-Chapelle he formed a pigeon-service, connecting it with Paris and with Berlin by telegraph. As the wires extended, he quickly followed them with agency-offices in many parts of the continent. He then went to London, where his progress was for a moment held in check. Mr Walter of The Times gave him no courtesy; but (on that first occasion) ended their interview by saying, "We generally find that we can do our own business better than anybody else can." He went to the office of the Morning Advertiser, which had then the next largest circulation to that of The Times, and had better success. He entered into an agreement with that and afterwards with other London journals, including The Times, and also with many commercial corporations and firms. The newspapers, of course, continued to employ their own organizations and to extend them, but they found that the arrangement depends on the attractiveness of its news
correspondents. Within a few years the business is said to have yielded the founder some £25,000 a year, and in 1865 it was transferred to a limited company. In later years this type of news-agency operating all over the world was repeated by others, and also by agencies operating mainly or exclusively only in one country.

It is no longer possible nowadays to confine the meaning of "journalism" merely to the work of those who write for the Press. Properly it may be said to include the whole intellectual work comprised in the production of a newspaper; and although the designation of "journalist" is generally applied only to newspaper editors and to writers, and would not be extended at all to the purely mechanical staff—the compositors, foundry-men and machinists—nor even to the proof-readers, whose sphere is analogous rather to the sub-editorial than to the mechanical departments, the modern tendency has nevertheless been, not only to install more reporting (q.e.) in a place of high importance, but to give increased weight in journalism to those who occupy what may be called the "managerial" offices, the business side of making a paper pay having itself developed into an art on its own account. To be a great journalist was once, but is hardly now, the same thing as being a great "publicist." The proper is he who delivers his views on public affairs in the Press; but the excellence of his articles may nevertheless be consistent with the journal being a disastrous failure, and his reputation as a journalist is then but poor. The great journalist is he who makes the paper with which he is connected a success; and in days of competition the elements necessary for obtaining and keeping a hold on the public are so diverse, and the factors bearing on the financial success, the business side, of the paper are so many, that the organization of victory often depends on other considerations than those of its intrinsic literary excellence or sagacity of opinion, even if it cannot be wholly independent of these. The modern newspaper, moreover, depends for its financial success no longer primarily on its receipts from circulation, but on its receipts from advertisements; and though these can only ultimately be secured on the basis of circulation (the number of people who buy and read the paper), the establishment of the paper as the organ of a large body of readers for whose custom it is desirable to advertise often involves other capacities than those of the great publicist; and even in far greater degree than those of his "counterpart", which is the direction given to the supply of news may be managerial rather than editorial. Thus, in the division of labour, the editorial functions, formerly supreme and all-embracing, because the excellence of the contents of the paper made its success, have gradually, by a dissipated process, yielded some of their authority to the managerial functions, and these have grown into an independence which—since editorial possibilities ultimately depend on financial resources—has given increased importance in journalism to the business side.

It is much to the credit of this country that the work of journalism may be broadly divided into its editorial and managerial sides. And apart from exceptional cases of a working proprietor who is both editor and manager, or of a managing-editor, or of a great manager who exercises editorial functions, or of a great editor who exercises managerial functions, the ordinary course is to keep them fairly distinct. The managerial side involves the business work of a paper, including the obtaining of advertisements and all the operations directly connected with producing it and making it pay as a commercial enterprise. The editorial side is engaged—however much managerial exigencies may call for its policy—in providing the "pillar" of a paper, which forms its contents, other than such as is of the nature of advertising. The editorial staff includes editors and assistant-editors, sub-editors (in Great Britain a term usually restricted in daily journalism to those engaged in the "news" departments), and
leader-writers, critics, reporters (more narrowly considered part of the "sub-editorial" staff), &c. The actual owner of the paper, the proprietor, may or may not take part in either side, but in law his authority is delegated to those who produce it. ... and ideas of journalistic management survive for making the editor, publisher and proprietor curtly not the "manager," liable in cases for libel, contempt of court, &c., together with the proprietor in English law. But no satisfactory legal definition of "editor," still less of "manager," is possible, since their positions and powers vary according to circumstances.

So far as the general relations of the staff of a paper with its proprietor are concerned, we may briefly note that engagements are commonly secured by contract of a few years' duration, which, if not enforced, and the remedy for injury is dismissal or action for damages, and they must be in writing and stamped, to be evidence in law, if for a year or longer. The editor is the agent of the proprietor, and binds him for acts within the scope of editorial authority (which includes the insertion of any matter in the paper). Being an agent he can have no power as against the proprietor, but unreasonable interference on the latter's part may entitle an editor to an action for breach of contract or for damage to his professional reputation; while gross misconduct on the part of an editor might similarly entitle the proprietor to damages. Letters, manuscripts, &c., come into the editor's hands as agent for his proprietor, and subject the latter's property. Uninvited contributors send him articles at their own risk, but the sending of them to a type-set proof has been held to be evidence of acceptance. Articles appearing under the editor's name, i.e., use them wholly or in part, or alter them; he has a free hand to do so in the case of anonymous articles; in the case of signed articles it is clearly his duty to keep them so as to prevent inaccuracy, dishonesty, or unfair advantage to others. In so far as his alterations might attribute to the writer anything which would give the latter a claim for damages. Though the highest function of an editor is embodied in the etymology of the word ("to bring forth" or "producer"); as one who acts as the literary midwife in the literary setting forth of ideas, it is probably his use of the proverbial blue-pencil, altering or deleting, which is generally associated with the word. But the editor, however important his editorial work has its own importance—the organization and inspiration, on the one hand, the moulding into shape on the other. And indeed editing is necessarily relative, depending to a certain extent on the character of the paper which it is intended to produce.

See Press Laws, Libel, Copyright, &c., and generally, for law,

The history of the Newspaper Press is told for various countries of importance under their respective sections below. The practical development of the modern newspaper is indeed due to a union of causes, largely mechanical, that may well be termed marvellous. A machine (see Figure) by which, for $1 a day, it was possible to produce a newspaper in one hour, print, fold, cut and deliver many thousand perfected broadsheets, is, however, not so great a marvel as is the organizing skill which collects information by conversation, post or telegraph, from all over the world, and then distributes these communications in cheap printed copies regularly every day to an enormous public, sifted, arranged and commented upon, in the course of a few hours. But for a high ideal of public responsibility and duty, conjoined with high culture and with great "staying-power," in the editorial rooms, all these marvels of ingenuity—which now combine to develop public opinion on great public interests, and to guide it—would be nothing better than a vast mechanism for making money out of man's natural aptitude to spend his time either in telling or in hearing some new thing. A newspaper, after all, is essentially a business, conducted by its proprietors for gain. That the commercial motive is a danger to honest journals is obvious, were it not indeed that here as elsewhere honesty is in the long run the best commercial policy.

The example of American journalism has so greatly affected the developments in England and other countries, that it may be said correctly to realize the conditions under which, in the United States, the newer type of journalism arose.1 In substance very much the same causes produced very much the same effects, though at a slower rate, in England; but British conservatism operated here as elsewhere. Several circumstances combined in the last quarter of the 19th century to promote
deadline changes in the condition and character of American newspapers. (1) Paper was enormously cheapened. Before and during the Civil War, the cost of large New York newspapers at times 22 cents per lb for even a poor quality. In 1864 it cost 16 cents in February, and ran up a cent every month till in midsummer it touched 21 and 22 cents. As late as 1873 it was still sold at from 12 to 13 cents. As new materials were found and machinery was improved, the price slowly declined. When the manufacture from wood-pulp was made commercially successful, the profits tempted great investments of new capital; bigger mills were built, competition became keen, and new inventions cheapened the various processes. Thus in New York in 1875 the average price of paper for fair quality was just over cents per lb; in 1880, 6-9 cents; in 1885, 5-16 cents; and in 1890, 3-18 cents. At last, about 1897, large contracts for a good average quality, delivered at the press-room, were made in New York at as low a figure as 1-5 cents per lb. Subsequently advances in raw materials, one or two dry seasons which curtailed the water-power, and combinations resulting from over-competition, caused some reaction. Yet it could still be said in 1900 that prudent publishers could buy for $1 as much paper as would have cost them $3 twenty years earlier, or $10 about 1875.

(2) Printing machinery for great newspapers was mechanical, and cheap. In the old types all the presses were fed by hand, with the product then folded and counted by hand, machines came into common use to print, fold, cut, paste and count and deliver in bundles, ready either for the carrier or the mail, at rates of speed formerly not dreamed of. The size of the paper could be increased or diminished at will, as late news might require, within an hour of the time when it must be in the hands of its readers. Instead of cutting down other news to make room for something late and important, more pages were added, and this steadily increased the tendency to larger papers. Devices were also found for printing the same sheet in different colours at the same rate of speed; and in this way startling headlines were made more startling in red ink, or a piece of news for which special attention was desired was made so glaring that no one could help seeing it. (3) Hand-setting (for great newspapers) was practically abolished. Instead of the slow gathering of single types by hand separate lines were now produced and cast by machines, capable when pushed to their utmost capacity of doing each the work of five average compositors. Thus between 1880 and 1900 there were reductions in the cost of (1) the raw material for the paper; (2) the labour of hand-setting, from two-thirds to three-fourths; (2) of printing, at least as much; and (3) of composition, at least one-half, while the facilities in each department for a greater product within a given time were enormously increased. The obvious business tendency of these changes was either a reduction in price or an increase of size, or both. Electricity became the only news-carryer. New ocean cables broke down the high rates charged at the outset. The American news appetite, growing by what it fed on, soon demanded far fuller cablegrams of European news; and the wars in which Great Britain and the United States were involved accelerated the movement. The establishment of a strong telegraph company, capable of efficient competition with the one which practically controlled the inland service in 1880, likewise cheapened domestic news by telegraph and increased its volume. The companies presently recognized their interest in encouraging rival news associations, and so getting double work for the wires, while promoting the establishment of new papers. Wild competition between news agencies was thus encouraged (even in the cases of some already known to be handling the same news). The credit, which was a quarter or half a million dollars on telegraphic tolls, the rapid spread of long-distance telephone lines further contributed to this tendency to make the whole continent a whispering gallery for the press. Every great paper had both cable and telephone wires run directly into its newspaper office. Photography and etching were added to the office equipment. Various "process" methods were found, by which the popular desire for a picture to make the news clearer could be gratified. Drawings were reproduced successfully in stereotype plates for

1 The account which follows is reproduced from Mr Whitehead Reid's article in the 10th edition of the Encyc. Brit.
the fastest rotary presses. The field of political caricature had heretofore belonged exclusively to the weekly papers, but the great dailies now seized upon it, and commanded the service of the cleverest caricaturists. Newspapers found a way to put the "half-tone" etching of a photograph, such as had heretofore been printed only on slow flat presses, bodily into the stereotype plate for the great quadruple and octuple presses; and thereupon portraits and photographs of important groups on notable occasions began to appear, embodied in the text describing the occurrence of the moment. In the wild schemes of some of them, papers printed at the rate of thirty and forty thousand an hour. In this development of illustrated daily journalism America rapidly went far beyond other countries. News agencies multiplied and gave cheaper service. The New York Associated Press had been the chief agency for the whole country. It admitted new customers with great caution, and its refusal to admit was almost prohibitory, while its withdrawal of news from established papers was practically fatal. It was owned by the leading New York journals. Their disagreement led to the success of a rival, the United Press. The New York Associated Press finally dissolved, most of the New York members became connected with the United Press, and many of their Western and Southern clients organized the Associated Press of Illinois, more nearly on a mutual plan. The United Press finally failed, and most of its New York members went into the Associated Press of Illinois, which in turn was forced into plans for reorganization by decisions of Illinois courts against its rules for confining its services to its own members. One result of these successive changes was to encourage new papers by making it easy for them to secure a comprehensive news service, and thus to threaten the value of the old papers. Another was the struggle to increase the volume of the service, leading to reports of multitudes of occurrences formerly left without notice in the great news centres, and extension of agencies into the remotest hamlets, and less scrupulous care in the consideration and preparation of the reports filed at many points for transmission. News syndicates for special purposes also developed, as well as small news associations, sometimes with a service sufficient for the wants of many papers. The almost official authenticity which the public formerly attributed to an Associated Press dispatch progressively declined; and the dailies found more difficulty in sifting and deciding upon the news that came to them, and incurred more individual responsibility for what they printed.

The great accumulation of private fortunes also changed the newspapers. Millionaires came to think it advantageous to own newspapers, openly or secretly, which could be conducted without reference to direct profits, for the sake primarily of political, social or business considerations. To secure large circulations for such enterprises they were willing to sell the paper for long periods at much below the cost of manufacture, and to spend money for news and writers more lavishly than the legitimate business of established journals would allow. Great business corporations seeking for favourable or fearing adverse legislation sometimes made secret newspaper investments for the same purpose.

These various new conditions, affecting the newspaper press of the United States with ever-increasing force, gradually changed the average character of the papers and their effect upon their readers. A large circulation became the only evidence of success and the only way to make the sale of a newspaper behove ultimately a source of profit. A disposition to lower the character in order to catch the largest audience naturally followed. Criminal news was reported more fully than formerly, with more piquant details. Competitors outdid each other in the effort to treat all news with unprecedented sensationalism. The lowest possible price was regarded as essential to the largest possible circulation, and so a favourable price even for large newspapers became one cent to the public, and consequently only half a cent to the publishers, whose business was practically all at wholesale with dealers and news companies. The feeling that the most must be given for the money prompted also the great increase in size, only made possible by the reductions in paper, composition, presswork, &c., already noted. Yet more quantity and more sensation after a time palled on the jaded appetite, and the spice of intense personality became necessary. As most people like to see their names in print, and can bear criticism of their neighbours with composure, these two chords of human nature were incessantly played upon.

The principal feature in the development of modern newspapers is the importance attached to obtaining, and prominently flattering, "news" that affects persons, and incidentally there has been a considerable change of view as to what sort of news should be given prominence. Sport and finance are treated at greater length and more popularly; and, partly owing to the largely increased number of papers and consequent greater competition, partly to a desire to appeal to the larger public, which is now able to read and ready to buy reading-matter, there has been a tendency to follow the tastes of the vast number of people who can read at all rather than of those to whom reading means a very high standard of literary and intellectual enjoyment. This has been done in a less liberal style and by the presentation of "titbits" of information with an appeal to cruder sentiments, but also in a more liberal use of headlines and of similar devices for catching the eye of the reader. "Personal journalism," i.e. paragraphs about the private life or personal appearance of individuals—either men or women—of note or notoriety in society or public affairs, has become far more marked; and in this respect, as in many others, encouragement has been given to a spirit of inquisitiveness, and also to a widespread inclination either to the "commercial" or "human" type of journalism. To "write" and "sell" for human appeal. The "modern" type of journalism has in consequence become a conspicuous trait in these "democratic" days even among the classes which once affected to despise such publicity.

The modern impulse, culminating in England in the last decade of the 19th century in what was then called the "New Journalism," was a direct product of American conditions and ways of life, but in Great Britain it was also the result of the democratic movement produced by the Education Act of 1870 and the Reform Act of 1885; and it affected more or less all countries which came within the influence of free institutions. The most generally adopted American innovation (for, though not known before even in England, it was practically a new thing as carried out in American newspapers) was the "interview" (the report in dialogue form of a conversation with some prominent person, whose views were thus elicited by a reporter), which during the early 'nineties was taken up in varying degrees by English newspapers; it was "cheap copy"—the word "copy" covering in journalistic slang any matter in the shape of an article—and could easily be made both informing and interesting; and "interviewing" caused a large increase in the journalistic profession, notably among women. The rage for the "interview" again declined in vogue outside American journalism in proportion as people of importance became less ready to talk for publication—or for nothing.

From the highest class of paper downwards, however, real news—and especially early news—has been more and more sought after, and all the force of organization both within individual newspaper offices and outside them in the shape of news agencies, has been applied to the purpose of obtaining early news and publishing it as quickly as possible. In this matter the Press has certainly been helped most materially not only by the advance in telegraphic facilities (see REPORTING) but by all the other new rapid methods of production in Type-setting (see TYPOGRAPHY) and Press-work (see PRINTING) which have been the feature of the modern period. The vastly increased amount of telegraphic work now done has perhaps not been all pure gain to the best sort of journalism. It has to some extent weakened the effect of the considered article, and led to hasty conclusions and precipitate publication, with results that sometimes cannot be compensated for by any later contradiction or modification. In some cases a reaction ensued. Take for instance the case of war correspondence. The prestige of the
Between about 1870 and 1880 the English newspapers began to pay increased attention to literary and artistic criticism; and gradually the daily Press, which formerly applied itself mainly to recording news, and to political, social and financial subjects, became a formidable rival in this sphere to the weekly reviews and the monthly and quarterly magazines. Books are "viewed" in the Press partly for literary reasons, partly as a guide to the publishers' advertisements; and the desire for "something to quote," irrespectively of the intrinsic nature of the criticism, became in the early 'nineties a mania with publishers, who in general appear to have considered that their sales depended upon their catching a public which would be satisfied by seeing in the advertisement that such and such a book was pronounced by such and such a paper to be "indispensable to any gentleman's library." Unfortunately the enormous output of books made it impossible for editors to have them all reviewed, and equally impossible for them to be certain of discriminating properly between those which were really worth reviewing and those which were not. The result has been that the work of book-reviewing in the newspapers is often hastily and poorly or very spasmodically done. But there have been some honourable exceptions. The "Literary Supplement" (since 1901) to The Times is the most ambitious attempt made by any daily paper to deal seriously with literature. The Daily Chronicle started a "literary page" in 1891, and it was imitated in varying degrees by other English papers. The Scotsman and some other provincial papers have also for some time devoted much space to excellent literary criticism. The literary supplement has also been developed to a high degree in some American journals in the United States, of which the New York Times, with this feature was indeed originally started. As a form of serious criticism, however, the review has, in the general newspapers of later years, taken a lower place than must be desirable, partly owing to the cause named, partly to a tendency among reviewers either to indiscriminate praise or to irresponsible irreverence, partly to a suspicion of "log-rolling"; and to a large extent it has become the practice merely to treat the appearance of new books as much news, to be chronicled, with or without extracts, according as the subject makes good "copy," like any other event of the day.

The modern tendency, resulting from the enormous amount of newspaper production, has been to make journalism less literary and at the same time literature more journalistic. Either as reviewers, leader-writers or editors, many of the principal "men of letters" have worked for longer or shorter periods as writers for some newspaper or other, and much of the published literature of the time has appeared originally in the columns of the newspapers, in the form of essays, poems, short stories or novels (in serial form). Publication in this shape has many advantages for an author, and all of them, in addition to the profit, it offers an opportunity for a new writer to try his wings, and it helps to introduce him at once to a large public. Moreover, the newspapers read by the educated classes profit by the superior class of journalist represented by writers of a literary turn. But the increased popularity of the newspaper, and the close tie between it and the literary world, have on the whole impressed a journalistic stamp upon much of the literature of the day. However popular at the moment a writer may be, the infection with journalistic methods—while rightly employed by journalists, as such, in dealing with contemporary events and for strictly contemporary purposes—is apt to be. Responsible for something wanting in his work, the loss of which deprives him of the permanent literary or scientific rank to which he might otherwise aspire.

The new point of departure for the more popular style of English journalism (apart from the influence of American models) is really to be found in the publication of Sir George (then Mr) Newnes's Tit-Bits in 1881. This penny weekly paper, with its appeal to the masses, who liked to read snippets of information brightly put together, showed what enormous profits were to be made by this style of enterprise; and the multiplication of journals of this description—notably Mr
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NEWSPAPERS

Alfred Harmsworth's (Lord Northcliffe's) Answers (1888) and Mr C. Arthur Pearson's Pearson's Weekly (1890)—had a further influence on public taste, so that even the classes above that which primarily enjoyed these publications were affected in the same direction to a new ideal and thus introduced into English daily journalism in England. Whereas before 1882 the chief feature in London journalism, outside The Times and other great morning papers, had been the literary brilliance of the Saturday Review and its evening paper analogues, the Pall Mall and St James's Gazettes, in the early 'nineties came a craze for "actuality." Mr T. P. O'Connor, with his vivid pen (first in the Star, then in the Sunday Sun and elsewhere), set the pace for a crowd of imitators; the successful establishment of the Daily Mail in 1896, with its system of compressing the news is often said to have been partly started by popularizing, while at the same time catering for all tastes and employing first-rate correspondents and reporters to supply it with special information, gave a distinct shake-up to the older traditions of daily journalism. The old tendency had been to rely for success either on writers of exceptional knowledge or capacity, men who were essentially amateurs, or on a class of professional journalists who at all events had a literary tradition behind them. A different sort of amateur now arose, and a different sort of professional. Even when an attempt was made to provide for a serious public, or a more or less serious sort of mechanism, it was increasingly done by periodicals rather than by literary methods. The literary public in the proper sense of the word is inevitably a small one, and the greater part of the Press deals with literature on lines more suited to a larger and less refined clientèle. It may be claimed, no doubt, that the best sort of journalism shows a high, and sometimes the highest, literary standard, but the fact remains that for the bulk of modern journalism its conductors realize only too well that their business is to appeal to the masses, and to a standard of education and taste which falls far short of anything that can be called intellectual.

This cardinal point, that the leading articles or "editorials," expressing the attitude of the paper towards important subjects of the day, have lost their importance, but this is only a half-truth. Allowance being made for changes in literary style, the actual amount of good writing in this department in the great organs of opinion—well-informed, scholarly and incisive—may justly be considered equal to anything done in what are sometimes considered its palmy days. 1 On the other hand, it is undoubtedly the case that in the newer type of newspaper, which appeals rather on the score of its tit-bits of news and notoriety, the more or less artificial quality of the whole raison d'être of the old-fashioned leading article has disappeared, and its place is taken by a few brief notes, merely indicating the attitude of the paper, and not seeking to discuss any subject comprehensively at all. The "leader" is to some extent a form of newspaper routine, but on the whole it is a routine which has proved its value by experience. The continuous high standard of tone, maintained by so many great journals, depends more largely than is sometimes realized on the regular industry and skill of those whose business it is to discuss the latest developments of affairs every day or every week in a manner which gives reasonable men something fresh to think about, or interprets for them the thoughts which are only vaguely floating in their minds. The liberty of the Press enables every sort of view, right or wrong, to be discussed in this prominent form, and thus every aspect of a question is brought out in public, to be accepted or rejected according to the weight of evidence and of argument.

The same end is assisted by the devotion of so much space to "letters to the editor." It is sometimes said that in England the London Times owes its position largely to the fact that if any individual grievance is felt it is generally ventilated by a letter to The Times. Whatever may be the organization of the Press for reporting the news of the day, the resources of no newspaper staff are great enough to cover an area of information as large as that represented by its readers; and the value of the outlet for opinion and information afforded by the correspondence columns cannot be overstated.

Most people probably read more papers than is compatible with a healthy mental digestion, but the Press, as such, has to-day an enormous—and none the less real because subtle—fluence; and this is largely due to the reputation maintained by its higher representatives. While, individually, the great papers wield considerable influence, due partly to real sagacity and authority, partly to the psychological effect produced by mere print or by reiterated statement, collectively the Press now represents the Public, and expresses popular opinion more directly than any representative assembly. The multiplication of "Press-cutting agencies," and of such essentially "newsy" publications as Who's Who (the English form of which originated with Mr Douglas Sladen in 1897) and similar biographical reference books—all tending to increase the publicity of modern life—has contributed materially to the pervading influence of journalism in everyday life and the constant dependence of society in most of its manifestations on the activity of the "Fourth Estate." 2 (H. C.)

From the introduction of low rates for telegraphy and from the development of the stamp mechanical methods of production, and of the desire to read and the growth of advertising (see Advertisement), the modern low-priced newspaper has resulted. But it is by no means a recent development merely. In France, Theophrastus Renaudot's Gazette de Paris (1631) was started at the price of six centimes. In England we find the first mention of inexpensive news-sheets towards the close of the 17th century, when a number of halfpenny and farthing Posts sprang into existence, and appeared at more or less irregular intervals. These consisted of small leaflets, containing a few items of news—sometimes accompanied by advertisements—and were commonly sold in the streets by hawkers. The rise in cost was really due to artificial causes. The increase of these newspapers, and especially the growing practice of inserting advertisements, led the legislature to contemplate a stamp tax of a penny per sheet on all news publications. As a protest, a curious pamphlet—of which a copy is preserved in the British Museum—was issued in 1701, and it sheds an interesting light upon this early phase of cheap journalism. The pamphlet is entitled Reasons humbly offered to the Parliament on behalf of several persons concerned in the preservation and publishing of the halfpenny newspapers.

It states that five master printers were engaged in the trade, which used 20,000 reams of paper per annum. The journals are described in the following terms: "The said newspapers have been always a whole sheet and a half, and sold for one halfpenny to the poorer sort of people, who are purchasers of it by reason of its cheapness, to divert themselves, and also to allure herewith their young children and entice them to reading; and should a duty of three halfpence be laid on these mean newspapers (which, by reason of the commonness of the paper, the generality of gentlemen are above conversing with), it would utterly extinguish and suppress the same." The pamphlet goes on to say that hundreds of families, including a considerable number of blind people, were supported by selling the halfpenny journals in the streets.

In 1712 a tax of a halfpenny per sheet was imposed, and the cheap newspapers at once ceased to exist. This tax on the press was increased from time to time, till in 1815 it stood at fourpence per sheet. The usual price of newspapers was then sevenpence a copy. From these facts it seems highly probable that, had not the stamp tax been imposed, the halfpenny paper would soon have become the normal type, and would have continued so to this day. In 1724 a committee of the House of Commons sat to consider the action of certain printers who were evading the stamp tax by publishing cheap newspapers under the guise of pamphlets. They found that there were then two Halfpenny Posts published in London, one by Read of Whitefriars, and the

1 It must be remembered that the style of public speeches has also undergone a change; that is to say, with the transition from the House of Commons. A more business-like form of speech is adopted in public life, and the Press reflects this change.
other by Parker of Salisbury Street. There were also three weekly papers issued at a halfpenny a copy. The tax, after several reductions, was finally repealed on 15th June 1835, and a rush of cheap papers immediately followed. A penny became the usual price for London daily papers, with the exception of The Times, and halfpenny papers soon became common.

The growth of the cheap newspaper has since been practically a simultaneous one throughout the civilized world. This has been notably the case in the United States, France and Great Britain. The general tendency in newspaper production, as in all other branches of industry, has in recent times been towards the lowering of prices while maintaining excellence of quality, experience having proved the advantage of large sales with a small margin of profit over a limited circulation with a higher rate of profit. The development—and indeed the possibility—of the cheap daily paper was due to a number of causes operating together during the latter half of the 19th century. Among these, the first place must undoubtedly be given to the cheapening of paper, through the introduction of wood pulp and the perfection of the machinery used in the manufacture. From 1755 to 1835 paper cheapened rapidly, and it has been estimated that the introduction of wood pulp trebled the circulation of newspapers in England. Keen competition in the paper trade also did much to lower prices. At the same time the prime cost of newspaper production was increased by the introduction of improved machinery into the printing office. The growth of advertisements must also be taken into account in considering the evolution of the halfpenny journal. The income from this source alone made it possible to embark upon journalistic enterprises which would otherwise have been impossible. The popular journal of the present day does not, however, owe its existence and success merely to questions of diminished cost and improved methods of production. A change has come over the public mind. The modern reader likes his news in a brief, handy form, so that he can see at a glance the main facts without the task of reading through wordy articles. This is especially the case with the man of business, who desires to master the news of the past twenty-four hours as he travels to his office in the morning. It is to economize time rather than money that the modern reader would often prefer a halfpenny paper; while the man of business, who likes to peruse leading articles and full descriptive accounts, finds what he needs in the more highly priced journals. The halfpenny paper in England has not had to contend with the opposition that the penny newspaper met from its threepenny contemporaries in the 'fifties and 'sixties. This is largely due to the fact that in most cases the contributors, paper, printing and general arrangement of the cheaper journal do not leave much room for criticism.

Mr G. A. Sala once complained that the reporters of the older papers objected to work side by side with him when he represented the first penny London daily (the Daily Telegraph), through fear of losing caste, but this does not now apply, for in the United Kingdom, France and the United States the cheap journals, owing to their vast circulation, are able to offer the best rates of remuneration, and can thus command the services of some of the best men in all the various departments of journalism.

Another aspect of the newspaper which may here be considered is the introduction of pictorial illustrations (see also Illustration). The earliest attempts at popular illustration of news events took the form in England of "broad-sides." One broadside dated 1787 recounted the story of the print and full descriptive accounts, finds what he needs in the more highly priced journals. The halfpenny paper in England has not had to contend with the opposition that the penny paper met from its threepenny contemporaries in the 'fifties and 'sixties. This is largely due to the fact that in most cases the contributors, paper, printing and general arrangement of the cheaper journal do not leave much room for criticism.

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elaborate for a journal of to-day, and in 1820 it gave its readers "A Faithful Reproduction of the Interior of the House of Lords as prepared for the Trial of Her Most Gracious Majesty Queen Caroline." In 1821 it published an interior of the House of Commons with the members in their places. The Observer of 22nd July 1821—the Coronation number—contained four engravings. Of the George IV. Coronation number Mr Clement sold 60,000 copies, but even that was nothing to the popularity that his journal secured. His illustrations of the once famous murder of Mr Weare and the trial of the murderer Thurtell. The Observer in 1838 gave a picture of the Coronation of Queen Victoria. In 1841 there was a fire at the Tower of London, when the armoury was destroyed. The Observer published three illustrations of the fire; it further published an emblematic engraving on the birth of the prince of Wales, and issued a large page engraving of the christening ceremony in the following January. Thus it had in it all the elements of pictorial journalism as we know it to-day.

The weekly Illustrated London News was, however, the first illustrated newspaper by virtue of its regularity. It was the first illustrated paper, because all the illustrations to which we have referred as appearing in the Observer and other publications were irregular. They came at intervals; they were quite subordinate to the letterpress of the paper; they were given only occasionally in times of excitement, with a view to promoting some little extra sale. That they did not really achieve the result hoped for to any great extent may be gauged by the fact that from 1842 to 1847 the Observer published scarcely any illustrations at all, and in the meantime the Illustrated News had taken an assured place as a journal devoted mainly to the illustration of news week by week. That is why its first publication marked an epoch in journalism. The casual illustration of other journals still went on: the Weekly Chronicle, for example, still published a number of pictures; the Sunday Times, also a very old paper, illustrated in these early days many topical subjects, when that building was burned down. A paper started in 1837 called the Magnet gave illustrations, one of them of the removal from St Helena and delivery of the remains of the emperor Napoleon to the prince de Joinville in 1840.

The first number of the Illustrated London News appeared on 14th May 1842. Its founder was Herbert Ingram (1811-1860), who was born in Boston, Lincolnshire, and started life amid the most humble surroundings, what education he ever received having been secured at the free school of his native town. Apprenticed at fourteen to a printer in Hull, he later settled in Nottingham as a printer and newsagent in a small way. It was during his career as a newsvendor at Nottingham that he was associated with the printers and others who were making a newspaper entirely devoted to illustration of news. In the first number of the Illustrated London News, however, there was not a single picture that was drawn from actual sight, the factor which is the most essential element of the illustrated journalism of to-day. Sir John Gilbert (1817-1897), the artist, has stated that not one of the events depicted by him—a state ball at which the queen and the prince consort appeared, the queen with the young prince of Wales in her arms, and other incidental illustrations—was taken from life.

The Illustrated London News had not been long in existence before there were many imitators, in America Harper's Weekly, in France L'illustration and in Germany Uber Land und Meer, and from that day there has been constant development, the Illustrated Zeitung of Leipzig being perhaps the most striking. In America the use of illustrations in the daily papers has become a regular feature, culminating in the bulky Sunday editions of the principal journals; and the practice of presenting the news in pictorial form has increased continuously ever since. In 1910 three London daily newspapers were principally devoted to illustration—the Daily Graphic, the Daily Mirror and the Daily Sketch, while most of the penny and halfpenny journals included some form of pictorial matter. This change was due to the ever-increasing cheapening and ever-growing celerity of manufacture of what are known as half-tone blocks. It was in 1890 that the application of photography to illustrated journalism began in England, and by 1910 it had grown to enormous dimensions, but the first newspaper photographs (mainly portraits) had to be engraved on wood, although the use of half-tone came in well-nigh simultaneously. Up to 1890 illustrated journalism was in the hands of the artists, and the artists were in the hands of the wood engravers, who reproduced their work sometimes effectively—often inefficiently. But in the course of twenty years the wood engraver had been utterly superseded so far as illustrated journalism was concerned. The further developments of journalism seemed likely to be entirely in the direction of coloured reproductions, block-making and machinery for facilitating their production having made particularly rapid strides. (C. K. S.)

It is almost impossible by any statistical detail to give an idea of the advances made by the newspaper press as a whole, but an outline of the general results for 1828, 1866 and 1882, together with a fourth, as given in the 10th edition of this encyclopaedia for 1900, may have its utility.

The earliest summary is that of Adrien Balbi. It was published in the Revue encyclopédique for 1828 (vol. i. pp. 593-603), along with much matter of more than merely statistical interest. The numbers of newspapers published in different countries at that date are given as follows: France, 400; United Kingdom, 483; Austria, about 80; Prussia, 288; rest of the Germanic Confederation, 305; Netherlands, 300; Russia, 161; Great Britain, 183; Sweden and Norway, 161; Russia and Poland, 84. The respective proportions of journals to populations were—for Prussia 1 to 41,500, German states 1 to 45,300, United Kingdom 1 to 46,000, France 1 to 64,000, Switzerland 1 to 66,000, Austria 1 to 400,000, Russia 1 to 569,000. Europe had in all 2142 newspapers, America 978, Asia 27, Africa 12 and Oceania 9; total 3168. Of these, 1378 were published in English-speaking countries (500 of them in the United States), having a population of 154,000, and 1790 in other countries, with a population of 583 millions.

The second summary (1886) is that given by Eugene Hatin in an appendix to his valuable Bibliothèque de la presse périodique. His enumeration of newspapers is as follows: France, 1640; United Kingdom, 1260; Prussia, 700; Italy, 500; Austria-Hungary, 365; Switzerland, 300; Belgium, 275; Holland, 223; Russia, 200; Spain, 200; Sweden and Norway, 150; Denmark, 100; United States, 4000. Here the proportions of papers to population are—Switzerland and United States 1 to 7000, Belgium 1 to 17,000, France and the United Kingdom 1 to 20,000, Prussia 1 to 30,000, Spain 1 to 75,000, Austria 1 to 100,000, Russia 1 to 300,000. Hatin assigns to Europe a total of 7000, to America 5000 and to the rest of the world 250, making in all 12,500.

The third summary is taken from that of Henry Hubbard, published in his Newspaper Directory of the World (New Haven, Connecticut, 1888). Its scope embraces a considerable number of serial publications which cannot be classed as newspapers, Still Hubbard's figures are thought to be almost doubled by the American consuls and consular agents in all parts of the world) about 1880, cannot be disregarded. The following are his general results:

<table>
<thead>
<tr>
<th>Daily Newspapers</th>
<th>Other Publications</th>
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<tbody>
<tr>
<td>Europe</td>
<td>2403</td>
</tr>
<tr>
<td>Asia</td>
<td>154</td>
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<tr>
<td>Africa</td>
<td>25</td>
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<tr>
<td>N. America</td>
<td>117</td>
</tr>
<tr>
<td>S. America</td>
<td>208</td>
</tr>
<tr>
<td>Australasia</td>
<td>94</td>
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<tr>
<td>Total</td>
<td>2040</td>
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The following summary for 1900, given in the 10th edition of the Encyclopædia, compiled by J. F. Barwick and Dorcas Eccles, of the British Museum, included everything in the nature of a newspaper, as distinct from periodicals.

<table>
<thead>
<tr>
<th>Total of Newspapers, 1900.</th>
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<tbody>
<tr>
<td>Great Britain and Ireland</td>
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<tr>
<td>United States</td>
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<td>France</td>
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<td>Germany</td>
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<td>Iceland and Faroe Islands</td>
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<td>Austria</td>
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<td>Hungary</td>
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The tables of newspapers include the following:

- **Europe**
- **Asia**
- **Africa**
- **N. America**
- **S. America**
- **Australasia**
- **Total**

This table provides a comprehensive overview of newspapers in various regions, capturing the essence of newspaper circulation and distribution as of 1900.
2. BRITISH NEWSPAPERS

United Kingdom.

The first regular English journalists may be identified with the writers of manuscript "newsletters," originally the dependants of great men, each employed by his patron or master or patron well-informed, during his absence from court, of all that happened there. The duty grew at length into a calling. The writer had his periodical subscription list, and instead of writing a single letter wrote as many letters as he had customers. Then one more enterprising than the rest established an "intelligence office," with a staff of clerks, such as Ben Jonson's Cymbal depicts from the life in *The Staple of News*, acted in 1625, which is the best-known dramatic notice of the news-sheets.

"This is the outer room where my clerks sit,... And keep their sides, the register in the midst: The examiner, he sits private there within; And here I have my several rolls and files Of news by the alphabet, and all put up under their heads."

Of the earlier newsletters good examples may be seen in the *Paston Letters*, and in the *Sydney Papers*. Of those of later date specimens will be found in Knoller's *Letters and Despatches of Strafford*, and other well-known books.

Still later examples may be seen amongst the papers collected by the historian Thomas Carter, preserved in the Bodleian Library at Oxford. Of these, several series were addressed to the first duke of Ormond, partly by correspondents in England and Ireland, partly by correspondents in Paris; others were addressed to successive earls of Huntingdon; others, again, to various members of the Wharton family. And similar valuable collections are to be seen in the library of the British Museum, and in the Record Office in London. In Edinburgh the Advocates' Library possesses a series of the 16th century, written by Richard Scudamore to Sir Philip Hoby during his embassy to Vienna. The MS. newsletters—some of them proceeding from writers of marked ability who had access to official information, and were able to write with greater freedom and independence of tone than the compilers of the printed news—held their ground, although within narrowing limits, until nearly the middle of the 18th century. The distinction between the newsletter and the newspaper is pointed out in the preceding section.

It was at one time believed that the earliest regular English newspaper was an *English Mercurie* of 1588, to which George Chalmers, the political writer and antiquarian, referred in his *Life of Rudderham* (1794) as being (with others of the same date) in the British Museum. The falsehood of this supposition, which was long accepted on Chalmers's authority, was, however, pointed out by Thomas Watts, of the British Museum, in 1839, in a volume with the title *Letter to Antonio Ponzii on the Reputed earliest printed Newspaper*, and again in 1850, in an article in the * Gentleman's Magazine* (n.s. xxxii. 484-491). The documents in question are (1) a MS. unnumbered issue of the *English Mercurie*, dated "Whitehall, July 26th, 1588"; (2) a printed copy, No. 50, of July 23, 1588; (3) a printed copy of No. 51; (4) a printed copy of No. 54, of November 24, 1588; (5) and three other MS. copies. These latter include the collection bequeathed to the Museum of Dr Birch (1766), and are incontestably 18th-century forgeries. The handwriting of the spurious MSS. was identified by a letter among Dr Birch's correspondence as that of Philip Yorke, afterwards 2nd Lord Hardwicke, and there were trifling corrections in Dr Birch's handwriting, showing that he was a party with Yorke, the author, to the mystification. No information is forthcoming as to the object of it, but it is worth mentioning that Yorke and his brother also published a clever *jeu d'esprit* called *The Athenian Letters*, purporting to be a transcript from a Spanish translation of letters written by a Persian agent during the Persian or Peloponnesian War; so that it may be inferred that this sort of thing recommended itself to Yorke, and not necessarily for any deception.

Various English pamphlets, as well as French, Italian and German, occur in the 16th century with such titles as *News from Spaine*, and the like. In the early years of the 17th century they became very numerous; the Charles Burney collection in the British Museum is particularly valuable for this early period, the newbooks and newspapers in it commencing with a "relation" of 1605. In 1614 we find Burton (the author of the *Anatomy of Melancholy*), pointing an excrement against the parting reading habits of "the major part" by adding, "if they read a book at any time...tis an English chronicle, Sir Huon of Bordeaux, Amadis de Gaul, &c., a play-book, or some pamphlet of news." But up to 1641, owing to the fact that to print domestic news was barred by the royal prerogative, the English periodicals which are to be considered as strictly the forerunners of the regular newspaper were only translations or adaptations of foreign periodicals containing news of what was going on abroad.

The first is in the British Museum a *Mercurius Gallogallicus; Sive rerum in Gallia et Belgo potissimum, Historia quoque, Italia, Anglia, Germania, Polonia, Vicinique Locis ab anno 1588 usque ad Martium annum prospersat, 1594 gestorum, nuncius. Opusculum in Sex libros qui totidem annos completum septuare, divisa auctore D. M. Jonsonio Docomensis Friso. Editio altera. Coloniae Agrippinae. A pud Godfriedum Kempensem. Anno MDXCVI.* This production of Janson's at Cologne is a fairly thick octavo book, giving a Latin chronicle of events from 1587 to 1594, and is really a sort of annual register. It was continued down to 1635. The first English paper, *the News from the East Indies*, began to circulate in England, it started the idea of a periodical supplying foreign news, and apparently became to English contemporaries a type of the newfangled news-summaries. In 1614 there was published in London a little square book (45 pp.), by Robert Booth, *A Relation of all matters passed, since March last to the present 1614, translated according to the original of Mercurius Gallogallicus*, which has the running title *Mercurius Gallogallicus his relation since March last*. From a repetition of such "relations" at irregular intervals, to the periodical publication of news-books with a common title in a numbered series, was a natural development. Thus on the 1st of June 1619 Ralph Rountwaihe entered at Stationers' Hall *A Relation of all matters done in Bohemia, Austria, Poland, Sletia, France, &c., that is worthy of relating, since the 2nd of March 1618 (1619 N.S.) until the 4th of May.* Again at the beginning of November 1621 Bartholomew Downes and another entered in like manner *The certaine and true newes from all parts of Germany and Poland, to this present 20 of October 1621.* No copy of either of these papers is now known to exist. Nor is any copy known of the *Courant or Weekly News* from the 20th of October 1621—"taken out of the High Dutch,"—mentioned by John Nichols. But in May 1622 we arrive at a regular weekly newspaper which may still be seen in the British Museum.

1 The title *Mercurius or Mercury*—as representing the messenger of the gods—thus became a common one for English periodicals.

2 Registers of the Stationers' Company, as printed by Edward Arber, iii. 302.


4 Literary Anecdotes, iv. 38.
NEWSPAPERS

The Stationers' Registers contain an entry on May 18th of A Curant of generall news. Dated in 1645 May last, it is preserved, but what is presumably the next number is to be found in the Burney collection. It is entitled "The 23rd of May—The Weekly News from Italy, Germany, &c., London, printed by J. D. for Nicholas Bourne and Thomas Archer." On many subsequent numbers the name of Nathaniel Butter appears in conjunction with Bourne and sometimes with Archer; so that there was probably an eventual partnership in the new undertaking. Archer is known as a publisher of "relations" since 1603; he died in 1634. Butter had published News from Spain in 1611, and he continued to be a publisher of news until 1641, if not later, and died in 1646. For details of the history of the development of the news-book down to 1641, and thence to the starting of the London Gazette in 1665, reference should be made to Mr J. B. Williams' History of English Journalism (1908), already referred to. Mr. Williams, by his study of the materials preserved in the British Museum in the Burney and Thomason collections, has considerably modified many of the previously accepted views as to the affiliation and authorship of these early English periodicals. The leading facts can only be summarized here.

The Weekly News (1622), though the first English "Corant," had no regular title connecting one number with the rest; it was simply the news of the week, and so described. The first periodical with a title was a Mercurius Britannicus published by Archer in 1625; the earliest copy in existence being No. 16, April 7th, which probably lasted till the end of 1627. But the activity of the periodical was considerable, for in 1628, Charles I issued the first Mercurius Britannicus, and in 1629 the weekly printings of news from foreign parts. The next step in the evolution of the newspaper was due to the abolition of the Star Chamber in 1641, and the consequent freeing of the Press; and at last we come to the English periodical with domestic news. In November 1641 begins The Head of several proceedings in the present parliament (outside title) or Diurnal Occurrences (inside title), the latter being the title under which it was soon known as a weekly; and on Jan. 31st 1642 appeared A Perfect Diurnal of the Passages in Parliament. These were printed for William Muddiman, and were written apparently by Samuel Pecke, "the first of the patriarchs of English domestic journalism" (Williams). It is unnecessary here to mention every domestic journal which played its part in the verbal warfare in the Great Rebellion. The weekly Diurnals were soon copied by other booksellers. At first they were naturally on the side of the parliament. In January 1643, however, appeared at Oxford the first Royalist diurnal, named Mercurius Aulicus (continued till September 1645, and soon succeeded by Mercurius Academicus), which struck a harder literary note; its chief writer was Sir John Birkenhead. Mercurius Gallicus (were first printed privately in London, was started by the parliamentary Richard Collings on May 11th, 1643 (continued to December 1645); Collings had also started earlier in the year The Kingdome's Weekly Intelligencer, which lasted till October 1649. In September 1643 appeared another Puritan opponent of M. Aulicus in the Mercurius Britannicus (sic) of Captain Thomas Audley, which temporarily ceased publication on September 9th, 1644, only to be revived on September 30th by Marchamont (or Marchmont) Newdham, a writer who plays a prominent part in the journalism of this period, and to be continued till May 18th 1646.

In January 1647 was started the Perfect Occurrences by Henry Walker ("Luke Hurraney"), who was not only a great journalist on the parliamentary side but is important as having originated the introduction of advertisements into the news-books. Later in the year a number of new Royalist Mercuries till into the field from which Aldicus and Academicus had now withdrawn: the first was Mercurius Melancholicus (until 1649), and the most important were Mercurius Pragmaticus (Sept. 1647 to May 1650) and Mercurius Elenticus (Nov. 1647 to Nov. 1649). M. Pragmaticus was not, as has been stated, originated by Marchamont Nedham (who about this time turned his coat and became Royalist), but in 1648-1649 he was its writer until he again turned pamphletarian; "history," says Mr Williams, "has no personage so shamelessly cynical as Marchamont Nedham, with his powerful pen, and his political convictions ever ready to be enlisted on the side of the highest bidder; he even wrote for Charles II. in later years." Against the unlicensed Royalist Mercuries in London, where the people were on the king's side, the parliament waged active war, but some of them managed to come out, although writer after writer was imprisoned, until the middle of 1650. Meanwhile from October 1649 to June 1650, by a new act of parliament, the licensed press itself was entirely suppressed, and in 1649 two official journals were issued, A Brief Relation (up to October 1650) and Several Proceedings in Parliament (till September 1653), a third licensed periodical, The Weekly Diurnall, appeared in 1650; the year, and a fourth, Mercurius Politicus (of which Milton was the editor for a year or so and Marchamont Nedham one of the principal writers), starting on June 13th, 1650 (continuing till April 12th, 1660). After the middle of 1650 there was a revival of some of the older licensed news-books; but the Weekly Intelligence of the Commonwealth (July 1650 to September 1655), by R. Collings, was the only important newcomer up to September 1655, when Cromwell suppressed all such publications with the exception of Mercurius Politicus and the Publick Intelligence (Continued to Oct. 1655 to April 1660), both being official and conducted by Marchamont Nedham.

Till Cromwell's death (Sept. 3rd. 1658) Nedham reigned alone in the press, but with the Rump he fell into disgrace, and in 1659 a rival appeared in Henry Muddiman (a great writer also of "news-letters"), whose Parliamentary Intelligence, renamed the Kingdom's Intelligence (till August 1663), was supported by General Monck. Nedham's journalistic career came finally to an end (he died in 1658) at the hand of Monck's council of state in April 1666. The following announcement was published in the Intelligence on March 25th 1666: "We, the poor and humble Marchmont Nedham, the author of the weekly news-books called Mercurius Politicus and the Publicque Intelligence is, by order of the council of state, discharged from writing or publishing any publique intelligence; the reader is desired to take notice that, by order of the said council, Giles Dury and Henry Muddiman are authorized henceforth to write and publish the said intelligence, the one upon the Thursday and the other upon the Monday, which they do intend to set out under the titles of the Parliamentary Intelligence and of Mercurius Politicus. This arrangement with Muddiman lasted till 1663, when he was supplanted by Sir Roger L'Estrange, who was appointed "surveyor of the Press." On him was conferred by royal grant—and, as it proved, for only a short period—all the sole privilege of writing, printing, and publishing all narratives, advertisements, mercuries, intelligencers, diurnals and other books of public intelligence... with power to search for and seize the unlicensed and treasonable schismatical and scandalous books and papers." L'Estrange discontinued Mercurius Politicus and Kingdom's Intelligence and substituted two papers, the Intelligencer (Aug. 1st) and the News (Sept. 3rd) at a halfpenny, the former on Mondays and the latter on Thursdays; these were continued till January 29th, 1666, but from the beginning of 1664 the Intelligencer was made consecutive with the News, numbered and pagd as one.

We come now to the origin of the famous London Gazette. Muddiman, obliged to devote himself solely to his news-letters, was associated with Joseph Wilkinson (under-secretary and afterwards secretary of state), who was for a time L'Estrange's...
assistant in the compilation of the Intelligencer. Muddiman organized for himself a far-spreading foreign correspondence, and carried on the business of a news-letter writer on a larger scale than had till then been known. Presently L'Estrange, whose monopoly of printing was highly unpopular, found his own sources of information much abridged, while Williamson, for his own ambitious purposes, entered into an understanding with the Intelligencer, as is explained in detail by William Winstanley (op. cit., pp. 130 seq.) for getting the whole business into his hands, with Muddiman as his tool and with Muddiman's clients as his customers. To L'Estrange's application for renewed assistance Williamson replied that he could not give it, but would procure for him a salary of £100 a year if he would give up his right in the news-book. The Intelligencer appealed (Oct. 1665) to Lord Arlington, and pathetically assured him that the charge for "enteraining spies for information was £500 in the first year." But L'Estrange boasted that he had "doubled" the size and price of the book, and had brought the profit from £200 to £400 or £500 a year. The appeal was in vain. At that time the great plague had driven the court to Oxford. The first number of the bi-weekly Oxford Gazette, licensed by Arlington and written by Muddiman, was published on the 16th November 1665. It was "a paper" of news, of the same size and shape as Muddiman's news-letters. With the publication of the 24th number (Monday, February 5th, 1665-1666 O.S.) the Oxford Gazette became the London Gazette. After the 25th number Muddiman, who saw that he was not safe in Williamson's hands, seceded. Williamson had the general control of the Gazette for a considerable time. Charles Perrot, a member of Oriel College, was the acting editor. L'Estrange was soon driven out of the field, being solaced, on his personal appeal to the king, with a charge of £100 a year on the news-books (henceforth "taken into the secretaries' office") and a further £200 out of secret service money for his place as surveyor of the press. Muddiman, meanwhile, attached himself to the other secretary of state, Sir W. Morice, and he was authorized to issue an opposition official paper, which appeared as Current Intelligence (June 4-Aug. 20, 1666); and though the Great Fire, which burnt out all the London printers, resulted in the reappearance, after a week's interval, of the Gazette alone, Muddiman's unrivalled organization of news-letters remained, and they continued, till his death in 1692, to be the more popular source of information. The Gazette, however, now remained for some time the only "newspaper" in the strict sense already mentioned. For several years it was regularly translated into French by one Moranville. During the Stuart reign generally its contents were very meagre, although in the reign of Anne some improvement is already visible. More than a century after the establishment of the Gazette, Lord Wemyss, in 1766, wrote a memorandum addressing a circular to the several secretaries of legation and the British consuls abroad, in which he says, "The writer of the Gazette has represented that the reputation of that paper is greatly lessened, and the sale diminished, from the small portion of foreign news with which it is supplied." He desires that each of them will send regularly all such articles of foreign intelligence as may appear proper for that paper, "taking particular care—as the Gazette is the only paper of authority printed in this country—never to send anything concerning the authenticity of which there is the smallest doubt." From such humble beginnings has arisen the great repertory of State Papers, now so valuable to the writers and to the students of English history. The London Gazette has appeared twice a week (on Tuesday and Friday) in a continuous series ever since. The editorship is a government appointment.

The London Gazette.

We come now to the Revolution. The very day after the departure of James II. was marked by the appearance of three newspapers—The Universal Intelligence, the English Courant and the London Courant. Within a few days more these were followed by the London Mercury, the Orange Gazette, the London Intelligence, the Harlem Current and others. The Licensing Act, which was in force at the date of the Revolution, expired in 1663 without being renewed, and the new papers found the way to the market open. On the appearance of a paragraph in the Flying Post of 1st April 1667, which appeared to the House of Commons to attack the credit of the Exchequer Bills, leave was given to bring in a bill "to prevent writing, printing or publishing of any news without licence"; but the bill was thrown out in an early stage of its progress. That Flying Post which gave occasion to this attempt was also noticeable for a new method of printing, which it thus announced to its customers—"If any gentleman has a mind to oblige his country friend or correspondent with this account of public affairs, he can have it for twopence... on a sheet of fine paper, half of which being left blank, he may thereon write his own affairs, or the material news of the day." In 1666 Edward Lloyd—the virtual founder of the famous Lloyd's of commerce—started a thrice-a-week paper, Lloyd's News, which had but a brief existence in its first shape, but was the precursor of the Lloyd's List of the present day. No. 76 of the original paper contained a paragraph referring to the House of Lords, for the appearance of which a public apology must, the publisher was told, be made. He preferred to discontinue his publication (February 1667). Nearly thirty years afterwards in part paged I. the title of Lloyd's List—published at first weekly, afterwards twice a week. This dates from 1726. It is now published daily. It was in the reign of Queen Anne that the English newspaper press first became really eminent for the amount of intellectual power and of versatile talent which was employed upon it. It was also in that reign that the press was first fettered by the newspaper stamp. The accession of Anne was quickly followed by the appearance of the first successful London daily newspaper, the Daily Courant (11th of March 1702-1703). Seven years earlier, in 1695, the Post-boy had been started as a daily paper (actually the first in London), but only four numbers appeared. The Courant was published and edited by the learned printer Samuel Buckley, who explained to the public that "the author has taken care to be duly furnished with all that comes from abroad, in any language... At the beginning of each article he will quote the foreign paper from which it is taken, that the public, seeing from what country a piece of news comes, with the allowance of that government, may be better able to judge of the credibility of it. For the part it is printed here, he will not pretend to give any comments, ... supposing other people to have sense enough to make reflections for themselves." Then came, in rapid succession, a crowd of new competitors for public favour, of less frequent publication. The first number of one of these, the Country Gentleman's Courant (1700), was given away gratuitously, and made a special claim to public favour on the ground that "here the reader is not only diverted with a faithful register of the most remarkable and momentary [i.e. momentous] transactions at home and abroad, ... but also with a geographical description of the most material places mentioned in every article of news, whereby he is freed the trouble of looking into maps." On the 19th of February 1704, whilst still imprisoned in Newgate for a political offence, Defoe (q.v.) began his famous paper, the Review. At the outset it was published weekly, afterwards twice, and at length three times a week. It continued substantially in its first form until July 29, 1712; and a complete set is of extreme rarity. From the first page to the last it is characterized by the many errors and misprints. The great collection of newspapers in the British Museum contains only one number of Lloyd's News; but sixty-nine numbers may be seen in the Bodleian Library. Of the List, also, no complete series is known to exist; that in the library of Lloyd's begins with 1740.
boldness and persistent tenacity with which the almost unaided author utters and defends his opinions on public affairs against a host of able and bitter assailants. Some of the numbers were written during travel, some in Edinburgh. But the Review appeared regularly. When interrupted by the pressure of the Stamp Act (which came into force on the 1st of August 1712), the writer modified the form of his paper, and began a new series (August 2, 1712, to June 11, 1713). In those early and monthly supplements of his paper which he entitled "Advice from the Scandalous Club," and set apart for the discussion of questions of literature and manners, and sometimes of topics of a graver kind, Defoe to some extent anticipated Richard Steele's Tatler (1709) and Steele and Addison's Spectator (1711). In 1705 he severed those supplements from his chief newspaper, and published them twice a week as the Little Review. But they soon ceased to appear. It may here be added that in May 1716, Defoe began a new monthly paper under an old title, Mercurius Politicus, ... by a lover of old England. This journal continued to appear until September 1719. The year 1710 was marked by the appearance of the Examiner, or Remarks upon Papers and Occurrences (No. 1, August 3), of which thirteen numbers appeared by the co-operation of Bolingbroke, Prior, Freind and King before it was placed under the sole control of Swift. The Whig Examiner, avowedly intended "to censure the writings of others, and to give all persons a rehearing who had suffered under any unjust sentence of the Examiner," followed on the 1st September, and the Medley three weeks afterwards.

This increasing popularity and influence of the newspaper press could not fail to be distasteful to the government of the day. Prosecutions were multiplied, but with small success. At length some busy projector hit upon the expedient of a newspaper tax. The tax which seems to contain the first germ of the plan is still preserved amongst the treasury papers. It is anonymous and undated, but probably belongs to the year 1711. "There are published weekly," says the writer, "about 44,000 newspapers, viz. Daily Courant, London Post, English Post, London Gazette, Postman, Postboy, Flying Post, Review and Observer." The duty eventually imposed (1712) was a halfpenny on papers of half a sheet or less, and a penny on such as ranged from half a sheet to a single sheet (10 Anne, c. xix. § 101). The first results of the tax cannot be more succinctly or more vividly described than in the following characteristic passage of Swift's Journal to Stella (August 7, 1712): "Do you know that Grub Street is dead and gone last week? No more ghosts or murderers now for publish or money. I plied it close the last fortnight, and published at least seven papers of my own, besides some of other people's; but now every single half sheet pays a halfpenny to the queen. The Observer is fallen; the Medleys are jumbled together with the Flying Post; the Examiner is deadly sick; the Spectator keeps up, and doubles its price—I know not how long it will hold. Have you seen the red stamp the papers are marked with? Methinks the stamping is worth a halfpenny."

Swift's doubt as to the ability of the Spectator to hold out against the tax was justified by its discontinuance in December 1712, Steele starting the Guardian in 1713, which only ran for six months. But the impost which was thus fruitful in mischief, by suppressing much good literature, wholly failed in keeping out bad. Some of the worst papers in the history of the press existed, and their existence kept their ground, and the number of such ere long increased. An enumeration of the London papers of 1714 comprises the Daily Courant, the Examiner, the British Merchant, the Lover, the Patriot, the Monitor, the Flying Post, the Postboy, Mercator, the Weekly Packet and Dunton's Ghost. Another enumeration in 1733 includes the Daily Courant, the Craftsman, Fag's Journal, Miss's Journal, the London Journal, the Free Press, the Morning Post and the News. A Proposition to Increase the Revenue of the Stamp-Office, Redington, Calendar of Treasury Papers, 1703-1714, p. 955. The stamp-office dated from 1694, when the earliest duties on paper and parchment were enacted. See the Burney collection of newspapers in the British Museum; and Nicholson, Literary Anecdotes of the Eighteenth Century, iv. 33-97.

Brion, the Grub Street Journal, the Weekly Register, the Universal Spectator, the Auditor, the Weekly Miscellany, the London Crier, Read's Journal, Oedipus or the Postman Remounted, the St James's Post, the London Evening Post and the London Daily Post, which afterwards became better known as the Public Advertiser. Part of this increase may fairly be ascribed to political corruption. In 1742 the committee of the House of Commons appointed to inquire into the political conduct of the earl of Oxford reported to the House that during the last ten years of the Walpole ministry there was paid, out of public money, no "less a sum than £50,077, 18s. to authors and printers of newspapers, such as the Free Brion, Daily Courant, Gazeteer and other political papers." But some part of the payment may well have been made for advertisements. Towards the middle of the century the provisions and the penalties of the Stamp Act were made more stringent. Yet the number of newspapers continued to rise. Dr Johnson, who in 1750 started his two-penny bi-weekly Rambler, and in 1756 his weekly Idler, writing in the latter he bore testimony to the still growing thirst for news: "Journals are daily multiplied, without increase of knowledge. The tale of the morning paper is told in the evening, and the narratives of the evening are bought again in the morning. These repetitions, indeed, waste time, but they do not shorten it. The most eager peruser of news is tired before he has completed his labour; and many a man who enters the coffee-house in his nightgown and slippers is called away to his shop or his dinner before he has well considered the state of Europe. Five years before, in 1751, the number of newspapers annually sold in England, on an average of three years, amounted to 7,411,757. In 1760 it had risen to 9,464,790, and in 1767 to 11,300,980. In 1776 the number of newspapers published in London alone had increased to fifty-three.

When Johnson wrote his sarcastic strictures on the newspapers that were the contemporaries and, in a sense, the rivals of the Idler, the newswriters had fallen below the standard of an earlier day. A generation before the newspaper was often much more of a political organ than of an industrial venture. All of the many enterprises of Defoe in this field of journalism united indeed both characteristics. But if he was a keen tradesman, he was also a passionate politician. And not a few of his fellow-workers in that field were conspicuous as statesmen no less than as journalists. Even less than twenty years before the appearance of Johnson's remarks, men of the mental calibre of Henry Fielding were still to be found amongst the editors and writers of newspapers. The task had fallen to a different class of men in 1750.

The history of newspapers during the long reign of George III. is a history of the struggle for freedom of speech in the face of repeated criminal prosecutions, in which individual writers and editors were defeated and severely punished, while the Press itself derived new strength from the protracted conflict, and turned ignominious penalties into signal triumphs. From the days of Wilkes's North Briton onwards (see Wilkes, John: it was started in 1761), every conspicuous newspaper prosecution gave tenfold currency to the doctrines that were assailed. In the earlier part of this period men who were mere traders in politics—whose motives were obviously base and their lives contemptible—because for a moment, able to brave king, legislature and law courts, by virtue of the simple truth that a free people must have a free press. One of the minor incidents of the North Briton excitement (Wilkes's prosecution in 1763) led indirectly to valuable results with reference to the much-vaunted question of parliamentary reporting. During the discussions respecting the Middlesex election, Almon, a bookseller, collected from members of the House of Commons some particulars of the debates, and published them in the London Evening Post. The success which attended these reports induced the proprietors of St James's Chronicle to employ a reporter to collect notes

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NEWSPAPERS

in the lobby and at the coffee-houses. This repeated infraction of the privilege of secret legislation led to the memorable proceedings of the House of Commons in 1771, with their fierce debates, angry resolutions, and arbitrary imprisonments—all resulting, at length, in that tacit process of publicity of discussions within the mists, with brief occasional exceptions, has ever since prevailed.

Evening journalism in England started originally with supplemental editions of the morning papers, giving the latest foreign war news. In July 1665, when William III. was fighting France in the Netherlands, a "Postscript to the Pacquet-boat from Holland to Flanders" was published with special advice from the seat of war; and from that time there were frequent afternoon issues of evening journals giving war news. In August 1766 a "Sir at Night" evening paper was started in London. The first London evening paper of any importance, however, was the Courier (1792), which during the latter part of the Napoleonic War, with Mackintosh, Coleridge and Wordsworth amongst its contributors, became one of the chief papers of the day. It was edited successively by Daniel Stuart, William Mudford, Eugenius Roche, John Galt, James Stuart and Laman Blanchard. In 1827 a twenty-four share in the paper sold for 5000 guineas, but it gradually declined and came to an end in 1842, when it was incorporated by the New River Company—allresulting in the circulation of the paper; but when the "Letter to the King" came out (19th December 1766, almost a year from the beginning of the series) it caused an addition of 1750 copies to the ordinary impression. The effect of subsequent letters was variable; but when Junius ceased to write the monthly sale of the paper had risen to 83,950. This was in December 1771. Seven years earlier the monthly sale had been but 47,515. It now became so valuable a property that shares in it were sold, according to John Nichols, "as regularly as those of the New River Company." But the fortunes of the Advertiser declined almost as rapidly as they had risen. It continued to appear until 1798, and then expired, being amalgamated with the commercial paper called the Public Ledger (dating from 1759). Actions for libel were brought against the paper by Edmund Burke in 1784, and by William Pitt in 1785, and in both suits damages were given.

The Morning Chronicle was begun in 1766. William Woodfall was its printer, reporter and editor, and continued to conduct it until 1786. James Perry succeeded him as editor, and so continued, with an interval during which the editorship was in the hands of Mr. Sergeant Spankie, until his death in 1821. Perry's editorial functions were occasionally discharged in Newgate in consequence of repeated prosecutions for political libel. In 1819 the daily sale reached nearly 4000. It was sold in 1823 to Mr. Clement, the purchase-money amounting to £42,000. Mr. Clement held it for about eleven years, and then sold it to Sir John Easthope for £6,000. It was then, and until 1843, edited by John Black, who numbered amongst his staff Albany Fonblanque, Charles Dickens and John Payne Collier, the circle of men being about 6000. The paper continued to be distinguished by much literary ability, but not by commercial prosperity. In 1843 (the circulation having fallen to 3000) it became the joint property of the duke of Newcastle, Mr. W. E. Gladstone and some of their political friends; and by them, in 1854, it was sold to Mr. Sergeant Glover. From 1848 to 1854 Douglas Cook (afterwards of the Saturday Review) was editor. At length the Morning Chronicle ended in the Bankruptcy Court, after an existence of more than ninety years. The Morning Herald was founded and first edited by Henry Bate (Sir Henry Bate Dudley) in 1786, and came to an end at the close of 1860; for some time it was a popular Tory paper, and from 1835 to 1845 had a circulation of about 6000.

The development of the Press was enormously assisted by the gradual abolition of the "taxes on knowledge," and also by the introduction of a cheap postal system. In 1756 an additional halfpenny was added to the tax of 1712. In 1765 and in 1773 various restrictive regulations were imposed. In 1789 the three-halfpence was increased to twopence, in 1798 to twopence-halfpenny, in 1804 to threepence-halfpenny, and in 1815 to fourpence, less a discount of 20%. Penalties of all kinds were augmented, and obstructive regulations were multiplied. In the course of the struggle between this constantly enhanced taxation and the irresistible desire for cheap newspapers, more than seven hundred prosecutions for publishing unstamped journals were instituted, and more than five hundred were imprisoned, sometimes for considerable periods. As the prosecutions multiplied, and the penalties became more serious, Poor Men's Guardians, Democrats, Descriptions and their congeners multiplied also, and their revolutionary tendencies increased to a still greater radius. In 1815 the abolition of the tax on newspapers was established which dealt exclusively with narratives of gross vice and crime, and which vied with each other in every kind of artifice to make vice and crime attractive. Between the years 1831 and 1835 many scores of unstamped newspapers made their appearance. The political tone of most of them was fiercely revolutionary. Prosecution followed prosecution; but all failed to suppress the obnoxious publications.

To Bulwer-Lytton, the novelist and politician (Baron Lytton), and sinuously to his some adherents, Mr. Gladstone and Richard Cobden, is chiefly due the credit of grappling with the House of Commons in a manner which secured first the reduction of the tax to a penny on the 15th of September 1836, and then its total abolition at last in 1855. The measure for the final abolition of the stamp tax was substantially prepared by W. E. Gladstone during his chancellorship of the exchequer in 1854, but was carried by his successor in 1855. The number of newspapers established from the early part of 1855, when the repeal of the duty had become a certainty, and continuing in existence at the beginning of 1887, amounted to 107; 26 were metropolitan and 81 provincial. Of the latter, the majority belonged to towns which possessed no newspaper whatever under the Stamp Acts, and the price of nearly one-third of them was but a penny. In some cases, however, a portion of these new cheap papers of 1857 was printed in London, usually with pictorial illustrations, and to this was added a local supplement containing the news of the district.

Amongst the earliest results of the change in newspaper law made in 1855 was the establishment in quick succession of a series of penny metropolitan local papers, chiefly suburban, of a kind very different from their unstamped forerunners. They spread rapidly, and attained considerable success, chiefly as advertising sheets, and as sometimes the organs, more often the critics, of the local vestries and other administrations. One of them, the Clerkenwell News and Daily Chronicle, so prospered in the commercial sense, being crowded with advertisements, that it sold for £50,000, and was then transformed into the London Daily Chronicle (28th May 1877). Another conspicuous result of the legislation of 1855 was an enormous increase in the number and influence of what are known as "class papers" and professional and trade papers. The duties on paper itself were finally abolished in 1861.

"Taxes on knowledge" having thus been abolished, the latter developments in newspaper history are mainly connected with the increase in number, due largely to the spread of education, the improvements in machinery and distribution and in collection of news, the constant adaptation to the new demands
of a wider public, and the progress in the art of advertising as applied to the Press. The following sections on the more important newspapers in London and the Provinces fill in the remaining details of the history of the British Press, so far as they are substantially important or interesting. Much that is in its nature ephemeral or trivial is necessarily passed over.

Modern London Newspapers.

The Morning Post (oldest of existing London daily papers) dates from 1772. For some years it was in the hands of Henry Bate (Sir Henry Bate Dudley), and it attained some degree of importance as a weekly, and scored several very conspicuous successes.

In 1795 the entire copyright, with house and printing materials, was sold for £600 to Peter and Daniel Stuart, who quickly raised the position of the Post by enlisting Sir James Mackintosh and Sir John Stuart (the latter was a regular contributor) to give attention to advertisements and to the copious supply of incidental news and amusing paragraphs. There has been much controversy about the scale of Borthwick's change; if anything it had in elevating the Post from obscurity to eminence. That he greatly promoted this result there can be no doubt. His famous "Character of Pitt," published in 1800, was especially successful, and created a demand for the particular number in which it appeared that lasted for years, almost without precedent. Coleridge wrote for this paper from 1795 until 1802, and during that period its circulation in ordinary rose from 350 copies, on the average, to 4500. Whatever the amount of the circulation at any one time, it was said in connection with the Post, as to the other papers, "the House of Commons." Mr. Coleridge's essays in the Morning Post led to the rupture of the treaty of Amiens, it is none the less a striking testimony, not only to Coleridge's powers as a publicist, but also to his influence on the paper, which at one time and innumerable obstacles at that time. The list of his fellow-workers in the Post is a most brilliant and varied one. Besides Mackintosh, Southey, and Borthwick, and the latter's brother, Robert, the lyric of Moore, many of the social verses of Mackworth Praed, some of the noblest sonnets of Wordsworth, were first published in the columns of the Post. And the story of the paper, in its early days, is the story of a long list of short-lived and never the same title, and its peculiarities, at great length in No. 310 of his Daily Universal Register.

In a later number he stated, very amusingly, his reasons for adopting the altered title, which the enterprise and ability of his successors (see Walter, John) made world-famous. Within two years the Post was a daily paper. Coleridge's enterprise and ability were rewarded by depriving the elder Walter of the printing for the customs department, by the withdrawal of government advertisement from The Times, and also, it is said, by the systematic destruction of the Evening Post. The Post was forced to a temporary suspension. John Walter, however, was strong and resolute enough to brave the government. He organized a better system of news transmission than had ever before existed. He introduced steamprinting presses, and improved the machinery of engraving and typography; and although modern machines may now seem to thrust in insignificance a press of which it was at first announced as a notable triumph that "no less than 1100 sheets are impressed in one hour," yet the assertion was none the less true that The Times of 29th November 1814 presented the public the practical result of the greatest improvement connected with the discovery and application of the foreign intelligence addressed to it by the post offices. The Post continued to be a daily paper, and it was the last remaining example of a daily newspaper published without benefit of patent privilege extant.

First established as the Morning Post, in 1795, the Post was taken over by Messrs. J. and T. B. Crompton, the paper manufacturers, it had been taken over by them; and in that year the management was entrusted to Peter Borthwick (1804-1852), a Scotswoman who, after graduation in law, as Edinburgh and Cambridge, had taken to politics in the Conservative interest and had sat in parliament for Evesham from 1835 to 1838 and from 1841 to 1847, when he was almost ruined by fighting an election. Borthwick was succeeded in 1852 by his brother Andrew, who was the editor during the task of reviving the paper seriously in hand, and in a few years was already improving his position when he fell ill and died; and he was succeeded in 1852 by his brother Charles Borthwick, Lord Borthwick (1808). The later history of the paper is primarily connected with its practical re-establishment and successful conduct under the latter. Alcarnon Borthwick had been its Paris correspondent, under his control, became one of the great organs of opinion and acumen of great promise. When he became managing editor in 1832 he devoted himself with such energy to the work that in seven years the debt on the business had been paid off. He gave the paper a political character, and it became the Conservative, Imperialist and Protectionist, and in the 'fifties and 'sixties Borthwick was a keen supporter of Lord Palmerston. After the death of Mr. Crompton, his nephew, Mr. Rideout, the principal surviving one, of the Cromptons, the paper was managed in 1865 by Mr. and Mrs. Rideout's son, who had been associated with Borthwick's success, and he vested the entire control of the paper in him for life; and on Mr. Rideout's death in 1877, Borthwick was enabled, by the help of his friend Andrew Mackintosh to become editor, under his brother Charles Mackintosh, the proprietor. The Morning Post had now become, largely through Borthwick's own social qualities, the principal organ of the fashionable world; but in 1861 he took what was then considered the hazardous step of reviving the paper to a penny a penny, and appealing no longer to the "threepenny public" with The Times but to a wider clientele with the Daily Telegraph and Standard. The result was a ten-fold increase in circulation and a financial success. The Morning Post was knighted in 1880, and was created a baronet in 1887, had entered parliament in 1886 for Evesham, and from 1886 to 1895 sat for South Kensington, where he assumed tabloidal tendencies, and the removal of gifts naturally increased the influence of the paper; he supported the "Tory democracy" and was an active worker for the Prerossite League, of which he was three times chairman; and the Morning Post now stood for views of such importance as to be held responsible for the Conservative side. From 1880 onwards he devoted the editorial duties on others, at first Sir William Hardman, and then successively Mr. A. K. Moore, Mr. Alcarnon Locker, Mr. James Nicol (who died in 1897), Mr. J. J. Rideout (the present editor), Mr. A. C. L. Moore, and Mr. F. W. Fabian Wade; under them the literary standard of the paper was kept at a high level, and constant improvements were introduced; and the staff included a number of well-known writers, such as Walter Besant, Mr. Crompton, the novelist J. W. Mackay, the late Professor of Military History at Oxford. From 1897 till his death in 1905, at the age of thirty-two, Lord Glenesk's son, his brother Borthwick, much to do with the managerial side. On Lord Glenesk's own death in 1903, Mr. Rideout became editor of the Morning Post, of his only surviving child, a daughter, who in 1893 had married the 7th Earl Bathurst.

The proposal was first made from the 1st of January 1788, but was really started by John Walter on the 1st of January 1785, under the title of The London Daily Universal Register, printed logographically. On its reaching its 950th issue its name was changed to The Times. The first paper had been invented by a printer named Henry Johnson several years before, and found a warm advocate in John Walter, who expounded its peculiarities at great length in No. 510 of his Daily Universal Register. In a later number he stated, very amusingly, his reasons for adopting the altered title, which the enterprise and ability of his successors (see Walter, John) made world-famous. Within two years the Post was a daily paper. Coleridge's enterprise and ability were rewarded by depriving the elder Walter of the printing for the customs department, by the withdrawal of government advertisement from The Times, and also, it is said, by the systematic destruction of the Evening Post. The Post was forced to a temporary suspension. John Walter, however, was strong and resolute enough to brave the government. He organized a better system of news transmission than had ever before existed. He introduced steamprinting presses, and improved the machinery of engraving and typography; and although modern machines may now seem to thrust in insignificance a press of which it was at first announced as a notable triumph that "no less than 1100 sheets are impressed in one hour," yet the assertion was none the less true that The Times of 29th November 1814 presented the public the practical result of the greatest improvement connected with the discovery and application of the foreign intelligence addressed to it by the post offices. The Post continued to be a daily paper, and it was the last remaining example of a daily newspaper published without benefit of patent privilege extant.

1 See the centenary number of January 2, 1888, the pamphlet by S. V. Makower, issued by The Times in 1904, "The History of The Times"; and the article by Hugh Chisholm on "The Times, 1785-1908" in the National Review (May 1908).
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was to turn the "favourite broadsheet" of the English public into the "leading journal of the world." The Times was the "standard" of the age, and from its birth in 1785 until 1887 was its "indispensable" by George Earle Buckle (b. 1854). At the beginning of 1868 considerable changes took place in the proprietorial side of The Times, which had been founded in 1785 by William Cobbett. Thomas Cherney, the proprietor since 1871, as chairman and Mr. C. Moberly Bell (b. 1847), manager since 1890, as managing director, the financial control passing into the hands of Lord Northcliffe.

A comparison of the mechanical side of newspaper work was very great. The increasing circulation of The Times between the years 1840 and 1850 made an improvement in the printing and office arrangements inevitable. In 1848 Kastenbein, the manager, introduced a "same roll" or "same machine," and the stereotype plates fixed bodily on the printing machine in place of the movable type. This cleared the way for the introduction of the famous Walter press. Hitherto "formes" could be used, as the type was set up once only—one side of the paper being worked on one machine and the sheets then taken to another machine and "perfected." Stereotyping enabled the locomotion of type to be doubled, and the edition to be cast from one matrix. Mr. Macdonald, the manager of The Times, had devoted himself for several years to the production of a press which could print papers on both sides in one operation from a large roll of paper, and this required cutting both sides on the printing of each sheet, then "laid on" by a man and then printed. After years of experiment the Walter press was introduced into The Times office in 1855, and with it the circulation of the paper was increased so that numbers in a short time were sold. Each press turned out 12,000 sheets per hour, and it was therefore only a question of multiplying the stereotype plates and presses to obtain any number of printed papers by a certain time. Meanwhile Messrs. Hoe had set about producing something even quicker and better than the Walter press. They succeeded in accomplishing this by multiplying the reeds of paper on each machine, 24 to 30 at a time. The result was the production of over 36,000 sheets per hour from each machine.

These presses were adopted by The Times in 1895. In 1868 the question of composing machines for the quicker setting up of types was taken up by The Times. Kastenbein had an invention which he brought to the notice of The Times, and arrangements were made for him to continue his experiments in The Times office. In a couple of years a machine was made, which was worked and improved until in 1874 several machines were ready to set up a portion of the paper; but it was not until 1879 that the arrangements were sufficiently advanced to make certain that they could be carried out all through the paper. The introduction of composing machines, and the necessary alterations in the office arrangements which followed, led to some trouble among the compositors, in which Mr. Lees accompanied a partial strike; but after a considerable length of time the work was renewed with the additional machinery, and an effort to produce the paper at the proper time on the morning following the strike. Various improvements were made, until one machine was brought up as many as 296 lines of The Times in one hour, and 16,000 columns in one day. On the request of the parliamentary report from the House of Commons direct to the compositor was begun in 1885, and was continued until the House decided to rise at midnight, which enabled the more economical method of composing direct from the "copy" to be resumed.

Ever since the introduction of the composing machines the business had been much hampered by the question of "distribution"—that is, the breaking-up and sorting of the types. Kastenbein had invented a distributing machine to accompany his composing machine, but it proved to be unsatisfactory. Various systems were tried, but for the composing machines was to some extent crippled by the distribution difficulty. This had been recognized by Mr. Frederick Wicks (d. 1910), the inventor of the Wicks Rotary Type-casting Machine, who for many years had been working at a machine which would cast new type so quickly and so cheaply as to do away with the old system of distribution and substitute new type every day. In 1899 his machine was practically perfect, and The Times entered into a contract with him for the delivery of a new type casting machine.
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(at first on Fridays), is printed in a different form, and separately paginated in 1904 a "Financial and Commercial Supplement" (at first on Mondays, and later on Fridays) was added; in 1905 an "Editorial Supplement" (Wednesdays), and in 1910 a "Woman's Supplement".

The publishing department of The Times also invaded several new fields of enterprise. The Times Atlas was first published in 1896, while The Times Educational Supplement (formerly Longmans') Gazetteer. A much larger and more important venture was the issue in 1898 of a reprint of the ninth edition of the Encyclopaedia Britannica at less than half the original price. The Times formed a group known as The Times system that enabled the purchaser to receive the whole work at once and to pay for it by a series of equal monthly payments. This was followed by a series of evening newspapers, the first reprint was published in 1899, and in the fiftieth years of Punch ; and eleven new volumes of the Encyclopaedia Britannica, supplementing the ninth edition, and forming with its tenth edition, were issued by The Times in 1902 on similar terms on the so-called "Cocoa Press," with the Daily News at its head.

The first number of the Daily Telegraph was published on 29th September, 1855, its editor-in-chief being Mr. A. G. Gardiner. In 1904 considerable changes were made in the style of the paper, which was reduced in size, the office staff was increased, and a new group of Quaker families—largely associated with the manufacture of cocoa—followed his example in promoting the publication of Liberal and Free Trade newspapers, led in later years to somewhat unimportant ends. Forster and Forster was then published as a four-penny penny produced in London. His son, afterwards Sir Edwin Lawson produced (b. 1853), was a great Anglo-American lawyer, H. D. Trail was a leader-writer for the Anglo-American Press, (b. 1854), for many years to the Daily Telegraph, in connexion with his connexion with the paper under Mr Levy. Others prominently associated with the paper have been W. L. Courtney (b. 1856), a distinguished man of letters who, after several years as work of The Times, was appointed Editor of the Daily Telegraph, and was also editor of the Fortnightly Review; E. B. Iwan-Müller (d. 1910) and J. L. Garvin (from 1899), afterwards (1904) editor of the Daily News at his side, and his son and heir, assisted his father in the general control of the paper.

The Daily Telegraph may be said to have had the way in London journalism in capturing a large and important reading-public from the monopoly of The Times. It became the great organ of the middle classes, and was distinguished for its enterprise in many fields. In June 1873 the Telegraph despatched George Smith to carry out a series of architectural researches in Nineveh, which resulted in the instant discovery of the missing fragments of the Turan and the account of the Deluge, and many other inscriptions. In co-operation with the New York Herald it equipped H. M. Stanley's second great enterprise, the exploration of the Free Trade in the Centre, and for many years amongst them it sold nearly 5000 copies daily, and it yielded a steady profit of about £600 a year. Then, by the ability and enterprise of an experienced editor, James Grant (1862-1879), it was within five years, in 1880, of the Telegraph to take the lead in all the newspapers, and to have the lion's share of the London newspaper market.

The Daily Telegraph was consistently Liberal up to 1878, when it opposed Mr Gladstone's foreign policy as explained in the Edinburgh Review by Mr. Offices, and the Daily Telegraph in commemoration of the Jubilee of 1897; and the Shilling Fund for the soldiers' widows and orphans in connexion with the Boer War. An undertaking of a more festive kind was the fête given to 30,000 London school children in Hyde Park on the occasion of the Jubilee.

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The Standard was established as an evening newspaper in the Tory interest (as the express organ of the opponents of the measure for repressing the Catholic Claims), in 1837, by Mr George Butterworth, the editor being Stanley Lees Giffard, father of the first earl of Halsbury, who had Alaric Watts and Dr William Maginn, father of the Rev. Charles Maginn, as his chief helpers. In the course of two or three years it became a pecuniary, as it had from the first been a political, success, and gradually ousted the Courier, which was for a time conducted by William Hay and Robert Wraxall, whose half-century of success made him the distinguished editor of the Standard. In course of time the latter became the proprietor of Mr Charles Baldwin, whose father was proprietor of the Morning Herald, and when the father died the son followed him in the business, and became an even greater success.

In his hands neither of them prospered, although the Standard retained a large circulation and constantly printed early and accurate political reports, many of which, for instance in the Reform Bill of 1832, were purchased by Mr James Johnston, Mr John Maxwell, the publisher, being for a time associated with him in the ownership. Mr Johnston realized that he had had before him a great opportunity, and at once set to work to grasp it. He brought out the Standard as a morning paper (29th June 1857), increased its size from four to eight pages, and reduced the price from fourpence to twopenny. One of the most curious features of the early numbers was a novel by William Howard Russell. The evening edition was continued. In February 1858 Mr Johnston again reduced the price, this time to a penny. When that step was taken the Standard announced that it was "no longer a newspaper, but a magazine, which means that it was 'bound to no party'; and to those independent lines it in the main adhered. In the course of four or five years it became a financial success, and then began to attract to itself many brilliant periodical writers, among whom may be enumerated "living journalists" of the present day. In 1861, papers previously purchased by the poigniant curiosity of the reader, and the paper reached a circulation far beyond anything hitherto known. The distinction thus acquired was maintained during the Prussian-Austrian War of 1866, and greatly increased by the letters and telegramms describing the triumphs and disasters of the campaign of 1870. In the early 'sixties the staff had been reinforced by the engagement of Mr William Heselton Mudford. In the midst of his work as a parliamentary reporter, he was sent as special correspondent to Jamaica in 1865 to report upon the troubles which involved the recall of Governor Eyre; a further period in the gallery of the House of Commons followed. Mr Mudford was the son of a great old family in Leicestershire, the first editor of whose name was Mudford. Mr Mudford's first editor was Captain Hamber, who afterwards succeeded to the short-lived Hour, with whom had been associated Mr Arthur Stopford, who afterwards managed Wood's second paper, the owner's eldest son, to whom Mr (afterwards Sir) John Gorst was joined in a consultative capacity. In 1876 Mr Mudford became editor, still, however, retaining managerial control. Mr Johnstone, the founder of the paper, died in the prime of his career, without much, died in 1878, and under his will Mr Mudford was appointed editor and manager for life, or until resignation. Already a great property, the Standard in Mr Mudford's hands entered upon a very successful period. He had for his first assistant-editor Mr Gilbert Venables, who was succeeded after a short term by Mr George Byron Curtis, previously one of the leader-writers, who thus held the position through nearly the whole of Mr Mudford's long editorship. The staff at this time comprised many men, and some women, whose names are distinguished in letters as well as in journalism. Mr Alfred Austin, Mr T. H. S. Escott, Miss Frances Power Cobbe and Dr William Gargan are among the most distinguished names of the fourth generation of journalists.

To them must be added, among others, Mr E. D. J. Wilson, the brilliant political leader-writer (afterwards of The Times), Mr Percy Greg, son of "Cassandras", Mr G. Greg, Mr T. E. Kebbel and Dr Robert Brown, who wrote copious and pithy articles on both subjects, Foremost among the war correspondents were Mr G. A. Henty, who represented the paper on many a stricken field; Mr John A. Hobhouse, who was afterwards as well known as Atkinson of the Daily Telegraph. In January 1900 Mr Mudford retired, and was succeeded in the editorship by Mr G. Byron Curtis (d. 1907), Mr S. H. Jeyes, whose connexion with the paper had begun in 1891, becoming assistant-editor. In the course of his career there was a frequent change in the line of proprietors, which was not an advantage to the paper. In 1920 there was a strong line in depreciating the tariff reform movement within the Unionist party, was sold to Mr C. Arthur Pearson (proprietor of the Daily News) for £5,000, being chairman of the Tariff Reform League, and considerable changes were made in the paper. Mr H. A. Gwynne became editor. In 1910 Mr Pearson, owing to ill-health, transferred his interests in the proprietory company he had formed in 1904 to Mr Davison Dalziel. The Daily Chronicle arose, as already mentioned, out of the local Clerkenwell News, the latter paper having been purchased by Mr R. W. Whelan Boyle, the Daily Chronicle was started in 1883 under the editorship of Lord Chamberlain. The Daily Chronicle, on the other hand, started in 1893, having a large staff, and was at first conducted by Robert Pearson, who was afterwards a great newspaper proprietor of very much influence.

The Daily Chronicle had taken a leading part in many public movements since 1877. It was conspicuous in its advocacy of the cause of the women in the London dock strike of 1889, and in the great mining strikes of 1892 and 1893, which was conducted by Mr Robert Pearson Rosebery in November 1893, raised over £13,000 for the relief committee. Much attention was given to the theosophical discussion which occurred in the course of a Daily Chronicle article, and to the events which followed. Mr Pearson had appeared before the British Association at Bristol in 1898. The Chronicle had an active part in the negotiations which led to the Venezolan Arbitration Treaty of 1897; it energetically advocated the cause of the Armenians and Turks during the massacres of 1896, and it encouraged the Greeks in the war with Turkey in 1897. Its foreign policy was, however, more distinguished by good will than by discretion—and notably in the latter instance. The Daily Chronicle was not only the leading newspaper in London, but in regard to the County Council, Borough Councils and the School Board. Its new successes included the first announcement of the revolution in eastern Rumelia (1896); the first circumstantial account of the death of Prince Randolph (1898); Nansen's own narrative of his expedition towards the North Pole; Sir Martin Conway's journey across Spitzbergen in 1896; and the first ascent of Aconcagua in 1897.

In 1890 the illustrated morning daily paper, the Daily Graphic, was founded by W. L. Thomas (1850-1901) as an offshoot from the weekly Illustrated Graphic, and soon came into its own. The Daily Graphic was managed by Mr Robert Pearson, who was afterwards a great newspaper proprietor of very much influence. In 1906 a new Liberal morning daily was started by Mr Franklin Thomason in the shape of the Tribune, edited by Mr W. H. Hill, who was subsequently a great newspaper proprietor of very much influence. The Tribune was managed by Mr Robert Pearson, who was afterwards a great newspaper proprietor of very much influence. The Morning Leader, under the same management as the (evening) Star, started to flourish, but the Morning had but a brief career.

The halfpenny Daily Mail was originated by Mr Alfred Charles Harmsworth (b. 1865), who was subsequently created a baronet (1902) and in 1905 a peer as Baron Northcliffe; it appeared in 1896, on the same day as Sir G. Newnes's penny Courir (which only lasted a few weeks). In the evolution of English newspapers, the Daily Mail was a great step forward; it furthered the work begun by the Daily Telegraph in earlier days. It was the first halfpenny morning newspaper to place its content before its readers completely, that is to say, not to offer any charge for the paper. The Daily Mail, in its first edition, appeared simultaneously in London and Manchester, the whole of the contents being telegraphed nightly. In May 1904 it began publishing a continental edition in Paris. The sensational success of the Daily Mail, with its large circulation of readers throughout the country, and particularly in London, was due to the adoption of the following policy: a close and lasting bond of interest; a large circulation, and resulting advertising revenue, gave it an influence which in politics was used on the Unionist side; but the readers of the Daily Mail went to it, not for politics, but for news, briefly and brightly displayed. Its triumph represented the
success of a business organization, in which individual views on affairs played a part.

The penny Daily Express, founded by Mr Cyril Arthur Pearson (b. 1866) on the lines of the Daily Mail, first appeared in 1900, and its senior editor, Hugh Ismay, with R. D. Blumenfeld as its head, was the first to introduce the practice of 'blue-pencil' editing. The Daily Mirror started in 1903 under the editorship of Colonel Torrens. The Times, the Daily Telegraph, and the Daily Mail are all newspapers founded in the 19th century, with the Daily Express and the Daily Mirror being the most successful of all the evening papers. The Daily Telegraph was the first to introduce the practice of 'blue-pencil' editing.

The Daily Mirror, started by Mr Harnsworth as a women's penny daily in 1904, failed to attract in its original form, but when it was transferred to London in 1905, it became a successful news sheet. The Daily Herald, founded in 1908, was also a success, and was later adopted by the Labour Party. The Daily Express, the Daily Mirror, and the Daily Herald were all established in the 19th century, with the Daily Mail and the Daily Telegraph being the most successful of all the evening papers. The Daily Telegraph was the first to introduce the practice of 'blue-pencil' editing.

By the end of the 19th century, the evening newspapers had become more and more influential, and the proprietors of the Daily Express, the Daily Mirror, and the Daily Herald were all successful in attracting readers.

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Poll Mall abandoned in 1892. Gradually these changes took effect. In 1908 Mr Theodore Andrea Cook, who had been assistant-editor since 1878, bought the house for a nominal sum from Ronald MacNeill (till 1903) who acted in this capacity, with Mr W. D. Ross as manager. Meanwhile the *St James's Budget*, which up to 1893 had been a weekly edition of the *St James's Gazette*, became a daily, weekly, edited from the same office by Mr J. Penderel-Brodhurst (afterwards editor of the *Guardian*), who had been on the editorial staff since 1888; and it continued to be published as a separate daily newspaper until the amalgamation with the *Morning Standard* in 1895. From the days of Daniel Defoe there have always been newspapers bearing the unmistakable impress of an individual and powerful mind. Cobbett's *Weekly Register* and the *Weekly Herald* were notable influences on the literature of its greatness and in its meanness as could be found throughout its entire annals. And Cobbett's paper has had many successors, some of which, profiting by the marvellous mechanical appliances which have come into existence, have exercised a greater influence than was possessed by the *Weekly Register* in its most prosperous days.

The history of the series of weekly reviews practically begins with the *Examiner*, which was founded in 1808 and had a long career as one of the most prominent organs of the Liberal party, ending in 1881. That its literary reputation was great resulted naturally from a succession of such editors as Leigh Hunt, Albany Fonblanque, John Foster and Henry Morley. This was succeeded in January 1817 by the foundation of the *Literary Gazette*, the proprietor of which was Henry Colburn and the first editor William Jordan. Jerdan succeeded in inducing Crabb and Campbell to contribute to it, and among those who assisted him were Bulwer Lytton, Barry Cornwall and Mrs Hemans. The *Literary Gazette* came to an end in 1826. At the end of August 1827 the *Quarterly Review* was founded, which for time had extraordinary popularity; to it he contributed the most brilliant of his *jeux d'esprit*.

Epochs in the development of this form of literature were marked by the *Edinburgh Review* (1813-1829) and *The Spectator* (1711), the latter sold the paper to Mr Scott, who retired, however, from the editorship after a few months; and for a time the *Spectator* was in low water. In 1861 it passed into the hands of Mr J. St Loe Strachey (b. 1860), but under him it became a more powerful organ, if only because it more than maintained its former standard of criticism. In 1886 the *Spectator* was purchased by the Free Trade Unionists, who, however, at the end of 1895, sold it to the *Spectator and Saturday Review*. It is the *Spectator* and *Saturday Review* of the *Spectator* and the "Spectator" and the *Saturday Review*.

When the Poll Mall Gazette was sold to Mr Astor in 1892 and converted into a Conservative organ, Mr E. T. Cook, the editor, and most of his staff, resigned, and in 1893 they came together again on the *Westminster Gazette*, for a purpose by Sir G. Nwens (who had made a fortune out of *Titt-bit* and other popular papers) as a penny Liberal evening paper. It was printed on green paper, but the novelty of this soon wore off. The paper was conducted on the lines of the old *Poll Mall*, and it had the advantage of a brilliant political cartoonist in F. Carruthers Gould. In 1894 Mr Cook was appointed editor of the *Daily News*, a paper which was also conducted on the old *Poll Mall* lines, and Mr A. B. Gould, who had been his assistant-editor, Mr Gould (who was knighted in 1906) being his chief assistant. Apart from Sir F. C. Gould's cartoons, the *Westminster* became conspicuous in London evening journalism for its high standard of production and the quality of its columns. It gradually became the chief organ of Liberal thought in London. One of its early literary successes was the original publication of Mr Anthony Hope's *Dolly Dialogues*, and it continued to maintain, more than any other evening paper, the older literary and political tradition of the "gentlemanly journalism" out of which it had sprung. In 1908 a change of proprietorship took place, the paper being sold by Sir G. Newnes (d. 1910) to Mr (afterwards editor of the *Echo* in London, and disappeared from the scene. In 1868 appeared the *London Echo*, published by Henry Cassell. It had for its first editor, until 1875, Mr (afterwards Sir) Arthur Arnold (1833-1900). It was a political paper, and was conducted by a committee, but was shortly afterwards bought by a Conservative syndicate. It was sold to the *Morning Star* (1887) and then became the *Morning Chronicle*. It was bought by Messrs Harnworth for £25,000, and under Mr Kennedy Jones's management developed into a highly successful property. On 17th January 1887, a new proprietorship of the *Morning Chronicle* was formed by the **Mr T. P. O'Connor (b. 1848), as a half penny evening newspaper in support of Mr Gladstone's policy. When Mr O'Connor left the paper, Mr H. W. Massey became its editor, and subsequently Mr Ernest Parke. In 1909 the Star was acquired by a new proprietorship in which Messrs Cadbury and the *Daily News* had an important share. From the first it was conceived for its advanced politics, and also for excellent literary criticism. In 1893 Mr T. P. O'Connor founded the *Sun*, which eventually passed on the title of a succession of proprietors and came to an end in October 1906.

As regards the purely sporting press in London, the *Sporting Life*, which was founded in 1836, became incorporated the old *Bell's Life*. The *Daily Sportsman*, the leading paper, was founded in 1865. The financial daily press is a modern creation and has taken many forms. In 1884 the financial *Financial Times*, under Mr H. H. Marks, made its appearance, and in 1888 the *Financial Times*, and these became the leading papers of their class. The weekly press (see also under *Periodicals*) has always worn a motley garb. Weekly publication facilitates the individuality of a journal, both as respects its editorship and as respects its contributors. To the best of my knowledge, there exists no newspaper in the world which is solely and entirely the work of one and the same individual. From the days of Daniel Defoe there have always been newspapers bearing the unmistakable impress of an individual and powerful mind. Cobbett's *Weekly Register* and the *Weekly Herald* were notable influences on the literature of its greatness and in its meanness as could be found throughout its entire annals. And Cobbett's paper has had many successors, some of which, profiting by the marvellous mechanical appliances which have come into existence, have exercised a greater influence than was possessed by the *Weekly Register* in its most prosperous days.

The *Spectator* was edited for thirty years by Robert Rintoul. In 1888 the latter sold the paper to Mr Scott, who retired, however, from the editorship after a few months; and for a time the *Spectator* was in low water. In 1861 it passed into the hands of Mr J. St Loe Strachey (b. 1860), but under him it became a more powerful organ, if only because it more than maintained its former standard of criticism. In 1886 the *Spectator* was purchased by the Free Trade Unionists, who, however, at the end of 1895, sold it to the *Spectator and Saturday Review*. It is the *Spectator* and *Saturday Review* of the *Spectator*. The *Spectator* and the "Spectator" and the *Saturday Review*.
was sold by the heirs of Mr. Beresford Hope to Mr. Lewis Edmunds, from whose hands it soon passed to Mr. Frank Harris. In 1809 the paper was sold to Lord Hardwicke and came under the editorship of Mr. William Hope who resided in this position when, after Lord Hardwicke's death in 1905, it passed into the hands of Mr. Gervase Becket.

The Saturday Review and Spectator, as the exponents of brilliant Truth and Cevanter, had grown very much and they themselves for some years; but when in 1886 the Spectator followed the Liberal Unionists in opposing Home Rule for Ireland, and ceased to support Gladstone, its long editorship passed to the hands of Lord Lonsdale in the Radical Speaker (1898); and in 1898 the threepenny Outlook (altered in price in 1905 to sixpence) was started, to present more particularly the growing interests of the Colonies and the Empire. The first editor of the Outlook was the proprietorship of Mr. J. L. Garvin (b. 1868) in its advocacy of Mr. Chamberlain's policy of a preferential tariff, when the Spectator became aggressively Free Trade. In December 1906 the Outlook was sold by its proprietor to Mr. Gervase Becket, and Mr. Garvin resigned the title.

In 1907 the Speaker was incorporated with the Nation, a new Radical weekly, edited by H. W. Massingham. Several ambitious new weeklies meanwhile started, and some passed away before the end of the century, such as the Realm, the British Review and the Review of the Week. The most brilliant of all these, which also lasted the longest, was the Scots (soon renamed the National Observer) which published in Edinburgh, and was conducted by Mr. J. S. Cottison. It began by a first number on 26th May, 1867, and was continued by Mr. J. S. Cottison until 1877. The Pilot (1900) under Mr. D. C. Lathbury was another brilliant attempt, but it failed to pay its way and hardly lasted for three years.

In 1879 a weeklies, was conducted by Mr. H. W. Massingham with a weekly, the Academy, founded in October 1869 by Dr. Appleton and edited by him. Later, under the editorship of J. S. Cottison, it was famous for its signed reviews and scholarly character; but the small circle to whom pure literature appealed made financial success difficult. In 1896 the Academy was bought by Mr. Morgan Richards, and for some years was edited by Mr. Lewis Hind, amalgamating Literature (a weekly conducted by Mr. L. A. L. Housman) and the Academy. Subsequently under changed proprietors it was successively edited by Mr. Teignmouth Shore and Mr. Anderson Graham. In April 1907 it was bought from Sir G. Newnes by Sir Edward Tennant, and thereafter conducted by Mr. Alfred Douglas, who in 1910 parted with it to a new proprietor.

The publication of Sunday editions of the daily papers has not found the same favour in England as in the United States. A Sunday Daily Mail and a Sunday Daily Telegraph appeared simultaneously; but public opinion was so violent against seven-day journalism that both were withdrawn. The oldest of the Sunday papers, the Observer (1791), was conducted by one editor, Mr. Doxat, for more than fifty years. It was one of the first papers to contain illustrations. In later years Mr. Edward Dicey was a notable editor. In 1905 the Observer passed into the hands of the Daily Telegraph, and编辑ed by Mr. and Mr. Harrison, a son of Frederic Harrison. In 1907 Mr. J. L. Garvin became editor, and under him the old influence of the Observer revived.

Lloyd's Weekly Newspaper started as an un stamped illustrated journal at a penny in September 1842. In 1843 it was enlarged in size, and the price raised to threepence. Curious ingenuity wasn shown in another new illustrated weekly, the Illustrated Times, which had been started by the Times (1841). From a weekly sale of 33,000 in 1848 it rose to 170,000 in 1861. In anticipation of the abolition of the paper duty, the price was then reduced to a penny, and its circulation continued to increase. It was conducted by Mr. F. Cattrell, but was eventually taken over by Reynolds's Weekly Newspaper, an extreme Radical paper with a large circulation, dates from May 1850. Other Sunday papers came later into existence—the People (1864) and the English Republic (1867) conducted by Mr. and Mr. Harcourt, the People's Weekly, which had been started by Mr. (1867) with which in 1904 amalgamated the Sunday Times (1822). The Referee (1877), a paper with a strong sporting and theatrical interest, is famous for the humorous contributions by Dagonet (C.M. Smeed) and for the fine illustrations which adorned its articles.

The London illustrated weekly papers the oldest, the Illustrated London News (1842), and the Pictorial World, which lasted for some years, began in 1874. In 1891 Black and White was started; and in 1892 the Sketch, edited by Mr. Clement Shorter (also then editor of the Observer) was introduced a lighter vein.

Mr. Shorter gave up the editorship of these two weekly papers in 1901, and became editor of a new illustrated weekly, the Sphere, with the proprietorship of which he came also to be associated. In 1897, the illustrated weekly of a high class, Country Life Illustrated, began in 1897.

The "Society" weeklies, Truth (1877), Vanity Fair (1868)—with a separate cartoon as a special feature, famous for the artistic work of Pellegrini, Leslie Ward and others—and the World, "Society" (1874), brought a new "note" into regular journalism, Mr. and Mr. Pellegrini, the World's most famous illustrator, contributing to the increase of the personal style which he did so much to introduce; and Truth made its proprietor, the politician Mr. Henry Labouchere, one of the most prominent men of the day. The World also published a Rural and Domestic Review as for its vigorous exposures of all sorts of public charlatanism.

Among other weeklies, important ones are such ecclesiastical and political weeklies, as the Spectator (1863), the Tableet (1840), Christian World (1857), Methodist Times (1885); the medical papers, the Lancet (1823) and British Medical Journal; the financial papers, the Economist (1843) and Statist (1851); and the great sporting and country-house paper, the Field (1853).

Among humorous papers Punch (1840) stands first (see Caricature), of which Mr. M. H. Spielmann published a History; Pan (1860–1901), Mr. Harry Furniss's Liba Joke (1894) (only for a few months), Judy (1867), Moonshine (1879), and Pick-me-up (1888), have also catered for popular mirth.

Women Journalists.

Women journalists were among the leaders of the women's movement in the 19th century. Among the prominent women writers of the period were Frances Power Cobbe (1822–1905), who was a member of the British Women's Suffrage Society and became a prominent public speaker; Jane Heavenly (1822–1905); and Jane 摘要
quickly afterwards; and other early papers worth mentioning were the Salisbury Journal (1729); Manchester Gazette (1730-1760); Manchester Mercury (1752-1762); the earliest Birmingham paper, Artiz's Gazette (1741); the Cambridge Chronicle (1744); and the North British Journal (1753). These were followed by the Liverpool Advertiser (1756) and Gore's General Advertiser (1755-1787). Of the above the Leeds Mercury (1757) became an increasingly important organ. The Newcastle Journal was first published in 1753, with a weekly price of three-halfpence. In 1726 it was reduced to four pence, with a circulation of 3000. Its price at this time was fourpence. The increase of the stamp duty in 1797 altered its price to fivepence. The York Mercury was purchased in 1801 by Edward Baines, who first began the insertion of "leaders," and whose family left an impress on not only journalism but literature as well. English provincial newspapers obtained a circulation of 1500; but the Mercury afterwards made rapid progress. When the Stamp Tax was removed, its price was reduced to a penny, and in 1901 to a halfpenny. For many years it admitted neither halfpenny nor a new sixpenny to its columns, and it had a powerful moral and political influence in Lancashire and Yorkshire.

The pollution of the duty on advertisements in 1853, of the stamp duty in 1855, and of the paper duty in 1861, opened the way for a cheap press, and within ten years of the abolition of the paper duty penny morning newspapers had taken up commanding positions. The Leeds Mercury, the Rotherham Advertiser, the Yorkpool, Manchester, Leeds, Bradford, Newcastle and Sheffield; in Birmingham and Nottingham; in Bristol, Cardiff and Plymouth; and across St George's Channel in Dublin, Cork, Belfast and Waterford. The provincial evening papers began to multiply. But any real importance as organs of opinion was still confined to only a few of the great penny press. The first to forecast the future was the Times, and to the last of its class, the Observer. The first to be in existence was the Liverpool Mercury (1857), Sheffield Telegraph (associated with Sir W. Leng), Liverpool Daily Post, Leeds Mercury and Western Morning News; others too numerous to mention here were at the same time catering to the curiosity of journalists who were to become famous in journalism, such as the Darlington Northern Echo, on which Mr W. T. Stead made his debut, while Mr Joseph Cowen for some years made the Newcastle Daily Chronicle a powerful organ. It began as strictly local organs. But even in 1870 it was beginning to be universally perceived that, though the influence of a newspaper depends upon the sagacity, sound judgment and courage of the editor, its success as a business enterprise rests mainly with the business manager. Managers demanded less localism, a wider range of news, prompter and fuller reports of all important events, longer parliamentary reports, parliamentary sketches, verbatim reports of speeches by statesmen of the first rank. In the early 'seventies such a thing as a full telegraphic report in a provincial morning newspaper of parliamentary proceedings, or of a speech by a leading statesman, was almost unheard of. After the early 'eighties there was short talk, but not had then covered the country with its organization. Reuter's foreign news service very briefly reported important events. Leading articles were written, but their circulation was not extended to the extent that their appearance was forecast, as the result of the social and educational changes. More newspapers had been content to fill their columns with local news and clippings from London and distant provincial papers put such matter aside. Telegraphic news rushed it out. In February 1870 the government took over the telegraph system. The advantage of the change was immediately felt by newspapers and their readers. In 1876, when the English and Irish newspapers, following Scotland's lead, began to open offices in London, where Fleet Street soon began to be an open directory to the provincial press—English, Scottish and Irish. The Scotch man in London not only attended to the 'London morning and evening papers, and the most enterprising English papers for convenience and advantage, engaged special wires. Others that were near enough to London to do so secured London news and advertisements by railway, and consequently that the paper was suppressed by the application of a system of special wires to the Commercial news, both home and foreign, especially American, was expanded. The Press Association spread its news-collecting organization over the whole country, and was stimulated to activity by the rising opposition of the Central News. All this energy had its "counterpart in the business side of the press. Rapid "perfecting", printing machines were introduced, and newspaper managers found themselves able to procure newspapers in practically unlimited quantities. Of the news itself there was an increased and more frequent circulation. New and more enterprising journals saved themselves by special London letters, parliamentary sketches and other special contributions. In the same way new newspapers sprang up, some to replace provincial newspapers, and these accordingly enjoyed new facilities for special effort and distinction. A more important matter, however, was the bombardment of Alexandria and the subsequent Egyptian War. The leading provincial newspapers had already emancipated themselves from localism, and in general news and criticism had risen almost, if not quite, to the average level of the London newspapers.
BRITISH

NEWSPAPERS

year the Gazette was transferred to John Reid, by whose family it long continued to be printed. In February 1705 Watson started the Edinburgh Courant. It was first printed by him, and later continued by his son, James Watson, who also published the Scots Courant, but at the site of allowance of the clerks of council. In 1710 the town council authorized Mr Daniel Defoe to print the Edinburgh Courant. It was therefore the place of the deceased Adam Boig. Four years earlier (1706) the town council advertised about the offices of Watson, James Watson, had begun the Scots Courant, which he continued to print until after the year 1718. To these papers were added in October 1741 the Edinburgh Flying Post and in August 1799, the Scots-Postman. Five years later this paper appears to have been incorporated with the Edinburgh Gazette. The Caledonian Mercury began April 25, 1720. At one period it was published three times and afterwards twice a week. Its first proprietor was William Rollan, an advocate, and its first editor Thomas Ruddiman. The property passed to Ruddiman on Rollan’s death in 1720, and remained in his family until 1772. It is curious to notice that in his initiatory number of April 1720, Rollan claimed a wide rate of distribution, his Mercury with that of 1660. This journal, he said in his preface to the public, “is the oldest [existing] in Great Britain.” And his successor of 1720 was continued by others of the paper of the Caledonian Mercury. He brought out a facsimile of No. 1 of Mercurius Caedonianus (January 1660), in its eight pages of small quarto, curiously contrasting with the great double sheet of the day. But this was done for a period of two months only, and was discontinued. The connexion of the two newspapers cannot be proved to be more than nominal. The Caledonian Mercury was the first of Scottish journals to give conspicuous place to literature—foreign as well as Scottish. In the 14 years of its editorship, Thomas Ruddiman, junior, virtually sacrificed his life,1 and the other, James Grant, went into exile, for the expression of conscientious political opinion. Its publication ceased after an existence of more than one hundred and forty years.

Notwithstanding the positive assertion 2 that the Edinburgh Courant and the Edinburgh Evening Courant “were entirely different journals, and that the contents of the one were not contained in the other” a substantial identity may be asserted upon better grounds than those for which identity used to be claimed for the Caledonian Mercury with Mercurius Caedonianus. The grant by the town council of Edinburgh in December 1718 of a licence to James McEwan to print an Evening Courant three times a week appears to have been really a revival, in altered form, of the original Courant, repeatedly referred to in earlier, but not much earlier records of the same corporation. So revived, the Evening Courant continued to be published until his paper to give foreign intelligence from original sources, instead of repeating the advice sent to London. In 1760 David Ramsay became editor, and, the journal adopted a more national character, and attained the largest Scottish circulation of its day. It was then of neutral politics. Subsequently, returning to its original title, and appearing as a daily morning paper, it ranked for long as the senior organ of the country, being answering at least the competition of the Scotsman caused its disappearance, and after amalgamating with the Glasgow News or the Scottish News in 1886, it expired in 1886.

The Edinburgh Weekly Journal began in 1744, but it only attained celebrity when, almost seventy years afterwards, it became the joint property of Sir Walter Scott and of James Ballantyne. Scott wrote in its columns many characteristic articles. Ballantyne died until his death in 1833, and was succeeded in the editorship by Thomas Moir. The paper was discontinued about 1840. The Edinburgh Evening News started in 1783.

The Edinburgh News, a Scottish newspaper, was established as a twice-a-week paper in January 1817 and became a daily in June 1855. It ranked as the chief organ of the Liberal party in Scotland, until the Home Rule split in 1886, when it became Unionist. It was founded by William Ritchie, in conjunction with Charles Watt. For a short period it was edited by J. R. M'Culloch, the eminent politician. He was succeeded by MacIntyre, who edited the paper until 1845, when he in turn was by Alexander Russel (1845–1870), who (as Mr L. C. Keith) may be considered its founder.

Kingdom’s Intelligence. But this was a London newspaper, dating from 1662, which may occasionally have been reprinted in Scotland; no such copies, however, are now known to exist. In like manner the Scottish Mercury, No. 1, May 8, 1692, appears to have been a London newspaper, printed from Scottish types. Almost the same article written in 1848, in the Scottish Journal of Topography, vol. ii. p. 301, it is mentioned as an Edinburgh newspaper.

During an imprisonment of six weeks in the Tolbooth of Edinburgh his health suffered so severely that he died very shortly after his release.

† History, Grant of the Newspaper Press (1873), iii. 412. great ability until 1876. In 1859 the first of Hoe’s rotary machines brought into Scotland was erected for the Scotsman. The Scotsman founded a great newspaper, strong both on its literary side and also in geographical scope. It also has been in Edinburgh, Scotland, its publishing offices being opened in Glasgow, which was a better centre for distributing in the west, and in Perth for the north and the Highlands. The Scotsman has maintained its rivals in Edinburgh. In 1885 the Scotsman issued an evening paper.

The North British Advertiser was founded in 1872. The Witness began in 1840 as the avowal of the subservience of the Free Church party in Scotland. In its first prospectus it calls itself the Old Whig. The paper appeared twice a week, and its editor, Hugh Miller, very soon made it famous. In the course of less than sixteen years it had so far increased its size and its influence that the literary ability, still more so for a wide range of acquaintance and of original thought, must of all for deep conscientiousness. It survived its rivalers’ deaths and, from 1853, this journal bore the name of the Press. In Glasgow the Glasgow Herald was founded in 1782. When the Scotsman extended its activities to Glasgow, the Herald opened an office in Edinburgh; and it took an active part in breaking down the wall of prejudice, and in 1786 it is said that it had a circulation of 1000. Its paper was a halfpenny, and later it became a powerful organ. The North British Daily Mail was established in April 1847. George Troup, its first editor, made it specially famous for the organizing skill with which he brought its intelligence at an unprecedented speed from Carlisle, the nearest point on the line, connected with London by railway. The Glasgow Evening News was started in 1870.

The Aberdeen Journal was founded as a weekly paper in 1748 and became a daily in 1876. In 1879 it issued an evening edition. The Aberdeen Daily Free Press, originally a weekly, dates from 1833. In 1881 it issued an evening paper in connexion with itself. The newspaper was started in 1780. The first roll for the Glasgow News was in 1809. In 1831 it began in 1865. Five years later the newspaper appeared under the name of the Glasgow Intelligencer. It ceased to appear, the official organ of the vice-regal government. The Freeman’s Journal was established in 1728. Edislaw’s News-Letter began in 1744, took the title of Saunders’s News-Letter in 1754 (when it appeared three times a week), and became a daily newspaper in 1777.

The Colonial Gazette, a weekly newspaper, has long been prominent among the Dublin papers. It was established as a daily newspaper by the British Government to promote the interests of the Irish people. It is published in English and was founded by a committee of the society of “United Irishmen” in 1763, and it was more to the demands of the time. The paper has been published in Dublin, and was first issued with the Dublin News-Letter of 1805. Five years later it was published in 1810. The Dublin Intelligencer (No. 1, September 30, 1809), of this title, was issued from 1790 to 1800. Both of the papers are continued to appear, and the number of are published in the Dublin papers of Ireland. In 1710 or in 1711 (there is some doubt as to the date of the earliest number) the Dublin Gazette began to appear, the official organ of the British Parliament. This newspaper first appeared in 1728. The Dublin News-Letter began in 1744, took the title of Saunders’s News-Letter in 1754 (when it appeared three times a week), and became a daily newspaper in 1777.

The Irish Waterford was started in 1737; the Belfast Telegraph was started in 1789; and the British Northern Whig in 1824.

British Dominions beyond the Sea.

It is unnecessary here to give all the statistics for the British Colonial Press, which has enormously increased in modern times. So far as its early history is concerned, it may be noted that the Kempt’s Gazette was started in Barbados in 1731 and Granada followed with its own paper in 1733. The first of its kind in the West Indies was The Halifax Gazette, which was established in 1751 and the Montreal Gazette in 1737. The first Australian paper was the Sydney Gazette and New South Wales Advertiser (1803-1843), the Devon Star, in Van Diemans Land (1852-1855), and the first paper on the south side of the Great Barrier Reef was the Townsville Daily Bulletin (1864-1889). The most extensive of the newsprint of the British Colonial Press, which had been produced outside the sea, and the well-conducted newspapers. The Canadian Press has naturally had certain marked affiliations with the country of newsprint and the globe.
the organ of the Liberal party, has played a leading part in Canadian journalism. In London and in India, the Oriental Press is the foremost organ; and among the colonial morning newspapers, those of Madras and Calcutta are the most important. The London and the New York Evening Post are still the two leading journals of the world; but the London papers are much more influential than the American daily newspapers.

In the colonial press, the rivalry between the two great periods of the 18th century, the first half of the century and the second, is not so evident as it is in the American press. The first half of the century was the period of the establishment of the colonies, and the second was the period of their consolidation. The first half of the century was the period of the American Revolution, and the second was the period of the War of 1812.

The first half of the century was the period of the American Revolution, and the second was the period of the War of 1812.

3. NEWSPAPERS OF THE UNITED STATES

Massachusetts.—Boston was the first city of America that possessed a local newspaper; but the earliest attempt in that direction, made in 1771, 'A Boston News-Letter' was not a success. It was published in the Publick Occurrences, which followed in September 1690, but was both suppressed by the government of Massachusetts. Nearly fourteen years afterwards (April 24, 1704), the first number of the Boston News-Letter was "printed by B. Green, and sold by Nicholas Boone." Its proprietor and editor—so far as it can be said to have had an editor, for extracts from the London papers were its staple contents—was John Campbell, postmaster of the town. In 1719 he enlarged his paper, in order, as he told his readers, "to make the news newer and more acceptable; ... whereby that which steamed in the former half-sheet by the post, is now by the sheet. ... This time twelvemonth we were thirteen months behind with the foreign news beyond Great Britain, and now less than five months; so that ... We have retrieved about eight months since January last;" and he encourages his subscribers with the assurance that if they will continue steady until January next, life permitted, they will be accommodated with all the news of Europe that are needful to be known in these parts." But Campbell's new plans were soon disturbed by the loss of his office, and the commencement of a new journal by his successor in the postmastership, William Draper, entitled the Boston Gazette, "published by authority" (No. 1, 21st December 1719). The old journal had a bitter controversy with his rival, but at the end of the year 1722 relinquished his concern in the paper to Benjamin Green, who carried it on, with higher aims and greater success, until his death, at the close of 1733, being then succeeded by his son-in-law, John Draper, who published it until December 1762. By Richard Draper, who followed his father, the title was altered to Massachusetts Gazette and Boston News-Letter; and the maintenance of the British rule against the rising spirit of independence was uniformly undertaken by the paper, and that of his widow (to whom, at a subsequent period, a pension was granted) for the general conditions producing the modern type of American newspaper, see the first section of this article. In the following account of American and foreign newspapers, the historical mention of these papers is also noted. The official editors of the Ency. Br. has been utilized and in parts revised.

In other words, the attention of the Bostonian politicians was engrossed on the siege of Belgrade, when their contemporaries in the mother country were intent on the destruction of the Spanish fleet on the coast of Sicily.
granted by the British government). It was the only paper printed in Boston during the siege, and ceased to appear when the British troops were compelled to evacuate the city.

The Boston Gazette, founded in 1719, had James Franklin, elder brother of the celebrated Benjamin Franklin, as its first printer. It lasted in March 1726, though its editorship was changed with the change of the proprietors. On the 17th August 1721 James Franklin started the New England Courant, the publication of which ceased in 1727; and two years later Benjamin Franklin purchased the Pennsylvania Gazette, which he continued weekly until 1765.

To the Boston Gazette and the Courant succeeded the New England Weekly Journal (20th March 1727; incorporated with the Boston Gazette in 1741), and the Weekly Rehearsal (27th September 1731), which became the Boston Evening Post (August 1735), and under that title was for a time the most popular of the Boston newspapers. It aimed at neutrality in politics, and therefore did not survive the exciting events of the spring of 1775. Several minor papers followed, which may be passed over without notice. A new Boston Gazette, which began in April 1755 (merged in 1836 in the Centinel), is of more interest. For a long time it was the main organ of the popular party against England, and expanded its policy with great ability, and in a dignified tone. Otis, John Adams, Samuel Adams and Joseph Warren were amongst its writers. It was strongly Republican after the adoption of the constitution, especially opposing its old contributors.

The Massachusetts Spy (1770), under the indefatigable editorship of the American historian of printing, Isaiah Thomas, did yeoman's service in this struggle, although of a different kind from that of the Boston Gazette. The latter spoke chiefly to the thinkers and natural leaders of the people. The Spy was a light and active skirmisher who engaged his antagonists wherever he met them, and frequently carried the war into the enemy's country. In July 1774, during the operation of the Boston Port Act, and soon after the landing of four British regiments, it adopted Franklin's odd device, representing Great Britain as a dragon, and the colonies as a snake divided into nine parts with the motto, "join or die." But Boston grew too hot for the patriotic printer, and he had to remove to Worcester on the day of the battle of Lexington. Here the paper continued to be published (as the Worcester Spy) until 1786,—the lack of the stirring revolutionary matter being occasionally supplied by the republication in its columns of entire books, such as Robertson's America and Gordon's History of the Revolution. This journal, like so many more, was for a time killed by a tax. The stamp duty imposed in March 1776, although repealed, was passed into law. It lasted until the end of 1775, and under that title was for a time the most popular of the New England newspapers.

The New Hampshire.—The New Hampshire Gazette (1756; daily edition since 1852), published at Portsmouth, was the "father" of the New England press. The Cheshire Republican (1793) and New Hampshire Sentinel (1799; evening edition since 1890) are still published at Keene.

Vermont.—The earliest paper established in Vermont was the Green Mountain Postboy, first published in April 1781. The oldest important paper in Vermont is the Rutland Herald (established in 1794 as a weekly; daily edition since 1861). The Vermont Journal of Windsor, Vermont, was established in 1791.

Maine.—The first papers of any importance published in Maine were the Portland Advertiser (evening, 1759), of which James G. Blaine was editor in 1857-1860; and the Eastern Argus of Portland (September 1803). The latter was established by Nathaniel Willis (1780-1789), the father of N. P. Willis. Willis was converted in Portland by Edward Payson and about 1808 he left the paper. In 1816-1826 he established in Boston the Recorder, which is supposed to have been the first American religious paper. In 1827 Willis established the Youth's Companion, the most popular American juvenile paper, and the Eastern Argus was edited in 1830-1834 by Seba Smith (1818-1868), who was established in 1829 the Portland Courier, which he edited until 1857 and to which he contributed the sketches published in 1833 as Life and Letters of Major Jack Downing.

Connecticut.—The Connecticut Courant of Hartford was established in October 1764 as a weekly; in 1803 there appeared a semi-weekly issue, and its daily issue, the Hartford Courant, first appeared in 1837. The paper was a strong supporter of the administrations of Washington and Adams. Probably the best known of its editors is Joseph R. Hawley, Charles Dudley Warner was for a long time a member of the staff. The Hartford Times (semi-weekly 1817; daily, 1841) has always been a prominent paper. Its principal early editors were Gideon Wells in 1826-1836 (in 1861-1866 he was United States secretary of the navy), and John Milton Niles (1826-1836), who was United States
Newspapers | American

The oldest newspaper now published in Baltimore is the American, the successor of the Maryland Journal and Baltimore Advertiser founded in August 1773; on the 21st September 1814 it published “The Star Spangled Banner.” The Baltimore Sun was started in 1837.

New Jersey.—New Jersey had no really established newspaper before the Revolution, although the first number of an intended journal was published in 1765, under the title of the Constitutional Gazette, containing matters interesting to Liberty, but no wise repugnant to Royalty. The earliest regular paper was the New Brunswick Times, which began in December 1775 at Burlington (soon removing to Trenton), and ceased publication in 1786. A State Gazette (weekly), now published in Trenton, dates from 1792 (daily, 1846); Trenton’s largest paper is the Times (evening; 1883). The Sentinel of Freedom, a Newark weekly, was first published in 1796; its daily edition, the Star, dates from 1832. Newark’s largest paper is the Evening News (1883). The New Brunswick Times was first published as a weekly in 1792; a daily edition was added in 1849.

Virginia.—Virginia, notwithstanding its illustrious predecessor, the province of Raleigh, the cradle of Washington, never produced either periodical or newspaper printed in 1780 by, so that (as respects one-half at least of the wish) there was once a prospect that the devout aspiration of Sir William Berkeley might be realized. “Thank God,” said this Virginia governor in 1671, “we have neither free school nor printing press, and I hope may not have for a hundred years to come.” The earliest newspaper established in the state was the Virginia Gazette, commenced in 1736. It was still published at Williamsburg in 1766, when a second paper of the same name was established there. This second paper, backed by Thomas Jefferson, was afterwards called the American Advertiser and then the Commercial Advertiser, and stopped in 1822. The Richmond Enquirer, which started in 1808, succeeding the Examiner, early attained a leading position as a Democratic organ; it was discontinued in 1880. The Alexandria Gazette (1816) is still published.

Washington, D.C.—The first “administration organ” (i.e. expressing the political views of the administration, but not officially a government paper), was the National Intelligencer (1800); this position it held until 1829, when it became an opposition paper. In Jackson’s administration the United States Telegraph, which he published himself, ceased. A new paper, the Daily Madisonian, President Tyler’s organ, and in 1845 the Union became the organ of President Polk. To the Union in 1845 the Globe sold out, but only as a party organ. In 1846 to 1871 the Globe was the publisher of the Congressional debates. President Taylor’s organ during his administration was the newly established Republican. During President Fillmore’s presidency the National Intelligencer, which was a Webster-Whig organ, returned to power, and during Pierce’s administration the Union was again the administration organ, with the Evening Star (1852) a close second. In Buchanan’s administration the influence of the Union continued. During the Civil War most of these papers died off, except the Star and the National Intelligencer, which in 1870 removed to New York, where it stayed as a semi-weekly for some time. The Washington Post, now the leading paper, was founded in 1877. The National Era, the organ of the American and Foreign Anti-Slavery Society, first published in Washington in 1844 (the Cincinnati Philanthropist was merged with it in 1847) by Gamaliel Bailey, is known principally because Uncle Tom’s Cabin ran in its columns as a serial in 1851–1852. A New
NEWSPAPERS

National Era (1859), was conducted in Washington by Frederick Douglass and his sons. The New York Gazette (which started in New York City on the 16th of October 1725) was followed by the Weekly Journal (No. 1, 5th November 1733), still memorable for the publication free of subscription which it established in 1781, on its front page, the New York Mercury, first headed by John Peter Zenger, and for the masterly defence of the accused by Andrew Hamilton. "The trial of Zenger," said Gouverneur Morris, "was the germ of American freedom." Gaine's New York Mercury was published from 1752 to 1783. James Rivington (1724-1802) in 1773 published the New York Gazette as a loyalist sheet, but his press was destroyed in 1775 and he went to England; in 1777 he returned and published Rivington's New York Loyal Gazette (semi-weekly), renamed first the Royal Gazette and then Rivington's New York Universal and Advertiser, which came—a and in 1785 (q.v). The semi-weekly Independent Journal was one of the papers of New York City in which, between October 27th, 1787, and April 2nd, 1788, the Federalist essays were published; in 1788 it became part of the New York Gazette, and then in 1806 was consolidated with the Journal of Commerce. The first daily newspaper published in the city or state of New York was the New York Journal and Register, commenced in 1788. In 1802 the Morning Chronicle, edited by Peter Irving (1771-1838), a brother of Washington Irving, was established as Aaron Burr's organ; in 1805 it was merged in the Poughkeepsie Journal. Another political paper was the New York Commercial Advertiser, under Noah Webster, which had its own weekly edition, the Herald. These in 1797 became the Commercial Advertiser and New York Spectator respectively. The former (surviving as the Globe and Commercial Advertiser) was edited in 1820-1844 by W. L. Stone and in 1867 by Thurlow Weed.

In 1801 the aggregate number of papers published within the state was 66, of which 14 belonged to New York City. Ten years later the city press included 8 daily journals, with an aggregate daily circulation of 10,000 copies. No one paper circulated more than 2,000, and but two—the Evening Post (1801) and the Commercial Advertiser (1797)—attained that number.

The New York Evening Post was at first strongly Federalist and practically an organ of Alexander Hamilton, with which John Jay assisted in founding it. Its first editor was William Coleman (1766-1829). In the years immediately following 1810 John Rodman Drake contributed to the Post the "Croaker" pieces, in which FitzGreene Halleck joined. William Cullen Bryant began to write for the Post in 1826, and became its editor-in-chief in 1828. John Bigelow, Parke Godwin, Carl Schurz, Horace Greeley, E. L. Godkin, editor from 1876 to 1881, and Henry Villard, were among the important names in its history. Rollo Ogden became editor in 1903. Closely connected with the Post was the weekly Nation, long edited by E. L. Godkin (q.v.). The Post was strongly Federalist until the War of 1812; it opposed the Hartford Convention; until 1860 it was consistently Democratic; it supported Lincoln in 1860 and in 1864 and Grant in 1868; in later years it was an advocate of free trade and of civil service reform. There were earlier Evening Posts in 1746-1747 and in 1794.

The cheap (two-cent) press of America (the previous price had been usually one and one-half cents) began in New York in the shape of the Morning Post (1st January 1833), which only lasted for a few weeks; the real pioneer was the Daily Sun (No. 1, 23rd September 1833), written, edited, set up, and worked off by Benjamin Henry Dury, a journeyman printer. It sold at one cent till the Civil War, when it charged two cents, the price remaining at that figure. The New York Sun was acquired in 1868 by Charles Anderson Dana (q.v.), who made it a powerful organ, and under his successor William M. Laffan (1849-1860) it remained one of the great dailies.

The New York Herald followed in May 1835, founded and edited by James Gordon Bennett (q.v.), and his efforts and those of his son gave it an enormous commercial success. The New York Tribune was established in 1841 by Horace Greeley (q.v.), who remained its editor and one of its proprietors until his death, shortly after his defeat for the presidency in 1872. He was succeeded as editor and proprietor by Whitelaw Reid (b. 1837), who had joined the staff in 1868 and afterwards became U.S. Ambassador in London. Directed by two such men the Tribune became a powerful organ.

The New York Times, which was once sunk with the Tribune and Sun among the best modern American daily papers, was established by Henry J. Raymond (q.v.) in September 1851; and, though absent at times in the discharge of his duties as lieut.-governor of New York and member of Congress, he continued its editor and chief proprietor until his death in June 1869. At the end of the century, under the control of Mr Adolph S. Ochs (b. 1858), it was prominent in American journalism for the excellence of its news service and literary character.

The New York World was founded in 1866 as a highly moral and religious sheet with immeasurably larger circulation. It was taken until 1861 the Morning Courier and the Enquirer were merged into it. In 1864 it and the Journal of Commerce were suppressed for several days by the Federal authorities because each had been tricked into publishing a forged presidential proclamation of a draft and of a general fast day. In 1869 it became the sole property of Manton Marble (b. 1834), who retired from its editorship in 1875; in 1876 it was sold to a syndicate and came under the control of Jay Gould; in 1883 it was purchased by Joseph Pulitzer (b. 1847), and its modern activity began. It worked hard for Grover Cleveland, especially in its first obtaining munificence Worth Bryan and his policies.

The journals owned by W. R. Hearst (b. 1863) all over America represent perhaps more conspicuously than any others the popular developments which at the end of the 19th century were associated with the nickname of the "Yellow Press." His papers in New York in 1910 were the American (originally Journal; morning except Sunday); the Evening Journal, the American and Journal (Sunday) and Das Morgen Journal. Starting in the 'nineties as proprietor of the San Francisco Examiner, Mr Hearst had a large fortune to enable him to carry out his creed of a thoroughly democratic journalism, appealing particularly to the least literate masses and supplying all sorts of sensational news. The class prejudice often underlying the policy of his papers was bitterly criticized and resented by sober American opinion, but their passionate appeal to the masses, combined with their audacious and lively presentation of news, gave Mr Hearst nevertheless a position of considerable power; and no secret was made of his ambition to reach the highest political positions, both in New York itself and in the Republic. Dangerous as his social influence was considered by important sections of the community, and because of his obtaining municipal office or presidential nomination, it remained the fact that, in the type of journalism so indefatigably conducted under him, he represented a serious force in American social and political life, and his journalistic methods were a remarkable outcome of the conditions of a modern free press in a democratic country, where a large public exists for the consumption of the sort of newspaper fare which he was ready to provide.

The New York Press (1887) is a morning Republican paper of the strictest party type.

An important commercial paper of long standing in New York is the Journal of Commerce and Commercial Bulletin, founded in 1827 as the Journal of Commerce by Arthur Tappan (1786-1865) and his brother Lewis Tappan (1788-1873), and in 1893 consolidated with the Commercial Bulletin (1865). The Journal of Commerce in 1829-1830 was the first American paper to send out news schooners which intercepted packet ships which brought news especially of the French Revolution of 1830. Arthur Tappan, who was one of the founders of Oberlin College, established in 1833 the Emancipator, an abolitionist paper, of which in 1837-1838 Elizur Wright (1804-1885), and in 1837-1840 Joshua Leavitt (1794-1873), were editors. Leavitt took the paper to Boston. It was the weekly organ of the American Anti-Slavery Society.

The New York Evening Mail (1833), for a time the Mail
and Express, was bought in 1888 and reorganized by Elliott Fitch Shepard (1833–1893). The Express was established in 1830 by John Graham and Isaac Ingraham, and was bought by the firm of Hall, Shepard, & Company in 1851, and continued under the name of the New York Daily Express. The Daily Express was founded by James G. Gordon, who later became editor and publisher of the New York Times. The Daily Express was first published in 1812; in 1843; and later in 1853. The Daily Express was a daily newspaper, and its circulation was more than 40,000 in 1862.

In 1856, the Daily Express was bought by the Daily News, which was established in 1847. The Daily News was the first daily newspaper in New York City, and its circulation was more than 50,000 in 1862. The Daily News was a daily newspaper, and its editor was William A. Riker, who later became editor and publisher of the New York World. The Daily News was first published in 1849, and its circulation was more than 40,000 in 1862.

In 1858, the Daily News was bought by the Daily Tribune, which was established in 1848. The Daily Tribune was a daily newspaper, and its circulation was more than 50,000 in 1862. The Daily Tribune was a daily newspaper, and its editor was A. T. Ticknor, who later became editor and publisher of the New York Times. The Daily Tribune was first published in 1850, and its circulation was more than 40,000 in 1862.

In 1864, the Daily Tribune was bought by the New York Times, which was established in 1851. The New York Times was a daily newspaper, and its circulation was more than 50,000 in 1862. The New York Times was a daily newspaper, and its editor was John W. Hays, who later became editor and publisher of the New York Times. The New York Times was first published in 1851, and its circulation was more than 40,000 in 1862.

In 1865, the New York Times was bought by the New York Daily Graphic, which was established in 1863. The New York Daily Graphic was a daily newspaper, and its circulation was more than 50,000 in 1862. The New York Daily Graphic was a daily newspaper, and its editor was J. W. Hays, who later became editor and publisher of the New York Times. The New York Daily Graphic was first published in 1863, and its circulation was more than 40,000 in 1862.

In 1866, the New York Daily Graphic was bought by the New York World, which was established in 1861. The New York World was a daily newspaper, and its circulation was more than 50,000 in 1862. The New York World was a daily newspaper, and its editor was A. T. Ticknor, who later became editor and publisher of the New York Times. The New York World was first published in 1861, and its circulation was more than 40,000 in 1862.

In 1867, the New York World was bought by the New York Daily News, which was established in 1849. The New York Daily News was a daily newspaper, and its circulation was more than 50,000 in 1862. The New York Daily News was a daily newspaper, and its editor was W. A. Riker, who later became editor and publisher of the New York World. The New York Daily News was first published in 1849, and its circulation was more than 40,000 in 1862.

In 1868, the New York Daily News was bought by the New York Tribune, which was established in 1842. The New York Tribune was a daily newspaper, and its circulation was more than 50,000 in 1862. The New York Tribune was a daily newspaper, and its editor was A. T. Ticknor, who later became editor and publisher of the New York Times. The New York Tribune was first published in 1842, and its circulation was more than 40,000 in 1862.

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The larger papers of Columbus are the Ohio State Journal (morning, 1831), the Post-Press (evening, 1827), the Citizen (evening, 1890), and the Express and Westbote (weekly, 1880; Sunday, 1878; daily, 1890—the different editions being under different names). The News of Springfield has a weekly edition, the Weekly Republic, which was founded in 1817. The Toledo Blade (daily, 1848; weekly, 1839) before and during the Civil War contained the attacks on slavery and on political abuses written by Petroleum V. Nasby, i.e. David Ross Locke (1833–1888). The first of these letters (signed "Rev. Petroleum Vosnous Nasby") appeared in the Jeffersonian of Findlay, Ohio, in 1860, when he was its editor. He had edited small papers in Plymouth and Mansfield (O.) before his connexion with the Blade; in 1871 he became managing editor of the Evening Mail of New York City, Will Carleton (b. 1845) was a member of the Blade's staff, and contributed to the Blade his first "ballads." The News-Bee (evening) of Toledo was formed in the consolidation in 1903 of the Times (1846), News (1888) and Bee (1804), and has a morning edition called the Times and a Sunday edition called the Times-Bees. The Zanesville Gazette (Republican; daily, 1840) has a weekly edition dating from 1809 (originally the Muskingum Messenger).

Among the smaller newspapers of Ohio the following are more than 100 years old: the Western Star of Lebanon (weekly, 1806); the Ohio Patriot of Lisbon (weekly, 1808; daily and semi-weekly, 1868) and the Evening Democrat of Worthington.

Illinois.—The first newspaper in Illinois was the Illinois Herald (1814; succeeded in 1815 by the Illinois Intelligencer) of Kaskaskia (then the seat of government); it removed to Vandalia, which then became the capital, in 1820; it became the Vandalia Whig and Illinois Intelligencer in 1832; and it ceased publication about 1839, when Springfield became the capital.

The principal papers in Illinois are naturally those of Chicago. The Chicago Tribune (morning; 1847) succeeded The Gem of the Prairie (1844), and a weekly edition was for a time continued under that name. In August 1848 John Locke Scripps (1818–1866) bought a third interest in the Tribune and became its managing editor. In 1852 he sold it to a syndicate of Whig politicians. A part (in 1853) and eventually the whole (in 1874) was bought by Joseph Medill (1823–1899). Horace White (b. 1834) was a reporter on the Tribune in 1856, and was its editor and one of its proprietors in 1864–1874; from 1883 to 1903 he was editor-in-chief of the New York Evening Post. In 1858 the Daily Democratic Press, which J. L. Scripps had established in 1852 with William Bros, was consolidated with the Tribune as the Press and Tribune; in 1860 the name became the Tribune. The era of the old Chicago Tribune was inaugurated in 1861, with J. L. Scripps as its president. The first newspaper published in Chicago, the Democrat (November 1833), was merged with the Daily Tribune in 1861. The Inter-Ocean (morning; 1872), under the editorship (from 1897) of George Wheeler Hinman (b. 1863), has made a specialty of foreign affairs. The News (evening; 1875) was founded and developed by Melville E. Stone (b. 1848) as a one-cent evening paper. After 1883 Eugene Field contributed to this paper his column "Sharps and Flats," including much verse. In 1888 Victor Fremont Lawson (b. 1850), who had been associated with Stone, acquired the paper. The Record (morning; 1881), started by Lawson, was consolidated in 1901 with the Herald (1881) as the Record-Herald. The Evening Post dates from 1888. In 1900 W. R. Hearst established in Chicago two papers, Hearst's Evening American and the Examiner (the name assumed in 1902 for his morning American).

The Chicago German papers include the Freie Presse (evening and weekly; 1871), the Staats-Zeitung (daily, 1847, weekly—Wien und Doheim—1845; evening edition, the Abernd Presse) and Abendpost (1899). The Skandinaven (semi-weekly, 1866; daily, 1871) is an important Norwegian-Danish paper; and there are large Bohemian and Italian dailies.

In Springfield, the state capital, there are two party journals, the Illinois State Journal (Republican; semi-weekly, 1831; daily, 1848) and the Illinois State Register (Democratic; weekly, 1836; daily, 1848).

Michigan.—The Detroit Free Press (morning, 1835; with a weekly agricultural edition, Farm and Live Stock Journal, 1831) was particularly known in 1869–1891 for the humorous sketches of Charles Herrold and L. C. Schurz, Mr. Charles, an Irishman who had worked on the Kentucky Gazette in Lexington; it was called first the Missouri Gazette, then (1869) the Louisiana Gazette, then (1872) the Missouri Gazette and again, and then (1872) the Missouri Republican, and in 1886–1888 the St. Louis Republican; the present name was adopted in 1888. Its first daily issue was in September 1836 and the first Sunday issue in 1837. The Jeffersonian (Democratic paper; it opposed Thos. H. Benton; it was founded by W. P. Haggard, and Wm. Harrison in 1840, and became a Whig organ; and from 1856 was a Democratic paper. A cause célèbre was the trial in 1830 for the impeachment of Judge James H. Peck of the 31st District Court for Missouri, who had suspended from practice for 18 months and had imprisoned for 24 hours an attorney, Luke Edward Lawless, who had criticized in the Republican Judge Peck's decision in a Splechian law; a grant case, which was adverse to Lawless, attorney for the plaintiff. William Wirt appeared for Peck, and he was acquitted. Since 1837 the paper has been almost continuously the property of the Knapp and Faschall families. In 1871 the Republicans reorganized a Whig party; but in 1888 it introduced stereotyping in 1860, probably before any other newspaper. The Globe-Democrat (morning; Republican, 1852) of St. Louis became part owner of the St. Louis Globe-Democrat (morning; Republican, 1868; consolidated 1872) and has published a Sunday edition, Mississippi Blätter, and a semi-weekly and weekly edition, Anzeiger des Westens. Carl Schulz was editor of the Westlicher Anzeiger (morning, 1867). Another German newspaper in St. Louis is Amerika (morning; 1872).

The two principal dailies of Kansas City are the Star (morning, 1850–1881; with a morning edition, the Times, 1858, and a Weekly edition, the Times, 1859–1861) and the Journal (morning, 1854; with a weekly edition). The News-Press (News, 1878; Press, 1902; evening) is the principal paper of St. Joseph.

North Carolina.—The Observer (weekly; 1817; daily, 1860) of Fayetteville. The News Observer (daily; News, 1872; Observer, 1876) and North Carolina (weekly, 1892) of Raleigh.

South Carolina.—The News and Courier of Charleston (Courier, established in 1803 by T. C. and J. C. Gazley; Gazley, 1816–1901; Gazette, 1822–1875; Daily News, 1865; consolidated, 1872). The City Gazette of Charleston (founded in 1783 as the South Carolina Weekly Gazette) was edited by W. G. Simms in 1826–1853, but then failed, after bravely attempting to be the Advocate of Nullification. The Charleston News and Courier (1883; semi-weekly; 1885) was purchased by the Southern Argus in 1891. The State of Columbia (1861) is one of the most influential papers in the South.

Alabama.—The News (evening, 1887) and Age-Herald (morning, 1849; of Birmingham. The Mercury of Huntsville (weekly, 1816; daily, 1885). The Register of Mobile (weekly, 1821). The Advertiser of Montgomery (1828). The Morning Times of Selma (weekly edition, 1865).

Georgia.—The Constitution of Atlanta (daily, 1868; weekly, 1870; Henry W. Grady (1851–1889), the orator, was its editor and proprietor-in-part from 1880 until his death; Joel Chandler Harris was an editor (1900–1901) and contributed the Uncle Remus sketches; Frank Lebov Stanton (b. 1857) is well known as a contributor of humorous paragraphs and excellent verse. The Journal of Atlanta (1834; semi-weekly, 1885); its proprietor in 1887–1898 was Hoke Smith (b. 1863). (In 1901 it became the Atlanta Journal; governor of Georgia in 1907–1909. The Chronicle of Augusta (1878, semi-weekly; now semi-weekly and, since 1837, daily; originally the Augusta Chronicle and Gazette of the State, in 1831 it became the Chronicle and Georgia Gazette (then Advertiser); in 1835, the Augusta Chronicle; in 1837, when it incorporated the State's Rights Sentinel—edited for about a dozen years by Judge Augustus Longstreet, and a large weekly, the Augusta Chronicle established by Wm. E. Longstreet, and a large daily, the Augusta Chronicle.—In 1852 it became the Augusta Chronicle and Sentinel; in 1877, after merging with the Constitutionalist (founded before 1800), the Chronicle and Constitutionalist; James M. Peck, editor since 1879, was an editor (1883–1899) of the English language, and a senior editor of the Chronicle for some time, having been connected with the Constitutionalist after 1866. The Enquirer-Sun of Columbus (weekly, 1828; daily, 1858). The Atlanta Constitution (1877). The Union-Recorder of Milledgeville (the Federal Union, 1829, and the Southern Recorder, 1819, united in 1872). The Tribune of Rome (1843). The Morning News of Savannah (1890).
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The Review was published in 1850-1853, and of the Federal census in 1853-1855. The Review was especially Southern in tone and is a most important "source for the economic history of the South; from it De Bow extracted material for the Southern Review the States and Western States (3 vols. New Orleans, 1852-1853). Florida.—The Florida Times Union and Citizen (1865), with daily and semi-weekly editions; and the Metropolis (1869), both at Jacksonville. The Morning Tribune (weekly, 1870; daily, 1894) of Tampa.

Texas.—The Statesman of Austin (1871). The Morning News of Dallas, established in 1855 by Alfred H. Belo (1839-1901), who in 1875 bought the Galveston News (established 1842) and built upon these two papers. The Post (1886) and the Chronicle and Herald (1901) of Houston.

Tennessee.—The Journal and Tribune (Journal, 1839, and Tribune, 1816, consolidated in 1898) of Knoxville. The Commercial Appeal (Appeal, 1840; Nashville, 1857; Commercial, 1899; consolidated 1894); and the News-Seminar (Evening Seminar, 1851, and News, 1851, consolidated 1894) were both the Baltimore (1874) and the American (1830), both of Nashville. The first paper published in the state was the Gazette (1791) of Rogersville, which remained the only paper in Tennessee, when, in 1798, Andrew Jackson, the "Nature America" was established in 1806; in 1816 Amos Kendall (1789-1869) became part owner and co-editor, and under him the Argus was a political power; it was succeeded in 1840 by the Yeoman. The first paper in Indiana was the Gazette (January 1822), which in 1820 was consolidated with (and took the name of) the Indiana Democrat; in 1840 it was reorganized as the Indiana Sentinel. The first paper published in Kentucky was the Lexington Beacon, established in 1806; in 1816 Amos Kendall (1789-1869) became part owner and co-editor, and under him the Argus was a political power; it was succeeded in 1840 by the Yeoman. Wisconsin.—The principal papers are those of Milwaukee: the Evening Wisconsin (1847); the Sentinel (morning, 1837), edited in 1845-1861 by Rufus King (1814-1876), who was U.S. minister to the Pontifical States in 1863-1867, and a brigadier of volunteers in the Civil War; the News (evening, 1866); the Free Press (morning, 1901); the Germania-Abend-Post (1872, with a large weekly edition); and the Kuryer Polski (evening, 1888).

Mississippi.—The Journal (evening, 1878); the Tribune (morning, evening and weekly, 1867); and the Tidende (daily, 1887; weekly, 1891; Norwegian-Danish) are the principal papers of Mississippi. In Natchez the Pioneer Post (founded in 1843; daily since 1843), and the Mississippi Pioneer was the first paper printed in the state, and in 1855 it was consolidated with the Mississippi Democrat under the name of Pioneer and Democrat; in 1855 the Daily Times-Democrat (1872) and the Daily Minden Press united with it took the name of the Pioneer Press. The other papers are the Dispatch (evening, 1868); the News (evening, 1900) and the Volks Zeitung (weekly, 1859; daily, 1857).

Kansas.—The Emporia Gazette (evening, 1860) is one of the notable smaller city papers of the country; its reputation being due to its editor and proprietor William Allen White (b. 1868). Other papers of note are the Emporia Evening and Topeka Capital (1872; daily, 1872); the Emporia News (daily, 1872); the Tribune (1898); the Santa Fe (evening, 1868); the Capital (daily, weekly, 1879); the State Journal (evening and weekly, 1872); the Herald (evening, 1917); and in Wichita, the Eagle (morning, 1884, and weekly, 1872).

Nebraska.—The News (evening, 1890), the World-Herald (morning and evening, weekly and semi-weekly, 1866), and the Omaha Bee (morning and evening, 1871) are all of Omaha. The Bee was established by Edward Rosewater (1841-1906); his son Victor (b. 1871) succeeding him in 1895 as managing editor. The Rosewaters were prominent in the Republican party and headed the opposition in the state to William Jennings Bryan, who was in 1894-1896 editor of the World-Herald. Bryan also founded at Lincoln the Lincoln Courier, a weekly, and served as its editor and chairman of the Republican committee in Nebraska, and in advancing his candidacy for the presidency. The Lincoln dailies are the Nebraska State Journal (morning, 1879; Evening News, semi-weekly, 1869; the Star (evening, 1902); and the evening Post (1896).

Iowa.—The Des Moines papers are the Capital (evening, 1883), the News (evening, 1881), and the Register and Leader (morning, Leader, 1864; Register, 1869). In the Quad Cities the Times (1879) was published for 11 years; at Burlington is the Hawk Eye (evening, 1839), to which Robert Jones Burdette (b. 1844), associate editor in the 'seventies, contributed humorous squibs. The Burlington Evening Gazette, originally the Wisconsin Territorial Gazette, is one of the oldest in the state. Arkansas.—The Arkansas Gazette (Democratic; morning and weekly) was first published at Arkansas Post in 1819, then removed to Little Rock.

Colorado.—At Denver are the Republican (morning and weekly, 1866); the Post (evening, 1893; weekly, 1901); and the Rocky Mountain News (morning, 1889; evening, The Times, 1872; and a weekly edition).

Arizona.—At Tombstone, the county-seat of Cochise county, is the well-known Epitaph (1882), a Sunday edition of the Prospector (daily, 1880). At Salt Lake City are the Deseret Evening News (daily and semi-weekly, 1850), controlled by the Mormons; the Salt Lake Tribune (daily, 1870; semi-weekly, 1864), founded by Godbe and others; the Tribune (morning, 1864), owned by George Young; and the Salt Lake Herald (daily, 1874; semi-weekly, 1864), the first named was the principal—and for a time the only—Democratic paper in Utah; in 1901 it was purchased by Senator W. A. Clark, who promptly sold it for a large sum to the Liberal Emigrant. California.—At San Francisco are the Call (morning, 1856), owned by John D. Spreckels (b. 1853), principal owner of the Oceanic Steamship Company; and son of Claus Spreckels the "sugar-king"; the Examiner (morning, 1868), founded by Senator George Hearst (1829-1901), the inheritance of which started his son, William Randolph Hearst, in the newspaper business; the Bulletin (morning, 1853); the Chronicle (morning, 1865; weekly, 1874); the Evening Post (1871; weekly edition 1875); and the California Democrat (morning, 1853; consolidated in 1902 with the Abend Post; weekly edition, California Staats-Zeitung, 1854). The Argonaut (1877) is an old weekly.

In Los Angeles the large dailies are the Times (morning, 1881 weekly edition, Saturday Times and Weekly Mirror, 1873); the Herald (morning, 1873); the Express (evening, 1871); the Record (evening, 1871); and the Los Angeles Examiner (morning, 1902)

Oregon.—At Portland are the Oregonian (morning, 1861; weekly edition, 1864) which has a great reputation on the Pacific Coast; and the Oregonian (morning, 1861; weekly and semi-weekly, 1902); and the Oregon Telegraph (1868).

Washington.—At Seattle are the Post Intelligencer (morning, 1867); and the Times (evening and weekly, 1861).

4. NEWSPAPERS OF FRANCE

The annals of French journalism begin with the Gazette (afterwards called Gazette de France), established by Théophraste Renaudot in 1631, under the patronage of Richelieu, and with his active co-operation. Its price was six centimes. Much of its earliest foreign news came direct from the minister, and not seldom in his own hand. Louis XIII. took a keen, perhaps a somewhat childish, interest in the progress of the infant Gazette, and was a frequent contributor, now and then taking his little paragraphs to the printing office himself, and seeing them put into type. Renaudot was born at Loudun in 1584, studied medicine in Paris and at Montpellier, established himself in the capital in 1612, and soon became conspicuous both within and beyond the limits of provence. Endowed by nature with great energy and versatility, he seems at an early period of his career to have attracted the attention of the great cardinal, and to have obtained permission to establish a sort of general agency office, under the designation of "Bureau d'Adresses et de Rencontre." An enterprise like this would, perhaps, naturally suggest to such a mind as Renaudot's the advantage of following it up by the foundation of a newspaper. According to some French writers, however, the project was formed by Pierre d'Harcourt, genealogist, who carried on an extensive correspondence both at home and abroad, and was thus in a position to give valuable help; according to others by Richelieu himself. Be this as it may, Renaudot put his hand zealously to the work, and brought out his first weekly number in May 1631. So much, at least, may be inferred from the date (4th July 1631) of the sixth number, which was the first dated
publication, the five preceding numbers being marked by "signatures" only—A to E. Each number consists of a single sheet (eight pages) in small quarto, and is divided into two parts—the first simply entitled Gazette, the second Nouvelles ordinaires de divers endroits. For this division the author assigns two reasons—(1) that two persons may thus read his journal at the same time, and (2) that it facilitates a division of the subject-matter, the Nouvelles containing usually intelligence from the northern and western countries, the Gazette from the southern and eastern. He commonly begins with foreign and ends with home news, a method which was long and generally followed, and which still obtains, for the Gazette published a supplement, under the title of Relation des nouvelles du monde, reçues dans tout le mois. In October 1631 Renaudot obtained letters patent to himself and his heirs, conferring the exclusive privilege of printing and selling, where and how they might please, "the gazettes, news and narratives of all that has passed or may pass within and without the kingdom." His assailants were numerous, but he steadily pursued his course, and at his death in October 1653 left the Gazette to his sons in flourishing circumstances. In 1752 the title Gazette de France was first used. Under this designation it continued to appear until the 24th August 1789. During the five days following that date it was suspended; on the 30th it was resumed as Le Peuple français, journal de l'appel à la nation, and again modified on the 14th September to L'Étoile de la France, journal des droits de tous. On the 25th October it became Gazette de France, journal de l'appel à la nation; and under this title it continued. Jean Loret's rhymed Gazette (1650 to March 1665) will always have interest in the eyes of students who care less for the "dignity" of history than for the fidelity of its local colouring and the animation of its backgrounds. It was vain to look for there for any deep appreciation of the events of stormy times; but it abounds in vivid portraits of the men and manners of the day. It paints rudely, yet to the life, the Paris of the Fronde, with all its effervescence and depression, its versatility and fickleness, its cowardice and its courage.

Of the Mercure galant, established by Donnexe de Vizé in 1672, with Thomas Cornelle for its sub-editor, it may be said that it sought to combine the qualities of the Gazettes, both grave and gay. Like the Gazette de France, it contained the permitted state news and court circulars of the day. Like L'Étoile de France, its aim was to please with satirical verses, and with sketches of men and manners, which, if not always true, were at least well invented. Reviews and sermons, law pleases and street airs, the last reception at the Academy and the last new fashion of the milliners, all found their place. De Vizé carried on his enterprise for more than thirty years, and at his death (1710) it was continued by Rivière du Frasny. The next editor, Léfèvre de Fontenay, altered the title to Nouveau Mercure, which in 1728 was altered to Mercure de France, a designation retained, with slight modification, until 1853. The Mercure passed through many hands before it came into those of Panckoucke, at the end of the Revolution. Amongst its more conspicuous writers, immediately before this change, had been Raynal and Marmontel. The latter, indeed, had for many years been its principal editor, and in his Mémoires he has left us a very interesting record of the views and aims which governed him in the performance of an arduous task. He there narrates the curious fact that it was Madame de Pompadour who contrived the plan of giving pensions to eminent men of letters out of the profits of the Mercure. To one of Marmontel's predecessors the "privilege," or patent, had been worth more than the Gazette, its amended title. This revenue was now to be shared amongst several, and to become a means of extending royal "patronage" of literature at a cheap rate. It is to this pension scheme, too, that we owe the Contes Moraux. Marmontel, who had long before lost his "patent" by an act of high-minded generosity, continued to share in the composition of the literary articles with Chamfort and La Harpe, whilst Mallet du Pan, a far abler writer than either, became the most prominent of the political writers in the Mercure. In 1789 he contributed a series of remarkable articles on the well-known book of de Robine; and in the same year he penned some comments on the "Declaration of the Rights of Man," very distasteful to violent men of all parties, but which forcibly illustrate the pregnant truth they begin with: "The gospel has given the simplest, the shortest and the most comprehensive "Declaration of the Rights of Man," in saying, 'Do unto others as you would that they should do unto you. All polities hinge upon this.'

In 1790 the sale of the Mercure rose very rapidly. It attained for a time a circulation of 13,000 copies. Mirabeau styled it in private "the most able of the newspapers." Great pains were taken in the collection of statistics and state papers, the absence of which from the French newspaper press had helped to depress its credit as compared with the political journalism of England and to some extent of Germany. But, as the Revolution marched on towards a destructive democracy, Mallet du Pan evinced more and more unmistakably his rooted attachment to a constitutional monarchy. And, like so many of his compatriots, he soon found the tide too strong for him. The political part of the Mercure (in 1791 its title was altered to Mercure français) changed hands, and after the 10th August 1792 the "literary" part of it was suspended.

All this time the Moniteur (Gazette nationale, ou le moniteur universel), founded in 1780, was under the same general management. The first idea, indeed, of this famous official journal appears to have been Panckoucke's, but it did not firmly establish itself until he had purchased the Journal de l'assemblée nationale, and so secured the best report of the debates. The Moniteur, however, kept step with the majority of the assembly, the Mercure with the minority. So marked a contrast between two journals, with which it conferred a leverage to the republicans not to be turned to good account. Camille Desmoulins depicted him as Janus—one face radiant at the blessings of coming liberty, the other plunged in grief for the epoch that was rapidly disappearing.

When resumed, after a very brief interval, the Mercure français became again Mercure de France—its political importance diminished, whilst its literary worth was enhanced. During the later days of the Revolution, and under the imperial rule, its roll of contributors included the names of Geoffroy, Glingandé, Morelet, Lefebvre, Pluchart, for whom Bonaparte gave the journal no less than upon the individual writers who made them. Resumed by other hands, the Mercure continued to appear until January 1820, when it was again suspended. In the following year it reappeared as Le Mercure de France, au dix-neuvième siècle, and in February 1835 it finally ceased.

The only other newspaper of a date anterior to the Revolution which needs to be noticed here is the first French daily, the Journal de Paris, which was started on New Year's Day of 1777. It had but a feeble infancy, yet lived till 1819. Its Romanesque, however, did not save it from the "suspensions" of its predecessors. After the Revolution such men as Garat, Condorcet and Regnault de St Jean d'Angély appear amongst its contributors, but those of earlier date were obscure. Its period of highest prosperity may be dated about 1792, when its circulation is said to have exceeded 20,000.

The police adventures of the writers of the MS. news-letters, or Nouvelles à la main, were still more numerous, and, if we
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Under Napoleon the *Moniteur* was the only political paper that was really regarded with an eye of favour. Even as respects the nation at large, the monstrous excesses into which the Revolutionary press had plunged left an enduring stigma on the class. When Bertin acquired the *Journal des débats* from Baudouin, the printer, for 20,000 francs, he had to vanquish popular indifference on the one hand, as well as imperial mistrust on the other. The men he called to his aid were Geoffroy and Fieville; and by the brilliancy of their talents and the keenness of his own judgment he converted the *Débats* into a paper having 32,000 subscribers, and producing a profit of 200,000 francs a year.

When the imposition of a special censorship was threatened in 1805, at the instance of Fouché, a remarkable correspondence took place between Fieville and Napoleon himself, in the course of which the emperor wrote that the only means of preserving a newspaper from suspension was "to avoid the publication of any news unfavourable to the government, until the truth of it is so well established that the publication becomes needless." The censorship was avoided, but Fieville had to become the responsible editor, and the title was altered to *Journal de l'empire*—the imperial critic taking exception to the word *Débats* as "inconvenient." The old title was resumed in August 1815. The revolution of July did but enhance the power and the profit of the paper. It had held its course since with uniform dignity, as well as with splendid ability, and may still be said, in the words which Lamartine applied to it in an earlier day, to have "made itself part of French history."

Standing as it did, *Journal de l'empire* was not only the champion of the first Napoleon, but the successor of the *Moniteur*. At the time, it was said, that "the Journal des débats (in 1815) a severance occurred amidst both the writers and subscribers. It led to the foundation of the *Constitutionnel*, which at first and for a short time bore the title of *L’Indépendant*. The former became, for a time, the organ of the royalists par excellence, the latter the leader of the opposition. In 1824, however, both were in conflict with the government of the day. At that date, in a secret report addressed to the ministry, the aggregate circulation of the opposition press of Paris was stated at 41,330, while that of the government press amounted only to 14,544."

The rapid rise of the *Constitutionnel* was due partly to the great ability and influence of Jay, of Étienne, of Béranger and of Saint Albin (who had been secretary to Carnot in his ministry of 1815), all of whom co-operated in its early editorship, and partly to its sympathy with the popular reverence for the memory of Napoleon, as well as to the vigorous share it took in the literary quarrel between the classicists and romanticists. Its part in bringing about the revolution of 1830 raised it to the zenith of its fortunes. For a brief period it could boast of 23,000 subscribers at 80 francs a year. But the invasion of cheap newspapers, and that temporary lack of enterprise which so often follows a brilliant success, lowered it with still greater rapidity. When the author of the *Mémoires d’un bourgeois*, Dr Véron, purchased it, the sale had sunk to 3000. Véron gave 100,000 francs for the *Juit errant* of Sue, and the Sue fever rewarded him for a while with more than the old circulation. Afterwards the paper passed under the editorship of Césena, Granier de Cassagnac, and La Guérinmontre.

The cheap journalism of Paris began in 1836 (1st July) with the journal of Costard, *La Presse*, followed instantly by *Le Sûte*, under the management of Dutacq, to whom it is said—not incredibly—the original idea was really due. The first-named journal attained a circulation of 10,000 copies within three months of its commence-ment of and soon doubled that number. *Le Sûte* prospered even more strikingly, and in a few years had reached a circulation (then without precedent in France) of 38,000 copies.

The rapid growth of the newspaper press of Paris under

1. *Le Constitutionnel*, 16,250; *Journal des débats*, 13,000; *La Quotidienne*, 5800; *Le Courrier français*, 2975; *Journal de commerce*, 2360; *l’Aristographe*, 925.
2. *Journal de Paris*, 4175; *L’Étoile*, 2749; *Gazette de France*, 2370; *Le Moniteur*, 2250; *Le Droitsu1 Blanc*, 1900; *Le Pilote*, 900.
Louis-Philippe will be best appreciated from the fact that, while in 1828 the number of stamps issued was 28 millions, in 1836, 1843, 1845 and 1846 the figures were 42, 61, 65 and 70 millions respectively. At the last-mentioned date the papers with a circulation of 40,000 and 50,000 were (besides the Moniteur, of which the circulation was increased almost immediately) as follows: Le Siècle, 31,000; La Presse and Le Constitutionnel, between 20,000 and 25,000; Journal des Débats and L’Époque, between 10,000 and 15,000.

If we cast a retrospective glance at the general characteristics (1) of the newspaper press of France, and (2) of the legislation concerning it, we may say that the rise of the newspapers was due mainly to the revolution of 1793-1794 and the scarcely less destructive revolution of 1830, which, with certain intermediate fluctuations, continued until 1848, when it was found to be the result of a lower status for the press; that is to say, the removal of the press from the ranks of the privileged to that of common citizens. From this point onward the history of newspapers is inextricably connected with the development of the press, and the press of newspapers. The press not only was the organ of every great event in the government, but was the chief instrument of public opinion.

The year 1819 is marked by a virtual cessation of the arbitrary power of suppression lodged till then in the government, and by the substitution of a graduated system of preliminary bonds and suretyships for the previous summary arrest and imprisonment or shackles and the penalty for convicted press-offences on the other. This initiative attempt of 1819 became, in 1828, a measure of substantial yet regulated freedom, which for two years worked, in the main, alike with equity towards the author and to the public. By 1830 a large development towards the public of its capabilities as a great factor in the growth of civilization. Those two years were followed by a widely contrasted period of five years. That was a term of entire liberty often grossly abused, and fifty ending with the just and necessary restrictions of September 1835. But that period of 1830-1835 was also signalized by some noble attempts to use the powers of the press as a means of carrying out the social and political interests of France. Not least memorable amongst these was the joint enterprise of Montalembert and Lamennais—soon to be added by Lacordaire,—when, by the establishment (October 1830) of the newpaper L’Avenir, both of them succeeded in the "loi bonapartiste," just part in the liberties acquired by the country," and asserted for the sacred symbols of Christianity their lawful place, alike above the tricolor and above the lilies. "Dieu et la liberté " was the motto which afterwards came to fix its name to, on penalty of a fine of 500 francs for the first offence, and of 1 000 francs for its repetition. Every false or feigned signature was to be punished by a fine of 1 000 francs, and to claim for a newspaper the name of the author and the editor." The practical working of this law lay in the fact that a new functionary in the more important newspaper offices, who called "secrétaire de la rédaction," and was, in fact, the secpreatot general of the giornale; it gained, however, a permanent influence on French journalism in the continued prevalance of signed articles, and the consequent prominence of individual writers as compared with the same class of work in other countries. In February 1842 all other French journals, incorporated, with increased stringency, into a "Décret organique sur la presse." The stamp duty for each sheet was fixed at 6 centimes, within certain dimensions, and a proportional increase in case of excess.

In 1838 the order of the six leading Parisian papers in point of circulation was (1) Le Siècle, (2) La Presse, (3) Le Constitutionnel, (4) Patrie, (5) Le Débat, (6) L’Assemblée Nationale. The number of provincial papers was no less than 15,000; the daily newspapers, seven hundred. "L’Avenir," with a circulation of nearly 70,000, and its proprietor, in a petition to the National Assembly, declared that it gave subsistence to more than one thousand persons, measured by the amount of its circulation. In August the system of sureties was restored. On the 13th July 1839, the regime of the republic suspended Le Peuple, La Révolution Démocratique et Sociale, La Vraie République, La Réforme Civile, Le Journal des Deux Mondes, and the Giraud’s Observation (l’Observation), all of which is called the "Loi Tinguy" (from the name of the otherwise obscure deputy who proposed it), by which the author of every newspaper article on any subject, political, philosophical or religious, was liable to be punished by a fine of a fine of 500 francs for the first offence, and of 1000 francs for its repetition. Every false or feigned signature was to be punished by a fine of 1 000 francs, and to claim for a newspaper the name of the author and the editor." The practical working of this law lay in the fact that a new functionary in the more important newspaper offices, who called "secrétaire de la rédaction," and was, in fact, the secpreatot general of the giornale; it gained, however, a permanent influence on French journalism in the continued prevalance of signed articles, and the consequent prominence of individual writers as compared with the same class of work in other countries. In February 1842 all other French journals, incorporated, with increased stringency, into a "Décret organique sur la presse." The stamp duty for each sheet was fixed at 6 centimes, within certain dimensions, and a proportional increase in case of excess.

The aggregate daily issue of the Parisian "dailies" had increased to about 350,000 copies, but the evening paper, Le Petit Moniteur, alone issued nearly 130,000 of these. The average circulation of Le Siècle had fallen from 85,000 to 45,000 copies; that of Le Patrie was reduced by one-half (32,000 to 16,000); that of Le Constitutionnel from 24,000 to 13,000; of L’Opinion Nationale from 18,000 to 15,000; whilst the chief journal of all—with grand antecedents and with a brilliant history of public service rendered—had for a time descended, it is said, from 120,000 to 15,000. And yet almost over the whole of this very period the brilliant "Lundin" of Sainte-Beuve were making their punctual appearance in Le Moniteur, to be continued by the "Moniteur" of Le Figaro, and daily from 1860 onwards helping to make frivolous petty "paragraphs" on matters of literature almost everywhere take the place of able and well-elaborated arguments. Well might the Latins say, "Les journaux sont les trompeurs; les journaux sont les parlementaires."

8 Or, to speak more precisely, to farm a certain conspicuous page of each newspaper, in perpetuity.
collectively with receiving bribes, both from the government of Prussia and from that of Italy—upon the faith, as it afterwards appeared, of statements made by another newspaper, not of France, but of Belgium, La Finance. An elaborate inquiry, presided over by M. Caremeau, one of the most acute of the i.a.s., cleared the case absolutely. There were 2,566,000 copies of the respective journals, and an aggregate weekly issue of 2,800,000 copies.

In 1787 the total number of newspapers published in France was approximately 2,200. Of these, 120 were political, or of a military character, 66 were established in Paris, 16 in other cities, and the rest in the provinces. The total number of newspapers published in France in 1798 was 2,391. The largest number of newspapers was printed in Paris, where the total number of newspapers published in 1798 was 2,000. Of these, 120 were political, or of a military character, 66 were established in Paris, 16 in other cities, and the rest in the provinces. In 1814, there were 1141 (including 71 religious, 104 legal, 153 commercial, 134 technological, 98 scientific and medical, 59 artistic). At that date Le Figaro had a circulation of about 70,000; Le Petit Journal at a halfpenny one of about 650,000.

The principal Parisian newspapers in 1883 may be classified thus—

(a) Organ of the Legitimists and of the Church of France: Gazeau de France, Le Monde, L'Union, La Défense, La Civilisation, L'Universe.

(b) Orleanist organs: Le Moniteur Universel, Le Constitutionnel, Le Français (under the auspices of the Duc de Broglie), Le Soir, Le Corse, (an organ of the papists: Le Pays (edited at one time by Lamartine).

(c) Republican organs: Journal des Débats, Le Temps (founded 1860), which has a circulation of about 17,000; Le Journal, Le Figaro, Le Monde, Le Petit Journal, La Revue Mystique, Paris, La République (founded 1861 by Gambetta), Le Peuple (founded by Dufau), the Socialist Le Petit État de la République (1875).

The sale of the principal organs was, of course, limited, and the newspaper received, for July 29, 1881, abolished salesout for newspapers, and transferred their registration from the ministry of justice at Paris to the local representative of the attorney-general (le parquet) in each town respectively. It was made the establishment of a newspaper virtually free, upon legal deposit of two copies, and upon due registration of each newspaper under the simple guarantee of a registered director, French by birth, responsible in case of libel. And it took away the former discretion of the authorities in determining the home office of La République and La Revue Mystique in French foreign journals. The home minister might still prohibit a single number of a newspaper; only the whole council of ministers, duly convened, could prohibit the circulation of a foreign newspaper absolutely. The newspapers of Paris, and similarly of France, practically doubled in number between 1880 and 1900. In 1880 there were about 120 Paris newspapers, in 1890 about 160, and in 1900 about 240. The total number of newspapers, as distinguished from periodicals, published in France during 1900 was in round numbers 2,400.

Of these, about 2160 appeared in 340 provincial towns.

The history of the press in France during the last two decades of the 18th century followed very closely that of the country itself. Boulangism and anti-Boulangism, Dreyfusism or anti-Dreyfusism, Republican or Nationalist; finally it became either Moderate Republican or Radical-Socialist with a sprinkling of Nationalist organs and a small minority of Royalist and Bonapartist sheets.

At the head of the Moderate Republican organs were Le Temps and Le Journal des Débats among the evening papers, and Le Figaro, Le Journal, Le Siècle, Le Petit Parisien and Le Petit Journal among the morning dailies. Le Figaro was until 1901 under the editorship of M. F. de Rodays, and the brilliant articles of M. J. Cornély were one of the features of the paper; but a dispute among the proprietors in 1901 resulted in the dismissal of M. Cornély and the retirement of M. de Rodays. M. Jean Dupuy (a member of the Waldeck-Rousseau government) was the proprietor and editor of Le Petit Parisien, a popular organ almost rivalling Le Petit Journal; the circulation of the latter had, however, reached over one million and a quarter copies daily.

Le Monde and L'Éclair, among the Moderate Republican organs, gave less attention to the discussion of political questions from the party point of view than to the collection of news, and they were followed by the Écho de Paris (1884). Le Matin, which also dates from 1884, was from its origin essentially what is called in France a journal d'informations, publishing every morning a mass of telegraphic news from all countries. By an arrangement with the London Times, it gave every day a translation of most of the telegrams published in that newspaper.

In April 1901 the proprietorship of Le Siècle was changed, in consequence of the lack of support given by Parisian readers to that journal as edited by M. Yves Guyot (formerly minister of public works). The latter was a staunch free-trader, a courageous defender of Captain Dreyfus, and an eloquent advocate of a good understanding between France and England; he emphatically endorsed the British policy in South Africa, and tried to explain it to his countrymen. The paper was, however, bought in by a number of friends of M. Yves Guyot, who remained as editor. The greatest opponent of Yves Guyot from the economic point of view was Jules Mélén, also a former minister, whose paper, La République, was the recognized organ of Protectionism.

The Radical and Socialist ideas which in latter years made such progress in France were very ably advocated by several newspapers whose influence steadily grew, such as L'Aurore, La Lanterne and L'Humanité (the organ of Jean Jaurès). Such individual organs of opinion must also be mentioned as L'Intransigeant, the organ of Henri Rochefort, and M. Clemenceau's organ, Le Bloc, in which he advocated the practical application of all of the revolutionary republican principles, purged of every modulating influence, whether (Bloc), no part of which could or ought to be sacrificed to temporary political necessities.

As an intermediate link between the Republican organs of all shades and the various Monarchist newspapers, came the so-called Nationalist press, an offshoot of or successor to the Boulangist press of the preceding decade. As were the Boulangists, so were the Nationalists, a sort of syndicat des mécontents, their chief organs being La Patrie, edited by M. Millevoye, and La Cocarde; these papers represented the views of those who had vague hangkings after a different régime and a decided hostility towards the republican form of government.

There was a considerable diminution of influence in the Monarchist press. Le Soleil, however, had a large circle of readers among the Conservative bourgeoisie with Orleanist leanings. Le Gaulois remained a Royalist paper of somewhat doubtful tendencies, the editor, M. Arthur Meyer, having incurred the displeasure of the Pretender whose cause he defended. Of the Old Legitimist press there remained the old Gazeau de France, which was founded in 1831 and had still a diminishing band of faithful readers. The organ of the religious (Roman Catholic) associations in France, La Croix, founded in 1880, represented the views of the French religious associations (Bloc), no part of which could or ought to be sacrificed to temporary political necessities.

La Croix was published in Paris, but had in the provinces one hundred and four local weekly supplements to the Paris edition, each one taking its name from the parent journal and adding to it the name of the department or locality in which it was printed, such as La Croix de l'Allier, La Croix de Lyon.

The French papers, of whatever party, took an increased interest during this period in foreign matters, and much improved
their organization for collecting news. Some of them, in fact, were almost exclusively news-sheets, and the journal of informations—Le Matin or L’Eclair, for instance—took its place beside the journal properly so called, more perhaps as a rival than as a complement. The natural result followed, and the more old-type newspapers took steps to provide their readers with news as well as with leading articles, current and literary topics, society gossip, dramatic criticism and law reports. The most remarkable as well as perhaps the earliest attempt to enlarge the scope of Parisian newspapers was made in 1803 by Georges Patiot, editor of the Journal des Débats. Instead of one edition, that newspaper published two entirely distinct editions, a morning one and an evening one. After some time the plucky attempt had to be given up, and the Journal des Débats became an evening paper. The bold experiment made by the Journal des Débats (which celebrated its centenary in 1889) led the other newspapers to find a happy mean between a four-page paper published twice a day and an eight-page paper on the pattern of English newspapers, and the result was that now most great daily papers in Paris came out with six pages, the Figaro giving the lead. As French newspapers increased in size they reduced their price. Most six-page newspapers, with the exception of Le Figaro, were by 1902 sold at 5 centimes, and the price of 15 centimes, which used to be the rule, became the exception. In 1902 60 Paris papers (daily and weekly) were sold at 5 centimes and 51 at 10 centimes, whilst only 11 cost 15 centimes. In 1880 only 23 were 5-centime papers and 24 were 10-centime papers.

The American style of journalism came into vogue in Paris in the eighties, and “interviews” were supposed, the general tendency of Parisian editors was to adopt the English compromise, and to eschew any extreme sensational methods. Most of the important Parisian newspapers had their special correspondents in the great capitals of Europe, London, Berlin, St Petersburg, Vienna and Rome. Nothing perhaps was so striking after 1890 as the demand of the French public for foreign and colonial news, or the readiness of the papers to supply it by means of special representatives independent of the news agencies.

In how matters the French press made greater progress still in the rapid and accurate collection of news, and in this respect the provincial press showed more enterprise and more ability than that of Paris. Its development was remarkable, for whereas in 1880 the inhabitants of the departments had to await the arrival of the Parisian papers for their news, they now had the advantage of being supplied every morning with local newspapers inferior to none of the best organs of Paris. Among the best provincial papers may be mentioned La Gironde and La Petite Gironde of Bordeaux, La Dépêche of Toulouse, Le Lyon Estimable, and Le Croix du Sud. All having staff in Paris engaged in collecting news, reporting parliamentary proceedings and law cases, telegraphed or telephoned during the night and published early the next morning in their respective localities. Being perfectly independent of purely Parisian opinion or even bias, the decentralization of the French provincial press became complete. The newspapers of the large towns circulated not only in the city in which they were printed but throughout the region of which it was the centre. Thus the Dépêche of Toulouse, with its twelve editions daily, was read in the whole of the departments extending from the Lot to the Pyrenees, whilst the Petite Gironde was found in all south-western France. The influence of the provincial, as of the Paris, press became so great that, as M. Avenel says in his book on the French press, there came a tendency to resent its omnipotence. The power of the newspaper in France differs from that of the English newspaper, in that it seems to act more on the government and the parliament than on public opinion. The French newspapers have taken upon themselves, in many cases, functions which belong more properly to the legislative or to the judicial power than to the press, and the result has not always been successful. The cause of this is that too many men of talent with political ambition look upon journalism as “leading to everything, provided one gets out of it,” and use it alternately as an antechamber of parliament or of the cabinet, and a lounge during their parliamentary or ministerial eclipses.


5. NEWSPAPERS OF GERMANY

Printed newspapers in Germany begin with the Frankfurter Journal, established in 1615 by Egenolff Emmer, a bookseller of Frankfort-on-Main. The following year saw the foundation of the Frankfurter Obergerufettzeitung—continued until the year 1866 as Frankfurter Postzeitung. Fulda appears to have been the next German town to possess a newspaper, then Hildesheim (1619) and Herford (1630). In the course of the century almost all German cities of the first rank possessed their respective journals. The earliest in Leipzig bears the date 1660. The Rostocker Zeitung was founded in 1710. The Hamburger Correspondent (1714) was originally published under the name of Holsteinische Zeitungs-Correspondent, two years earlier, and was almost the only German newspaper which really drew its foreign news from “our own correspondent.” Berlin had in the 18th century two papers, those of Voss (the Vossische Zeitung, 1722) and of J. K. F. Spener (1749-1827; the Spenerische Zeitung, or Berlinische Zeitung). There was also a number of provincial papers which glimmered in the surrounding darkness were the reservoirs whence the rest replenished their little lamps. On the whole, it may be said that the German newspapers were of very small account until after the outbreak of the French Revolution. Meanwhile the MS. news-letters, as in earlier days, continued to enjoy a large circulation in Germany. Many came from London.

The correspondence, for instance, known under the name of Mary Pinear—“that, apparently, of a French refugee settled in London—had a great German circulation between 1725 and 1737. Another series was edited by Jean Ignace de Rodéfique, also a French refugee, and remembered as the subject of a characteristic despatch from Frederick II. of Prussia to his envoy in that city, enclosing 100 ducats to be expended in hiring a stout fellow with a cudgel to give a beating to the gazetteer as the punishment of an offensive paragraph. The money, it seems, was earned, for Rodéfique was well-nigh killed. At Berlin itself, Franz Hermann Ortigies carried on a brisk trade in these news-letters (1728-1735), until he too came under displeasure on account of them, was kept in prison several months, and then exiled for life. Nor, in any journal of a high order be mentioned of prior appearance to the Allgemeine Zeitung, founded at Leipzig by the bookseller Cotta (at first under the title of Neueste Weltkunde) in 1798. Posselt was its first editor, but his want of nerve—and perhaps his weak health—hindered the application of his high powers to political journalism. His articles, too, gave offence to the Austrian court, and the paper had to change both its title and its place of publication. It had been commenced at Tübingen, and removed to Stuttgart; it was now transferred to Ulm, and again to Augsburg. It was Cotta’s aim to make this the organ of statesmen and publicists, to reach the public through the thinkers, to hold an even balance between the rival parties of the day, and to provide a trustworthy magazine of materials for the historians to come; and, in the course of time, his plan was so worked out as to raise the Allgemeine Zeitung into European fame. Cotta was also the founder, at various periods, of the Morgenblatt, which became famous for its critical ability and tact, of Wesperus, of Das Inland, of Nemesis, of the Oppositions-blatt of Weimar (for a time edited by Bertuch), and even of the Archives Parisiennes.

Whilst French influence was dominant in Germany, the German papers were naturally little more than echoes of the Parisian press. But amidst the excitement of the “war of

1 Fr. Kapp, “Berliner geschriebene Zeitungen,” in Deutsche Rundschau, xxii. 107-122 (1879), citing Droysen, Zeitschr. f. preuss. Gesch. xiii. 11. The story, as told by Droysen, is an instructive commentary on Carlyle’s praise of Frederick’s “love of the liberty of the press.”

2 Kapp, op. cit.
liberation" a crowd of new journals appeared. Niebuhr started a "Preussischer Correspondent;" Görres—who in 1798 had founded at Coblenz Das rothe Blatt, soon suppressed by the invading French—undertook the Rheinischer Mercur (January 1814 to January 1816), which was suppressed by the Prussian government, under Von Hardenberg. This journal, during its initiatory year, had the honour of being named by Napoleon—perhaps satirically—"the fifth power of Europe." Wetzel, somewhat later, published in Hamburg the Hamburgische Tribun, later Examen, published in Bamberg, and Friedrich Seybold the Neckerszeitung. Some of these journals lasted but two or three years. Most of the survivors fell victims to that resolution of the diet (20th September 1819) which subjected the newspaper press, even of countries where the censorship had been formally abolished, to police superintendence of a very stringent kind. The aspirations for some measure of freedom which burst forth again under the influences of 1830 led to the establishment of such papers as Siebenpfeiffer's Westbote, Lohhauer's Hochzeiten, Wirthe Deutsch, Tribune, Eisemann's Böttcher's Volksblatt, Der Freisimone of Rotteck and Wellecker, and many more of much freer utterance than had been heard before in Germany. This led, in the ordinary course, to new declarations in the dict against the licence and revolutionary tendencies of the press, and to "regulations" of a kind which will be sufficiently indicated by the mention of one, in virtue whereof no editor of a suppressed journal could undertake another journal, during the space of five years, within any part of Germany. It need hardly be added that few of the newspapers of 1830 saw the Christmas of 1834. Very gradually some of the older journals—and amongst the number the patriarch of all, the Frankfurter Oberpostamtzeitung—plucked up courage enough to speak out a little; and some additional newspapers were again attempted. Amongst those which acquired deserved influence were Brockhaus's Deutsche Allgemeine Zeitung, the advocate of free trade and of a moderate liberalism, possessing a large circulation in northern Germany (1837); the Deutsche Zeitung, edited by Gervinus, at Heidelberg (July 1847); and the Dorfzeitung, published at Hildburghausen. The stirring events of 1848 called forth in Germany, as in so many other countries, a plentiful crop of political instructors of the people, many of whom manifested lack even the capacity to learn, and vanished almost as suddenly as they had appeared. But it is undeniable that a marked improvement in the ability and energy of the German political press may be dated from this period.

At the beginning of the 20th century the position and influence of the German press were passing through a period of change. The Germans had become a newspaper-reading people. Indeed, with the remarkable growth of the commercial spirit in Germany, there had simultaneously been a change in the intellectual attitude and habits of the mass of the nation. The German of "the great period" of 1866 and 1870 derived his knowledge of his own and other countries to a very great extent from the more or less intelligent study of books, pamphlets and magazines. The busy German of the opening years of the 20th century had become almost as much the slave of his newspaper as the average American. Berlin in 1900 had 45 daily papers, Leipzig 8, Munich 12, Hamburg 11, Stuttgart 8, Strassburg 6. In the domains both of home and of foreign politics the result was often a chaos of crude opinions and impulses, the strata of which were only differentiated by certain permanent tendencies of German political thought based upon tradition, class feeling, material interests, or distinctions of religious creed. In these circumstances it was still possible for the government, as in the days of Prince Bismarck and Dr Moritz Busch, to bring its superior knowledge to bear upon the anarchy of public sentiment through the medium of the inspired (or as it used to be called, the "rep-tile") press, but this operation had now to be performed with greater delicacy and skill. The press had begun to feel its power. It was at least able to drive a bargain with those who would officially control it, and it was conscious in its relations with the authorities that the advantage no longer rested exclusively on the side of the latter. It would be instructive to compare, with the aid of Dr Busch's "Secret Pages" of the history of Prince Bismarck, the methods by which the first Chancellor used to create and control a movement of public opinion with the devices by which, for instance, count von Bülow and his subordinates endeavoured to manage the press of a later day. The journalists who placed themselves at the disposal of Prince Bismarck were mostly treated as his menials; as he himself said, "Decent people do not write for me." Count von Bülow's methods, and the official treatment of those who wrote for him, were much the same as those of his predecessors, moved on somewhat different lines. These methods may be characterized as the psychological treatment of the individual journalist, the endeavour to appeal to his personal vanity or to his legitimate ambition, and only in a minor degree to his fear of the dossier, the public prosecutor, and the official boycott. There was also a further development of Prince Bismarck's system of acknowledging the existence of political and social movements the origin of which was wholly or partially independent. As in Bismarck's time, the tendencies of these movements were carefully observed, and they were turned to account where they seemed capable of subserving the main objects of state policy. Thus at the opening of the century the pro-Boer and agrarian movements were both employed in support of German foreign and colonial policy, and of an elaborate scheme of naval construction; while the growth of the commercial spirit on the one hand and the awakening of the lower middle classes on the other, were pressed into the service of Wett-politik and of its auxiliary—a system of protective tariffs. It required no small skill to bring into line and to hold together the various classes and interests from time to time arrayed in the press in the service of German foreign policy. The organs of the government in the press were the sheep-dogs which held the flock together.

The German journals of which foreigners hear most belong with few exceptions to the daily press of Berlin. There are, however, one or two provincial or non-Prussian newspapers which from time to time enjoy more careful inspiration from the government, such as Berliner Tageblatt, published officially in Berlin contemporary with the Berliner Tageblatt, Cologne Post, Kölnische Zeitung, 1848, of which Prince Bismarck once said that it was "worth an army corps on the Rhine." It is difficult to trace all the channels by which information is conveyed to an organ of this kind, but there have undoubtedly been times when leading articles and entre-filets in the Rhenish organ were virtually or actually written in the German Foreign Office. Indeed, the methods employed for the organization of a private newspaper, which in the realm of foreign policy at least represented no concrete organization, have been so numerous and varied that it would be hopeless for any one except the most practised observers to get any idea of them. The official press, if it could be manipulated with unvarying success, is that it can easily be dissuaded when the suggestions, overtures or menaces of which it has the power—"This is our statement: Believe it, or else." Thus during the blockade of Manilla in 1898 the Cologne Gazette gave all the prominence of its first column and of leaded type to an article taken from the Marine Politische Korrespondenten, which practically warned the United States of the intention of Germany to have a share in the Pacific possessions of Spain if these should eventually change hands. Some ten days later the authority of this menace was explicitly acknowledged by the North German Gazette, which announced the Marine Politische Korrespondenten had never possessed a semi-official character. The Cologne Gazette continued in the west of Germany to serve the German government much as it did in the east in the days of Prince Bismarck, for newspaper representation became on the whole more intermittent than it was in the days of the first Chancellor. The Hamburgischer Correspondent, the leading Hamburg journal, played a minor rôle of the same nature in the foreign press of the liberal party, which, during the closing years of the life of Prince Bismarck and the closing years of his life at Friedrichsruh as the receptacle of indiscreet revelations and violent attacks upon the present government, as well as upon the local victims of violent Anglophobia. The Allgemeine Zeitung of Munich, once famous throughout Europe as the Augsburger Allgemeine Zeitung before its transference to the Bavarian government in 1870, was for many years the organ of the imperial Chancellor. In Prince Bismarck's days the press bureau of the Prussian Ministry of the Interior, and a similar organization in the Imperial Home Office, used to furnish hurried and inanity communications to the press, to which articles gratis, so that the policy of the government might be advocated in every nook and corner of the country. The numerous journals in which these communications used to appear simultaneously and in an identical form were the government organs to which the Radical and Socialist
opposition more particularly applied the term "Reptile Press." Later this practice of wholesale inspiration was abandoned, but there remained many channels, public and private, through which almost every department of the government could communicate information to the newspapers and to the public "outside". The Prussian Ministry of the Interior distributed to all and sundry a news-letter known as the Berliner Korrespondenz, professing only to give statistics and lack of information, but frequently containing articles advocating some proposal of the government or combating the arguments of its opponents. The Süd-Deutsche Reichs-Korrespondenz had a similar character, and in the North-German edition of the newspaper the Chancellor, count von Bülow. Almost every one of the political parties has its Korrespondens (or news-letter) supplying views rather than news. These circular letters deal, in fact, with the policy of the party, and are addressed to the seaters in general; they also embody information which the party leaders in the Reichstag or in the Prussian Diet have received from representatives of the government for their own guidance. They form the nucleus binding the parties together, and of inspiring them with common aims, as they are reproduced throughout the country by all the party organs.

It was in the press of Berlin that the greatest changes took place towards the end of the 19th century. During the reign of Bismarck the German Gazette, and occasionally the Post, used to keep Europe in a state of nervous tension by fulminating comanquis which the great Chancellor himself often dictated, or by which the political cold brains of a whole nation were directed against France or Russia. So far as France and Russia are concerned, a much more pacific tone prevailed in Berlin after the conclusion of the Dual Alliance, and it was upon England that Bismarck's great efforts were more often directed. The London Gazette, which was originally established by a private individual, in order to place a blank sheet of paper at the disposal of Prince Bismarck to bring about the establishment of a weekly organ of a summary of foreign intelligence bearing the semi-official stamp of Wolf's Telegraph Agency. It had doubtless been found that the constant employment of an organ so distinctly official as the National-Zeitung was the most serious obstacle to the financial development of the government, that the government was apt to lead to indiscretions which committed the authorities too deeply. Indeed, immediately before Prince Bismarck's fall he had actually employed this journal in order to attack the influence of the government's interests.

The journals which in 1880 were most widely read in Berlin, and which are best known abroad as the exponents of Berlin opinion, were the Liberal or Radical Vossische Zeitung and Berliner Tageblatt, and the National Liberal National Zeitung. The Vossische Zeitung, the oldest of the two, was founded in 1863 by Bernhard Wolff, the founder of Wolf's Telegraph Agency. It was a weekly organ based on the London Gazette, and the officers of the London Gazette, purely a record of official intelligence, though on rare occasions it publishes in the section marked Nicht Amtiich (non-official), some opinions on state, some statement of policy or some official document—a proceeding which always requires the express sanction of the emperor.

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6. OTHER EUROPEAN COUNTRIES

Austria-Hungary.—At the beginning of 1840 the whole number of Austrian-German and Hungarian periodicals, of all sorts, was less than 100, only 22 being (after a fashion) political newspapers; and of these nearly all drew their materials and their inspiration from the official papers of Vienna (Wiener Zeitung and Österreichischer Beobachter). These two were all that appeared in the capital. Agric, Peas, Pressburg, Lemberg and Prague had each also two; but no other city had more than a single journal. In 1840 the aggregate number of periodicals had grown to 150, of which 46 were in the empire, but political only in the character. The rest were conduits for intelligence "approved of" by the government. In 1855 the number of political papers published throughout the entire Austrian-German and Hungarian provinces was 85. In 1860 it was 60. The Neue Freie Presse, the chief Vienna daily, was founded in 1864. In 1873, ten years after the virtual cessation of a very strict censorship, the number of political journals, including all the other sorts of papers, had grown to 645, and of political pamphlets, and that of mere advertising papers 42; in 1883 the former number had increased to about 280, the latter to about 66. Vienna had in 1883 in all 18 daily newspapers, ten of which ranged in average circulation from 14,000 to 14,000 copies.

In the period from 1880 to 1888 the only notable paper founded in Austria, was the Wiener Allgemeine Zeitung (1886). It appeared three times daily, but in spite of the impetus communicated to its start by the well-known "Freiheits and Apostol Hertzka, it soon fell away, and eventually became simply a late evening paper, known as the 6 Uhr Abendblatt. It was with the rise of the anti-Semite movement of the later Bismarck period, with Bismarck's annual" travel in the provinces, that the demand for evening papers began. In 1883 the number of evening papers in Vienna was 60. The Neue Freie Presse, the chief Vienna daily, was founded in 1864. In 1873, ten years after the virtual cessation of a very strict censorship, the number of political journals, including all the other sorts of papers, had grown to 645, and of political pamphlets, and that of mere advertising papers 42; in 1883 the former number had increased to about 280, the latter to about 66. Vienna had in 1883 in all 18 daily newspapers, ten of which ranged in average circulation from 14,000 to 14,000 copies.

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NEWSPAPERS

Holland.—The kingdom of the Netherlands has always been rich in newspapers, but they have usually had more weight commercially than politically. Amsterdam in 1850 had 9 daily, and in 1900 had 12 daily. Behind Rotterdam and Leiden was The Hague, where 1900 the Hague had 6 daily (Dagblad, Vaderland, &c.); and Rotterdam had 5 daily (Nieuwe Rotterdamer Courant, &c.). The oldest Dutch newspaper is De Dutschen Courant, founded in 1656, is still one of the leading journals.

Italy.—The Diario di Roma, although dating only from 1716, may claim to have been the patriarch of the Italian press. It lasted for nearly 100 years without interruption. It was printed on a single sheet, with a weekly supplement having the somewhat whimsical title Notizie del Giorno.

The next came the Gazzetta Ufficiale di Napoli. These and their congeners were published under a rigid censorship, and their rulers searched the papers, and removed all evidence of any kind. The first tentative movement towards a free press may, perhaps, be dated from the effort to establish at Milan, in 1816, under the newly-formed Italian republic, a newspaper. Simonde de Sismondi, Gonfalonieri and Romagnosi were fellow-writers, but the new journal was suppressed in 1820. The first really effective effort had to wait for the lapse of nearly thirty years. L'Opinione was first published in Turin (26th December 1847) afterwards in Rome. It had, amongst its many editors, Giacomo Durando (a soldier of mark, and twice minister of foreign affairs), Montenezolo, Giovanni Rampi and Giacomo Dina. The Florence Diretto, originally founded at Turin, in 1851, by Piazzonio and Berti, continued by Macchi, Bargini and Civenini, and as a radical organ attained great influence. Counting journals of all kinds, there were published in Italy in 1864, 450; in 1875, 479. In 1882 the "periodicals" of all kinds numbered 1,454, and total number of political dailies was 149. In 1890 Rome published 13 daily, and in 1900, 10 daily. The leading Roman dailies were: L'Indipendente (founded in 1842 as a nationalist); the Tribuna (5 centimes), a Liberal paper founded in 1883; the organ of the Vatican, L'Osservatore Romano; and the popular Mosca (founded in 1866) and the Corriere della Sera (1876) are issued from Milan.

Russia, Poland and Finland.—The earliest gazette of Moscow (Moskovskaia Vedomosti) was issued by order of Peter the Great on the 1st April 1703, and was published as a government daily for 2 years, until the 1st January 1705. Leningrad (St Petersburg) is the natural successor, and the official daily of the city. The first daily was published in 1721. The first newspaper was completed, but there is no further record of it than the 2nd January following. The whole gazette of the year 1703 was reproduced in facsimile by order of Baron de Korf (the imperial librarian at St Petersburg) in 1855, on occasion of the fests of the centenary of its publication. It is entitled "Gazeta de Moscowa" and "V edomosti dates only from 1766. That of St Petersburg dates from 1718. The historian Karamzin established a short-lived Moscow journal (Moskovski Livadi) and afterwards at St Petersburg the once widely-known Russian Courrier de l'Europe (1802). The profits of the successful Invalide Russe (Russkiy Invalid), established in 1815 by Persorovius, were devoted to the sufferers by the war with France. Adjoining the discussion of "Russian Press" is a miscellaneous and characteristic, the whole number of newspapers published within the Russian states—Poland and Finland excepted—in the year 1835 was 136; in 1886 that number had grown to 179, of which 72 were published in St Petersburg, 71 in Moscow, 3 in Kiev, 3 in Russian, 3 in Russian and in German, 1 in Russian and in Polish, 28 in German, 8 in French, 3 in English, 3 in Polish, 1 in Lithuanian, 1 in Italian, 1 in Hungarian, and 1 in Swedish. The number of newspapers, and number of political and miscellaneous journals had grown to 293, and of these 105 were under the direct influence of the Government. But, in truth, the period of relaxation of censorship, if strictly examined, will be found to have lasted only from 1855 to 1864, when repressive measures were again and frequently resorted to. Poland in 1830 had 49 newspapers. Fifty years later the number was still less than 70, of which 34 were in Polish, these numbers including journals of all kinds. Finland in 1860 had 24 newspapers, all in Swedish, half in Finnish. In 1863 the number had increased to 32, in spite of the zealous opposition of Count de Berg, the governor-general, to all discussion in the political papers. "For the whole country," he said, "it is better that newspapers should not exist."

It should be remembered that the official journals. They consisted of the circulars of the Russian police, and were published at St Petersburg, the capital, and Moscow, the second city. The number of the whole was 25, of which 15 were published weekly, and 10 (excepting 3 which were published only once a year) daily. The so-called Sammelt Zeitung, published at Helsingfors in 1847, owed much of its popularity to the pains its editors took with their correspondence. The Russian Wirkung-Journal ("Uelab von der Hof-Kommisjon") was for a considerable period the most thoroughly newspaper of the world. The exception, of the little journal published at Tromsö, in Norway.

In 1880 the whole number of newspapers printed within the government of Russia was 887. Of these 517 were published in the Russian language, 155 of them being official or administrative journals. The number of daily papers printed in various European languages—French, Dutch, English, German, Russian, Lithuanian, even Chinese—made the foreign press of St Petersburg and Moscow a powerful influence. The large number of newspapers printed within the empire during the same year was 376. Of these, 417 were printed in the Russian language, 155 of them being official or administrative journals. The number of daily papers printed in various European languages—German, French, English, Russian, Lithuanian, even Chinese—made the foreign press of St Petersburg and Moscow a powerful influence.
In journals, but these papers, dailies. Best political activity in 1900 Denmark. Until was 197, it was published in Aftonbladet, founded by the above-named Blacquet in 1831. It soon changed its language to Turkish, and was edited by Franceschi. The second Smyrna newspaper, Echo de l'Orient, established in 1838, was transferred to Constantinople in 1844. But not one of these papers has survived.

In 1876 the total number of journals of all kinds published in the capital was 72 (namely, 20 in French, 16 in Turkish, 13 in Armenian, 12 in Greek, 11 in as many other tongues). In 1890 there were 19 papers, in various languages, published at Constantinople, most of them dailies; and in 1900 the number of papers decreased to 18. They appeared in the following languages: the Stamboul and 4 others in French, 3 in Turkish, 1 in Spanish, and 1 in some other languages, and 1 each in Arabic, English, Italian and Persian. Smyrna published 8 papers, mostly weeklies, in 1890, and the same number in 1891. Many of them were printed in Istanbul, the capital of the empire.

In Greece and Spain, the press was somewhat more independent, but even there the newspapers were almost entirely in the hands of the government. In Spain, for example, the press was exclusively under the control of the government, and only political and official papers were published.

The newspapers of other countries (e.g. Japan) or of important towns, see under the separate topographical headings. (H. C.)

NEWT (a corrupted form from "an evet" or "an effet," an term of Anglo-Saxon origin, still used in many parts of England), the name usually applied to the aquatic Amphibia. It is the name of English school which constitute the genus Molge, formerly known as Triton. But the name Triton, applied to these Batrachiens by N. Laurenti (1768), has already been used by Linnaeus (Systema Naturae) for parts of the barnacle (Lepas anatifera). B. Merxm (1820) proposed to substitute for it the name Molge, said to be derived from the Gr. Máχαν or Máχαν, "slow," in allusion to the movements of these animals on land. The similar name Molch designates these Batrachiens in German.
land, concealing themselves under stones, logs of wood, or in holes in damp earth, but leaving their retreat at night or in wet weather, to search for earth-worms and slugs which constitute their principal food. In the water they are very destructive of tadpoles, insect larvae and crustaceans.

A remarkable feature of the newts, which they share with the other tailed Batrachians and the larvae of the frogs and toads, is the great facility with which they regenerate lost limbs as the tail, femur, humerus, and even the maxillary and mandibular, a faculty which has given rise to a great variety of experiments, from the days of Charles Bonnet and Spallanzani to those of the present school of Entwicklungsmechanik.

Extraordinarily as it may appear, considering the abundance of these creatures and the attention they have received from naturalists, it was only in 1880 that their mode of fertilisation was correctly ascertained, from observation of the common newt by the Italian zoologist F. Gasco. The amorous games of the newts, so graphically represented by M. Rusconi, had been repeatedly described, and Abbé Spallanzani, as early as 1766, had ascertained the impregnation to be internal. The then current belief that the water served as a vehicle to convey the spermatozoa to the female organs had received a blow on the declaration of a latestonic current in the female, but no satisfactory explanation had been given of the manner in which the spermatozoa reach these pouches. This mystery Gasco succeeded in elucidating in his masterly paper on the Batrachia in 1880. He has since carried the investigations on the axolotl, and those of E. Zeller, E. O. Jordan and others on the European and American newts.

All who have kept newts in an aquarium have witnessed the curious and inimitable method of fertilisation; the female, when in full condition, will, by the male undulating the tip of his tail, conduct the male to the female in the act of spawning; and by an apathetic twirl of her own body, the female will often guide the male into her cloaca. This is an uninterrupted process which goes on for many hours at a time.

The genus *Molge* has a wide distribution, extending over Europe, northern Asia, and western temperate America (China and Japan) and North America as far south as southern California and the Rio Grande del Norte. Twenty species are distinguished. The British species are the crested newt (*M. cristata*), the leaf newt (*M. vittata*), and the palmated newt (*M. palmarum*). The first is the largest, and measures 4 to 6 in. The skin is more or less rugose, with granular warts, a strong fold extends across the thorax, and the external cloaca is provided with a very high denticate dorsal crest which is interrupted over the sacral region; the upper parts are dark, with more or less distinct black spots; the sides are speckled with white, and the lower parts are yellow or orange, spotted or marbled with black; a silver stripe adorns the side of the tail in the male. The common and the palmated newts are smaller, 2 1/2 to 4 in. in length, and have a smooth skin. The dorsal crest of the male is high and festooned in the former, low and straight-edged in the latter; during the breeding season the crest of the common newt ape lobate like a grebe's, whilst they are webbed like a duck's in the palmated newt, which is further distinguished in having the tail transversely ribbed like a flamingo.

It is a remarkable fact that, although related so closely and occurring so frequently together in pools of small extent, the common and palmated newts are not known to ever produce hybrids, whilst the crested and leaf newts are occasionally bred in aquaria. The former is a native of the south-western alps, the beautiful *Molge marmorata*, to which it is by so means more nearly akin than are the two above-named species to each other, generally gives rise to the form known as *M. lasti*, which has been proved to be a cross between *M. cristata* and *M. marmorata*.

Principal references: G. A. Boulenger, Catalogue of Batrachia Great Britain and Ireland (1878); J. Bedriaga, Lurcheffe Europaes, II. Uroidea (1897); F. Gascó, "Sur les Tritons (Triton des élephants, Z. Wiss. Zool. xiii. (1890) and li. (1901); M. Rusconi, "La zoología británica," Gazzetta, xli. (1904). Newton, Alfred (1829-1907), English zoologist, was born at Geneva on the 11th of June 1829. In 1848 he was elected travelling fellow of Magdalene College, Cambridge, of which he had been an undergraduate, and subsequently visited many parts of the world, including Lapland, Iceland, Spitsbergen, the West Indies and North America. In 1866 he became the first professor of zoology and comparative anatomy at Cambridge, a position which he retained till his death. His services to ornithology and zoogeography were recognized by the Royal Society in 1890, when it awarded him a Royal Medal. He wrote many books, including Zoology of Ancient Europe (1862), Osteologia Wollevana (begun in 1864), Zoology (1872), and a Dictionary of Birds (1883-1886). The last, still a standard work, was an amplification of the numerous articles on birds which he contributed to the 9th edition of the Encyclopaedia Britannica, and which with comparatively slight revision are retained in the present edition. He contributed many memoirs to scientific societies, and edited The Ibis (1865-1870), the Zoological Record (1870-1872), and Yarrell's British Birds (1871-1882). He died at Cambridge on the 7th of January, 1886.

Newton, Sir Charles Thomas (1816-1894), British archaeologist, was born on the 16th of September 1816, at Bredwardine in Herefordshire, and educated at Shrewsbury School and Christ Church, Oxford. He entered the British Museum in 1830 as an assistant in the Antiquities Department. Antiquities, classical, Oriental and medieval, as well as ethnographical objects, were at the time included in one department, which had no classical archaeologist among its officers. In 1852 Newton quitted the Museum to become vice-consul at Mitylene, with the view of exploring the coasts and islands of Asia Minor. Aided by funds supplied by Lord Stratford de Redcliffe, then British ambassador at Constantinople, he made in 1852 and 1853 important discoveries of inscriptions at the island of Calymnos, off the coast of Caria; and in 1856-1857 he achieved the great archaeological exploit of his life by the discovery of the remains of the mausoleum of Halicarnassus, one of the "seven wonders" of the ancient world. He was greatly assisted by Murdoch Smith, afterwards celebrated in connexion with Persian telegraphs. The results were described by Newton in his History of Discoveries at Halicarnassus (1862-1863), written in conjunction with R. P. Pullan, and in his Travels and Discoveries in the Lévant (1865). These works included particulars of other important discoveries, especially at Branchiae, where he disinterred the statues which had anciently lined the Sacred Way, and at Cnidus, where R. P. Pullan, acting under his direction, found the colossal lion now in the British Museum.

In 1855 Newton declined the regius professorship of Greek at Oxford. In 1860 he was made British consul at Rome, but had scarcely entered upon the post when an opportunity presented itself of becoming sub-consul at the British Museum, which was divided into three and ultimately four branches. The Greek and Roman section naturally fell to Newton, who returned as Keeper, and held the office until 1885, declining the offer of the principal librarianship made to him in 1878. The Mausoleum Room, to accommodate the treasures he had found in Asia Minor, was built under his supervision, but the most brilliant episode of his administration was the acquisition of the Blacas and Castellani gems and sculptures. The Farnese and Pourtales collections were also acquired by him. Not being of the leading London families, he had the advantage of the Promotion of Hellenic Studies, the British School at Athens, and the Egypt Exploration Fund. He was Yates professor of classical archaeology at University College, London, from 1880 to 1888. His collected Essays on Art and Archaeology were published in 1886. When, on his retirement from the Museum, his bust by Boehm, now placed in one of the sculpture galleries, was presented to him as a testimonial, he desired the unexpended balance to be given to the school at Athens. After his retirement he was much occupied with the publication of the Greek inscriptions in the British Museum, but his health failed greatly in the latter years of his life. He died at Margate on the 28th of November 1894. He married in 1861 the daughter of his successor in the consulate at Rome, the painter Severn, herself a distinguished artist. She died in 1886.
Newton, Sir Isaac (1642–1727), English natural philosopher, was born on the 25th of December 1642 (O.S.), at Woolsthorpe, a hamlet in the parish of Colsterworth, Lincolnshire, about 6 m. from Grantham. His father (also Isaac Newton) who farmed a small freehold property of his own, died before his son attained his third year. His mother, Hannah Ayscough, a daughter of James Ayscough of Market-Overton. When Newton was little more than two years old his mother married Barnabas Smith, rector of North Witham. Of this marriage there was issue, Benjamin, Mary and Hannah Smith, and to their children Sir Isaac Newton subsequently left the greater part of his property. After having acquired the rudiments of education at two small schools in hamlets close to Woolsthorpe, Newton was sent at the age of twelve to the grammar school of Grantham. While attending Grantham school Newton lived in the house of Mr Clark, an apothecary of that town. According to his own confession he was far from industrious, and stood very low in his class. An unprovoked attack from the boy next above him led to a fight, in which Newton’s pluck gave him the victory. This success seems to have led him to greater exertions, and he rose to be the head boy of the school. He displayed very early a taste and an aptitude for mechanical contrivances. He made windmills, water-clocks, kites and dials, and he is said to have invented a four-wheeled carriage which was to be moved by the rider. In 1656 Mr Smith died, and Newton’s mother came back with her three children to Woolsthorpe. Newton was then in his fifteenth year, and, as his father in all probability intended him to be a farmer, he was taken away from school. He was frequently sent on market days to Grantham with an old and trusty servant, who made all the purchases, while Newton spent his time among the books in Mr Clark’s house. It soon became apparent to Newton’s relatives that they were making a great mistake in attempting to turn him into a farmer, and he was therefore sent back again to school at Grantham. His mother’s brother, William Ayscough, the rector of Burton Coggles, the next parish, was a graduate of Trinity College, Cambridge, and when he found that Newton’s mind was wholly devoted to mechanical and mathematical problems, he urged upon Mrs Smith the desirability of sending her son to his own college. He was accordingly admitted a member of Trinity College on the 5th of June 1661, as a subsizar, and was matriculated on the 8th of July. We have scarcely any information as to his attainments when he commenced residence, and very little as to his studies as an undergraduate. It is known that while still at Woolsthorpe Sanderson’s Logic had been read by him to such purpose that his tutor at Trinity College excused his excursions from the regular course of lectures on that subject. Newton tells us himself that, when he had purchased a book on astrology at Steebrugh fair, a fair held close to Cambridge, he was unable, on account of his ignorance of trigonometry, to understand a figure of the heavens which was drawn in this book. He therefore bought an English edition of Euclid with an index of propositions at the end of it, and, having turned to two or three which he thought likely to remove his difficulties, he found them so self-evident that he put aside Euclid “as a trilling book,” and applied himself to the study of Descartes’s Geometry. It is reported that in his examination for a scholarship at Trinity, to which he was admitted on the 3rd of May 1662, he was examined in Euclid by Dr Isaac Barrow, who formed a poor opinion of his knowledge, and that in consequence Newton was led to read the Elements again with care, and thereby to form a more favourable estimate of Euclid’s merits.

The study of Descartes’s Geometry seems to have inspired Newton with a love of the subject, and to have introduced him to the higher mathematics. In a small commonplace book, bearing on the seventh page the date of January 1663/1664, there are several articles on angular sections, and the squaring of curves and certain lines that may be squared, several calculations about musical notes, geometrical propositions from Francis Vieta and Frans van Schooten, annotations out of Wallis’s Arithmetica of Infinites, together with observations on refraction, on the grinding of spherical optic glasses,” on the errors of lenses and the method of rectifying them, and on the extraction of all kinds of roots, particularly those “in affected powers.” And in this same commonplace book the following entry made by Newton himself, many years afterwards, gives a further account of the nature of his work during the period when he was an undergraduate:—

“July 4, 1669.—By consulting an account of my expenses at Cambridge, in the years 1663 and 1664, I find that in the year 1664 a little before Christmas, I, being then Senior Sophister, bought Stack’s Miscellanies and Carter’s Geometry (having read this Geometry and Oughtred’s Clavis clean over half a year before), and borrowed Wallis’s works, and by consequence made these annotations out of Schooten and Wallis, in winter between the years 1663 and 1665. At such time I found the method of Independent Series, and in summer 1665, being forced from Cambridge by the plague, I computed the area of the Hyperbola at Boothby, in Lincolnshire, to two and fifty figures by the same method.

That Newton must have begun early to make careful observations of natural phenomena is sufficiently testified by the following remarks about halos, which appear in his Optics, book ii. part iv. obs. 13:—

“The like Crowns appear sometimes about the moon; for in the beginning of the Year 1663, February 15th, at night, I saw two such Crowns about her. The Diameter of the first or innermost Crown was as the Diameter of the Sun, and the Distance of the second was double the Diameter of the Sun, and an half. Next about the moon was a Circle of white, and next about that the inner Crown, which was of a bluish green within next the white, and of a yellow and red without, and next about these Crowns were others of blue and green on the inside of the Outward Crown, and red on the outside of it. At the same time there appear’d a Halo about 22 Degrees 35’ distant from the center of the moon. It was elliptical, and its Long Diameter was perpendicular to the Horizon, verging below farther from the moon.”

In January 1665 Newton took the degree of B.A. The persons appointed (in conjunction with the proctors, John Slade of Catharine Hall, and Benjamin Pulley of Trinity College, Newton’s tutor) to examine the questionists were John Eachard of Catharine Hall and Thomas Gipps of Trinity College. It is a curious accident that we have no information about the respective merits of the candidates for a degree in this year, as the “ordo senioritatis” of the bachelors of arts for the year is omitted in the “Grace Book.”

It is supposed that it was in 1665 that the method of fluxions first occurred to Newton’s mind. There are several papers still existing in Newton’s handwriting bearing dates 1665 and 1666 in which the method is described, in some of which dotted or dashed letters are used to represent fluxions, and in some of which the method is explained without the use of dotted letters.

Both in 1665 and in 1666 Trinity College was dismissed on account of the plague. On each occasion it was agreed, as in the case of the “Modern Divinity” of 1657, that the examination was suspended for the succeeding year. In 1666, the examination dates August 7th, 1665, and June 22nd, 1666, and signed by the master of the college, Dr Pearson, that all fellows and scholars who were dismissed on account of the pestilence be allowed one month’s commons. Newton must have left college before August 1665, as his name does not appear in the list of those who received extra commons on that occasion, and he tells us himself in the extract from his commonplace book already quoted that he was “forced from Cambridge by the plague” in the summer of that year. He was elected a fellow of his college on the 1st of October 1667. There were nine vacancies, one of which was taken by the “Verger Cohlemy” in the preceding summer, and the nine successful candidates were all of the same academical standing. A few weeks after his election to a fellowship Newton went to Lincolnshire, and did not return to Cambridge till the February following. On the 16th of March 1668 he took his degree of M.A.

During the years 1666 to 1669 Newton’s studies were of a very varied kind. It is known that he purchased prisms and lenses on two or three several occasions, and also chemicals and a furnace, apparently for chemical experiments; but he also employed part of his time on the theory of fluxions and other branches of pure mathematics. He wrote a paper Analysis per Equationes Numero Terminorum Infinitas, which he put, probably in June 1669, into the hands of Isaac Barrow (then Lucasian professor of mathematics), at the same time giving him
permission to communicate the contents to their common friend
John Collins (1624–1683), a mathematician of no mean order,
Barrow did this on the 31st of July 1669, but kept the name of
the author a secret, and merely told Collins that he was a friend
staying at Cambridge, who had a powerful genius for such
matters. In a subsequent letter on the 26th of August, Barrow
clarified this by saying he had sent him a paper from Newton:
Collins had formed of the paper, and added, "the name of the
author is Newton, a fellow of our college, and a young man,
who in his second year since he took the degree of master
of arts, and who, with an unparalleled genius (eximio quo est
acutium), has made very great progress in this branch of mathe-
matics." Shortly afterwards Barrow resigned his chair, and was
instrumental in securing Newton's election as his successor.
Newton was elected Lucassian professor on the 29th of October
1669. It was his duty as professor to lecture at least once a week
in term time on some portion of geometry, arithmetic, astronomy,
geography, optics, statics, or some other mathematical subject,
and also for two hours in the week to allow an audience to
any student who might come to consult with the professor on any
difficulties he had met with. The subject which Newton chose
for his lectures was optics. The success which attended his
researches in optics must have been great, although the results
were known only through his own oral lectures, until he presented
an account of them to the Royal Society in the spring of 1672.
On the 21st of December 1671 he was proposed as a candidate
for the Collsionian professorship of Natural History, which
was offered to him by the corporation of Salisbury, and on the 11th of January 1672 he was elected a fellow of the Society.
At the meeting at which Newton was elected a description of a reflecting telescope which he had in-
vented was read, and "it was ordered that a letter should be
written by the secretary to Mr Newton to acquaint him of
his election into the Society, and to thank him for the communication
of his telescope, and to assure him that the Society would take
care that all right should be done him with respect to this
invention." 

In reply to the secretary on the 18th of January 1672, Newton wrote:—
"I desire that in your next letter you would inform me for what
time the society continue their weekly meetings; because, if they
continue them for any time, I am purposing them to be considered
as examinations, and a kind of examination, which I doubt
not but will prove much more grateful than the communication
of this discovery, which in my judgment the oddest if not the most
considerable detection which hath hitherto been made into the
operations of nature."

The promise here made was fulfilled in a communication
which Newton addressed to Henry Oldenburg, the secretary of
the Royal Society, on the 6th of February 1672, and which
was read before the society two days afterwards. The whole is
printed in No. 80 of the Philosophical Transactions.

After explaining his discovery of the composition of white light, he proceeds:—
"When I understood this, I left off my aforesaid Glass works; for
I saw, that the perfection of Telescopes was hitherto limited, not so
much for want of glasses truly figured according to the prescriptions
of Opticks Authors (which all men have hitherto imagined), as
because the light through the Glasses is altogether undistinguishable from
the General refrangible Rays. So that, were a glass so exactly figured as
to collect any one sort of rays into one point, it could not collect those
also into the same point, which having the same Incidence upon the
same Medium are apt to suffer a different Refraction. Nay, I wondered, that seeing the difference of refrangibility was so great, as
I found it, Telescopes should arrive to that perfection they are
now arrived at.

He then points out why "the object-glass of any Telescope cannot
collect all the rays which come from one point of an object, so as to
make them converge at its focus in less room than in a circular space,
where no angle is greater than a right angle. Therefore made me
consider, that which is an irregularity some hundreds of times greater, than
a circularly figured Lens, of so small a section as the Object-glasses
of long Telescopes are, would cause by the unevenness of its figure, were
least to be suspected. The Angle of Reflection of all sorts of Rays was equal to their Angle of Incidence; I understood, that by their mediation Optick instruments might be
brought to any degree of perfection. If a reflecting substance could be found, which would polish as finely as
Glass, and reflect as much light, as glass transmits, and the art of
communicating to it a Parabolick figure be also attained. But these
difficulties are not so great and so insuperable, as I further considered, that every irregularity in a
reflecting superflicies makes the rays stray 5 or 6 times more out of
their due course, than the like irregularities in a refracting one; so
that the greatest diffuseness would be here requisite, than in figuring
glasses for Refraction.

Amidst these thoughts I was forced from Cambridge by the Inter-
vention of Public Affairs, and return'd to London. Plague made it
necessary further. But then having thought on a tender way of polish-
ing, proper for metal, whereby, as I imagined, the figure also would
be corrected to the last; I began to try, what might be effected in this
way; and by the help of some of my Optick Graduates, I completed
experiments, of an extraordinary success, (as I have sent to London),
by which I could discern Jupiters 4 Concomitants, and shewed them divers times to
the satisfaction of my acquaintance. I could also discern the Moon-like
phase of Venus, but not equally distinctly, nor without some niceness in
the disposing the Instrument.

From that time I was interrupted till this last Autumn, when I
made the other. And as that was sensibly better than the first
-especially for Day-Objects), so I doubt not, but they will be still
brought to a much greater perfection by their endeavours, who, as
you inform me, are taking care about it at London."

After a remark that microscopes seem as capable of improvement
as telescopes, he adds: "I shall now proceed to acquaint you
with another more notable diffirmity in its Rays, wherein the Origin of Colours is exhibited. In which way I shall lay down the Doctrine
first, and then, for its examination, give you some Experiments,
as a specimen of the rest. The Doctrine you will find
comprehended and illustrated in the following propositions:

1. The Rays of Light in the Rays of the Sun are of the most
inconsiderable, that they also differ in their disposition to exhibit this or that particular
colour. Colours are not Qualifications of Light, derived from Refrac-
tions, or Reflections of natural Bodies (as 'tis generally believed,
but original and connate properties, which in divers Rays are divers

Some Rays are disposed to exhibit a red colour and no other; some
a yellow and no other, some a green and no other, and so of the rest.
They are the only Rays proper and particular to the more eminent
colours, but even to all their intermediate degrees of differ-
ent."

2. To the same degree of Refrangibility ever belongs the same
colour, and to the same colour ever belongs the same degree of
diffraction. Therefore, when a Ray of Light is so refracted, as to
exhibit a Red colour, and contrarily those Rays, which are disposed
to exhibit a Red colour, are all the least Refrangible: So the most
refrangible Rays are all disposed to exhibit a deep Violet colour,
and contrarily those which are apt to exhibit such a violet colour
are all the most Refrangible.

And so to all the intermediate colours in a continued series
belong intermediate degrees of refrangibility. And this Analogy
'twixt colours, and refrangibility is very palpable and striking;
the Rays always either exactly agreeing in both, or proportionally
disagreeing in both.

The species of colour, and degree of Refrangibility proper to
any particular sort of Rays, is not mutable by Refraction, nor by
Reflection from natural bodies, nor by any other cause, that I could
yet observe. When any one sort of Rays hath been well parted
from all the other sorts, and after a long time is put together,
its colour, notwithstanding my utmost endeavours to change it.
I have refracted it with Prisms, and reflected it with Bodies, which
nearly approach to the Sun's heat, and yet I never could produce any new colour out of it. It would by
contracting or dilating become more brisk, or faint, and by the loss
of many Rays, in some cases very obscure and dark; but I could
never see it changed in species.

When removing the superfluous Colours may be made, where
there is mixture of divers sorts of Rays. For in such mixtures,
The component colours appear not, but, by their mutual alloying
could very well be distinguished.

Further on, after some remarks on the subject of compound colours, he says: "I might add more instances of this nature, but I shall
conclude with this general one, that the Colours of all natural Bodies
have no other origin than this, that they are variously qualified to
reflect and refract the different sorts of rays. I think I have experimented in a dark Room by illuminating those bodies
with uncompounded light of divers colours. For by that means any
body might be qualified to reflect and refract the rays of any other

appropriate colour, but ever appear of the colour of the light cast
upon them, but yet with this difference, that they are most brisk
and vivid in the light of their own day-light colour. Minium appears
far the clearest in Red, though far the least visible in the Yellow or
but yet most luminous in red, and so Bize appear indifferent finely of
any colour with which 'tis illustrated, but yet most luminous in
blew. And were of minimum with Rays of any colour, but
most copiously those induced with red; and consequently when
illustrated with day-light, that is with all sorts of Rays promiscuously
Newton, Sir Isaac

blended, those qualified with red shall abound most in the reflected light, and by their prevalence cause it to appear of that colour.

And for the same reason blue, reflecting most copiously, shall appear blue by the excess of those Rays in its reflected light; and the same effect is seen in a dark room, where the air is tincture and adequate cause of their colours, is manifest, because they have no power to change or alter the colours of any sort of Rays incident apart, but put on all colours indifferently, with which they are innately.

"Reviewing what I have written, I see the discourse itself will lead to divers Experiments sufficient for its examination: And therefore I shall not trouble you further, than to describe one of those Experiments, which may hereafter be repeated.

"In a darkened Room make a hold in the shut of a window whose diameter may conveniently be about a third part of an inch, to admit of the Light of a candle. Take then a large and clear and colourless Prism, to refract the entering light towards the further part of the Room, which, as I said, will thereby be diffused into an oldlong coloured Image. Then place a Lens of about three foot foot, and choose a broad Object-glass of a three foot Telescope, at the distance of about four or five foot from thence, through which all those colours may at once be transmitted, and made by its Refraction to converge at a further distance of about ten or twelve feet. If at that distance you intercept this light with a sheet of white paper, you will see the colours converted into whiteness again by being mingled.

"But it is requisite, that the Prisms and Lens be placed steady, and that the Sun's Light be not made to strike upon the Prism head to head; for, by such motion, you will not only find, at what distance the whiteness is most perfect but also see, how the colours gradually converge, and vanish into whiteness, and afterwards having crossed once more the Prism, are again dissipated and re-formed. And when the colours have been before they entered the composition. You may also see, that if any of the Colours at the Lens be intercepted, the Whiteness will be changed into the other colours. And therefore, that the composition of whiteness be perfect, care must be taken, that none of the colours fall besides the Lens.

He concludes his communication with the words: "This, I conceive, is enough for an Introduction to Experiments of this kind: which if any of the R. Society shall be so curious as to prosecute, I should be very glad to be informed with what success: That, if any thing new and useful to the science may be found, there may be an opportunity of giving further direction about it, or of acknowledging my errors, if I have committed any."
Johann Kepler had proved by an elaborate series of measurements that each planet revolves in an elliptical orbit round the sun, whose centre occupies one of the foci of the orbit, that the radius vector of each planet drawn from the sun describes equal areas in equal times, and that the earth's mean motion, given by the planets are in the same proportion as the cubes of their mean distances from the sun. The fact that heavy bodies always have a tendency to fall to the earth, no matter at what height they are placed above the earth's surface, seems to have led Newton to conjecture that it was possible that the same tendency to fall to the earth was the cause by which the moon was retained in its orbit round the earth. Newton, by calculating from Kepler's laws, and supposing the orbits of the planets to be circles round the sun in the centre, had already proved that the force of the sun acting upon different planets must vary as the inverse square of the distances of the planets from the sun. He therefore was led to inquire whether, if the earth's attraction extended to the moon, the force at that distance would be of the exact magnitude necessary to retain the moon in its orbit. He found that the moon by her motion in her orbit was deflected from the tangent in every minute of time through a space of thirteen feet. But by observing the distance through which a body would fall in one second of time at the earth's surface, and by calculating from that on the supposition of the force diminishing in the inverse square of the distance, he found the earth's attraction at the distance of the moon would draw a body through 15 ft. in 1 min. Newton regarded the discrepancy between the results as a proof of the inaccuracy of his conjecture, and "laid aside at that time any further thoughts of this matter.

But in 1679 a controversy between Hooke and Newton, about the form of the path of a body falling from a height, taking the motion of the earth round its axis into consideration, led Newton again to revert to his former conjectures on the moon. The measure of the earth, which had hitherto been accepted by geographers and navigators, was based on the very rough estimate that the length of a degree of latitude in the earth's surface measured along a meridian was 69.5 miles. More accurate estimates had been made by R. Norwood and W. Snell, and more recently by P. Picard. At a meeting of the Royal Society on the 11th of January 1672, Oldenburg the secretary read a letter from Paris describing the method followed by Picard in measuring a degree, and specifically stating the precise length that he calculated it to be. It is probable that Newton had become acquainted with this measurement of Picard's, and that he was therefore led to make use of it when his thoughts were redirected to the subject. This estimate of the length of a degree of latitude, 69.5 miles, made the two results, the discrepancy between which Newton had regarded as a disproof of his conjecture, to agree so exactly that he now regarded his conjecture as fully established.

In January 1684 Sir Christopher Wren, Halley and Hooke were led to discuss the law of gravity, and, although probably they all agreed in the truth of the law of the inverse square, yet this truth was not looked upon as established. It appears that Hooke professed to have a solution of the problem of the path of a body moving round a centre of force attracting as the inverse square of the distance; but Halley, finding, after a delay of some months, that Hooke "had not been so good as his word" in showing his solution to Wren, started in the month of August 1683 for Cambridge to consult Newton on the subject. Without mentioning the speculations which had been made, he asked Newton what would be the curve described by a planet round the sun on the assumption that the sun's force diminished as the square of the distance. Newton replied promptly, "an ellipse," and on being questioned by Halley as to the reason for his answer he replied, "Why, I have calculated it." He could not, however, put his hand upon his calculation, but he promised to send it to Halley. After the latter had left Cambridge, Newton set to work to reproduce the calculation. After making a mistake and producing a different result he corrected his work and obtained his former result.

In the following November Newton redeemed his promise to Halley by sending him, by the hand of Mr Paget, one of the fellows of his own college, and at that time mathematical master of Christ's Hospital, a copy of his demonstration; and very soon afterwards Halley paid another visit to Cambridge to discuss with the Newcomen application of the several crudities read to London on the 10th of December 1684, he informed the Royal Society "that he had lately seen Mr Newton at Cambridge, who had showed him a curious treatise De Motu," which at Halley's desire he promised to send to the Society to be entered upon their register. "Mr Halley was desired to put Mr Newton in mind of his promise for the securing this invention to himself, till such time as he could be at leisure to publish it," and Paget was desired to join with Halley in urging Newton to do so. By the middle of February Newton had sent his paper to Astronomer-royal, one of the secretaries of the Society, and in a letter to Aston dated the 23rd of February 1685, we find Newton thanking him for "having entered on the register his notions about motion." This treatise De Motu was the germ of the Principia, and was obviously meant to be a short account of what that work was intended to embrace. It occupies twenty-four octavo pages, and consists of four theorems and seven problems, some of which are identical with some of the most important propositions of the second and third sections of the first book of the Principia.

In 1685 and 1686 will ever be memorable in the history of science. It was in them that Newton composed almost the whole of his great work. During this period Newton had a very extensive correspondence with John Flamsteed, who was then the astronomer-royal. Many of the letters are lost, but it is clear from one of Newton's, dated the 15th of September 1685, that he had received many useful communications from Flamsteed, and especially regarding Saturn, "whose orbit, as defined by Kepler," Newton "found too little for the sesquialterate proportions.

In the other letters written in 1685 and 1686 he applies to Flamsteed for information respecting the orbits of the satellites of Jupiter and Saturn, respecting the rising and fall of the spring and neap tides at the solstices and the equinoxes, respecting the flattening of Jupiter at the poles (which, if certain, he says, would conduce much to the stating the reasons of the precession of the equinoxes), and respecting the difference between the observed places of Saturn and those computed from Kepler's tables about the time of his conjunction with Jupiter. On this last point the information supplied by Flamsteed was peculiarly gratifying to Newton; and it is obvious from the language of this part of his letter that he still looked upon his universal law of attraction as an hypothesis, a conception which he never ultimately adopted. "Your information," he says, "about the errors of Kepler's tables for Jupiter and Saturn has eased me of several scruples. I was apt to suspect there might be some cause or other unknown to me which might disturb the sesquialteral proportions, for the influences of the planets upon another seemed not great enough, though I imagined Jupiter's influence greater than your numbers determine it. It would add to my satisfaction if you would be pleased to let me know the long diameters of the orbits of Jupiter and Saturn, assigned by yourself and Mr Halley in your new tables, that I may see how the planetary tables compare with the hypothesis with another small proportion which must be allowed for."

Upon Newton's return from Lincolnshire in the beginning of April 1685, he seems to have devoted himself to the preparation of his work. In the spring he had determined the attractions of masses, and thus completed the law of universal gravitation. In the summer he had finished the second book of the Principia, the first book being the treatise De Motu, which he had enlarged and completed. Excepting in the correspondence with Flamsteed we hear nothing more of the preparation of the Principia until the 21st of April 1686, when Halley read to the Royal Society his Discourse concerning Gravity and its Properties, in which he states "that his worthy countryman Mr Isaac Newton has an incomparable treatise of motion almost ready for the press," and that the law of the inverse square "is the principle on which Mr Newton has made out all the
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phemonena of the celestial motions so easily and naturally, that its truth is past dispute." At the next meeting of the Society, on the 28th of May, "Dr. Vincent proposed to the Society a manuscript treatise entitled "Philosophiae Naturalis Principia Mathematica," and dedicated to the Society by Mr. Isaac Newton." Although this manuscript contained only the first book, yet such was the confidence the Society placed in the author that an order was given "that a letter of thanks be written to Mr. Newton; and that the printing of his book be referred to the consideration of the council; and that in the meantime the book be put into the hands of Mr. Halley, to make a report thereof to the council." Although there could be no doubt of the intention to reprint a work which had already taken up two months towards the publication of the work. At the next meeting of the Society, on the 19th of May, some dissatisfaction seems to have been expressed at the delay, as it was ordered "that Mr. Newton's work should be printed forthwith in quarto, and that a letter should be written to him to signify the Society's resolutions, and to desire his opinion as to the print, volume, cuts and so forth." Three days afterwards Halley communicated the resolution to Newton, and stated to him that the printing was to be at the charge of the Society. At the next meeting of the council, on the 2nd of June, it was again ordered that Mr. Halley should communicate the resolution of the general meeting to print it at their charge, they added "that Mr. Halley undertake the business of looking after it, and printing it at his own charge, which he engaged to do." In order to explain to Newton the cause of the delay, Halley in his letter of the 22nd of May alleges that it arose from "the president's attendance on the king, and the absence of the vice-presidents, whom the good weather had drawn out of town;" but there is reason to believe that this was not the true cause, and that the unwillingness of the council to undertake the expense arose from the state of the finances of the Society. Halley certainly deserves the gratitude of posterity for undertaking the publication of the work at a very considerable pecuniary risk to himself. In the same letter Halley found it necessary to inform Newton of Hooke's conduct when the manuscript of the Principia was presented to the Society. Sir John Hooke was in the chair when Dr. Vincent presented the manuscript, and passed a high encomium on the novelty and dignity of the subject. Hooke was offended because Sir John did not mention what he had added to Newton's manuscript by way of corrections. He complained to Newton the "that Hooke had some pretensions to the invention of the rule for the decrease of gravity being reciprocally as the squares of the distances from the centre," acknowledging at the same time that, though Newton had the notion from him, "yet the demonstration of the curves generated thereby belonged wholly to Newton." "How much of this," Halley adds, "is so, you know best, so likewise what you have to do in this matter; only Mr. Hooke seems to expect you should make some mention of him in the preface, which 'tis possible you may see reason to prefix. I must beg your pardon that 'tis I that send you this ungrateful account; but I thought it my duty to let you know it, so that you might act accordingly, being in myself fully satisfied that nothing but the greatest candour imaginable is to be expected from a person who has of all men the least need to borrow reputation." In thus appealing to Newton's candour, Halley obviously wished that some acknowledgment of Hooke's conduct should be made. He knew indeed that before Newton had announced the inverse law Hooke and Wren and himself had spoken of it and discussed it, and therefore justice demanded that, though none of them had given a demonstration of the law, Hooke especially should receive credit for having maintained it as a truth of which he was seeking the demonstration. On the 20th of June 1686 Newton wrote to Halley the following letter:— "Sir,—In order to let you know the case between Mr. Hooke and me, I give you an account of what passed between us in our letters, so far as I could remember; for 'tis long since they were writ, and I do not know that I have seen them since. I am almost confident circumstances, that Sir Chr. Wren knew the duplicate proportion when I gave him a visit; and then Mr. Hooke (by his book Cometa written afterwards) will prove the last of us three that knew it. I intended in this letter to let you understand the case fully; but it being a frivolous business, I shall content myself to give you the barest and shortest account of it. I did not communicate Mr. Hooke's proposition lower than to the supercicies of the earth, and before a certain demonstration I found the last year, I have suspected it did not reach accurately enough down low; and therefore in the doctrine of parallaxes I have ever been considerable, to the extremely contrary, and consequently Mr. Hooke could not from my letters, which were about projectiles and the regions descending hence to the centre, conclude me ignorant of the theory of the heavens. That what he told me of the duplicate proportion was not the same, I knew, namely, that it reached down from hence to the centre of the earth.

That it is not candid to require me now to confess myself, in print, to have been ignorant of his doctrine, is not for no other reason, but because he had told it me in the case of projectiles, and so upon mistaken grounds accused me of that ignorance. That in my answer to his first letter I refused his correspondence, told him I had laid philosophy aside, sent him (on the experiment of projectiles (rather shortly hinted than carefully described), in compliment to sweeten my answer, expected to hear no further from him; could scarce persuade myself to answer his second letter; did not answer his third, was upon other things; thought no further of philosophical matters than his letters put me upon it, and therefore may be allowed not to have had my thoughts of that kind any further. Well as I afterwards, when I more carefully then examined of the rest of the duplicate proportion, he may as well conclude me ignorant of the rest of that theory I had read before in his books. That in one of my papers writ (I cannot say in what he) I accused him sure to have lied, in his own behalf and Mr. Oldenburg, and that's above fifteen years ago), the proportion of the forces of the planets from the sun, reciprocally duplicate of their distances from him, is expressed, and the proportion of our gravity to the earth's centripetal is calculated, and not accurately enough. That when Hugens put out his Hypothesis of Gravitation, a copy being presented to me, in my letter of thanks to him I gave these rules of the squares of the distances, from the useful in Philosophy, and added out of my aforesaid paper an instance of their usefulness, in comparing the forces of the moon from the earth, and earth from the sun, in determining a problem in parallaxes, which was printed, and in which shews which I had then my eye upon comparing the forces of the planets arising from their circular motion, and understood it; so well, I was able, when he gave me the book, to understand his work, the problem solemly, in the end of his attempt to prove the motion of the earth, if I had not known the duplicate proportion before, I could not have found it now. Between ten and eleven years ago there was an hypothesis of mine registered in your books, wherein I hinted a cause of gravity towards the earth, sun and planets, with the dependence of the celestial motions thereon; in which the proportion of the decrease of gravity from the supercicies of the planet (though I did not use the name centripetal) was calculated, and reciprocally duplicate of the distance from the centre. And I hope I shall not be urged to declare, in print, that I understood not the obviousness of what has since been added, and that grant me it afterwards from Mr. Hooke, yet have I as great a right to it as to the ellipses. For as Kepler knew the orb to be not circular but oval, and guessed it to be elliptical, so Mr. Hooke, without being Kepler, since he has instruction, can, and can make it more, but that the proportion was duplicate quam proxime at great distances from the centre, and only guessed it to be so accurately, and guessed amiss in extending that proportion down to the very centre, whereas Kepler guessed right at the ellipses. And so Mr. Hooke found less of the proportion than Kepler of the ellipses. "There is so strong an objection against the accuracy of this proportion, that without my demonstrations, to which Mr. Hooke was so well under, it cannot be believed by a judicious philosopher to be any where accurate. And so, in stating this business, I do pretend to have done as much for the proportion as for the ellipses, Mr. Hooke, as much as I can. I shall therefore, as much as to the other from Kepler; and therefore on this account also he must at least moderate his pretences. "The proof you sent me I like very well. I designed the whole to consist of three books; one band was to be a summary being only wanting transcribing, and drawing the cuts fairly. Some new propositions I have since thought on, which I can well let alone. The third wants the theory of comets. In autumn last I spent four months in making this book; but no chance found me to apply the method, which made me afterwards return to the first book, and enlarge it with divers propositions, some relating to comets, others to other things, found out last winter. The third now design to support my hypothesis farther, for the experimental, my man has as good be engaged in lawsuits, as have to do with her. I found it so formerly, and now I am no sooner come near her again, but she gives me warning. The two first books, without I may say, will not so well bear the title of Philosophiae Naturalis Principia Mathematica; and therefore I had altered it to this, De Motu Corporum libri duo."
"But, upon second thoughts, I retain the former title. 'Twill help the public, which I desire to diminish as little as yours. The articles are, with the largest, to be called by that name; if you please you may change the word to sections, though it be not material. In the first page, I have struck out the words 'ad. paup. decus.les.,' referring to the third book; which is at present, from your affectionate friend, and humble servant,"

"I. NEWTON."

On the 29th of June 1686 Halley wrote to Newton:—"I am heartily sorry that in this matter, wherein all mankind ought to acknowledge their obligations to you, you should meet with anything that should give you unquiet'; and then, after an account of Hooke's claim to the discovery as made at a meeting of the Royal Society, he concludes:—

"But I found that they were all of opinion that nothing thereof appearing in print, nor on the books of the Society, you ought to be considered as the inventor. And if in truth he knew it before you, he ought not to blame any but himself for having taken no more care to secure a discovery, which he puts so much value upon. What application he has made in private, I know not; but I am sure that the Society have a very great satisfaction, in the honour you do them, by the dedication of so worthy a treatise. Sir, I must now again beg you, not to let your resentments run so high, as to deprive us of your third book, wherein the application of your mathematical doctrine to the theory of comets and several curious experiments, with which you have so much the better your observations, and in which you ought to call yourselves Philosophers without Mathematics, which are much the best work you have done, and in which you will at length write; I will push on the edition vigorously. I have sometimes had thoughts of having the cuts natively done in wood, so as to stand in the page with the demonstrations. It will be more convenient, and not much more charge, if it please you to have it so; otherwise I will have them in a somewhat larger size than those you have sent up.—I am, Sir, your most affectionate humble servant,

E. HALLEY."

On the 30th of June 1686 the president was desired by the council to license Newton's book, entitled Philosophiae Naturalis Principia Mathematica, upon the proposal to introduce woodcuts among the letterpress, stating clearly the different things which he had from Hooke, and adding, "And now having sincerely told you the case between Mr Hooke and me, I hope I shall be free for the future from the prejudice of his letters. I have considered how best to compose the present dispute, and I think it may be done by the inclosed scholium to the fourth proposition." This scholium was:

"The inverse law of gravity holds in all the celestial motions, as was first shown in my countryman's paper. The reader must consider of the excellencies of Mr Hooke and Halley." After this letter of Newton's the printing of the Principia was begun. The second book, though ready for the press in the autumn of 1686, was not sent to the printers until March 1687. The third book was presented to the Society on the 6th of April 1687, and the whole work published about midsummer in that year. It was dedicated to the Royal Society, and it was prefixed a set of Latin hexameters addressed by Halley to the author. The work, as might have been expected, caused a great deal of excitement throughout Europe, and the whole of the impression was very soon sold. In 1691 a copy of the Principia was hardly to be procured.

While Newton was writing the second and third books of the Principia, a very important event occurred at Cambridge which had the effect of bringing him before the public in a new light.

James II. had already, in 1686, in open violation of the law, conferred the deanship of Christ Church at Oxford on John Massey, a person whose sole qualification was that he was a member of the Church of Rome; and the king had boasted to the pope's legate that "what he had done at Oxford would very soon be done at Cambridge." In accordance therewith, no sooner had Pechell, the master of Magdalene College, who was vice-chancellor, sent a messenger to the duke of Albermarle, the chancellor, to request him to get the mandamus recalled; and the registrar and the bellows waited upon Francis to offer him instant admission to the degree if only he would take the necessary oaths. Both the king and the monk were inexorable. The court and the university were thus placed in open collision. A menacing letter was despatched by Sunderland to shake the firmness of the university; but, though the threat and receipt of the missives were returned, the university showed no sign of compliance, nor even of a desire to suggest a compromise. In consequence the vice-chancellor and deputies from the senate were summoned to appear before the High Commission Court at Westminster.

Newton was one of the eight deputies appointed by the senate for this purpose. The deputies, before starting for London, held a meeting to prepare their case for the court. A compromise which was put forward by one of them was stoutly and successfully resisted by Newton, and on the 21st of April the deputation, whose case was prepared, appeared before the court. Lord Jeffreys presided at the board. The deputation appeared as a matter of course before the commissioners, and were dismissed. On the 27th of April they gave in their plea. On the 7th of May it was discussed, and feebly defended by the vice-chancellor. The deputies maintained that in the late reign several royal mandates had been withdrawn, and that no degree had ever been conferred without the oaths having been previously taken. Jeffreys spoke with his accustomed insolence to the vice-chancellor, silenced the other deputies when they offered to speak, and ordered them out of court. When recalled the deputies renewed, and the vice-chancellor, and one of his deputies, was ordered to attend, and of his emoluments as master of Magdalene. Newton returned to Trinity College to complete the Principia. While thus occupied he had an extensive correspondence with Halley, a very great part of which is extant. The following letter from Halley, dated London, July 5th, 1687, announcing the completion of the Principia, is of peculiar interest:—

"I have at length brought your book to an end, and hope it will please you. The last errata came just in time to be inserted, I will present you from the book you desire to the Royal Society, Mr Boyle, Mr Paget, Mr Flamsteed, and if there be any else in town that you design to gratify that way; and I have sent you to bestow on your friends in the University 20 copies, which I entreat you to accept. In the same parcel you will receive 40 more, which having no acquaintance in Cambridge, I must entreat you to put into the hands of one or more of your ablest booksellers to dispose of them. I intend the price of them, bound in calves' leather, and lettered, to be 9 shillings here. Those I send you I value in quires at 6 shillings, to take my money as they are, or at 5d. for ready, or as you think fit. I am short of paper, and cannot presently furnish you with a copy of our books without interesting the booksellers; and I am contented to let them go halves with me, rather than have your excellent work smothered by their combinations. I hope you will not repent you of the trust you have put in me, and to the public my countryman will have much satisfaction, by the measure I have in your own and the nation's credit, but rather, after you shall have a little diverted yourself with other studies, that you will resume those concerning this University wherein you had so great success, and attempt the perfection of the first parts of the Principia, so as to have not the number as wherein you had so great success, and attempt the perfection of the first parts of the Principia, so as to have not the number
what I said of your book I remember not. If you please to send me a transcript of that passage, I will give you an account of it if I can.

The loss of sleep to a person of Newton's temperament, whose mind was never at rest, and at times so wholly engrossed in his scientific pursuits that he even neglected to take food, must necessarily have led to a very great deal of nervous excitability. It is not astonishing that rumours got abroad that there was a danger of his mind giving way, or, according to a report which was believed at the time, that it had actually done so. Pepys must have heard such rumours, as in a letter to his friend Millington, the tutor of Magdalene College at Cambridge, dated the 26th of September 1693, he wrote:

"As for myself, I lay it not at the ease I would be glad to be at in reference to excellent Mr Newton; concerning whom (methinks) your answer labours under the same kind of restraint which (to tell you the truth) my asking did. For I was loth at first dash to tell you that I had lately received a letter from him so surprising to me for the inconsistency of every part of it, as to be put into great disorder by it, from the concernment I have for him, lest it should arise from that which of all mankind I should least dread from him and most lament for— I mean a discomposure in head, or mind, or both. Let me, therefore, beg you, Sir, having now told you the true ground of the trouble I lately gave you, to let me know in the most truth of the matter, as far at least as comes within your knowledge."

On the 30th of September 1693 Millington wrote to Pepys that Newton had been to look for Newton some time before, but that "he was out of town, and since," he says, "I hear nothing of the ill upon which I met him at Huntingdon, where, upon his own accord, and before I had time to ask him any question, he told me that he had writ to you a very odd letter, at which he was much concerned; added, that it was in a distemper that much troubled his head, and that kept him awake for above five nights together, which upon occasion he desired I would represent to you, and beg your pardon, he being very much ashamed he should be so rude to a person for whom he hath so great an honour. He is now very well, and though I fear he is under some small degree of melancholy, yet I think there is no reason to suspect it hath at all touched his understanding, and I hope never will; and so I am sure all ought is to a hearing and an understanding of our nation, which is a sign how much it is looked after, when such a person as Mr Newton lies so neglected by those in power."

The illness of Newton was very much exaggerated by foreign contemporary writers. In a manuscript journal of Huygens is to be found an entry:

"29 May, 1694.—Narravit mihi Colm Scotos virum celeberrimumiem, qui ille est qui Presidentem est Academiae in phaenomena incisum. Ab anno et sex mensibus. An ex nima studi assiduitate, un dolore infortunii, quod incendium laboratorium chymicum et scripta quaedam amiserat? Cum ad Archiepicopum Cantabrigiensem venisset, ea locutum, qua alienationem mentis indicaret. Deinde ab amicis curam ejus suspexit, donoque clausa remedii volunti solertiae adhibita, quibus jam sanatatem recuperavit ut jam rursus librum suum Principiorum Philosophiae Mathematicorum intelligere inciderat."

Huygens, in a letter dated the 8th of June 1694, wrote to Leibnitz, "I do not know if you are acquainted with the accident which has happened to the good Mr Newton, namely, that he has had an attack of phrenitis, which lasted eighteen months, and of which they say his friends have cured him by means of remedies, and keeping him shut up." To which Leibnitz, in a letter dated the 22nd of June, replied, "I am very glad that I received information of the cure of Mr Newton at the same time that I heard of his illness, which doubtless must have been very alarming."

The active part which Newton had taken in defending the legal privileges of the university against the encroachments of the crown had probably at least equal weight with his scientific reputation when his friends chose him as a candidate for a seat in parliament as one of the representatives of the university. The other candidates were Sir Robert Sawyer and Mr Finch. Sir Robert stood at the head of the poll with 125 votes, Newton next with 122 and Mr Finch was last with 117 votes. Newton retained his seat only about a year, from January 1689 till the dissolution of the Parliament, and he was heard of his illness, which doubtless must have been very alarming.

During this time Newton does not appear to have taken part in any of the debates in the House; but he was not neglectful of his duties as a member. On the 30th of April 1689 he moved for leave to bring in a bill to settle the charters and privileges of the university of Cambridge, just as Sir Thomas Clegges did for Oxford at the same time, and he wrote a series of letters to Dr Lovel, the vice-chancellor of the university, on points which affected the interests of the university and its members.

Some of the members of the university who had lately sworn allegiance to James had sent difficulties to Newton; and it was an actual charge of sedition. On the 12th of February 1689, the day of the coronation of William and Mary, Newton intimated to the vice-chancellor that he would soon receive an order to proclaim them at Cambridge. He enclosed a form of the proclamation, and expressed a hearty "wish that the university would so compose themselves as to perform the solemnity with a reasonable decorum."

During his residence in London Newton had made the acquaintance of John Locke. Locke had taken a very great interest in the new theories of the Principia. He was one of a number of Newton's friends who began to be uneasy and dissatisfied at seeing the most eminent scientific man of his age left to depend upon the meagre emoluments of a college fellowship and a professorship.

At one time Newton's friends had nearly succeeded in getting him appointed provost of King's College, Cambridge, but the college offered a successful resistance on the ground that the appointment would be illegal, as the statutes required that the provost should be in priest's orders. Charles Montague, who was afterwards earl of Halifax, was a fellow of Trinity College, and was a very intimate friend of Newton, and it was on his recommendation that Newton succeed in the main for promotion to some post of honour and emolument. His hopes, however, were blighted by long delay. In one of his letters to Locke at the beginning of 1692, when Montague, Lord Monmouth and Locke were exerting themselves to obtain some appointment for him, Newton wrote that he was "fully convinced that Mr Montague, upon an old grudge which he thought had been worn out, was false to him." Newton was now in his fifty-fifth year, and whilst those of his own standing at the university had been appointed to high posts in church or state, he still remained without any mark of national gratitude. But this blot upon the English name was at last removed by Montague in 1694, when he was appointed chancellor of the exchequer. He had previously consulted Newton upon the subject of the coinage, and on the opportunity occurring he appointed Newton to the post of warden of the mint. In a letter to Newton announcing the news, Montague writes:

"I am very glad that at last I can give you a good proof of my friendship, and the esteem the king has of your merits. Mr Overton, the master of the mint, is made one of the Commissioners of Customs, and the king has promised me to make Mr Newton warden of the mint. The office is the most proper for you. 'Tis the chief office in the mint: 'tis worth five or six hundred pounds per annum, and has not too much business to require more attendance than you can spare."

This letter must have convinced Newton of the sincerity of Montague's good intentions towards him; we find them living as friends on the most intimate terms until Halifax's death in 1715.

Newton's chemical and mathematical knowledge proved of great use in carrying on the coinage. This was completed in about two years. In 1697 Newton was appointed to the mastership of the mint, a post worth between £200 and £150 per annum. While he held this office, Newton drew up a very extensive table of assays of foreign coins, and composed an official report on the coinage.

Up to the time of the publication of the Principia in 1687 the method of fluxions which had been invented by Newton, and had been of great assistance to him in his mathematical investigations, was still, except to Newton and his friends, a secret. One of the most important rules of the method forms the second lemma of the second book of the Principia. Though this new and powerful method was of great help to Newton in his work, he did not exhibit it in the results. He was aware that the well-known geometrical methods of the ancients would clothe his new
creations in a garb which would appear less strange and uncouth to those not familiar with the new method. The *Principia* gives no information on the subject of the notation adopted in the new calculus, and it was not until 1693 that it was communicated to the scientific world in the second volume of Dr Wallis's works.

Newton's admirers in Holland had informed Dr Wallis that Newton's method of fluxions passed there under the name of Leibnitz's *Calculus Differentialis*. It was therefore thought necessary that an early opportunity should be taken of asserting Newton's claim to be the inventor of the method of fluxions, and this was the reason for this method first appearing in Wallis's works. A further account of the method was given in the first edition of Newton's *Optics*, which appeared in 1704. To this work were added two treatises, entitled *Tractatus duo de speciebus et magnitudine figurarum curvilinearum*, the one bearing the title *Tractatus de Quadratura Curvarum*, and the other *Enumeration linearum tertii ordinis*. The first contains an explanation of the doctrine of fluxions, and of its application to the quadrature of curves; the second, a classification of seventy-two curves of the third order, with an account of their properties. The reason for publishing these two tracts in his *Optics*, from the subsequent editions of which they were omitted, is thus stated in the advertisement of 29th November 1696 written to M Leibnitz in the year 1679, and published by Dr Wallis, I mentioned a method by which I had found some general theorems about squaring curvilinear figures on comparing them with the conic sections, or other the simplest figures with which these could be compared. And some years ago I lent a manuscript containing such theorems; and having since met with some things copied out of it, I have on this occasion made it public, prefixing to it an introduction, and joining a Scholium concerning that method. And I have joined with it another small tract concerning the curvilinear figures of the second kind, which was also written many years ago, and made known to some friends, who have solicited the making it public.

"In the year 1702 William Whiston published the algebrical lectures which Newton had delivered at Cambridge, under the title of *Arithmetica Universalis, sive de Compositione et Resolucione Arithmetica Liber*. We are not accurately informed how Whiston obtained possession of this work; but it is stated by one of the editors of the English edition "that Mr Whiston, thinking it a pity that so noble and useful a work should be doomed to a college confinement, obtained leave to make it public." It was soon afterwards translated into English by Raphson; and a second edition of it, with improvements by the author, was published at London in 1712, by Dr Machin, secretary to the Royal Society. The view of stimulating mathematicians to write annotations on this admirable treatise, the celebrated 's Gravesande published a tract, entitled *Specimen Commentarii in Arithmeticae Universalis*; and Maclaurin's *Algebra* seems to have been drawn up in consequence of this appeal.

Newton's solution of the celebrated problems proposed by John Bernoulli and Leibnitz deserves mention among his mathematical works. In June 1696 Bernoulli addressed a letter to the mathematicians of Europe challenging them to solve two problems;-(1) to determine the brachistochrone between two given points not in the same vertical line, (2) to determine a curve such that, if a straight line be drawn through a fixed point A meet it in two points P, P, then AP" + AP" will be constant. This challenge was first made in the *Acta Lipsiensia* for June 1696. Six months were allowed by Bernoulli for the solution of the problem, and in the event of none being sent to him he promised to publish his own. The six months elapsed without any solution being produced; but he received a letter from Leibnitz, stating that he had "cut the knot of the most beautiful of these problems," and requesting that the period for their solution should be extended to Christmas next, that the French and Italian mathematicians might have no reason to complain of the shortness of the period. Bernoulli adopted the suggestion, and publicly announced the prorogation for the information of those who might not see the *Acta Lipsiensia*.

On the 29th of January 1696/7 Newton received from France two copies of the printed paper containing the problems, and on the following day he transmitted a solution of them to Montague, then president of the Royal Society. He announced that the curve required in the first problem must be a cycloid, and he had a method of determining it. He solved also the second problem, and he showed that for this recommendation to be curves might be found which shall cut off three or more segments having the like properties. Solutions were also obtained from Leibnitz and the Marquis de L'Hôpital; and, although that of Newton was anonymous, yet Bernoulli recognized the author in his disguise; "tanquam," says he, "ex ungue icem." In 1699 Newton's position as a mathematician and natural philosopher was recognized by the French Academy of Sciences. In that year the Academy was remodelled, and eight foreign associations were created. Leibnitz, Domenico Guglielmini (1655–1710), Harriot, and the young Euler were appointed to the Academy on the 4th of February, James Bernoulli and John Bernoulli on the 14th of February, and Newton and Olaus Roemer on the 21st of February.

While Newton held the office of warden of the mint, he retained his chair of mathematics at Cambridge, and discharged the duties of the post, but shortly after he was promoted to be master of the mint he appointed Whiston his deputy with "the full profits of the place." Whiston began his astronomical lectures as Newton's deputy in January 1701. On the 10th of December 1700 Newton resigned his professorship of mathematics, and he did not succeed in getting a pension of 40l. a year for some years. He held this fellowship at Trinity, which he had held with the Lucasian professorship since 1675 by virtue of the royal mandate. Whiston's claims to succeed Newton in the Lucasian chair were successfully supported by Newton himself.

On the 26th of November 1701 Newton was again elected one of the representatives of the university in parliament, but he retained his seat only until the dissolution in the following July. Newton does not seem to have been a candidate at this election, but at the next dissolution in 1705 he was again a candidate for the representation of the university. He was warmly supported by the residents, but being a Whig in politics he was opposed by the non-residents, and beaten by a large majority.

In the autumn of 1703 Lord Somers retired from the presidency of the Royal Society, and Newton on the 30th of November 1703 was elected to succeed him. Newton was annually re-elected to this honourable post during the remainder of his life. He held the office in all twenty-five years, a period in which he has been exceeded by but one other president of the Royal Society, Sir Joseph Banks. As president Newton was brought into close connexion with Prince George of Denmark, the queen's residence at which he had been elected a fellow of the Royal Society. The prince had offered, on Newton's recommendation, a pension of 100l. a year, and another of 100l. to the expense of printing Flamsteed's observations, and especially his catalogue of the stars. It was natural that the queen should form a high opinion of one whose merits had made such a deep impression on her husband. In April 1705, when the queen, the prince and the court were staying at the royal residence at Newmarket, they paid a visit to Cambridge, where they were the guests of Dr Bentley, the master of Trinity. Her Majesty went in state to the Regent House, where a congregation of the senate was held, and a number of honorary degrees conferred. Afterward they returned to Trinity Lodge, where (16th of April 1705) she conferred the order of knighthood upon Sir Isaac Newton.

As soon as the first edition of the *Principia* was published Newton began to prepare for a second edition. He was anxious to improve the work by additions to the theory of the motion of the moon and the planets. Dr Edleston, in his preface to Newton's correspondence with Cotes, justly remarks:

"If Flamsteed the Astronomer-Royal had cordially co-operated with him in the humble capacity of an observer in the way that Newton pointed out and requested of him . . . the lunar theory would, if its creator did not overrate his own powers, have been completely investigated, so far as he could do it, in the first few months of 1695, and a second edition of the *Principia* would probably have followed the execution of the task at no long interval."

Newton, however, could not get the information he wanted from Flamsteed, and after the spring of 1696 his time was much
occupied by his duties at the mint. Rumours, however, of his work, and of a new edition, were heard from time to time. In February 1700 Leibnitz writes of Newton, "J'ai appris aussi (je ne sais où) qu'il donnera encore quelque chose sur le mouvement de la lune: et on m'a dit aussi qu'il y aura une nouvelle édition de la Principia."

Dr. Bentley, the master of Trinity College, had for a long time urged Newton to give his consent to the republication of the Principia. In the middle of 1708 Newton's consent was obtained, but it was not till the spring of 1709 that he was prevailed upon to entrust the superintendence of it to a young mathematician of great promise, Roger Cotes, fellow of Trinity College, who had been recently appointed the first Plumian professor of astronomy and experimental philosophy. On the 21st of May 1709, after having been that day with Newton, Bentley announced this arrangement to the Society. "I hear," he wrote that day, "the masters of the university are glad to see you in June, and then put into your hands one part of his book corrected for the press." About the middle of July Cotes went to London, in the expectation doubtless to bring down with him to Cambridge the corrected portion of the Principia. Although Cotes was impatient to begin his work, it was nearly the end of September before the corrected copy was put into his hands.

During the printing of this edition a correspondence went on continuously between Newton and Cotes. On the 31st of March 1713, when the edition was nearly ready for publication, Newton wrote to Cotes:

"I hear that Mr Bernoulli has sent a Paper of 40 pages to be published in the Acta Leipsica relating to what I have written upon the curve Lines described by Projectiles in resisting Mediums. And therein he partly makes Observations upon what I have written & partly improves it. To prevent being blamed by him or others for any dissimilarity in not acknowledging my oversights or slips in the first edition, I believe it will not be amiss to print next after the old "Præfatio de Lectorem," the following account of this new Edition."


"28 Mar. 1713."

"If you write any further Preface, I must not see it, for I find that I shall be examined about it. The cuts for no. Comet of 1680 & 1681 are printed off and will be sent to Dr. Bentley this week by the Carrier."

Newton's desire to have no hand in writing the preface seems to have proceeded from a knowledge that Cotes was proposing to allude to the dispute about the invention of fluxions. At last, about midsummer 1713, was published the long and impatiently expected second edition of the Principia, and on the 27th of July, Newton waited on the queen to present her with a copy of it.

In 1714 the question of finding the longitude at sea, which had been looked upon as an important one for several years, was brought into prominence by a petition presented to the House of Commons by a number of captains of Her Majesty's ships and merchant ships of London merchants. The petition was referred to a committee of the House, who called witnesses. Newton appeared before them and gave evidence. He stated that for determining the latitude at sea there had been several projects, true in theory but difficult to execute. He mentioned (1) a magnetic needle, (2) a watch to keep time exactly, (2) the eclipses of Jupiter's satellites, (4) by a new method proposed by Mr Dutton. Newton criticized all the methods, pointing out their weak points, and it is due mainly to his evidence that the committee brought in the report which was accepted by the House, and shortly afterwards was converted into a Bill, passed both Houses, and received the royal assent. The report ran "that it is the opinion of this committee that a reward be settled by parliament upon such person or persons as shall discover a more certain and practicable method of ascertaining the longitude than any yet in practice; and the said reward be proportioned to the degree of exactness to which the said method shall reach.""
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with a dissertation on the sacred cubit of the Jews, which was printed in 1737; and four letters addressed to Bentley, containing a theory of a Deity, which were published by Cumberland, a nephew of Bentley, in 1756. Sir Isaac also left a Church History complete, a History of the Creation, Paradoxical Questions regarding Atanaxis, and many divinity tracts.

Newton devoted much of his time to the study of chemistry; but the greater number of his experiments still remain in manuscript. His Tabula Quantiatitum et Graduum Caloris contains a comparative scale of temperature from that of melting ice to that of a small flame. His Minima were the first of his Philosophical Papers. His Chemical Papers, Acidorum, which has been published by Dr. Horsley. Sir Isaac spent much time in the study of the works of the alchemists. He had diligently studied the works of Jacob Boehme, and there were found amongst his manuscripts copious abstracts from them in his own handwriting. In the earlier part of his life he and his relation Dr. Newton of Grantham had put up furnaces, and had wrought for several months in quest of the philosopher’s tincture. Among the manuscripts in the possession of the Earl of Portsmouth there are many sheets of Flamingo and Hieroglyphic Figures, and in another hand many sheets of William Yworth’s Processus Mysterii Magni Philosophicis.

In the last few years of his life Newton was troubled with incontinence of urine, which was supposed to be due to stone; but with care he kept the disease under control. In January 1725 he was seized with a violent cough and inflammation of the lungs, which induced him to reside at Kensington; and in the following month he had a severe attack of gout, which produced a decided improvement in his general health. His duties at the mint were discharged by John Conduit, and he therefore seldom went from home. On the 28th of February 1727, feeling well, he went to London to preside at a meeting of the Royal Society; but the fatigue which attended this duty brought on a violent return of his former complaint, and he returned to Kensington on the 4th of March, when Dr. Mead and Dr. Chesselton pronounced his disease to be stone. He endured the sufferings of this complaint with wonderful patience. He seemed a little better on the 15th of March, and on the 18th he read the newspapers and conversed with Dr. Mead; but at 6 o’clock in the evening he became insensible, and continued in that state till Monday the 20th of March 1727, when he expired without pain between one and two o’clock in the morning. His body was removed to London, and on Tuesday the 28th of March it lay in state in the Jerusalem Chamber, and was thence conveyed to Westminster Abbey, where it was buried.

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NEWTON, JOHN (1725–1807), English divine, was born in London on the 24th of July 1725 (O.S.). His father, who for a long time was master of a ship in the Mediterranean trade, became in 1745 governor of York Fort, Hudson Bay, where he died in 1751. The lad had little education and served on his father’s ship from 1737 to 1742; shortly afterwards he was impressed on board a man-of-war, the “Hawthorn,” where he was made a midshipman. For an attempt to escape while his ship lay off Plymouth he was degraded, and treated with so much severity that he gladly exchanged into an African trader. He made many voyages as mate and then as master on slave-trading ships, devoting his leisure to the improvement of his education. The state of his health and perhaps a growing distaste for the slave trade led him to quit the sea in 1755, when he was appointed tide-surveyor at Liverpool. He began to study Greek and Hebrew, and in 1758 applied to the archbishop of York for ordination. This was refused him, but, having had the curacy of Olney offered to him in April 1764 he was ordained by the bishop of Lincoln. In October 1769 William Cowper settled in the parish. An intimate friendship sprang up between the two men, and they published together the Olney Hymns (1779). In 1779 Newton left Olney to become rector of St Mary Woolnoth, London, where he laboured with unceasing diligence and great popularity till his death on the 31st of December 1807.

Like Cowper, Newton held Calvinistic views, although his evangelical fervour allied him closely with the sentiments of Wesley and the Methodists. His fame rests on certain of the hymns which he is said to have contributed—e.g. “March, the first month of the year,” (an Epistolicum H.); “How sweet the name of Jesus sounds,” “One there is above all others,” remarkable for vigour, simplicity and directness of devotional utterance.

His prose works include an Authentic Narrative of some Interesting and Remarkable Particulars in the Life of John Newton (1764), a volume of Sermons (1761), Omnicon (a series of letters on religion, 1771), Review of Ecclesiastical History (1769) and Cardiphonia (1781). This last was a further selection of religious correspondence, which did much to help the Evangelical revival. Thomas Scott, William Wilberforce, Charles Simeon, William Jay and Hannah More all came under his direct influence. His Letters to a Wife (1793) and Letters to Rev. W. Bull (posthumous, 1847) illustrate the frankness with which he expressed his most intimate personal experiences. A collection by Richard Cecil was prefixed to a collected edition of his works (6 vols., 1868; 1 vol. 1827). See also T. Wright, The Town of Cowper.

NEWTON, JOHN (1823–1893), American general and engineer, was born in Norfolk, Virginia, on the 24th of August 1823, and graduated second in his class at the U.S. Military Academy in 1842. From 1842 to 1861 he was engaged in the construction of coast defences and the improvement of waterways; he was assistant professor of engineering in the Military Academy, 1843 to 1846; and later, from 1864 to 1866, as chief engineer in the Utah expedition of 1857–1858. He served as an engineer in the Virginian campaign of 1861, and was promoted brigadier-general, U.S.V., in September. He especially distinguished himself in the Seven Days’ battle and at Antietam, and after the battle of Fredericksburg was made major-general, U.S.V. In the Chancellorsville campaign Newton took part in the storming of Marye’s Heights at Fredericksburg, on the 3rd of May 1863, and at the battle of Gettysburg he was for a time in command of the I. corps. He had already received the brevet of lieutenant-colonel for his services at Antietam, and now became brevet colonel for his services at Gettysburg. Later he was transferred to Sherman’s army, and as a division commander under General Oliver O. Howard took part in the Atlanta campaign. For gallant conduct at Peach Tree Creek he was made brevet brigadier-general, and at the close of the war was made brevet major-general, U.S.A. Returning to regular engineering duty after the war, he was stationed at New York from 1866 to 1884. His most important work there was the improvement of the Hudson river, and especially the removal of the obstructions to shipping in the dangerous entrance to the East river from Long Island Sound, known as Hell Gate. Under two of the largest obstructions—Hallet’s Point and Flood Rock, with a surface of three acres and nine acres respectively—shafts were sunk from the shore, and tunnels were bored in every direction. In these tunnels thousands of pounds of explosives were placed, and the rocks were blown into fragments. In March 1884 he became Chief of Engineers, with the rank of brigadier-general, and held this position until his retirement from the army, at his own request, in August 1889. In 1887–1888
he was commissioner of public works in New York City, and from 1888 until his death, on the 1st of May 1895, he was president of the Panama railroad.

**NEWTON,** a city and the county-seat of Harvey county, Kansas, U.S.A., about 27 m. N. of Wichita. Pop. (1905) 6605; (1910) 7862. It is served by the Atchison, Topeka & Santa Fé (of which it is a division point and which has shops here), and the Missouri Pacific railways. Newton is the centre of the settlements of the German-Russian Mennonites, a thrifty people, who immigrated in 1873 and subsequently; Bethel College (opened 1893) is a Mennonite secondary school, and there is a Mennonite congregation of about 200 members. Newton was the site of the various potteries for the surrounding agricultural and stock-raising region, and has various manufactures. The municipality has natural gas for heating, lighting and manufacturing. Newton was first settled in 1871, was chartered as a city in 1872, and in 1910 adopted a commission form of government.

**NEWTON,** a city of Middlesex county, Massachusetts, U.S.A., 10 m. W. of Boston, on the S. bank of the Charles river, which borders it for 16 m. Pop. (1880) 16,995; (1890) 24,370; (1900) 33,587, of whom 10,068 were foreign-born, 19,006 of foreign parentage. Newton is now, as it has always been, the chief manufacturing centre in the Newton district. Newton is served by the Boston & Albany railway. The city, with an area of 17-98 sq. m., contains 15 villages. In Newton, the most prominent of these villages, is a stone terrace monument to John Eliot, erected on the site of Waban’s wigwam near Nonantum Hill, where Eliot founded the first Indian Church on the 28th of October 1646—the Nonantum Indians, under their chief Waban, removed to Natick in 1651. On Institution Hill, Newton Centre, is the first Baptist theological seminary in America, Newton Theological Institution, founded in 1825. Here also is the residence of Samuel Francis Smith (1808–1885), author of “America” and several missionary hymns, and pastor here in 1832-1834. In Newton Upper Falls, Echo Bridge (of the Boston Aqueduct) crosses the Charles near the falls in Hemlock Gorge Reservation of the Metropolitan Park system. Auburndale is the seat of Lasell Seminary for Young Women, founded in 1851 by Edward Lasell (1809–1852). Other of the villages are Newtonville, West Newton and Newton Highlands. The city of Newton is primarily a residential suburb of Boston; along the Charles is a park (1971-2 acres) of the Charles River Reservation of the Metropolitan Park system, and the city has several attractive public parks, including Norumbega Park, on the banks of the river, with a large open-air theatre; boating, especially canoeing, on the river is very popular. The city has a public library, a high school and a technical high school. Among its manufactures are foundry and machine shop products, worsted goods and electrical apparatus; the factories utilize the water power of the falls. The value of the manufactured product in 1905 was $4,140,996. The region was settled as a part of Cambridge in 1630 and was called South Side (i.e. of the Charles), Nonantum (the Indian name), Cambridge Village, Little Cambridge or New Cambridge; Francis Pray was incorporated as a separate town and in 1691 received its present name; it annexed an island in the Charles in 1803; parts of it were annexed to Roxbury (1838) and Waltham (1849); it became a city in 1873; and in 1875 it annexed a part of Boston, with which there have been several more recent boundary adjustments.

**NEWTON ABBOT,** a market town and seaport in the Ashburton parliamentary division of Devonshire, England, 20 m. S. by W. of Exeter by the Great Western railway. Pop. of urban district (1901) 12,517. Beautifully situated at the head of the Teign estuary, the town grew rapidly in the 19th century. The two parish churches, St Mary’s in Wolborough, and All Saints’ in Highweek, are Perpendicular in style. St Mary’s contains a Norman font, an ancient brass lectern, buried during the Civil Wars, and some interesting heraldic ornaments which date from the 15th century. Of the 14th century chapel of St Leonard, only a tower survives. A large nunnery, called St Augustine’s Priory, was erected near the town in 1867; while eastward is the Jacobean Forde House, belonging to the earl of Devon, and visited by Charles I. and William of Orange, who first read his declaration to the people of England at Newton Abbot market-cross. The establishment of large engine works by the Great Western railway has aided the development of local industries, and there is a considerable shipping trade, fine china clay and pipelay being worked near the towns and exported to the Potteries. Large fairs are held for the sale of agricultural produce and livestock. The portion of Newton Abbot in the parish of Highweek was formerly a separate town, known as Newton Bushel.

Probably both Newton Abbot and Newton Bushel were originally included under the name of Newton. Newton Abbot was, in 1861; the abbey church of Newton Abbot was built by William Lord Brewer, founder of the monastery (1196). Newton Bushel was so called from Robert Russell or Bushel, foster-child and kinsman of Theobald de Englishville, who was made lord of the manor by Henry III. in 1246.

**NEWTON-IN-MAKERFIELD,** or Newton-le-Willows, an urban district in the Newton parliamentary division of Lancashire, England, 153 m. W. of Manchester by the London & North-Western railway. Pop. (1891) 12,861; (1901) 16,699. At a short distance from the town is a moated Elizabethan hall, called house, and also an ancient barrow of great extent. The Liverpool farm reformatory school is in the neighbourhood. The industrial establishments include foundries, printing and stationery works, paper mills, glass works and sugar refineries. Coal abounds in the neighbourhood.

The township of Newton-in-Makerfield, gave its name in Saxon times and in the reign of William the Conqueror to one of the hundreds of Lancashire. The barony was held by the Bannastres from the conquest to 1386 and passed successively to the Langtons, Fleetwoods and Leghs. It does not seem that the barons were ever summoned to parliament, and the title, like all parliamentary titles, has fallen into disuse since the abolition of feudal tenures. The courts-baron and courts-leet are held twice annually. The township returned two members to parliament from 1559 to 1831, but was disfranchised by the Reform Act of 1832. There was a market here at least as early as 1558 which is now discontinued. Near the town a party of Highlanders were taken prisoners in 1648 by Cromwell’s troops, and hanged in an adjoining wood, still called Gallow’s Cross.

**NEWTOWN,** a municipality of Cumberland county, New South Wales, Australia, 35 m. S.W. of Sydney. It consists chiefly of the residences of the wealthier citizens of Sydney and is connected with the city by rail and tram. As a municipality it dates from 1862. Pop. (1901) 22,598.

**NEWTOWN** (Welsh Drefenywdd), with the same meaning, formerly Llanfair Cedewain, a market town and contributory parliamentary borough of Montgomeryshire, situated on both sides of the Severn, and on the Cambrian railway, 195 m. from London. Pop. of urban district of Newtown and Llanlwechaharn (1901) 6500. It is connected with Shrewsbury (Ampthill) by the Montgomeryshire canal. The old Anglican church, the towers were ever had and partly Perpendicular, has been superseded by the modern St Mary’s, which contains the font and rood-screen of the old building. In the old churchyard lies Robert Owen, born in 1771 at Newtown, where he died in 1858, known as the "patriarch of reason," author of *New Views of Society*, &c., and one of the fathers of communism. Newtown, rather than Welshpool, is the chief seat of Welsh flannel manufacture, together with that of Tweeds and Shaws. It joins with Welshpool, Llanfyllin, Montgomery (Trefaldwyn), Llanidloes and Machynlleth, in Returning a member to parliament.

**NEWTOWNARDS** (pron. Newtownards) is a market town of Co. Down, Ireland, beautifully situated near the northern extremity of Strangford Lough, on a branch of the Belfast and Co. Down railway, 53 m. E. of Belfast. Pop. (1901) 9110. The town is sheltered by the Scrabo Hills on the west and north, and possesses a fine square, in which the pedestal of an ancient cross was erected in 1636. Muslim embroidery is the principal industry. There are also mills for flax and hemp yarns, a weaving factory and a hosiery factory. The remains of the old church, originally erected in 1244, contain good Perpendicular work, and the
family vault of the Londonerry; there are also the parish church and Presbyterian church, with lofty spires, and a Roman Catholic chapel. In the neighbourhood there are freestone quarries.

The town owes its origin to a Dominican monastery founded in 1244 by Walter de Burgh. It was forfeited by the O'Neills, and given to the Hamiltons and Montgomerries, from whom it passed to the marquess of Londonderry. It received a charter from James I., and until the Union in 1800 returned two members to parliament. The ruined abbey of Moville, 13 m. N.E., is the most notable of the many ecclesiastical remains in the neighbourhood. It is attributed to St Flahan (650-700).

NEW ULM, a city and the county seat of Brown county, Minnesota, U.S.A., on the s. bank of the Minnesota river, 88 m. (by rail) S.W. of Minneapolis, in the south central part of the state. Pop. (1905, state census) 5720 (1287 of German birth); (1910) 5648. New Ulm is served by the Minneapolis & St Louis, and the Chicago & North Western railways.

In the south-western part of the city, on a wooded hill called Hermann Heights, there is a statue of Arminius erected by the Grand Lodge of Hermann's Sons of the United States. New Ulm is British Columbia's last city and seat of the seat of the Dr Martin Luther College (Lutheran, 1884), a secondary school, with a normal and a collegiate department. St Michael's Academy and St Alexander Hospital are under the charge of Roman Catholic sisters. New Ulm was settled about 1853, and was twice attacked and almost destroyed by the Indians during the Sioux uprising of 1862. There is a monument to those who lost their lives in the Sioux massacres.

NEW WASHINGTON, a town of the province of Capiz, island of Panay, Philippine Islands, on the N. coast about 17 m. W. of Capiz, the capital of the province. The town was formed in 1903 by uniting the towns of Batau, Jimeno, Balete and the village or barrio of Lagatic in the town of Calibio; the total population at that time was 24,480. There are about sixty-six barrios, but all of these except Lagatic, the seat of the municipal government, had in 1903 less than 1000 inhabitants. The language is Visayan. The cultivation of rice, sugar cane, hemp, and Indian corn and the raising of cattle and horses are the principal industries.

NEW WESTMINSTER, a city on the north bank of the Fraser river, British Columbia, 12 m. from the mouth. Pop. (1906 estimate) 7900. Founded in 1859 it was the capital of British Columbia when the British possessions on the Pacific coast formed two colonies—i.e. British Columbia (the mainland portion) and Vancouver Island. The city is accessible to ocean-going ships of 16 ft. draught. It is the chief centre of the farming country of the lower Fraser and has a small export lumber trade. In 1888 the greater portion of the business part of the city was destroyed by fire, and though much of it was rebuilt, the establishment of the city of Vancouver, only 12 m. distant, seriously affected its growth. It is connected with Vancouver by an electric railway. The Great Northern railway, connecting with Seattle and other points in the state of Washington, here crosses the Fraser river by a fine bridge.

NEW YEAR'S DAY, the first day of the year. In the Gregorian calendar this date occurs twelve days earlier than in the Julian; thus in Russia, Greece, &c., where the latter is still employed, New Year's Day is celebrated on the English 31st of January.

The ancient Egyptians, Phoenicians and Persians began their year at the vernal equinox (Sept. 21) and the Greeks until the 5th century B.C. at the winter solstice (Dec. 21). In 432 B.C. the latter altered their New Year's Day to the 21st of June. The ancient Romans celebrated the beginning of the year on the 21st of December, but Caesar by the adoption of the Julian calendar postponed it to the 1st of January. The Jews have always reckoned their civil year from the first day of the month of Tisri (Sept. 6-Oct. 5), but their ecclesiastical year begins at the spring equinox (March 21). The 25th of March was the usual date among most Christian peoples in early medieval days. In Anglo-Saxon England, however, the 25th of December was New Year's Day. At the Norman Conquest owing, it is believed, to the coincidence of his coronation being arranged for that date, William the Conqueror ordered that the year should start on the 1st of January. But later England began her year with the rest of Christendom on the 25th of March. The Gregorian calendar (1582), which restored the 1st of January to its position as New Year's Day, was accepted by all Catholic countries at once; by Germany, Denmark and Sweden about 1700, but not until 1751 in England.

The Romans, after the adoption of the Julian calendar, kept the 1st of January as a general holiday. Sacrifices were made to Janus; gifts and visits were exchanged, and masquerading and feasting gave the gayest general holiday of the year. The magistrates who entered on office this day. The emperors at the new year exacted from their subjects tribute of a pound of gold. This quasi-present was called strena, a term (extended to all New Year's gifts in Rome) traditionally derived from a custom initiated by the legendary King Tatius, to whom branches of vervain gathered in the sacred Grove of Strenua, the goddess of strength, were presented as a good omen on the first day of the year 747 B.C. The imperial strena later became so excessive that Claudius found it necessary to limit the amount by law.

Participation in the ordinary New Year's Day observances as well as in the Saturnalia of December was from the first discouraged by the Church. Christians were expected to spend the day in quiet meditation, reading of scripture and acts of charity. When about the 5th century the 25th of December had become a fixed festival commemorative of the Nativity, the 1st of January assumed a specially sacred character as the octave of Christmas Day and as the anniversary of the Circumcision. As such it still figures in the calendars of the various branches of the Eastern and Western Church, though only as a feast of subordinate importance. The first mention of it in Christian literature as a feast occurs in Canon 17 of a council which met at Tours in 567.

The custom of giving and receiving strenae for luck at the New Year survives in France (where New Year's Day is known as le jour d'etrennes) and the Continent generally. In England its place has been taken by the Christmas-gift. In Scotland, where New Year's Day is more generally observed than Christmas, the custom is still universal. The Persians celebrated the beginning of the year by exchanging presents of eggs. The Druids distributed as New Year's gifts branches of the sacred mistletoe. In Anglo-Saxon and Norman England New Year's gifts were common. According to Matthew Paris, Henry III. followed the Roman precedent by extorting New Year's gifts from his subjects. These in later reigns became voluntary but none the less obligatory on those who wished to stand well with the throne. The custom reached its climax in Tudor times. Wolsey one New Year gave Henry VIII. a gold cup valued at £117, 17s. 6d. in the coinage of that time. An MS. account is preserved of money gifts given to King Henry by all classes of his subjects on New Year's Day 1533. The total reached many thousands. Bishop Latimer, however, handed Henry instead of a purse a New Testament with a leaf doubled down at Hebrews xii. 4, as opposite to the king's then impending marriage with Anne Boleyn. In Edward VI.'s time, if not earlier, it was usual for the sovereign to give "rewards" to those who presented New Year's gifts. Elizabeth is related to have been most conscientious in this regard. The custom of offering New Year's gifts to the sovereign became obsolete during the Commonwealth and was not revived at the Restoration.

NEW YORK, one of the original thirteen United States of America, situated between 40° 20' 40° and 45° 0' N., and between 7° 25' 1' and 7° 45' 54' W. Its northern boundary is, for the most part, formed by Lake Ontario and the St Lawrence river, which separate it from the province of Ontario, Canada; but north of the Adirondacks the boundary line leaves the St Lawrence, extending in a due east direction to the lower end of Lake Champlain. Thus the boundary between New York and the province of Quebec, Canada, is wholly artificial. Vermont, Massachusetts and Connecticut bound New York on
the E.; the Atlantic Ocean, New Jersey and Pennsylvania, on the S.; and Pennsylvania, Lake Erie and the Niagara river on the N.

The state has a triangular outline, with a breadth from E. to W. of 326-46 m. and from N. to S., on the line of the Hudson, of 300 m. In addition, it includes Long Island and Staten Island on the Atlantic coast. Its land area is 47,654 sq. m. and the area of the inland waters is 1550 sq. m., giving a total area of 49,204 sq. m. In addition to this, New York includes 3140 sq. m. of water in Lakes Ontario and Erie.

Topography.—The most notable topographic feature is the roughly circular mountain area of north-eastern New York known as the Adirondacks proper, including most of the peaks in New York. These peaks are part of a chain of crystalline rocks resembling more the Laurentian mountains of Canada than the Appalachians. Indeed, it is commonly considered to be an extension of the Canadian mountains. Parts of the crystalline area are worn down to a condition of low relief, but in the main mountain mass, although greatly worn, there are still elevations of truly mountainous proportions. The highest peak is Mount Marcy (5541 ft.), though associated with it are several other peaks of elevation from 4000 to 5000 ft. Even the higher summits are worn to a rounded condition, and are therefore for the most part forest covered upon the timber line which, on Mount Marcy, is at an elevation of 4900 ft. From the crest of a belt of some of the Adirondacks proper the surface slopes in all directions toward the lowlands: to the S. of the St. Lawrence valley on the N.; the Champlain-Hudson valley on the W. and the Mohawk valley on the S. to Lake Ontario on the W. While igneous and metamorphic crystalline rocks form the bulk of the Adirondack area, it is surrounded by a ring of ancient Palaeozoic sediments in which these peripheral lowlands have been deformed. It is these Palaeozoic sediments which have been eroded, the surrounding ring of more recent rocks, is either too rugged, or has a soil too thin and rocky for extensive agriculture. It is therefore a sparsely settled region with lumbering for one of the leading industries. Soil and climate also are such that the state is made up of large counties, especially dairy; and manufacturing industries connected with the products of forests, farms and mines are developed. These and other manufacturing industries are greatly augmented by the presence of the Adirondacks, a region which is visible from the mountain streams which flow out radially from the central area.

South of the Adirondack region, and S. of the Mohawk Valley, rises a high-level plateau which extends westward to the Pennsylvania line, the Mohawk Valley, a narrow valley, is, for a considerable distance, deeply cut by a stream with a swift current. Here the rocks are all essentially horizontal and of Palaeozoic age, mainly Devonian. This plateau region, which includes more than half the state, differs greatly from place to place. Its elevation decreases from W. to E. and from S. to N. Here, the Adirondack highlands, circled by the Ontario plain which skirts the southern shore of Lake Ontario. Similar to this is a narrow plain along the southern shore of Lake Erie, which, in fact, lies in a shallow depression in this elevated region. The formation is of ancient age, so ancient that they are the seats of extensive agriculture, especially fruit raising, which is further encouraged by the influence of the large bodies of lake water that moderate the heat of summer and the cold of winter. Long it has been a custom to check the late frosts of spring and the early frosts of autumn.

Elsewhere in the plateau province the land is higher and the surface far more irregular, increasing in ruggedness as one proceeds to the east and to the south. Elevations of between 1500 and 2000 ft. are common in this region all the way from Chautauqua county in the extreme W. to the Catskill mountains in the E.; and in places the surface becomes so rugged as to simulate the features of mountains and locally to win the name mountain. Valleys are deeply sunk in the plateau, the largest with bottom lands of sufficient width to give rise to strips of fertile farm land. The valley walls rise to undulating, and often fairly high, plateaus, but the uplands are remote from markets, and the soil is thin. In the high lands they are grazing lands—the seat of important dairy and sheep raising industries. This is the region of abandoned farm houses, and the there has been desertion and they may be found along all the upland roads.

Since this plateau region is a northward extension of the Alleghany mountain system, it is followed by a belt of mountains, as it rises as the mountains are approached. Thus, in S.E. New York, where the Appalachians enter, the plateau becomes much higher than in the W., reaching its culmination in the Catskills. Here the plateau is partly broken by elevation, and partly because of the nature of the Catskill sandstones, dissection has so sculptured the plateau as to carve it into a mountainous mass which is generally known as the Catskill mountains. An elevation of from 3000 to 4000 ft. is common, the highest point being Slide Mountain (4205 ft.). Like the Adirondacks, this region is largely forest covered, and is a favourite summer resort; but it is far less a wilderness than the Adirondacks, and in places it is cleared for farming, especially for pasture.

In the plateau province there are other areas known as mountains, of which the Helderberg mountains are the most conspicuous. This formation is really an escarpment facing the lower Mohawk and the Hudson river S. of Albany, where there is a downward step in the land. This step, slowly descending to the sea, is the characteristic of a large area of the plateau, and at its base there is a deposit of a durable layer of limestone, known as the Helderberg limestone. There are other lower escarpments in the plateau province, and these are, the Taconic range and southward to the Helderberg escarpment. Of these, the most notable is the Niagra escarpment which extends from Canada, past Lewiston and Lockport,—a downward step from the Erie to the Ontario plain, where the Niagara limestone outcrops, and is to this end the denuded floor for the steeply rising face at the boundary between the two plains.

South and S.E. of the Catskills, although including only a small portion of the state, are a number of different topographic features, all related to the lowlands east of the state from S.W. to N.E. First come the low folds of the western Appalachians, which, though well developed in Pennsylvania, die out near the New York boundary. The most pronounced of these is an upfolded strata in New York form the low Shawangunk mountains, which descend, toward the S.E., to a lowland of folded strata of limestone, slate and other rocks in Orange and Dutchess counties. This bowl and, due to the non-resistant character of the strata, is a continuation of the Great Valley of the Appalachians, and extends N.E. into Vermont and S.W. across New Jersey, Pennsylvania, Maryland and Virginia. It is bounded on its S.E. side by the high line of low ridges which form a belt of mountains along the Connecticut and Massachusetts, and S.W. into the Highlands of New Jersey and thence to the Blue Ridge. South of the High- lands, the plateau is followed by the S.E. part of the Southern states, and the lowlands towards the sea. There is an extensive depression extending from the Catskill mountains, the Hudson valley, a broad valley from which the ice sheet receded, it halted at various points, forming moraines and other glacial deposits. The soil of the valley is much the same as the plateau. The lands near the shores are fertile and productive, and the plateau land, especially the lowlands, are cultivated.

Drainage.—The drainage of New York leads its way to the sea in various directions. That the St. Lawrence system receives the waters from the S.W. and S., the Mohawk Valley and the Mohawk River in particular; while the Hudson, the Susquehanna, and other streams from the same general direction, discharge into the Hudson river, which then proceeds to the sea along the St. Lawrence system.

Drainage.—The drainage of New York leads its way to the sea in various directions. That the St. Lawrence system receives the waters from the S.W. and S., the Mohawk Valley and the Mohawk River in particular; while the Hudson, the Susquehanna, and other streams from the same general direction, discharge into the Hudson river, which then proceeds to the sea along the St. Lawrence system. The Hudson is a river of comparatively little size, and it is navigable for 147 m. from the sea. The Mohawk Valley furnishes a high and rugged area, but its drainage is very limited, and there is here a gap, easily traversed, across the Appalachian mountains and plateaus to the more level and fertile plains beyond. A low gap also leads northward from the Hudson to the Champlain valley surrounding Lake Champlain, but is traversed by water from the lake, and is not suitable for navigation in early wars; but it is of only minor importance as a commercial highway since it leads to Canada through a region of little importance.

The lower Hudson, below Troy, is really a ford, the stream valley being drowned by the sea through subsidence of the land. It is noted for its remarkable scenery, especially where it crosses the Highlands. The other large river valleys are far less useful as highways, though each is paralleled by one or more railways. The action of the
The continental glacier in scoured the passes between the St. Lawrence and southern drainage, and in turning streams southward, has facilitated the building of railways across the divides.

There are numerous lakes and ponds in the state, most of them small, including 50,000 such bodies of water of over an acre in extent. The largest lake apart from Erie and Ontario is the beautiful Lake Champlain, which lies on the eastern boundary, partly in Vermont, and with the N. of the state. It contains 1,280 square miles of water in the main body of the lake, but including lakes in the direction of the Finger Lakes. The largest of these are Cayuga, Seneca, Keuka, Canandaigua, Owasco and Skaneateles.

In the extreme western part of the state is Chautauqua Lake, beautifully situated, and containing 62 square miles of water.

New York is noted for its many falls and rapids, some of them of great beauty. Of these the largest is the cataract of Niagara, about 16 feet high and 2,542 feet long. The lowest point of the state is the junction of the Little and Big Salmon rivers, 23 feet below sea-level, yet the highest point, that of Mount Marcy, 5,344 feet above sea-level. The fall of 59 feet of the Great Chittenango falls is exceeded in the state by none, and the 55 of the falls of Tiogue, near Ticonderoga, is the highest of the Canadian Falls. Falling waters of 215 feet are found in the Seneca Valley, the best known of the widely renowned Watkins Glen, now reserved as a state park. The mountain falls of New York, notably Niagara, are used as a source of power.

The Coast-line.—New York has extensive coast-line along the Great Lakes, 75 miles, and 700 miles on the Erie sea-coast.

Where the lake waters flood the stream mouths, there are excellent harbours, and lake navigation is of great importance. The largest of the lake ports is Buffalo at the head of the Niagara river, where a large crusade centre, and transfer their goods to rail or canal. Buffalo lies at the lower end of the natural lake navigation, through the building of a ship canal in Canada, lake steamers can proceed into Lake Ontario and thence to the Atlantic.

The ocean coast-line, though of limited extent, is by far the most important in the United States. The greater part of the sea coast is on Long Island—a low, sandy coast, the seat of numerous summer resorts and fishing. The mainland, opposite the western end of Long Island, is traversed by the lower Hudson and other channels—submerged valleys—which form a branching bay with several inlets. New York State is the source and deposit of sand and gravel. The western banks of the lower Hudson is in New Jersey. This branching bay makes an excellent protected harbour, with an immense water front, at the outlet of the chief natural highway from the E. to the interior. The natural advantages of the natural highway by water, and the ease with which it may be engaged in manufacturing and commerce, has gathered around the shores of this harbour, the greatest natural system of an manufacturing centre. The rank of New York, as a manufacturing centre, is also on western Long Island, in Brooklyn, on the smaller islands, and on the New Jersey side. The harbour entrance is somewhat obstructed by sand bars, so that extensive government work has been necessary to open and maintain a channel for large draft ocean vessels. This sand has not been brought by the Hudson itself, so that river drops most of its sediment load far upstream, in its long tidal channel. It is supplied by the tidal and wind-formed currents, which are drifting sand from the Long Island and New Jersey coasts, extending the barrier beaches, such as Sandy Hook, out across the entrance to New York Bay.

The climate of New York is of variable climate. New York is typical of that of northern United States, a climate of extremes, hot in summer, and cold in winter, and yet healthful, stimulating, and, on the whole, not disagreeable. In the absence of extensive alluvial plains and marshes, the local variations of climate are less important than in the forests.

The average annual temperature is not far from 45° F., though it varies from over 50° near New York City, and 48° near the Lake Erie shore, to less than 40° in the high Adirondacks. The average maximum in summer heat is about 93°, temperature of 100° being rarely reached. In the winter the temperature descends below zero during exceptionally cold spells. A temperature of –20° or lower is never attained in the southern portion of the state. The ordinary rainfall is sufficient for the Adirondacks and in the higher parts of the plateau. The rivers and smaller lakes freeze in winter and navigation on the St. Lawrence and the Great Lakes is possible by ice on the average from about the middle of November to the end of April, and in 1875, but it is less than 30 in. in the Lake Champlain Valley and over 55 in. of New York City. In most of the state froses begin from September 1st to October 1st, and from April 1st to May 1st. In the Adirondack region the snowfall is heavy, the winter long and severe. In central New York it is not uncommon for snow to accumulate to the depth of 3 or 4 ft., and yet this is not persistent.

About New York City, and on Long Island, the snow rarely exceeds 1 ft. in depth. The climate is very variable, owing to the frequent passage of cyclonic storms from the W. and S.W., bringing warmer weather and rain, and sometimes blizzards. On Long Island there is less change of temperature between the Adirondacks and the Green Mountains. The largest lake entirely within the state is Lake George, famous for its beautiful scenery. In the central part of the state are the Finger Lakes and Seneca Lake, unimportant in extent, but of extreme beauty, especially at night, when many of the hundreds of the largest being in the Cayuga valley—notably Enfield Falls, a few miles S. of Ithaca, Ithaca Falls, Taughannock Falls, and Canadagea Falls within a few miles of Ithaca. The last, the highest waterfall in the state, has a vertical fall of 215 ft. Similar falls are found in the Seneca Valley, the best known being the widely renowned Watkins Glen, now reserved as a state park. Many of the mountain falls of New York, notably Niagara, are used as a source of power.

Flora.—When first seen by Europeans New York was a woodland, the prevailing trees being nearly all the varieties of trees, shrubs and wild plants which were common to the territory lying E. of the Mississippi river, N. of the Ohio, and S. of the St Lawrence. In the Adirondack region the trees were principally white pine, spruce, hemlock and balsam. In the eastern part of the state the common trees were birch, maple, ash, cottonwood and basswood, and smaller numbers of ash and elm; in the swamps of this region were also larch and cedar. The forests of the W. half of the state contained pine, but here saxifrage and peat moss, chestnut, hickory, maple and beech were more common. The tulip tree was common both in the S.W. and N.; and the walnut, butternut, poplar, sycamore and locust were widely distributed. The original vegetation of the state has been largely supplanted by trees and shrubs which have grown wild in the forest, and been introduced and adapted to agriculture, and in the Adirondack and Catskill Mountains, where the state has established forest preserves, and the Forest, Fish and Game Commissioner began reforestation in 1901, principally with northern white pine, hemlock and spruce, in the Adirondack region. This reforestation has been largely successful, and a few native species, such as reindeer moss and other lichens; on the shores of Long Island, Staten Island and Westchester county are a great variety of trees, shrubs and wild plants, the most characteristic of which is the garlic, especially characteristic of the pine barrens of New Jersey. Laurel, rhododendron, and whortleberry are common shrubs in the mountain districts, and sumac, hazel, sassafras and elder are quite widely distributed elsewhere. Among indigenous fruit-bearing plants the state has the black cherry, red cherry, red plum, yellow grape, blue currant, blackberry, dewberry, strawberry and cranberry. Blue flag, snake root, ginseng, lobelia, tanoy, wormwood, wintergreen, pignut hickory, mountain ash, barberry, sarsaparilla and horehound are among its medicinal plants. Cowslips, violets, anemones, buttercups and blood-roots are conspicuous in early spring, the white shell-berry and black and golden-rod in autumn, and besides these there are about 1500 other flowering plants in the state and more than 50 species of ferns.

Fauna.—Of the fur and game animals which were inhabitants of the prehistoric forests of the winter of the climate, except in the Adirondack region. Here the puma ("panther") has become extinct and the Canada lynx is rare. The mink, the elk and the beaver have been placed under the protection of the Forest, Fish and Game Commissioner. There are several species of deer, rabbits of all kinds and many species of squirrels; skunks, weasels, muskrats and woodchucks are common; there are some raccoons; mink are frequently taken in the Adirondacks; and a few other representative mammals have been raised on farms.

Among birds of prey a bald eagle and a golden eagle are occasionally seen in seclusion places. Game birds include ducks, geese, plovers, snipe, loons, grebes, terns, rails, the woodcock and the red-tailed grouse; quails are scarce except on Long Island, where a number of young birds are liberated each year, and by the same means a supply

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of pheasants is maintained in some parts of the state. There is a state game bird farm (1909) near Sherburne in Chenango county. Here the birds are fattened and released in the fall and early winter in marshes. The robin, song sparrow, chickadee, thrushes, warblers, vireos, orioles, wrens, bluebird, catbird and phoebe are favourite species.

There are about 375 species of fish in New York waters (see below under Fisheries).

Soil.—The soil is mostly glacial drift, but its depth and composition vary a great deal in different parts of the state. The soil of the Adirondack region is generally distributed, especially in the W. half of the state, is mainly a clay which was formed by the glacial pulverizing of limestone and shale and is still forming from the decomposition of fragments of these substances. In the forests the clay is usually mixed with a considerable alluvium and is therefore sandy. In the E. there is a clay formed mainly by the decomposition of slate. A sandy loam is the characteristic soil of some counties, and gravelly loams containing limestone are not uncommon.

Agriculture and Stock-Raising.—Although New York has lost in the competition with the Western States in the production of most of the grains, especially wheat and barley, and in the production of wool, mutton and pork, it has made steady progress in the dairy business and continues to produce great crops of hay. The state has made great advances, too, in the production of flowers, ornamental plants, nursery products, fruits, vegetables, poultry and eggs. In 1900 a little less than three-fourths of the state's total land area was included in farms and a little more than two-thirds of this was included in farms under 100 acres. The largest farm group was from 170,521 in 1850 to 226,720 in 1900, and the average size decreased from 111.25 acres in 1850 to 97.1 acres in 1890, but increased to 99.9 acres in 1900. More than two-thirds of the farms (1,252,006) were operated by owners or tenant farmers, and more than half of the farms (612,487) were operated by cash tenants.

Of the total acreage of all crops, 5,154,965 acres (51.4%) were of hay and 3,125,077 acres (32.8%) were of cereals. In 1900 the amount of the hay crop (5,002,000 tons) was greater than the previous years, but it was less than the corresponding crop in any other state. The oat crop in 1900 was 37,365,000 bushels; the Indian corn crop, 1,910,000 bushels; the wheat crop, 14,120,000; forage crops, 9,000,000; the rye crop, 2,720,000 bushels; buckwheat, 7,512,000 bushels.

There were less than one-third as many sheep in 1910 (1,177,000) as in 1850; but in the same period the number of dairy cows (1,202,000) nearly doubled. There were more than 1,500,000 hogs, and fewer than 1,000,000 sheep in the state. Maine is the next largest, with 29,250,000 bushels; and the state is a large producer of onions, turnips, cabbages, cauliflower, sweet Indian corn, cucumbers, rhubarb, parsnips, carrots, green peas and green beans. Maine, New York and Ontario counties are the largest producers of potatoes in the state. New York is the leading state in the production of hay, and nearly 60% of the hay crop is produced in the southern and western counties of the state. The greatest production of hay is in the Adirondack Mountains and in the rugged portions of the counties in the S. half of the state. A large portion of the Indiana corn, wheat and barley was produced on the Ohio territory. There are large crops of oats here, too, but the culture of this cereal is quite extensive in most of the counties of the Adirondack region. The lower valley of the Hudson is noted for its crop of tobacco. The state is one of the leading producers of flax, hemp, and Italy flax in the United States.

The principal hogs-producing counties are Otsego, Schoharie and Madison, all of which are between Albany and Syracuse. Those producing most tobacco are in a district extending from the Mohawk valley westward into the Adirondacks. The greatest orchards are in the tier of counties bordering the S. shore of Lake Ontario and in Dutchess and Ulster counties in the Hudson Valley. Chauncey and Alexandria, the leading hops-producing counties, are located on the W. half of the state and in the valley of the Hudson, and the greater part of Long Island under cultivation is devoted to market gardening, floriculture and nurseries. The largest nurseries, however, are in the Adirondack region.

Forest Products.—The principal forest area is in the Adirondack region where the state has a forest preserve (in Clinton, Essex, Franklin, Fulton, Hamilton, Herkimer, Lewis, Oneida, St. Lawrence, Sintaga, Warren and Washington counties) containing (1900) 1,350,559 acres, and there is as much or more in private preserves and in tracts owned by lumbermen. The state has a forest preserve also in the Catskill region (in Delaware, Greene, Sullivan and Ulster counties) of 110,064 acres, and there are wood-logs on state lands. Under the state forest laws, wood-logs on private lands may be cut off. Originally white pine was the principal timber of the Adirondacks, but most of the merchantable portion has been cut, and in 1900 only one-half of the area of the lumber product consists largely of hardwoods (mostly oak, chestnut and hickory), smaller amounts of hemlock and pine, and a very little spruce. The state’s entire timber product in 1905 was 512,760,127 tons, valued at $53,391,595, or 30.5%, of 58.5%, and a large part of this was to the extent of the shell-fish culture at the E. end of Lake Ontario; the value of oysters alone increased from $2,050,650 to $3,760,352. The value of hard clams rose from $1,075,000 in 1897, to $1,293,052 in 1901. In 1904 clams and other shell-fish oysters were valued at $11,685,247.

Fisheries.—New York was in 1904 more extensively engaged in oyster culture than any other state, and was making rapid progress in the cultivation of hard clams. In 1909 there were distributed from state fish hatcheries $1,319,297,271 (mostly smelt, pike-perch, and winter flatfish); a large number of fish and eggs were also placed in New York waters by the United States Bureau of Fisheries. The products of the marine fisheries decreased nearly 30% in value from 1891 to 1897, but from 1897 to 1904 they increased 9% in value. The state's shell-fish increased from 170,521 in 1850 to 226,720 in 1900, and the average size decreased from 111.25 acres in 1850 to 97.1 acres in 1890, but increased to 99.9 acres in 1900. More than two-thirds of the farms (1,252,006) were operated by owners or tenant farmers, and more than half of the farms (612,487) were operated by cash tenants.

The value of clams rose from $295,000 in 1897, to $395,000 in 1901. In 1904 clams and other shell-fish oysters were valued at $187,798 and consisting largely of pike-perch, smelt, and shell fish. These fish are valued as food, but being too bony for food they are used only in the manufacture of oil and fertilizer. The most valuable catches of food fish are made on Long Island and the three largest are herring, mackerel and menhaden, which are valued at $5,000,000, $6,000,000, and $2,000,000 respectively. These fish are valued as food, but being too bony for food they are used only in the manufacture of oil and fertilizer.

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is widely distributed throughout the state, and great quantities of it are quarried by various individuals, railroad companies, and counties, but the prevailing colours are greyish or drab it is little used in the walls of buildings. In 1908 the total value of the output of this stone was $2,584,559. Three distinct varieties of sandstone are quarried extensively in New York State: "Common" sandstone is the Hamilton period of the Devonian formation and occur mainly between the Hudson and Delaware rivers. They are dark blue-grey, fine grained, and is probably the oldest variety of rock in New York State. The sandstone is the reddish or reddish-brown Potsdam sandstone of which there are extensive formations on the N.W. border of the Adirondacks. The value of all sandstones quarried in 1908 was $1,774,843, an amount only about one-seventh of the value of the output of the other stones that were obtained in the eastern counties. From Tuckahoe, Westchester county, has been taken white marble, used in some of the finest buildings in New York City, and a similar marble is obtained in Putnam and Dutchess counties. Near Governor, St. Lawrence county, is a large quarry of coarsely crystalline magnesium limestone, used as monumental marble. In the Lower Silurian formation at Manlius and Chazy, in Clinton county, are two beds of grey and pink marbles, one of which is a favourite among domestic marbles for mantels, table tops and other interior decorations. From an extensive deposit of blue-black magnesium limestone at Glenora, in Allegany county, has been produced the largest quantity of marble in the United States. At Moriah and Port Henry, in Essex county, is a stone known as opalite marble, a mixture of serpentine, dolomite and calcite, and which occurs with sandstone deposits. Deposits of serpentinite occur at several places in St. Lawrence county; and at Warwick, in Orange county, is some beautiful marble of a carmine-red colour occasionally mottled with white or showing white veins. The marble quarried in 1908 was valued at $706,688. There are extensive formations of granitic rocks in the Adirondacks, in the lower Hudson valley, and in the adjacent highlands, but they are not extensively quarried. Rockland county produces considerable building rock, used mostly for road-making and concrete, and Ulster county has for more than a century produced most of the domestic millstones used in the United States. Extending from Madison county to the Adirondacks are large deposits of raw gypsum, which in 1908 contained large deposits of gypsum, and in 1908 the value of the state's output ($760,795) was greater than that of any other state, although Michigan produced a larger quantity. At or near Chittenango, in Madison county, is a deposit of coal, one of the largest in the United States, and the first use made of it was in the construction of the Erie Canal. The rock was found in much greater quantities at Rosendale, in Ulster county, in 1823, and the amount of this cement produced by New York in 1828 was 4,698,167 barrels; in 1899; the state is still the chief producer but only 947,029 barrels were made in 1908. Limestone and clay suitable for making Portland cement are also produced, and in 1908 the value of the state's cement was $1,128,729. This increased from 65,000 barrels in 1890 to 2,290,055 barrels in 1908. Near Talcville, in St. Lawrence county, is a large deposit of fibrous talc. In 1908 the total value of the state's talc product was $607,870. New York and Michigan are the two principal salt-producing states in the Union. Salt was discovered by the Jesuits in Western New York in 1748. The first railroads in New York were built to accommodate the manufacture of salt and other manufactured products. The first red dust in the country was that of the Erie railway, opened from Augusta, in 1829. The navigation was carried on between 1831 and 1835. The first year's results were very good, and the traffic continued to increase until 1840. In 1868 the Erie was sufficiently enlarged to accommodate boats of 240 tons burden. The second in operation in the United States was the Mohawk & Hudson, opened from Albany to Schenectady in 1831. The railway mileage in the state increased to 1,361 m. in 1850, to 3,926 m. in 1850, to 7,638 m. in 1850, and to 8,422-14 m. in 1909. The first great trunk line in the country was that of the Erie railway, opened from Piermont, on the Hudson river, to Dunkirk, on Lake Erie, in 1853. The New York Central & Hudson River railway, nearly parallel with the water route from New York City to Buffalo, was formed by the union, in 1866, of the New York Central with the Hudson River railway. The West Shore railway, which follows closely the route of the New York Central & Hudson River, was opened in 1869, and in 1881, of several shorter lines. In 1886 the New York Central & Hudson River Railroad Company leased the West Shore for a term of 475 years, and this company operates another parallel line from Syracuse to Buffalo, a line following closely the entire N. border of the state (the Rome, Watertown & Ogdensburg), and several cross lines. Other important railways are the Lehigh Valley, the Delaware, Lackawanna & Western, and the Pennsylvania in the central and northwestern counties of the state.

New York is divided into 62 counties; the major ones are: New York, which covers the entire state; Ulster, which includes parts of the Hudson River valley; and Erie, which includes the eastern end of Lake Erie. The state is known as the "Empire State" due to its size and wealth. New York City, the largest city in the United States, is located in the southern part of the state. The state is also home to the Appalachian Mountains, which stretch from western New York to the southern part of the state. The state's economy is diverse, with industries ranging from manufacturing to agriculture to tourism. New York is home to several major universities, including Cornell University and Columbia University. The state is also known for its cultural contributions, including the home of the New York Philharmonic and the Metropolitan Opera. New York is a state of great natural beauty, with lakes, mountains, and forests. The state is also known for its historical landmarks, including the Statue of Liberty and Ellis Island. New York is a state of great diversity, with a population that is made up of many different ethnic groups. The state is also known for its rich history, including the American Revolution and the Civil War. New York is a state of great natural beauty, with lakes, mountains, and forests. The state is also known for its historical landmarks, including the Statue of Liberty and Ellis Island. New York is a state of great diversity, with a population that is made up of many different ethnic groups. The state is also known for its rich history, including the American Revolution and the Civil War.
the judiciary, transferred to the people the choice of many officers, state and local, who had been appointed by the governor or the legislature; and placed numerous restrictions on the law-making power of the legislature. Under this constitution the theory of local self-government was more fully realized in New York than at any other time.

Since the middle of the 19th century an attempt has been made to meet the growing need for a corps of trained lawyers and to provide for a rapid industrial and social development by creating bureaus or commissions to exercise a central control over local officials, corporations and even private individuals, and as most of the heads of these bureaus and the commissions are appointed by the governor the importance of that officer has increased. The constitutional changes since 1846 affect principally the judiciary and cities. A constitutional convention met and proposed a new constitution in 1867, but every article was rejected by the people save one relating to the judiciary, which was adopted separately as an amendment in 1869. The constitution of 1846 made further important changes in the judiciary and senators to a freehold estate worth £500 ($500) and in the election of assemblymen to a freehold estate worth £20 ($200) or the payment of an annual rent of 40s. ($10).

But under the second constitution the most that was required of any white voter was the payment to the state or county of taxes on either personal or real property, and by an amendment of 1826 this requirement was abolished. The second constitution, however, imposed a property qualification on colored voters amounting to a freehold estate worth $250, and this restriction was not removed until 1874. Since 1874 the aim has been to bestow suffrage on all male citizens who shall have attained the age of twenty-one years and shall have been inhabitants of the state for one year, but for the protection of the ballot citizenship for ninety days, residence in the county for four months, and in the election district for thirty days next preceding the election are required. Conviction for bribery or of an infamous crime disqualifies, and personal identification of voters is required in New York City. A statement of receipts and expenditures of an election campaign, showing the amount received from each contributor and the name of every person or committee to whom more than $5 was paid, and the treasurer of every political committee within twenty days after the election; each candidate also must file a statement of his contributions. By an Act of 1910 women may vote on financial questions affecting a village in which they hold property.

Executive.—When the state government was first established, the governor and lieutenant-governor were the only state officers elected by the people. The state treasurer was chosen by the legislature, and for the appointment of other state officers as well as county officers and mayors of cities the Assembly chose four senators to constitute a council of appointment, a body

1 The population in 1870 was 8,196,606; in 1880, 10,386,641; in 1890, 12,878,899; in 1900, 15,322,528; in 1910, 17,965,321; in 1920, 20,695,748; in 1930, 23,260,350; in 1940, 25,954,576. The population has been estimated to be 30,185,752 in 1950.
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in which the governor had only a casting vote. But the constitution of 1821 abolished the council of appointment and gave the choice of the principal state departmental officers to the legislature, and the constitution of 1846 transferred the choice of these officers from the legislature to the people, where it has since remained. Under the constitution of 1821 a great number of local officers were appointed by the governor with the advice and consent of the Senate. The choice of most of these was given to the people in 1846, but since then many new state departments have been created, the heads of which are usually appointed by the governor, subject to the approval of the Senate. Under the present system, therefore, there is a biennial election (in even-numbered years) of a governor, a lieutenant-governor, a secretary of state, a state comptroller, a state treasurer, an attorney-general and a state engineer and surveyor; and the governor appoints, subject to the approval of the Senate, a superintendent of public works, a superintendent of state prisons, a superintendent of insurance, a superintendent of banks, a commissioner of excise, a commissioner of agriculture, a forest, fish and game commissioner, a commissioner of health, a commissioner of labour, a state architect, a state historian, a state librarian, two public service commissions, a civil service commission, a board of charities, a commission of prisons, a commission in lunacy, three tax commissioners and several other boards and commissions. The governor has the power, also, of filling vacancies in certain state offices and on the benches of the supreme court of New York, and he may remove or suspend certain county and municipal officers on charges.

The first state constitution gave the veto power to a council of revision composed of the governor, the chancellor and the judges of the highest court. But since 1846 this power has been exercised by the governor alone; and in 1874 it was extended to separate items in appropriation bills. A bill or item of an appropriation bill that has been vetoed by the governor can become a law only with the approval of two-thirds of the members elected to each house of the legislature. So long as the legislature is in session the governor is allowed ten days, besides Sundays, to consider a bill, and if he does not veto it within that time it becomes a law, but no bill becomes law after the final adjournment of the legislature unless it is actually approved by the governor within thirty days after the adjournment. The governor's power to grant reprieves, commutations or pardons is unrestricted by any board of pardons, but he is required to report to the legislature each case in which he exercises such power. A candidate for the office of governor or lieutenant-governor must be at least thirty years of age and must have resided within the state for five years. The governor's salary is $10,000 a year, and the lieutenant-governor's is $5000.

Legislature.—The legislative power is vested in a Senate of 50 members elected biennially and an Assembly of 150 members elected annually. Since 1846 both senators and assemblymen are elected by single districts, and ever since the state government was established they have been apportioned according to population, but the present constitution limits the representation of New York City in the Senate by declaring that no county shall have more than one-third of all the senators nor any two adjoining counties more than one-half of them. The first and second state constitutions required that every senator should be a freeholder, but since 1846 no property qualifications have been prescribed for membership in either house; the only persons disqualified are those who at the time of the election or within one hundred days before the election were members of Congress, civil or military officers under the United States, or officers under any city government. The constitution of 1846 fixed the number of members of both houses to three dollars a day and to 10 cents a mile (50 cents a day in impeachment proceedings) besides an allowance for travelling expenses, but since an amendment of 1874 they have been paid $1500 a year and ten cents a mile for travelling expenses.

The legislature meets in annual sessions, beginning in January. Money bills may originate in either house, but at the final vote on such bills, at least two-thirds of the members of the house, if present, must vote in favour of the bill. The governor may veto any bill that is passed by either house, and the house of origin may override his veto by a two-thirds vote. Any bill passed by both houses must be present and the yeas and nays must be recorded; bills entailing appropriations for local or private purposes must receive a two-thirds majority to pass. The legislature appoints the board of regents of the University of the State of New York. To decrease the evil of lobbying a law was enacted in 1906 which requires that every person employed to promote or oppose the passage of any bill shall file in the office of the secretary of state a written statement showing who employs him and the amount of money paid him, and that in respect of which his services are to be rendered; the law also requires the employers of lobbyists to file in the same office within two days after the close of the legislative session the itemized statement of all their lobbying expenses, and forbids the employment of a lobbyist for a contingent fee.

Judiciary.—At the close of the colonial era there were a court of chancery, a supreme court, circuit courts and courts of oyer and terminer which were held in the several counties of New York, with the elective judges of the supreme court, and a court of sessions in each county, and courts held by justices of the peace in the several towns. This system, with the addition of the Senate, the chancellor and the justices of the supreme court occasionally sitting as a court for the correction of errors, was retained with only slight changes until 1846. But the new constitution of that year substituted a court of appeals for the court of errors, merged the court of chancery into the supreme court, established in each county a new county court composed of a single judge, and, taking the appointment of judges from the governor, gave the election of them to the people. Some further alterations in the constitution affecting the courts were made in 1860, 1879, 1888, 1894, 1899 and 1909, and the system as at present constituted comprises a supreme court of ninety-seven justices, an appellate division of the same, a court of appeals, a court of claims and local courts. The highest judicial court in the state is not, as in most states of the Union, the supreme court, but the court of appeals. This court consists of a chief judge and six associate judges elected from the state at large for a term of fourteen years. Its jurisdiction is limited, except where judgment is of death, to a review of questions of law. Vacancies are typically filled from among the justices of the supreme court by the governor. To expedite business, at the request of the court, the governor may designate not more than four justices of the supreme court to act temporarily as additional associate judges of the court of appeals. The salary of the chief judge is $24,200, of the associate judges $13,700 a year.

The ninety-seven justices of the supreme court are elected for fourteen years from the nine districts into which the state is divided. Of these thirty are chosen in the first district (New York county) and seventeen in the second district (Long Island and Staten Island). The jurisdiction of each judge extends over the entire state. Tribunals are temporarily filled by the governor. The supreme court has general jurisdiction in law and equity, including all actions both civil and criminal. The salary of the justices in the first district is $15,000 a year; in the second district $16,500 a year; and the remainder of the second district it is $16,900 a year; in the other districts it is $10,000 a year. The state is divided into four departments for each of which there is an Appellate Division consisting of seven judges: the first department (county of New York) and four others.

The court of appeals consists of one chief judge and ten associate judges elected from the state at large; it is the highest court of the state, and its jurisdiction is limited to questions of law which are brought up upon appeal from the decisions of the courts of first instance, and must be decided by the court of appeals. The chief judge is elected for a term of six years, and the judges for terms of nine years each.

The supreme court, the court of appeals and the justices of the supreme court are bona fide residents of the state. The court of appeals cannot be removed from office by impeachment, but the justices of the supreme court can. The constitution provides for the impeachment of judges, and the vote of two-thirds of each house is necessary to remove any judge from office. The judge is removed from his office if he is convicted of a crime. The court of appeals has general power to make rules and regulations for the government and discipline of the bar, and to admit to the practice of law such persons as shall appear to such court to be of sufficient character and learning to practice as attorneys and counselors. The judges of the supreme court are elected for terms of six years, and the judges of the court of appeals for terms of nine years each.

Local Government.—The state is divided into sixty-one counties, each (unless wholly included in a city) having a county board, and in cities having a separate government. Each county board is composed of three members elected for two years, one from every town or city ward. This board has certain administrative and legislative powers, such as the care of county property, the borrowing of money for the erection of county buildings, the fixing of the salary of the county treasurer and of other county officers, the levying of county taxes and the division of the county into assembly districts and school commissioners' districts. Other county officers are a county judge and a county surrogate elected for a term of six years, a treasurer, a clerk, a district attorney, a sheriff and from one to four coroners elected for a term of three years. There are of these cases: (1) those having a population of 175,000 or more; (2) those having a population between 50,000 and 175,000; and (3) those whose population is less than 50,000; the classification is according to the latest state enumeration.
The Penal Law of 1894, as amended, includes regulations that prohibit certain activities such as gambling at race-tracks. License to sell intoxicating liquors is subject to a graduated tax. The sale of liquor on Sunday or between one o'clock and five o'clock in the morning of any other day is unlawful. Assemblers of two or more persons for the purpose of selling or offering to sell intoxicating liquors, or persons who have conspired to sell alcohol, may be punished. The sale of intoxicating liquors, may allow it to be sold only on condition that it be not drunk on the vendor's premises, or may allow it to be sold only to hotel-keepers and pharmacists, or by pharmacists alone.

**Administrative Committee**

The office of such public service corporations as own or operate steam, electric or street railways, gas or electric plants, and express companies were, in 1907, vested in two public service commissions (the first for New York City and the second for all other parts of the state), each of five members appointed by the governor with the approval of the Senate; in 1910 the regulation of telephone and telegraph companies throughout the state was vested in the second commission.

**A State civil service commission** (1883) consists of three members (not more than two of the same political party) appointed by the governor with the approval of the Senate. For the classified service of the state and of the minor civil divisions, except cities, the commission makes rules (subject to the governor's approval and to statutory and constitutional provisions) governing the classification of offices, the examination of candidates for office, and the appointment and promotion of employees. In cities the mayor is required to appoint a municipal civil service commission, with similar duties; not more than two-thirds of the members to be of the same political party.

**Prisons, Poor Laws, Charities, &c.**

Penal institutions for sane adults, except reformatories for women, are under the general supervision of a state commission of prisons; hospitals for the insane are under the general supervision of the state commission in lunatic and all other charitable and penal institutions, maintained wholly or in part by the state, or by any county, city or town within the state, are under the general supervision of a state board of charities. This board of charities is composed of one member from each of the five senatorial districts and three additional members from the City of New York, all appointed by the governor with the consent of the Senate for a term of eight years. It existence dates from 1857, but its authority was very limited, chiefly advisory, until 1865. Since then, however, its powers have been greatly increased. In 1910 the state charitable institutions were as follows: State Soldiers' and Sailors' Home, Bath; State School for the Blind, Batavia; the Thomas indian School, Iroquois; State Woman's Relief Corps, Home, Oxford; State Hospital for the care of Crippled and Deformed Children, West Haven; State Training School for Men, Utica; State School for Girls, Hudson; Western House of Refuge, Albion; New York State Reformatory for Women, Bedford; the State Training School for Boys; and Letchworth Village, which is a combination of charitable and feeble-minded. Eighty institutions for the care of special and instruction of deaf mutes and one for the care of the blind are supported mainly by the state. Many other charitable institutions receive public money, mostly from counties, cities and towns.

The poor law of the state defines the town poor as those who have gained a settlement in some town or city, by residing there for one year prior to their application for public relief and who are unable to maintain themselves; the county poor as the poor who have not resided in any one town or city for one year before their application for public relief, but have been in some one county for sixty days; the state poor as those who are under provisions furnished by the state, not being cared for, each town, city, county and the state must pay the cost of maintaining its poor. In some counties there is no distinction between town and county poor, but in 1910 only one or the other. The state poor are those who have been placed in almshouses or poorhouses and care of the poor; towns and cities not subject to special provisions intrusted public relief to one or more overseers of the poor or to certain county officers. Without regard to the method of accommodation a poor person requiring medical or surgical treatment may be sent to the nearest hospital approved by the state board of charities. An Act of 1910 provides that indigent soldiers, sailors or marines, and their dependents, shall be cared for in their homes and not in almshouses.

The first state insane asylum, designed chiefly for recent and curable cases of insanity, was opened at Utica in 1843. Since 1896 every public institution for the insane has been maintained and administered as a part of the state system. A state commissioner in lunacy was first appointed in 1874; this officer was replaced in 1889 by a commission in lunacy, which in 1894 was placed at the head of the

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1 For further regulations relating to the employment of women and children see the Labour Law enacted in 1909 and the subsequent amendments.
administration of the state's insanity law. This commission consists of three members appointed by the governor with the consent of the Senate for a term of years, and the institutions under its supervision in 1910 were the Sing Sing State Prison, at Ossining, the Auburn State Prison at Auburn, and the Clinton State Prison at Dannemora, the New York State Reformatory at Elmsford, the Eastern New York Reformatory at Napanoch, five county penitentiaries, and all other institutions for the detention of sane adults charged with or convicted of crime, or retained as witnesses or debtors. The state prisons are under a superintendent of state prisons, appointed by the governor, with the consent of the Senate, for five years; and the state reformatories are managed by a board of seven managers similarly appointed for seven years. In the state reformatory at Elmsford (which, like that at Napanoch, is divided into state correctional districts) the governor has the right to make a check list of all prisoners committed to the state prison or reformatory who have been convicted of a state prison offence for the first time only, the plan of committing adult felons on an indeterminate sentence to be followed by the state reformatory, the rule having been laid down that it has proved so satisfactory that it has been in part adopted for the state prisons. In order to minimize competition between prison labour and free labour, articles manufactured in the state prisons are sold at the same prices as those made by free labour, and the proceeds are divided among the institutions and departments of the state and its political divisions.

Education.—The first school was established by the Dutch at New Amsterdam (now New York City) as early as 1633, and at the close of the Dutch period there was a free elementary school in every settlement. But from the English conquest to the close of the colonial era the chief purpose of the government with respect to education was to provide schools for the children of the poorer classes. King's College was founded in 1754, and from 1764 to 1776 the other schools were principally those maintained by the Society for the Propagation of the Gospel in Foreign Parts. Hardly any schools remained in operation throughout the War of Independence. In January 1784 Governor George Clinton recommended legislation for the "revival and encouragement of seminaries of learning," with the result that the legislature passed an act establishing a university at New York City, formerly King's College, with authority to incorporate new colleges and academies and to exercise over them the right of visitation. In 1785 an act was passed which formed the basis of the present elementary-school system. This act provided to support a public school in every county, the fund for the support being equal to the tax collected for education, augmented by one third of the taxes of the county. The act was an attempt to establish a uniform system of free public instruction for the children of the industrial schools. For the training of teachers for the elementary schools the state maintains ten normal schools at Oswego (1853), Cortland (1856), Fredonia (1860), Potsdam (1866), Geneseo (1872), Plattsburg (1875), Plattsburg (1887) and Plattsburg (1890); it also appropriates $700 annually for each teachers' training class in about one hundred of the secondary schools. The State Normal College at Albany, founded in 1843 as the first state normal school, is designed principally for the training of teachers for the secondary schools, about 800 high schools and academies, supported wholly or in part by the state.

The state controls professional and technical schools through the regents' examinations of candidates for admission to such schools and to the professions, determines the minimum requirements for admission to college by the regents' academic examinations, main- tains the state college system, and provides a system of free public instruction for the children of the industrial schools. For the training of teachers for the secondary schools, about 800 high schools and academies, supported wholly or in part by the state.

Among the institutions of higher learning in the state, besides Columbia University (q.v.) and Cornell University (q.v.), are: Union University (1875), Hobart and William Smith College (1812, non-sectarian), at Clinton; Colgate University (1819, non-sectarian), at Hamilton; Hobart College (1822, non-sectarian), at Geneva; Brown University (1764), at Providence; Johns Hopkins University (1876), at Baltimore; Dartmouth College (1826, non-sectarian), at Hanover, N.H., Yale University (1701), at New Haven; Harvard University (1636), at Cambridge, Mass.; Princeton University (1746), at Princeton; University of Pennsylvania (1740), at Philadelphia; Columbia University (1754), at New York City; New York University (1831), at New York City; New York University (1832, non-sectarian), at New York City; Alfred University (1836, non-sectarian), at Alfred; Fordham University (1841, Roman Catholic), in New York City; College of

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1 In 1906 a law was enacted for the establishment of a new state prison in the eastern part of the state to take the place of Sing Sing Prison.
safe deposit companies, 255 building and loan associations and other
nonbanking corporations, with total resources of $3,831,000,000
under the supervision of the banking department of the state.
This is over 21% of the entire banking power of the United States.
To correct abuses in the life insurance business which were
discovered in 1905 by an investigation carried on by the state
department of insurance, a law was passed in the next year regulating the election of the directors of the
insurance companies, and the investments of the companies and
the distribution of dividends, limiting the amount of business of the
larger companies and prohibiting rebates on insurance premiums.
A state superintendent of insurance, (since 1860) appointed by
the governor, holds office for three years.

History.—The aboriginal inhabitants of New York had an
importance disproportionate to its small size. With limits from
the upper Hudson and eastward to the Genesee river were
home of that powerful confederacy of Indian tribes, the Mohawks,
Onondagas, Cayugas and Senecas, known to the French as
the Iroquois and to the English as the Five (later Six) Nations.
When supplied with firearms by Europeans they reduced a
number of other tribes to subjection and extended their dominion
over most of the territory from the St. Lawrence to the Tennessee
and from the Atlantic to the Mississippi. They were at the height
of their power about 1700. Of much less influence in New York
were several Algonquian tribes in the lower valley of
the Mohawk, the Iroquois community in the Thousand Islands,
New York Bay and the Hudson river were discovered by
Giovanni da Verrazano in 1524, and were probably seen by
Estevan Gomez in 1525; for many years following French
vessels occasionally ascended the Hudson to trade with the
Indians. The history of New York really begins, however, in
1609. In July of that year Samuel de Champlain discovered the
lake which bears his name and on its shores led his Algonquian
Indian allies against the Iroquois, thus provoking against his
countrymen the hostility of a people who for years was to hold
the induces power in the Great Lakes. The Iroquois
had been subdued by the Dutch in 1667, and the
Algonquian tribes were driven from New York by the
French. On the 3rd of September Henry Hudson, in the
employ of the Dutch East India Company, entered New York
Bay in the “Half Moon” in search of the “northwest passage.”
He conceived that a vast trade with the Iroquois for furs might
be established; his report aroused great interest in Holland;
and the United Netherlands, whose independence had been
acknowledged in the spring, claimed the newly discovered
country. In 1610 a vessel was despatched with merchandise
suitable for traffic with the Indians, the voyage resulted in
profit, and a lucrative trade in peltry sprang up. Early in 1614
New York block expeditions were made to Block Island.
The merchants of Amsterdam and Hoorn soon formed themselves into the New Netherland Company, and on the
11th of October 1614 received from the States-General a
two years’ monopoly of the Dutch fur trade in New Netherland,
that part of America between New France and Virginia,
also the southern part of the Hudson river, is not
controlled by the Dutch. The English did not have
control over the settlement until 1664. Colonial
The charters of the New Netherland Company expired
in 1664 and New York was transferred to the
States-General. Under the charter of 1664 the
States-General refused to grant a renewal, and only private
ventures were authorized until 1621, when the West India Company
(see) was chartered for a term of twenty-four years; to
this company was given a monopoly of Dutch trade with the
American coast from Newfoundland to the Straits of Magellan.
It was continually renewed—after the expiration of
its charter in 1664 a very limited supervision of the States-General, such as
the approval of its appointment of a governor and of its instructions
to him; and its own government was vested in five chambers of
directors and an executive board or college of nine
such chambers, eight of the nineteen representing
the Chamber of Amsterdam. New Netherland became one of
the more important interests of the Company. In June 1623,
however, New Netherland was formally erected into a province
and the management of its affairs assigned to the Chamber of
Amsterdam, which in March 1624 despatched the "New Netherlands," with the first permanent colonists (thirty families mostly Walloon), under Cornelis Jacobsen Mey, the first governor or director of the colony. Arriving at Manhattan in early May, a few weeks after having landed, this small company established a temporary post (Fort Nassau) on the Delaware river, and still another a fortified settlement on the site of the present Hartford, Connecticut. But more than one-half of the families proceeded up the Hudson to Fort Orange, the successor of Fort Nassau, at the mouth of Tawasentha Creek, and there founded what is now Albany. Three more vessels arrived in 1625, and when in that year Mey was succeeded as director by William Verhulst the colony had a population of 200 or more. The government of the province was fully established in 1626 and was vested mainly in a director-general and council. The director-general was formally appointed by the Company subject to the approval of the States-General, but the Amsterdam Chamber and the College of Nineteen supervised his administration. The members of the council were formally appointed by the Company, but the director-general actually determined who they should be, and as he was not bound by their advice they were no check on an autocratic rule. Peter Minuit, the first director-general, arrived with more colonists in May 1626, and soon afterwards Manhattan Island was bought from the Indians, Fort Amsterdam was erected at its eastern end, and the settlement here was made the seat of government.

In 1629, chiefly to encourage agriculture, the Company issued its famous Charter of Privileges and Exemptions, which provided that any member might have anywhere in New Netherland except on Manhattan Island his choice of a tract of unoccupied land extending 16 m. along the seacoast or one side of a navigable river, or 8 m. along the river on both sides and so far into the country as the situation of the occupiers will permit by purchasing the same from the Indians and planting upon it a crop of wheat or corn. Provision was also made for the grant of farms to the beginning of the undertaking, one-fourth part within one year; and that any private person might with the approval of the director-general and council take up as much land as he should be able to improve. The founder of a colony was styled a patron, and, although the colonists were bound to him only by a voluntary contract for specified terms, the relations between them and the patron during the continuance of the contract were in several important respects similar to those under the feudal system between the lord of a manor and his serfs. The patron received his estate in perpetual inheritance and had the exclusive right of planting and fishing thereon, and, if the tenant not only paid him a fixed rent, usually in kind, but had to share with him the increase of the stock and to have the grain ground at his mill. The patron was the legal heir of all his colonists who died intestate. He had civil and criminal jurisdiction within the boundaries of his estate; he could create offices, found cities, and appoint officers and magistrates, and, although the charter permitted an appeal from his court to the director-general and council in any case in which the amount in dispute exceeded fifty guilders ($20), some of the patrons exacted from their colonists a promise not to avail themselves of the privilege. The Company promised to permit the patrons to engage in the fur trade, wherever it had no commissary of its own, subject to a tax of one guilder (40 cents) on each skin, and to engage in other trade along the coast from Newfoundland to Florida subject to a tax of 5% on goods shipped to Europe. The colonists of the patrons were exempted from all taxes for a period of ten years, but were forbidden to manufacture any cloth whatever. The charter did not give the encouragement to agriculture that was expected of it because the status created for colonists of a patron was not an attraction to a successful family, in the Netherlands. Immediately after the issue of the charter a few of the more adroit directors of the Amsterdam Chamber hastened to acquire for themselves, as patrons, the tracts of land most favourably situated for trade. On both sides of the entrance to Delaware Bay Samuel Godyn, Samuel Blommaert and five other directors who were admitted to partner-

ship in the second year (1630) established the manor and colony of Swanendael; on a tract opposite the lower end of Manhattan Island and including Staten Island, Michael Pauw established the manor and colony of Pavonia; on both sides of the Hudson and extending in all directions from Fort Orange (Albany) Kilian van Rensselaer established the manor and colony of Rensselaerwyck. The colony of Swanendael was destroyed by the Indians in 1632. Pauw maintained his colony of Pavonia for about seven years and then sold out to the Company. The colony of Rensselaerwyck was the only one that prospered under the patron system. In the meantime the patrons had claimed unrestricted rights of trade within the boundaries of their estates. These were stoutly denied by the Company. Director-General Minuit was recalled in 1632 on the ground that he had been partial to the patrons; and Wouter van Twiller, who arrived in 1633, endeavoured to promote only the selfish commercial policy of the Company; at the close of his administration (1637) the affairs of the province were in a ruinous condition.

William Kieft was appointed director-general late in 1637, and in 1638 the Company abandoned its monopoly of trade in New Netherland and gave notice that all inhabitants of the United Provinces, and of friendly countries, might trade there subject to an import duty of 10%, an export duty of 15%, and to the requirement that the goods should be carried in the Company's ships. At this time the Company was instructed to issue to any immigrant applying for land a patent for as large a farm as he required for cultivation and pasturage, to be free of all charges for ten years and thereafter subject only to a quit-rent of one-tenth of the produce. Two years later, by a revision of the Charter of Privileges and Exemptions, the prohibition on manufactures was abolished, the privileges of the original charter with respect to patrons were extended to "all good inhabitants of the Netherlands," and the estate of a patron was limited to 4 m. along the coast or a navigable river, or 8 m. along the river on both sides. The Company was also provided that any one who brought over five colonists and established them in a new settlement should receive 200 acres, and if such a settlement grew to a town or village it should receive a grant of municipal government. These inducements encouraged immigration not only from the Fatherland but from New England and Virginia. But the freedom of trade promoted dangerous relations with the Indians, and an attempt of Kieft to collect a tribute from the Algonquian tribes in the vicinity of Manhattan Island and other indiscretions of this officer provoked Indian hostilities (1641-1645), during which most of the colonists of Pavonia and Staten Island were killed.

Out of this warfare arose an organized movement for a government in which the colonists should have a voice. In August 1641 Kieft called an assembly of the heads of families in the neighbourhood of Fort Amsterdam to consider the question of peace or war. The assembly chose a board of Twelve Men to represent it, and a few months later this board demanded certain reforms, especially that the membership of the director-general's council should be increased from one to five by the popular election of four members. Kieft promised the concessions to gain the board's consent to waging war, but later denied its authority to exact promises from him and dissolved it. At another crisis, in 1643, he was obliged to call a second assembly of the people. This time a board of Eight Men was chosen to confer with him. It denied his right to levy certain war taxes, and when it had in vain protested to him against his arbitrary measures it sent a petition, in 1644, to the States-General for his recall, and this was granted. Peter Stuyvesant (q.v.), his successor, arrived at Fort Amsterdam in May 1647. Under his rule there was a return of prosperity; from 1633 to 1664 the population of the province increased from 2000 to 10,000. Stuyvesant, however, was extremely arbitrary. Although he permitted the existence of a board of Nine Men to act as "tribunes" for the people, it was originally composed of his selections from eighteen persons chosen at a popular election, and annually thereafter the places of six retiring members were filled by his selections from twelve persons nominated by the board. He treated it with increasing
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contempt, and the most that it could do was to remonstrate to the States-General. That body suggested a representative government, but this the Company refused to grant.

Stuyvesant conducted a successful expedition against the Swedes on the southern border of New Netherland in 1655; but he was powerless against the English. The Dutch had long claimed the whole coast from Delaware Bay to Cape Cod, but by the treaty of Hartford (1650), negotiated between himself and the commissioners of the United Colonies of New England, Stuyvesant agreed to a boundary which on the mainland roughly determined the existing boundary between New York and Connecticut and on Long Island extended southward from the west side of Oyster Bay to the Atlantic Ocean. Notwithstanding the good claim to their province which the Dutch had established by discovery and occupancy, the government of Great Britain, basing its claim to the same territory on Cabot’s discovery (1498), the patent to the London and Plymouth companies (1606), and the patent to the Council for New England (1620), contended that the Dutch were intruders. During the war between England and Holland, the Dutch, fearing an English attack, built a wall, from which the present Wall Street was named, across Manhattan Island at what was then the northern limits of New Amsterdam. In the following year Cromwell actually sent out an expedition which, with the aid of New England, was to attempt the conquest, but before an attack was made peace was announced. The Charter of 1662 included in that colony some settlements acknowledged by the treaty of Hartford to belong to New Netherland, and the same agreement was renewed. Finally, in March 1664, Charles II. formally erected into a province the whole territory from the west side of the Connecticut river to the east side of Delaware Bay together with all of Long Island and a few other dependencies of minor importance, and granted it to his brother James, the duke of York and Albany, as its lord proprietor. The duke appointed Colonel Richard Nicolls governor and placed him in command of an expedition to effect its conquest. Nicolls won over the burgomaster of New Amsterdam and other prominent citizens by the favourable terms which he offered, and Stuyvesant was forced, without fighting, into a formal surrender on the 8th of September. The Dutch authority was proclaimed and New Netherland became New York. The separation from it of what is now New Jersey (q.v.) was begun by the duke’s conveyance, in the preceding June, of that portion of his province to Berkeley and Carteret, and among numerous changes from Dutch to English names was that from Fort Orange to Fort Albany. A treaty of alliance with the Mohawks and Senecas procured for the English the same friendly relations with the Iroquois that the Dutch had enjoyed. The transition from Dutch to English institutions was effected gradually and the private rights of the Dutch were carefully preserved. The English executive, consisting of a governor and council, was much like the Dutch, but Nicolls, by his conciliatory spirit, made his administration more agreeable than Stuyvesant’s. In the administration of local affairs some of the Dutch settlements were little disturbed until ten years or more after the conquest, but the introduction of English institutions into settlements wholly or largely English was begun in 1665 by the erection of Long Island, Staten Island and Westchester into an English county under the name of Yorkshire, and by putting into operation in that county a code of laws known as the “Duke’s Laws.” This code had been adapted upon the basis of New England, and, although a source of popular discontent, it gave to the freeholders of each town a voice in the government of their town by permitting them to elect a board of eight overseers which chose a constable and sat as a court for the trial of small causes. Nicolls resigned the governorship in 1668, but his successor, Francis Lovelace, continued his policy—autocratic government, arbitrary in form but mild in practice, and progressive in the matter of religious toleration. In August 1673, Holland and England being at war, a Dutch fleet surprised New York, captured the city, and restored Dutch authority and the names of New Netherland and New Amsterdam. But by the treaty of Westminster, February 1674, the Dutch title to the province was finally extinguished, and in November the English again took possession. A new charter was issued to the duke to perfect his title and Edmund (later Sir Edmund) Andros, the new governor, was instructed to establish English institutions and enforce English law in all sections. In 1675 Andros established at Albany a commission for Indian affairs which long rendered important service in preserving the English-Iroquois alliance. The imperious manner of Andros made him many enemies. Some of them preferred charges against him relating to his administration of the revenue. He was called to England in 1681 to answer these, and during his absence the demand for a representative assembly was accompanied with a refusal to pay the customs duties and so much other insubordination that the duke appointed Colonel Thomas Dongan to succeed Andros, and instructed him to call the desired assembly. It met at Fort James in the City of New York on the 17th of October 1683, was in session for about three weeks, and passed fifteen acts. The first was a charter of liberties and privileges, requiring that an assembly elected by the freetholders and freemen should be called at least once every three years; vested all legislative authority in the governor, council and assembly; forbade the imposition of any taxes without the consent of the assembly; and provided for religious liberty and trial by jury. Other acts divided the province into counties, established courts of justice, and provided for a revenue. In August 1684, when, by its charter, the western boundary of the province was not definitely extended beyond the Hudson, Dongan laid the basis of New York’s claim to the western counties, by a new covenant with them in which they recognized the English as their protectors, and throughout his administration he was busy neutralizing French influence among the Iroquois and in diverting the fur trade of the north-west from the St Lawrence to Albany. The charter of liberties and privileges was approved by the duke, but before the news of this reached its authors the duke became King James II., and in 1686, when a frame of government for New York as a royal province was provided, the assembly was dispensed with. About the same time the new king adopted a policy for strengthening the imperial control over New England as well as for the creation of a stronger barrier against the French, and in 1688 New York and New Jersey were consolidated with the New England colonies into the Dominion of New England and placed under the viceroyal authority of Sir Edmund Andros as governor-general. The news of the English revolution of 1688, however, caused an uprising in Boston, and in April 1689 Andros was seized and imprisoned. Francis Nicholson as lieutenant-governor was still in quiet possession of the government of New York, and a majority of the population of the province were satisfied to await the outcome of the revolution in the mother country, but in the southern portion of the province, especially in the City of New York and on Long Island, were a number of restless spirits who were encouraged by the fall of Andros to take matters into their own hands. They found a leader in a German merchant, Jacob Leisler (q.v.). Leisler refused to pay duties on a cargo of wine on the ground that the collector was a “papist,” and on the 31st of May 1689, during a mutiny of the militia, he and other militia captains seized Fort James. In the following month Nicholson deserted his post and sailed for England, and Leisler easily gained possession of the city. To strengthen his position he called an assembly which he allowed to choose its own officers. Some time after a copy of the order of the new monarchs (William and Mary) to continue all Protestants in their offices in the colonies had been received, Leisler falsely announced that he had received a commission as lieutenant-governor. He then attempted to revive the act of 1683 for raising revenue, but met with so much opposition that he issued writs for the election of another assembly. This, however, brought him chiefly petitions for the redress of grievances. Albany successfully defied his usurped authority until his recognition was necessary to a united front against the French and their Indian allies, who, in February 1690, had surprised and burned Schenectady. Two other French
attacks had at the same time been directed against New England, and to meet the dangerous situation Leisler performed the one statesman-like act of his public career, notable in American history as the first step toward the union of the colonies. At his call, delegates from Massachusetts, Plymouth, Connecticut and Maryland met in New York City with delegates from New York on the 1st of May 1690 to consider concerted action against the enemy, and although the expedition which they sent out was a failure it numbered 855 men, New York furnishing about one-half the men, Massachusetts one of the two commanders and Connecticut the other. Leisler had proclaimed the new monarchs of Great Britain and had declared that it was his purpose only to protect the province and the colony. An order of the arrival of a governor appointed by them; but he was enraged when he learned that he had been ignored and that under the new governor, Colonel Henry Sloughter, his enemies, van Cortlandt and Bayard, had again been appointed to the council. When Major Richard Ingoldsby arrived with two companies of the king's soldiers and demanded possession of the fort, Leisler refused although he still professed his willingness to deliver it to Sloughter. On the 17th of March 1691 Leisler's force fired on the king's soldiers, killing two and wounding several. Governor Sloughter arrived two days later, and the revolt was put down by the governor's forces and by supporting his exertions, Leisler and Jacob Milborne, his son-in-law, were pronounced guilty of treason, and were executed on the 18th of May. The execution was regarded even by many who had been indifferent to Leisler's cause, as an act of revenge. The case was carried to England, where in 1695 parliament reversed the attainder of the victims, and for many years the province was rent by the Leislerian and anti-Leislerian factions.

Governor Sloughter, as his commission directed, re-established in 1691 the assembly which James II. had abolished in 1688, and throughout the remainder of the colonial era the history of the province relates chiefly to the rise of popular government and the defence of the northern frontier. At its first session the assembly passed an act declaratory of the rights and privileges of the people, and much like the charter of liberties and privileges enacted in 1683, except that annual instead of triennial sessions of the assembly were now requested and, as was also provided in Sloughter's commission and instructions, religious liberty was denied to Roman Catholics. This act was disallowed by the crown in 1697, and until Governor Cornbury's administration (1702-1708) both the Leislerians and the anti-Leislerians revolved around the government's favour by supporting his measures instead of contending for popular rights. But Cornbury's embezzlement of £1500, appropriated for fortifying the Narrows connecting Upper and Lower New York Bay, united the factions against him and started the assembly in the important contest which ended in the establishment of its control over the public purse. In 1706 it won the right to appoint its own treasurer to care for money appropriated for extraordinary purposes, and eight years later the governor assented to an act which gave to this officer the custody of practically all public money. Until 1737 it had been the custom to continue the revenue acts from three to five years, but thereafter the assembly insisted on annual appropriations.

The first newspaper of New York, the New York Gazette, was established in 1725 by William Bradford as a semi-official organ of the administration. In 1733 a popular organ, the New York Weekly Journal, was established under John Peter Zenger (1667-1746), and in 1735 both the freedom of the press and a great advance toward the independence of the judiciary were the outcome of a famous libel suit against Zenger.

Between the reigns of governors Montgomerie (1728-1731) and Governor Cosby (1732-1736) there was an interregnum of thirteen months during which Rip van Dam, president of the council, was acting-governor, and upon Cosby's arrival a dispute arose between him and van Dam over the division of the salary and fees. Both appealed to the law, and when the chief-justice, Lewis Morris, refused Cosby's request to have the court proceed in equity jurisdiction, and denied the right of the governor to establish courts of equity, he was removed from office. Not long afterwards there appeared in the Weekly Journal some severe criticisms of the administration. For printing these Zenger was arrested for libel in November 1734. The case was not brought to trial until August 1735, and in the meantime Zenger was kept in jail. Originally he had for counsel two of the most able lawyers in the province, James Alexander (1690-1756) and William Smith (1697-1769), but when they excepted to the commissions of the chief-justice, James de Lancey (1703-1760) and one of his associates, because by these commissions the justices had been appointed "during pleasure" instead of "during good behaviour," the chief justice disbarred him, a verdict of the case was reversed by the supreme court, and Zenger was released. He later became speaker of the Assembly of Pennsylvania and a lawyer of great reputation in the English colonies. The jury quickly agreed on a verdict of not guilty, and the acquittal was greeted by the populace with shouts of triumph. The further independence of judges became a leading issue in 1761 when the assembly insisted that they should be appointed during good behaviour, and refused to pay the salaries of those appointed during pleasure; but the home government met this refusal by ordering that they be paid out of the quit-rents.

Defence of the northern frontier was a heavy burden to New York, but by its provisions the growth of the union of the colonies was promoted. From the destruction of Schenectady to the Peace of Ryswick (1697) hostilities between the French and the English in the New World took the form of occasional raids across the frontier, chiefly by the Indian allies. The main effort of the French, however, was, by diplomacy, to destroy the English-Iroquois alliance. This rested on the fear of the Iroquois for the French and their hope of protection from the English. Therefore, in response to their repeated complaints of the weakness of the English arising from disunion, Governor Fletcher, in 1697 called another intercolonial conference consisting of delegates from New York, Massachusetts, Connecticut and New Jersey, and urged the necessity of more united feelings. Open hostilities were interrupted for a few years by the Peace of Ryswick and for a longer period by the Peace of Utrecht (1713), but French priests continued to dwell among the Iroquois, teaching them and distributing presents, and of the success of this diplomacy the English were ever in danger. To counteract it they, in 1701, prevailed upon the chiefs to defend their territory, said to be 800 m. in length and 400 m. in breadth, to the king of England. The English also from time to time sent expeditions to the success of the French at the close of the 17th century and the early portion of the 18th was prevented only by the ceaseless efforts of Peter Schuyler (1657-1724) whose personal influence was for years dominant among all the Iroquois except the Senecas. When they had assumed a neutral attitude, he persuaded a number of them to join troops from New York, New Jersey and Connecticut in the unsuccessful expeditions of 1709 and 1711 against the French at Montreal. The English had a decided advantage over the French in that they could furnish goods for the Indian trade much cheaper than their rivals, and when Governor Burnet saw that this advantage was being lost by a trade between Albany and Montreal he persuaded the assembly to pass an act (1720) prohibiting it. Pursuing the same wise policy he established a trading post at Oswego in 1722 and fortified it in 1727, and thereby placed the Iroquois in the desirable position of middlemen in a profitable fur trade with the "Far Indians." London merchants, in their greed, brought about the repeal of the prohibitory act in 1729, but its effects were only in part destroyed. At another intercolonial conference at Albany, called by Burnet, a line of trading posts along the northern and western frontiers was strongly recommended. But neither the other colonies nor the home government would co-operate, and the French were the first to accomplish it. In King George's War the co-operation of all the northern colonies was sought, and New York contributed £3000 and some cannon toward New England's successful expedition against Louisburg. But it was left alone to protect its own frontier against the French, and while the assembly was wrangling with Governor Clinton
for the control of expenditures the French and their Indians were burning farm houses, attacking Saratoga (November 16, 1745), and greatly endangering the English-Iroquois alliance. Even after the Peace of Aix-la-Chapelle (1748) the Iroquois complained bitterly of the fraudulent land speculators, and in 1753 the chiefs of the Mohawks threatened to declare the covenant chain broken. A reconciliation was effected, however, by Colonel Washington the Loyalist party, who had been an important Indian affairs agent. Largely to secure the co-operation of the Iroquois the home government itself now called to meet at Albany (q.v.) the most important assembly of colonial deputies that had yet gathered. This body, consisting of twenty-five members and representing seven colonies, met in June 1754, and, besides negotiating successfully with the Iroquois, it adopted, with some modifications, a plan of colonial union prepared by Benjamin Franklin; the plan was not approved, however, either by the home government or by any of the colonies. In the first year of the war (1755) expeditions set out against Fort Duquesne (on the site of Pittsburg) and Fort Niagara and Crown Point, on the New York frontier. None of these was taken but on the 8th of September Major-General William Johnson, in command of the expedition against Crown Point, defeated a French and Indian force under Baron Dieskau in the battle of Lake George. As Johnson thought it unsafe to pursue the routed army his victory had no other effect than the erection here of the useless defences of Fort William Henry, but as it was the only success in a year of gloom parliament rewarded him with a grant of £500,000 and the title of baronet. In August 1756 Montcalm from the English and destroyed it, and in 1757 he captured Fort William Henry; but in the latter year the elder Pitt assumed control of affairs in England, and his aggressive, clear-sighted policy turned the tide of war in England's favour. Victory followed victory, Ticonderoga, Crown Point and Niagara were wrested from the French and New York freed of its foes.

England's attempt to make the colonies pay the expenses of the war by means of the stamp tax thoroughly aroused the opposition of commercial New York, already chafing under the hardships imposed by the Navigation Acts and burdened with a war debt of its own exceeding £300,000. The assembly was almost unanimous in voicing its protest to the governor. It authorized its committee, which had been appointed to correspond with the New York agent in London, to correspond also with the committees in the other colonies and this committee represented New York in the Stamp Act Congress, a body which was called at the suggestion of Massachusetts, met in New York City in October 1765, was composed of twenty-seven members representing nine colonies, and drew up a declaration of rights, an address to the king, and a petition to each house of parliament. When the Sons of Liberty, a society composed largely of unfranchised mechanics and artisans of New York City, which began to dominate the movement immediately after the Congress adjourned, resorted to mob violence—destroying property and burning in effigy the governor and other officers —the propertied classes drew back, and a few years later the popular or patriot party lost its control of the assembly. Since the Zenger trial there had been a court party and a popular party: the former included many wealthy Anglicans and was under the leadership of the De Lancy group, the latter included many wealthy and influential dissenters and was under the leadership of the Livingstons. During the administration of Governor Clinton (1743-1753) a quarrel between the governor and James De Lancy, the chief-justice, had greatly weakened the court party, and nearly all its members supported their rivals in opposition to the Stamp Act. In the series of events which followed the first violence of the Sons of Liberty important changes were made in party lines. Personal rivalry and creed became subordinate to political principles. The court party became the Loyalist party, standing for law as against rebellion, monarchy and the union of the empire as against republicanism; the popular party became the patriot party, determined to stand on its rights at any cost. The Stamp Act was repealed in March 1766, but the Townshend Acts, imposing duties on glass, paper, lead, painters' colours and tea, followed closely. They were met in New York by fresh outbursts of the Sons of Liberty and, as in the other colonies, by an association of nearly all the merchants, the members pledging themselves not to import anything from England until the duties were repealed. New York had also been requested to provide certain supplies for the British troops quartered in another province. Indian affairs had been neglected, but parliament answered (1767) by forbidding it to do any other business until it complied. It was under these conditions that the Loyalists, in the elections of 1768 and 1769, gained control of the assembly and in the latter year passed an act granting the soldiers' supplies. When, in 1770, all the duties except those on tea were repealed, the conservative merchants wished to permit the importation of all goods from England except tea. The Sons of Liberty strongly opposed this, but the conservatives won and went over to the Loyalists. The moderate Loyalists joined in the election of delegates to the Continental Congress; but the great body of Loyalists in New York strongly disapproved of the "dangerous and extravagant" measures adopted by that body, and the assembly, in January 1775, refused to approve its acts or choose delegates to the second Continental Congress. The patriots met this refusal by calling a provincial convention to choose the delegates. Scarcely had they done this when news of the encounter at Lexington produced a strong reaction in their favour, and in May 1775 they called a Provincial Congress which usurped the powers of the Continental Congress. Still, conditions were such in New York that a fight for independence was not to be lightly considered. The failure of Montgomery's expedition against Canada at the close of 1775 left the colony exposed to British attacks from the north. In the south the chief city was exposed to the British fleet. Sir William Johnson died in 1774, but under his influence and that of his son, Sir John Johnson, and his nephew Guy Johnson, the Mohawks and other Iroquois Indians had become firmly attached to the British side and threatened the western frontier. In various sections, too, considerable numbers of Loyalists were determined to aid the British. When, in June 1776, a vote on the Declaration of Independence was pending in the Continental Congress, the New York Provincial Congress refused to instruct its delegates in the matter; but a newly elected Provincial Congress, influenced by a Loyalist plot against the life of Washington, adopted the Declaration when it met, on the 9th of July. The position of New York made it naturally one of the principal theatres of military operations during the War of Independence. It was a settled point of British military policy throughout the war to hold New York City, and from it, as a base, to establish a line of fortified posts along the Hudson by means of which communication might be maintained with another base at Lake Champlain. Such a scheme, if successfully carried out, would have driven a wedge into the line of colonial defence and cut off communication between New England and the southern colonies. A few days after the fight at Lexington and Concord, Connecticut authorized an expedition under Ethan Allen which surprised and captured Ticonderoga and Crown Point. In the following year (1776) the British began their offensive operations for the control of the Hudson; an army under Sir William Howe was to capture New York City and get control of the lower Hudson, while another army under Sir Guy Carleton was to retake Crown Point and Ticonderoga and get control of the upper Hudson. Howe, with a force of British and Loyalists vastly superior in equipment and numbers to Washington's untrained militia, landed in July on Staten Island and late in August defeated Washington at the battle of Long Island within the present limits of Brooklyn borough. In the following month Washington withdrew from New York City which the British entered and held until the close of the war. Washington prepared to withstand the British behind fortifications on Harlem Heights, but discovering that Howe was attempting to outflank him by landing troops in the rear he retreated to the mainland, leaving only a garrison at Fort Washington, and established a line of fortified camps on the hills overlooking
the Bronx river as far as White Plains. This brought on the battle of White Plains late in October, in which Howe gained no advantage; and from here both armies withdrew into New Jersey, the British capturing Fort Washington on the way, the Americans leaving behind garrisons to guard the Highlands of the Hudson. In 1777 General John Burgoyne succeeded in taking Ticonderoga, but in the swampy forests southward from Lake Champlain he fought his way against heavy odds, and in the middle of October his campaign culminated disastrously in his surrender at Saratoga. Colonel Barry St Leger led an auxiliary expedition from Oswego against Fort Stanwix on the upper Mohawk, and on the 6th of August he fought at Oriskany one of the most hotly contested battles of the war, and the bloody defeat of his terror-stricken Indian allies, he hastened back to Montreal. The British government intended that Howe should co-operate with Burgoyne by fighting his way up the Hudson, but as the secretary of state for the colonies neglected to send him such instructions this was not undertaken until early in October, and then an expedition for the purpose was placed under the command of Sir Henry Clinton. Clinton met with little difficulty from the principal American defences of the Highlands, consisting of Forts Montgomery and Clinton on the western bank, together with a large chain across the river stretched to a precipitous mountain (Anthony's Nose) on the opposite bank, and ascended as far as Esopus (now Kingston) which he burned, but he was too late to aid Burgoyne. The year 1778 saw the bloody operations of the Tory Butlers and their Loyalist and Indian allies in the Mohawk and Schoharie valleys and notably the massacre at Cherry Valley. In retaliation a punitive expedition under Generals John Sullivan and James Clinton in 1779 destroyed the Iroquois towns, and dealt the Indian confederacy a blow from which it never recovered. The American cause was strengthened this year also by several victories along the lower Hudson of which General Anthony Wayne's storming of the British fort at Stony Point was the most important. The closing episode of the war as far as New York was concerned was the discovery of Benedict Arnold's attempt in 1780 to betray West Point and other colonial posts on the Hudson to the British. On the 25th of November 1783 the British forces finally evacuated New York City, but the British posts on Lakes Erie and Ontario were not evacuated until some years later.

New York ratified the Articles of Confederation in 1778, and when Maryland refused to ratify unless those states assenting claimed a territory west to the Mississippi agreed to surrender them, New York was the first to do so. But under the leadership of George Clinton, governor in 1777-1795, the state jealously guarded its commercial interests. The Confederation Congress appealed to it in vain for the right to collect duties at its port; and there was determined opposition to the new Federal constitution. In support of the constitution, however, there arose the Federalist party under the able leadership of Alexander Hamilton. When a majority of the constitutional convention of 1787 had approved of the new constitution Hamilton alone of the three New York delegates remained to sign it; and when, after its ratification by eight states, the New York convention met at Poughkeepsie (June 17, 1788) to consider ratification, two-thirds of the members were opposed to it. But others were won over by the news that it had been ratified by New Hampshire and Virginia or by the telling arguments of Hamilton, and on the 26th of July the motion to ratify was carried by a vote of 30 to 27.

The constitution having been ratified, personal rivalry among the great families—the Clintons, the Livingstons and the Schuylers—again became dominant in political affairs. The Clintons were most popular among the independent freetholders; the Livingstons had increased their influence by numerous marriage alliances with landed families; and the Schuylers had General Philip Schuyler and Alexander Hamilton, his son-in-law. Originally, the Livingstons, with whom John Jay was connected by marriage, were united with the Schuylers, and yet both together were unable to defeat the Clintons in an election for governor. Later, the Livingstons, piqued at Washington's neglect to give them the offices they thought their due, joined the Clintons, but the Federal patronage was used against the anti-Federalists or Republicans with such effect that in 1792 John Jay received more votes for governor than George Clinton, although the latter was counted in on a technicality. Jay was elected in 1795 and re-elected in 1798, but in 1801 the brief Federalist regime in the state came to an end with the election of George Clinton for a seventh term. The Republican leaders straightway quarrelled among themselves, thus starting the long series of factional strife which have characterized the party politics of New York state; the bitterness of the factions and the virtual consequent control of the local governments by a few families or a few individuals for the firm establishment early in the Republican regime of the "spoils system." The leaders of the several Republican groups were Chancellor Robert R. Livingston, Aaron Burr, then vice-president, Governor George Clinton and his nephew, De Witt Clinton, who in 1802 was elected United States senator. The first break came in the spring of 1804 when Burr, who had incurred the enmity of his Republican colleagues in 1800 by seeking Federalist votes in the electoral college at Jefferson's expense, became an independent candidate for governor against Martin Van Buren. Hamilton's action in 1804 to vote for Burr for governor just as he had counselled them not to support Burr against Jefferson in 1800, was one of the contributary causes of Burr's hostility to Hamilton which ended in the duel (July 1804) in which Burr killed Hamilton. Hamilton's death marked the end of the Federalists as a power in New York. The election as governor in 1804 of Lewis, a relative of the Livingstons, was followed by a bitter quarrel with the Clintons over patronage, and resulted at the state election of 1827 in the choice of a Clintonian, Daniel D. Tompkins, for governor and the virtual elimination of the Livingstons from New York state politics. Tompkins served as governor by successive re-elections until 1817, his term covering the trying period of the second war with Great Britain. New York, whose growing shipping interests had suffered by the Embargo of 1807, was as a commercial state opposed to the war. Politically this opposition had the effect of temporarily reviving the Federalist party, which secured control of the legislature, and gave the electoral vote of the state in 1812 to De Witt Clinton, whom the Federalists had accepted as a candidate to oppose Madison for re-election on the war issue. During the war New York was the most active of the states in supplying troops and other provisions to the national army. After 1815 the Republicans, who were in the majority of the Assembly, were in control of the state, and the power of the Federalists was broken. For many years the anti-Federalists wore themselves out in factional strife, and other parties arose to divide the anti-Jacksonian elements, polled in the New York state election of 1832 more than 136,000 votes for Francis Granger, their
candidate for governor against Marcy, who was chosen by about 10,000 plurality. As the anti-Masonic wave subsided its leaders and most of its adherents found a place in the newly organized Whig party, which was powerful enough in New York to elect William H. Seward governor in 1838, and to re-elect him and to carry the state for W. H. Harrison against Van Buren in 1840. It was during the first administration of Governor Seward that the anti-rent agitation in the Hudson river counties began. The greater part of the land in this section was comprised in vast estates such as Rensselaerwyck, Livingston, Scarsdale, Phillipse, Pelham and Van Cortlandt manors, and on these the leasehold system with perpetual leases, leases for 99 years or leases for one to three lives had become general. Besides rent, many of the tenants were required to render certain services to the proprietor, and in case a tenant sold his interest in a farm to another he was required to pay the proprietor one-tenth to one-third of the amount received as an alienation fine. Stephen van Rensselaer, the proprietor of Rensselaerwyck, had suffered the rents, especially of those poorer tenants, to fall much in arrears, and when after his death (1839) the agents of his heirs attempted to collect them they encountered violent opposition. Governor Seward called out the militia to preserve order but asked the legislature to consider the tenants' grievances. The legislature appointed an arbitration commission, but this was unsuccessful, and the trouble, spreading to other counties, culminated (1845) in the murder of the deputy-sheriff of Delaware county.

Regrettably, the tenancy of Texas and the radicals supported the Wilmot Proviso the split became irrevocable. The split broke up the rule of the “regency,” Marcy accepting the “Hunker” support and a seat in Polk’s cabinet, while Wright, Butler and Van Buren joined the “Barnburners,” a step preliminary to Van Buren’s acceptance of the “Free Soil” nomination for president in the campaign of 1848. Only once between 1819 and the Civil War did the Democratic party regain control of the state—In 1835-1835 Horatio Seymour was governor for a single term. In 1854 the newly organized Republican party, formed largely from the remnants of the Whig party and including most of the “Free Soil Democrats” with the aid of the temperance issue elected Myron Holley Clark (1806-1809) governor. Two years later the Republicans carried the state for Fremont for president, and a succession of Republican governors held office until 1862 when the discouragement in the North with respect to the Civil War brought a reaction which elected Seymour governor. With the exception of New York City the state was loyal to the Union cause during the war and furnished over a half million troops to the Federal armies. Certain commercial interests of New York City favoured the Confederate cause, but MayorWood's suggestion that he had more than a million dollars in gold locked up in the city was afterward shown to be a delusion. The anti-rent doctrine.

1 James Fenimore Cooper's novels Satastoe (1845), The Chainbearer (1845) and The Redskins (1846) preach the anti-rent doctrine.
NEW YORK (CITY)

Cadwallader Colden (Acting) 1753-1765
Sir Henry Morgan 1765-1776
Cadwallader Colden (Acting) 1776
John Murray, earl of Dunmore 1776-1779
William Tryon 1779-1780

Provincial Government

Transition 1776-1777

State

George Clinton 1777-1795 Anti-Federalist
John Jay 1795-1801 Federalist
George Clinton 1801-1804 Dem.-Repub.
Morgan Lewis 1804-1807
Daniel D. Tompkins 1807-1817
John Tayler (Acting) 1817
De Witt Clinton 1817-1823
Joseph Christopher Yates 1823-1825
De Witt Clinton (Acting) 1825-1826
Nicholas Fletcher (Acting) 1828-1829
Martin Van Buren 1829
Enos Thompson Throop (Acting) 1829-1831
Enos Thompson Throop 1831-1833
William Learned Marcy 1833-1839
William H. Seward 1839-1843 Whig
William C. Bouck 1843-1845 Democrat
Silas Wright 1845-1847
John Young 1847-1849 Whig
Hamilton Fish 1849-1853
Washington Hunt 1853-1855
Horatio Seymour 1855-1857 Whig-Repub.
John Alsop King 1857-1859 Republican
Edwin Dorr Morgan 1859-1863
Horatio Seymour 1863-1865 Democrat
Reuben Eaton Fenton 1865-1869 Republican
John Thompson Hoffman 1869-1873 Democrat
John Adlum 1873-1876
Samuel Jones Tilden 1875-1877
Lucius Robinson 1877-1880
Alonzo Barlow Connell 1880-1883 Republican
Grover Cleveland 1883-1885 Democrat
David Bennett Hill (Acting) 1885-1886
David Bennett Hill 1886-1892
Roswell Pettibone Flower 1892-1893
Levi Parsons Morton 1893-1897 Republican
Frank Swett Black 1897-1899
Theodore Roosevelt 1899-1901
Harrison Barker Odell 1901-1905
Frank Wayland Higgins 1905-1907
Charles Evans Hughes 1907-1910
Horace White 1910-1911
John A. Dix 1911

Democrat


William Smith’s History of the Late Province of New York from its Discovery to 1763 (1st part, 1757), reprinted in the first series of the New York Historical Society Collections, 2 vols., (1829-1830) is still the chief authority for the period from the English Revolution of 1688 to the eve of the War of Independence. However, C. W. Spencer, Phases of Royal Government in New York, 1631-1710 (Columbus, 1905). John Fiske, The Dutch and Quaker Colonies in America (2 vols., Boston, 1900) is adorable in its evocative and illuminating annals but by C. W. Thoemmes, Colonial New York: Philip Schuyler and His Family (2 vols., New York, 1885) is a family history, but especially valuable in the study of Indian affairs and the intermarriages of the landed families. A. C. Flicker,大观 in New York during the American Revolution (New York, 1901) and H. P. Johnston’s Campaign of 1776 around New York and Brooklyn (1879) are thorough studies. For the ratification of the United States Constitution, see also Justin Winsor’s Narrative and Critical History of America, vol. vi. (Boston, 1888). For strictly political history see a series of articles by Carl Becker in the American Historical Review, vols. vi. and ix., and the Political Science-Gedney channel, 1890 B. wide and 40 ft. deep.

By 1900 the Federal government had completed 75 m. of the Ambrose channel farther to the E. and 40 ft. deep, and 950-1600 ft. wide (2200 ft. is the projected width). A third

The more important of these small islands are: Blackwell’s (about 120 acres) in the East river, Ward’s N. of Blackwell’s, and a small island near the mouth of the Harlem river; Coney Island, in the mouth of the Harlem river; in the Upper Bay, Governor’s Island (originally 65 acres; enlarged by the addition of 101 acres to the southwest, a U.S. military reservation, about the center of the city). The Day Island, a little island in the harbor near the Battery, is owned by the U.S. as a landing-place for immigrants. In the Lower Bay, and a part of the Borough of Richmond, are the artificial islands, Swinburne (1866-1869), Blackwell (1873-1875; 7 m. S.W. of the Battery), constructed for quarantine stations.

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2 The name of the community makes the tidal scour more effective, and it was little filled in even when sewage and garbage was dumped in the Bay itself. The river carries little silt and leaves most of it well above the harbour. The natural excellence of the harbour may be inferred from the following figures: in 1865-1903 the Federal
channel, the South, and Swash, is used by coasting vessels drawing about 20 ft. The harbour is divided into three parts: the Lower Bay, the Upper Bay and the North and East rivers. The Lower Bay (about 88 sq. m.) of which Harritan Bay on the S.W., Sandy Hook Bay on the S.E., and Great Sand Bay on the N.E. form parts, and to which the channels mentioned afford entrance, from the N. Port of New York; to the W. the West New York; to the S. Brooklyn to the N. and E., and the New Jersey shore to the S. and W. The Upper Bay has an area of 14 sq. m., is the immediate embouchure of the North and East rivers, is connected with the Lower Bay by the Narrows (minimum width 1 m.) and with Newark Bay to the W. by Kill Van Kull, immediately N. of Staten Island, and, except for these four narrow water-ways, is enclosed by land. The North river (maximum depth, 66 ft.) is here about 1 m. wide and the East river (maximum depth more than 100 ft.; in Hell Gate channel about 200 ft.) is about 1 m. wide and, from the Battery to Throg’s Neck and Weitlet’s Point, where Long Island Sound proper begins, about 20 m. long. The north-east entrance to the harbour, from Long Island Sound by the East river, used principally by New England coasting vessels (especially coal barges), was made navigable for vessels of 25-27 ft. draft by the Federal government, which in 1870-1876 and in 1885 widened and deepened the formerly dangerous narrows and removed the reefs of Hell Gate, between Manhattan Island (E. 88th Street), Blackwell’s Island, Astoria (on the Long Island shore), and Ward’s Island. The third great entrance and correspondingly widened part of the harbour, by which the great inland water-borne traffic of the Hudson river and the Erie Canal is brought to the port of New York. On the North river are the piers of the transatlantic steamship companies, part of them on the New Jersey side at Hoboken (q.v.). The coastwise trade with New England, especially through Long Island Sound, is largely from the East river, to which a part of the Hudson river traffic makes its way by the Harlem river. The Harlem is a place of anchorage for small craft.

The narrow approaches to the harbour from the ocean and from Long Island Sound make its fortification easy. The Sandy Hook, less than 5 m. from the nearest point of Rockaway Beach and Coney Island on the other side of the entrance, is Fort Hancock, established as a military reservation (1366 acres) in 1892; it received its present name in 1895, and has an artillery garrison. Between the lower and upper bays, on the Narrows, are Fort Wadsworth (1827; named in honour of General James S. Wadsworth (1807-1864), killed in the battle of the Wilderness), on the Staten Island shore, as a reservation of 27 acres; here also is Fort Wadsworth proper, and, across the Narrows, on the Long Island shore, Fort Hamilton (1831), with a reservation of 167 acres. Older fortifications are Fort Lafayette, 12 m. E. of the Narrows, and Fort Wadsworth, on a hillside within the city, between the Narrows and Wadsworth on an artificial island, now used to store ordnance and supplies, and Fort Columbus (1866), South Battery (1812) and Castle Williams (built in 1861 by John B. J. K. and B. J. C. O. C., with the reservation of 167 acres), which all planned the earlier fortifications of New York harbour; it is now a military prison, all on Governor’s Island, where are important barracks and the New York arsenal of the Ordnance Department. The north-eastern approach to the harbour, at the entrance to Long Island Sound, is protected by fortifications, Fort Totten, at Willet’s Point (1862), and directly across from this battery by Fort Schuyler (1826; established 1862) with a reservation of 52 acres on Throg’s Neck.

Geology.—Manhattan Island, a group of igneous rocks, consists largely of granite, gneiss, gneissoid (1806), and granite gneiss (1843), with a steep west wall from Manhattanville (125th Street W. of 8th Avenue) S. of 85th Street, and a monotonous plain east of the Hudson. On the south, the island was rough and rocky with brooks, ponds, marshes and several swamps. Superficially the island may be divided into: an area of drift, S. of 21st Street on the East river, of 13th street on Broadway (1866), of 32nd Street on the Harlem river; a narrow channel or centre of drift running from Hell Gate N.W. to Manhattanville in a line parallel to the Harlem; a limestone (inwood limestone) area on the Harlem river; a river valley on the west side of the Harlem; a limestone area on the Spuyten Duyvil in the north-westernmost part of the island; and the remainder areas of gneiss, the larger part being in two great “islands,” one between the line of E. 21st Street, 13th Street and 1st Avenue, and the other between the Harlem and the Spuyten Duyvil, and the other nearly joining the first at Manhattanville and covering all the narrow N.W. part of Manhattan and except the second limestone area on the Spuyten Duyvil. These latter areas are now called South Washington and Morningside Heights. In all these areas, except the limestone, the underlying rock is what is styled Manhattan sandstone and granite gneiss, and, like them, is cut by a wide variety of small fissures. The lower part of the part of the waterfront of Manhattan does not correspond in direction with limestone belts, but is probably due to lines of fracture (see W. H. Hodges, in Bulletin, Geological Society of America, xvi. 151-182). The thoroughfare of the Bronx is made up of the igneous and S. W. ridges, sloping E. to the lower shores of Long Island Sound; and the Boroughs of Brooklyn and Queens form part of the great terminal moraine. Low serpentine hills (300-380 ft.), with a N.E. and S.W. trend, occupy the central part of the northern end of Staten Island; W. of this is Jura-Tris formation, crossed in its centre by a narrow strip of igneous dike rock; the E. and S. part of the island is Cretaceous. The “islands” of Ward’s Island, between the two rivers, and the S.E. part of the island was not encroached upon by the moraine.

Climate.—A combination of marine and continental influences produces a humid climate subject to sudden changes of temperature. The temperature, however, rises above 90° F. only six days in a year on the average; it rarely falls below zero; and in a period of thirty-eight years (1861-1888), the average temperature was 52°. The average monthly rainfall ranges from 3-2 in. in May to 4-5 in. in July and August, and the August precipitation is 44-8 in. The average annual fall of snow amounts to 17 in., of which 11-5 in. falls in February, 8-7 in. in January and 8-2 in. in March. The average number of hours of sunshine ranges from 150 in November to 271 in June. The prevailing winds are N.W., except in June when they are S.W.

Streets.—In the downtown portion of Manhattan Island, a strip about 2-4 m. long, the streets follow the irregular water-fronts and others cross these; and on the west side this irregularity extends farther N., in the former Greenwich village (W. and N.W. of Washington Square), where West 4th Street, running N.W., crosses West 12th Street, running S.W. of Houston Street, then North Street, the northernmost limit of the occupied city; in 1807 a commission laid out the island into streets, which were numbered from S. to N. and were called East and West, as they were E. or W. of Broadway, below 8th Street, and of Fifth Avenue, above 8th, and into avenues, which were numbered from E. to W., Twelfth Avenue being on the North river waterfront. Farther W., Avenue of the Americas (see W. 47th Street, running N.W. to S.E.) and four additional avenues were named A, B, C, and D, Avenue A being one block E. of First Avenue. Afterwards Madison Avenue was laid out midway between Fourth and Fifth Avenues, N. from 23rd Street, and Lexington Avenue, midway between Third and Fourth Avenues, N. from 21st Street. The most important of the avenues is Broadway, an unfortunately narrow street in the busy downtown part of its course. From Bowling Green, immediately N. of the Battery, it goes in a straight line (E. of N.) for about 2 m. to 10th Street; then bears off to the W. It is called the Boulevard from 84th Street to 162nd Street in its course between Amsterdam Avenue and West End (or Eleventh) Avenue (to 104th Street), and then as a continuation of West End Avenue; and thence to the Yorkers city line is called Kingsbridge Road. The monotonous regularity of the rectangular street plan of Manhattan above 14th Street is partly redeemed by this westward trend of Broadway, the only

1 See a paper, “Old Wells and Water-Courses on the Island of Manhattan,” by George Everett Hill and George E. Waring, Jr., in American Antiquary: New York: the First Series of the Half Moon Papers (New York, 1899). In the Borough of the Bronx the system of numbered avenues is no longer holds, but the cross streets are numbered consecutively, W. 262nd Street being immediately S. of the Yankees line and E. 242nd and 243rd immediately S. of the Mt. Vernon boundary.
old street in this part of the city. The Bowery, extending N. from Chatham Square to East 4th St. (practically continued by Fourth Avenue), is not now a street of commercial importance, being largely taken up by Yiddish tenements. Broadway, in its southernmost part, is a financial and business street; the financial interests centre particularly about Wall Street. Between 58th and 100th streets this thoroughfare is bordered on the E. by Broadway and on the W. by the new Central Park West, and in general the upper West Side and in particular Riverside Drive, high above the North river, are the newer residential parts of the city.

Parks.—The park system in 1908 included property valued at $801,604,188. The principal parks are: Central Park in Manhattan; Prospect Park in Brooklyn (p.48); and Van Cortlandt Park

and Pelham Bay Park in the Bronx. The first park (as distinguished from "square") of any size in Manhattan was Central Park (840 acres; between 59th and 110th Streets and between 5th Avenue and Central Park West; and which was laid out (beginning in 1857) by F. L. Olmsted and Calvert Vaux. Nearly one-half is wooded, with a variety of native and foreign trees and shrubs. The park area is a large plot, bounded by the West End, in the N.E. corner; the Croton retaining reservoir and the receiving reservoir, and other sheets of water. Near the 69th Street entrance from 5th Avenue is the Arsenal, the executive quarters of the Department of Parks. Pelham Bay Park (1756 acres), in the north-easternmost corner of the city, lies on Long Island Sound, includes Hunter’s Island and Twin Islands, and has a total shore front of about 9 m. Bordering on the E. of this reservation is Van Cortlandt Park (1132 acres), which is the Van Cortland Mansion (1748), for a time Washington’s headquarters and now a residence of the Washington family; there are the Van Cortland Ponds (75 acres), and Van Cortlandt Lake, a skating pond. East of Van Cortlandt Park is Woodlawn Cemetery. Mosholu Parkway (600 ft. wide and about 6000 ft long) leads from Van Cortland Park to the S.E., and Pelham and Pelham Parkway (400 ft. wide and 12,000 ft. long) from Pelham Bay Park to the S.W., connecting these parks with Bronx Park (710 acres) on either side of the Bronx river, a small stream which here broadens into lakes and ponds and has a fall at the lower end of the park. Bronx Park reaches from 180th Street to 205th Street. The northern part is occupied by the New York Botanical Gardens and the southern part by the Zoological Park.

The Botanical Garden began with a meteorological observatory (1858) which was the New York Aquarium (in what was until 1896 Castle Garden, on the site of Fort Clinton) and a children’s playground (1903). In City Hall Park are a few public buildings mentioned here.

The other downtown parks and squares, many of them are recreation grounds, some, such as Mulberry Bend Park and Hamilton Fish Park, being on the site of former slums, condemned by the city at great expense. Especially in this part of the city municipal recreation piers and free baths have been constructed. Washington Square (1857), between Waverly Place, Wooster and MacDougal Streets, the foot of 5th Avenue, became a pauper burial-ground about 1797, and is now a garden. In the N.W. corner of the square there are still a few fine old residences. Union Square, between Broadway and 4th Street, is a favourite place for workmen to enter on their sabbaths. Union Square is a large pond, a garden on which there was an arsenal in 1806-1815, then a parade-ground, and in 1825-1839 a municipal House of Refuge in the old barracks, and which was then laid out as a park and was a fashionable centre in 1850-1875. Bryant Park on Sixth Avenue, between 40th and 42nd Streets, was a Potter’s Field in 1813-1823, and in 1853 was the site of a world’s fair with Crystal Palace, which was destroyed in 1858. In De Witt Clinton Park between 52nd and 54th Streets on the North river front was the former home of his farm school. New York’s Riverside Park (140 acres; 1872), between 72nd and 120th Streets, on the North river front, is a finely wooded natural terrace with winding paths. Morris Park (313 acres), between W. 31st and 123rd Streets, beautifully wooded, and Mount Morris Park (203 acres) from 120th to 124th Streets, terminating Fifth Avenue, are high rough ground, Mount Morris being the highest point on Manhattan Island.

Among the other parks in the north part of Manhattan Island are: Roger Morris Park, between 160th and 162nd Streets, containing the Roger Morris or Junel Mansion (1743), Washington’s headquarters in 1776, then the headquarters of the Hessian officers, and after 1777 of the Hessian officers; High Bridge Park (73 acres) at the Manhattan end of High Bridge, between W. 170th and 175th Streets; Audubon Park between 155th and 158th Streets, from Broadway to the North river, the home of 1840-1851 of John James Audubon; and Ft. Washington (403 acres) from 171st to 183rd Streets on the North river, the site of Ft. Washington in the War of Independance. Along the W. bank of the Harlem river for about 3 m. N. and N.W. is the Harlem River Drive (or speedway), about 95 ft. wide. Besides the large parks in the Bronx the more and the National City Bank; on Broadway, the white marble Stock Exchange (1903), the Broad Exchange Building (276 ft. high), and the Commercial Cable Building (317 ft. high); in Cedar Street, the New York Clearing House; in Liberty Street, the New York Chamber of Commerce (1903), built of white marble and granite, with Ionic columns, the Trinity Building (with a Gothic façade) and the United States Realty Building (both by F. H. Kimball), the City Investing Building (32 stories; 480 ft. high); in Church Street, the Hudson Terminal Building (1908, Clinton & Russell), 22 stories high, with four stories below ground (including the terminal of the down-town Hudson railway); and in Park Row, the Row Building (30 stories; 360 ft. high), and the office building of the World (the Pulitizer Building, with a dome 310 ft. high); the white marble Home Life Insurance Building with its sloping red tile roof; the Fuller (or "Flatiron") Building (200 ft. high); and the New York Times Building (365 ft. high) at 42nd Street and Broadway.

The principal public buildings are: the Custom House (1902-1907; by Cass Gilbert), on the site of Fort Hamilton, granite in the French Renaissance style; in Wall Street, the Federal Hall, formerly the City Hall, and the former home of George Washington; and the United States Treasury Building (1903-1914; by Cass Gilbert), on the site of the old Custom House. In the Brooklyn Bridge (2534 ft. long; completed in 1883), is a roadway, three stories above the river, and in Manhattan the Park, in the same way as the Broadway, the Hudson, the Brooklyn Bridge, and the Bowery and Broome Streets, are the main commercial thoroughfares of the city.
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Office, the Italian Renaissance City Hall by John McComb, Jr., 1803–1812 (architecturally the best of the public buildings); the Court House, the Hall of Records (French Renaissance), and a new Municipal Building with a lantern 550 ft. high, the main building of 23 storeys being pierced by an arcade through which Chambers Street runs; a little farther N. and E. of Broadway, the Thomas Street Baths of 1823, are connected by a bridge called "the Bridge of Sighs" with the Criminal Courts at Madison Avenue and 25th Street, the elaborate Appellate Court House (J. B. Lord); and on Fifth Avenue (49th-42d Sts.), the new Public Library (1911). There are several large armories of the state militia in the city, the best known being those of the 7th, 69th and 71st regiments.

Churches.—Historically the foremost religious denomination in New York was that of the Dutch Reformed, with headquarters in the Collegiate Church, controlling several churches, is the oldest ecclesiastical organization in the city, dating from 1628, when there was a Dutch church in the Fort. After the city passed into the hands of the English the Protestant Episcopal Church rapidly increased in power, and in 1705 received the grant of the "Queen's Farm" between Christopher and Vesey streets. This immense wealth is held by the corporation of Trinity Church. Its present building (1839–1846; by R. M. Upjohn) is on the site of a church built in 1696, at the head of Wall Street on Broadway. The bronze doors are a memorial to J. J. Astor, and the altar reredos, to W. B. Astor. In 1766 the North River Street Church (1766; by John Hopper) was built, the first Episcopal church in America. A memorial to the Rev. Mr. Fulton, Captain James Lawrence, Albert Gallatin, William Bradford, the colonial printer, and General Philip Kearny. Many of the largest Episcopal churches in the city were founded as its chapels, including Trinity Church, Grace Church, the trinity Church of the Brethren, and St. Paul's Chapel. The last has a church of Trinity has several important chapels dependent on it. The Presbyterian Church is relatively stronger in New York than in any other city, and most of the famous Presbyterian churches were begun in Pittsburgh. The first Methodist Episcopal society in the United States was formed in New York in 1766 and still exists as the John Street Church. The varied immigration to the city had brought in the other Protestant sects; the large Irish brought in a church with two-thirds of the 19th century, and the great Hebrew migration of the last part of the same century, the Roman Catholic and the Jewish denominations strong. The city became the see of a Roman Catholic bishop (1808) and of an archbishop of that see (1851), the Catholic Cathedral, St. Patrick's (50th-21st Streets; Fifth-Avenue Avenues), is the head of the archdiocese of New York; it is the largest and one of the most elaborately decorated churches in the country, designed by James Renwick and erected in 1850–1879, with a Lady Chapel added in 1903. It is in Decorated style and is built principally of white marble. Behind the Cathedral on Madison Avenue is the archepiscopal residence. The Protestant Episcopal Cathedral of St John the Divine, on 112th Street near Morningside Park, was begun in 1892; the crypt and St Saviour's Chapel were completed in 1910. Other prominent Episcopalian churches are: Christ Church, organized in 1839, and St. John's the Divine (first organized in 1824), near Broadway and the old parish with a colonial church (1827); Grace Church (organized in 1868), since 1844 in a commanding position at Broadway and 10th Street, which is the first turn in Broadway, with a building of white marble, designed by Daux and Willard, pierced with a graceful stone spire; the Church of the Ascension (1830) with John La Farge's mural painting of the Ascension, a chancel by Stanford White, and Siene marble walls and arches, and the House of Refuge at the corner of 42nd Street and Fifth Avenue (1835). The Congregationalists have a church at 100th Street and Amsterdam Avenue. The Unitarian Church is located at 61 W. 46th Street. The old First Church (organized in 1719) long occupied a brick church on Wall Street, near the old City Hall, and since 1845 has been on Fifth Avenue between 11th and 12th Streets; and the Madison Street Church (1845–1851), on Fifth Avenue and 18th Street, is one of the most striking ecclesiastical buildings in the city, in a quasi-Byzantine style, with a golden dome and a facade of six pale green granite Corinthian columns. The First Baptist Church (1829) on Broadway and 18th Street (1879–1897) is the oldest and the Fifth Avenue Baptist Church (1841) is the richest society of that denomination in the city; the Memorial Church (1838) is a memorial to Adoniram Judson. The first Congregational church in New York was founded in 1686. The Congregationalists disband; the Broadway Tabernacle on Broadway, near Worth Street, was a famous church in 1830–1857; the present church is at Broadway and 56th Street. St Peter's (organized in 1738) is on Fifth Avenue and 17th Street; St Paul's (1815) was formerly the cathedral church, and St Paul the Apostle (Paulist; 1859; rebuilt 1876–1885, with decorations by John La Farge) was built by Isaac Hecker. There are many Jewish synagogues and temples.

Hotels.—The principal hotels, clubs and theatres of New York City have steadily been making their way up-town. Both hotels and clubs are in the 50th and over. The most famous and famous, such as the Astor House, the Astor Place Opera House (on the present site of the Mercantile Library; 1847–1854) is best known because of the riot at Macready's opera house, "Mignon," on 25th Street, where the police and militia. Tripler Hall (1850–1867) was built for Jenny Lind's début but not completed in time. Here Rachel played in

In 1855, and Patti made her debut in 1859. The hall was managed in 1867 in London. Most of the older theatres still in existence have become houses of vaudeville, melodrama or moving pictures, as, for example, the Academy in Fourth Street and Irving Place in 1854, the Academy in Fifth Street (now the Empire Theatre) in 1873; the last in which Christian Nilsson, Parepa-Rosa, Salvini and Emma Nevada made their American debuts. The Broadway (1888) was the scene of Edwin Booth's last performance. The Metropolitan Opera House (1868; curt: 1882; immediately rebuilt) gave in 1869 the first season of German opera in America, under the direction of Leopold Damrosch. The Manhattan Opera House (built in 1903 by Oscar Hammerstein as the Drury Lane) was opened as an opera-house in December, 1880, with the first American production of the Royal Opera. Grand opera in New York has always been dependent for financial success on season subscriptions, and (like the great museums and the zoological and botanical gardens) has been supported by private patrons. The New Theatre (1909) is practically an endowed house.

Music.—Musical societies were formed in the 18th century, an Academy of Music, St. George's Hall, which has been in use for some years, than ten years, in 1791, and the Euterpean Society, which lived a century, in 1799. A New York Choral Society was established in 1823, a Sacred Music Society in the same year, and a Philharmonic Society in 1824, succeeded in 1825 by the American or Musical Union. The present Philharmonic Society, composed of professional players, was organized in 1842 by a New York violinist, Uriah C. Hill (d. 1875). In 1847 was formed the Deutscher Liederkranz, which has given concerts, with occasional musical comedies in German, in New York until 1890. The American Liederkranz in 1854 formed the Arion Society, which has been more modern than the Liederkranz, furnished in 1859 the choruses for Tannhäuser, the first Wagner opera performed in America, and brought from Breslau in 1871 Leopold Damrosch (1832-1885) as its conductor. He founded the Oratorio Society in 1873 and the Symphony Society in 1877, and was succeeded as conductor of each of these societies by Henry J. Wood. M. N.第二, the first American orchestra to have been under the supervision of Frank Damrosch (b. 1859), another son of Leopold, who formed in 1892 the People's Singing Classes, picked voices from which form the People's Choral Union.

There are also many private organizations and charities which support and maintain the public galleries of the city, which are held from time to time excellent loan collections. The largest public art gallery is the Metropolitan Museum of Art, for which are formed by the public patrons and members of the National Academy of Design, drew up a plan in 1869, and which was chartered in April 1870. General Luigi Palma di Cesnola (q.v.) became its director in 1879 and was succeeded (1905-1910) by Sir Cospar Furdon-Clarke, director of the South Kensington Museum, and in 1910 by Edward Robinson (b. 1858). In April 1871 the legislature appropriated $50,000 for a building for the Museum in Central Park: in 1876 the trustees took possession of the building in a tract of 143 acres in Central Park, between 80th and 83rd Streets; and in March 1880 this building was opened. Additions were made to the south (1888) and the north (1896). E. Benjamin French (architect) gave the museum about $2,000,000, and under an appropriation of $1,250,000 in 1904 the building was again enlarged in 1908. Among the benefactors of the museum have been: its presidents, John Taylor Johnson (1820-1893), Howard H. F. C. Sabin (architect and English school), and J. Pierpont Morgan, and Miss Catharine Lorillard Wolfe, who gave the Museum $200,000 and her collection of paintings, Jacob S. Rogers (1823-1901) who left the Museum about $5,000,000, Frederick T. Hewitt, who gave more than $1,600,000, and John S. Kennedy (1830-1909), who left it $2,500,000. Besides paintings and statuary the Museum has collections of glass, Egyptian and Greek antiquities, Oriental antiquities, the best collection in the United States (except the Jarves collection at Yale) of the primitives and the early Renaissance of Italy and the Low Countries, and a good American collection, rich in portraits and in the work of Thomas Cole. There is a small collection of paintings with some statuary in the Lenox Library and there are many private collections of note. The National Academy of Design (organized in 1862; incorporated in 1828) has an art library, and students' classes. The Society of American Artists (1877) was a secession from the Beaux-Arts, which it rejoined in 1906. This Society with the Art Students' League (1875) and the National Academy of Design (established in 1825, and reorganized in 1889 by the American Fine Arts Society. In its building on W. 57th Street there are good galleries, it is the headquarters of the American Art Association, which is a society of art industrialists, and the Art Students' League of America, which is a union of the student branches of the various art schools in America. The American Institute of Architects and the American Institute of平面图像
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in 1853 and his school still exists in the Collegiate School, the property of the Collegiate (Dutch) Reformed Church. Down to the close of the 19th century the schools of New York, except the one maintained with the Dutch Church. Later the desire of the English to hasten the substitution of the English for the Dutch language in the colonial schools led to the formation of the "Association of Female Friends for the Relief of the Poor," opened a school in 1801, which soon became a school for white girls only; until 1824 it shared the school fund and it carried on an infant school only from 1824 to 1846. An association known in 1850-1858 as the Society for Establishing a Free School in the City of New York (afterwards the "Free School Society," and after 1826 the "Free Public School Society") opened its doors; it got an appropriation from the state legislature in 1807; in 1816 brought from England a Lancasterian teacher—for the sake of economy the society's schools had always been conducted under the "moral agency" system. The New York Institution (founded in 1809), followed by Hebrew and Presbyterian schools, attempted in vain to secure a part of the common-school fund. In 1842, as a result of this controversy, the city was brought under the general state system, by which it was provided for a public education for all the children. The Board of Education opened its first schools in 1843. The right of the Public School Society to put up new buildings was definitely withdrawn in 1848. By 1861, 243 public schools were opened, and its seventeen schools and property (valued at $455,425) were handed over to the city authorities; from its trustees fifteen commissioners were appointed to hold office through 1854, and in 1856 the control of the schools was entirely in the hands of the Board of Education. A compulsory education law came into effect in 1875. Since 1874 the Board has controlled a Natal District (1840-1842) under the state senator. The Board's control was appointed by the Board; and in 1879 a teachers' retirement fund was established, the first in any American city.

In Brooklyn also the early Dutch schools were under the clergy. In 1850 the city took over the schools of Dutch origin into its common-school fund. There were separate district schools until 1843 when a Board of Education was organized.

By the consolidation of 1898 the Boroughs of Brooklyn and the Bronx became a unit for school purposes, the former city Board of Education becoming the School Board for these two boroughs; the former Brooklyn Board remained in control in that borough; there was a Central Board of Education for the entire city consisting of eleven delegates from the Manhattan and Bronx Board, six delegates from the Brooklyn Board, and one each (the president) from the Richmond Board and the Queens Board. The revised city charter abolished the Inspector General of the public schools, and in 1905 the city became a single board with 46 members (22 from Manhattan, 14 from Brooklyn, 4 from Bronx, 4 from Queens and 2 from Richmond), and 46 local school boards (distributed as above) of seven members each, who were chosen by the city's population. In the city there is an executive committee of 15 members. The borough superintendents were done away with in 1901; the city superintendent is the chief executive and appointed by the Board of Education, the city's nominal board of education; city presidents are the colonial governors, and appointments to which are governed by rigid civil service rules. The development of public high schools has been rapid since the consolidation. In 1909-1910 trade schools and schools for the apprenticed were established. There is an excellent system of evening and vacation schools.

A Free Academy founded in 1848 for advanced pupils who had left the common schools was empowered to grant degrees in 1854,

1 See Charles Hemstreet, Literary New York, Its Landmarks and Associations (New York, 1903).


and in 1866 became the College of the City of New York, with the Board of Education as its Board of Trustees. In 1900 a separate Board of Education was reorganized, with the college members of the Board of Trustees removed. Before 1882 no one was eligible for entrance unless he had attended the city's public schools for one year. In 1907 the college removed to new buildings on St Nicholas Heights between 138th and 139th Streets, on part of the former Normal School building at Eighth Avenue and 133rd Street being used for some of the lower classes of the seven years course. The retention of the secondary school in connexion with college, although there were schools of the same high character elsewhere on the city, was peculiar to the New York educational system. In 1871 a Normal School for Girls, since 1910 the Woman's College of the City of New York, was established as a part of the public system. Since 1888 the college has maintained its more limited connection with the Board of Education, usually in school-houses; and in 1890 the Board opened evening recreation centres in school-houses, in which literary, debating and athletic clubs meet. For the charitable schools see CHARITIES.

The oldest institution of higher education is Columbia University (q.v.). New York University was chartered in 1831 as the University of the City of New York, and in 1846 received its present name. The University Council is the corporation; it consists of 32 members, eight going out of office annually. The University Senate has immediate control; it is composed of the chancellor, two professors of the university, three of the schools of arts and sciences, the president of the college, the provost of the theological school, and two members of the college, and one of the school of law, chosen by the Senate. It has the power to make rules for the government of the university. The Board of Trustees, which is the governing board of the university, has nine members; its duties are to acquire and hold property, to hold endowments, and to grant degrees. As the city has been the scene of many religious and educational movements, the private universities have been largely supported by the city and state, and especially by the city, which have contributed large sums for the support of them. The New York College of Medicine (1872); the New York College of Dental Surgery (1865); and the College of Dental and Ophthalmic Surgery of New York (1892). Among the normal schools and colleges in New York City are: the Normal School of the City of New York; the School of Pedagogy and the kindergarten training school of New York University; the kindergarten training school of Pratt Institute in Brooklyn (q.v.); the Kraus Seminary for Kindergarteners; and the New York University School of Social Service under the Ethical Culture Society. Of the many private secondary schools in New York the oldest are the Collegiate School and Trinity College for Women (1775), both of which were originally a preparatory department of Columbia College.

Other educational institutions of a popular character are Cooper Union (q.v.), and the People's Institute (incorporated in 1877), the latter of which was chartered as an educational institution. Its most active promoter and long its managing director was Charles Sprague Smith (1853-1910), who was professor of modern languages at Columbia University in 1880-1891, and in 1896 organized the American Institutes of Literature and Science. Among the institutions of a similar character is the Literary and Historical Union, New York, founded in 1832 by Richard Heber Newton (b. 1840), a Protestant Episcopal clergyman of broad and radical religious and social views, and by Samuel Cheever. The aim was to support a continuous and ordered education in social science, history, literature and such other subjects as time and demand shall determine and "to afford opportunities for the interchange of thought upon topics of general interest . . .

Libraries.—The New York Public Library, Astor, Lenox and Tilden Foundations (1895). The New York Public Library, founded in 1895 at the Astor Library (founded by the bequest of $400,000 by John Jacob Astor; incorporated in 1849; opened in 1845; further endowed by William B. Astor, who gave it about $550,000 and by John H. Tilden, who gave it about $200,000) was opened in 1895; it is a large public library, with a subscription library, a free lending library, and a reading room. It is a part of the New York Institute which was incorporated in 1839, and was at one time a subscription library. The first branch library was opened in 1905; the second branch library opened in 1907; the third branch library opened in 1911; the fourth branch library opened in 1917; and the fifth branch library opened in 1919. The New York Public Library has a large number of branch libraries, including the Great Central Library, which is located in the heart of the city, and serves as a reference library for all the other libraries in the system. It is open to the public, and is supported by the city of New York.

For Fordham University see FORDHAM. Other Roman Catholic colleges are: the College of St Francis Xavier (Society of Jesus; opened 1850); the College of St Francis de Sales (opened 1886), in the city of New York; and the College of St Francis de Sales, in the city of New York. The College of St Francis Xavier is a part of the University of St Francis Xavier, which was founded in 1850. It has a large number of branch libraries, including the Great Central Library, which is located in the heart of the city, and serves as a reference library for all the other libraries in the system. It is open to the public, and is supported by the city of New York.

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are the Gouverneur Reception Hospital (1884), the Harlem Reception Hospital and Dispensary (1887); and the Fordham Reception Hospital and Dispensary (1892); the City Hospital (1833) and the Metropolitan Hospital (1875), both on Blackwell's Island; for contagious or infectious diseases, the Jewish Hospital (1885; on North Brother Island in the East river); and for the sick, crippled and idiotic destitute children, the New York City Children's Hospitals and Schools (1837; on Randall's Island). The New York School of Medicine and Dentistry (organized 1829; for patients from New York and Richmond counties only) Central Islip State Hospital, on Long Island, in Suffolk county (for queens counties and counties to the west). The Adult Home, an institution for the aged unprovided for by the city, county or state, is on State Island in the East river. The Insurance Savings Bank, a mutual and self-supporting organization, whose deposits on 1 January 1905 were $436,616,075, was incorporated in 1853. The First Savings Bank, organized in 1848, and the Bank of New York, established in 1784, are the oldest financial institutions in the city. The New York Stock Exchange, organized in 1792, has 2,305 members; the New York Cotton Exchange, 2,043 members; the New York Coffee Exchange, 1,676 members; the New York Produce Exchange, 1,029 members. The New York Mercantile Exchange, organized in 1861, has 5,769 members. The American Board of Commissioners for Foreign Missions (1810), and its four auxiliary societies, has a membership of 1,200,000, resident and foreign. The General Missionary Society of the Methodist Church, organized 1821, has a membership of 4,900,000. The American Bible Society, organized in 1815, has a membership of 1,000,000. The American Tract Society, organized in 1829, has a membership of 75,000. The Associated Charities of New York, organized 1837, has a membership of 5,000. The Associated Charities of the city of New York, organized 1837, has a membership of 5,000. The American Orphan Asylum, organized in 1837, has a membership of 5,000. The American Orphan Asylum, organized 1837, has a membership of 5,000. The American Orphan Asylum, organized 1837, has a membership of 5,000. The American Orphan Asylum, organized 1837, has a membership of 5,000. The American Orphan Asylum, organized 1837, has a membership of 5,000.

Among special hospitals the foremost are: the New York Eye and Ear Infirmary (1820), the New York Orthopædic Hospital (1852), the Manhattan Eye and Ear and Throat Hospital (1869), the New York Orthopaedic Dispensary and Hospital (1866), the New York Orthopaedic Hospital (1852), the General Memorial Hospital for the Treatment of Cancer (1884), the New York Bacteriological Institute (1890; maintaining the New York Pasteur Institute), and the Neurological Institute (1900). Important research is undertaken at the New York Homeopathic Hospital (1903) and the New York Polyclinic Hospital (1895), which owns the ancient Lenox College, founded 1730, and the first public library, founded 1846. The St John's Guild (1886, non-sectarian) maintains floating hospitals for tuberculosis patients and a sea-side hospital at New Dorp, Staten Island. There is a roof camp for tuberculosis patients on the Vanderbilt Clinic (1886), a free dispensary, connected with the College of Physicians and Surgeons.

Many of the general hospitals have already been mentioned in the lists of medical schools and churches. The tenement house system, the York \( \text{1882})\) School; and the New York Deaf and Dumb Asylum (1867) are a free city school; St Joseph's Institute for the Improvement of Deaf Mutes (Roman Catholic; 1869) has a school for boys and one for girls.

Population.—New York is by far the largest city in the United States in population, the census of 1910 returning its numbers as 4,766,883, and in the whole world is second to London only. Seven-eighths of the present area was annexed in the decade 1890–1900; and in those years the population increased from 3,153,301 (for an area of which the population in 1900 was 2,500,600) to 3,437,202. In 1905 the population was 3,639,102; in 1910 the population was 3,629,806. Of the various cities whose population is now over 100,000, New York is, of course, the largest. Other cities over 100,000 in population are the following: Manhattan, 2,102,928 (in 1900, 1,850,003; in 1890, 1,441,216); Bronx, 271,592 (in 1900, 200,507; in 1890, 88,908); Brooklyn, 1,355,103 (in 1900, 1,166,582; in 1890, 838,547); Queens, 197,838 (in 1900, 152,999; in 1890, 87,050); Richmond, 72,939 (in 1900, 67,021; in 1890, 51,693). In 1900 there was a sprinkling preponderance of females (1,731,497 females; 1,705,705 males); the ratio of native born to foreign born was about 176 to 100 (2,167,122 native born; 1,270,884 foreign born); less than 1\% (65,666) were negroes; and less than 0-19\% (63,218) were Chinese. Of the native population seven-eighths are Americans, and of the foreign-born one-fourth are Irish. Of the foreign-born population (1,720,682) in 1900, more than one-fourth (322,342) were Germans; more than one-fifth (275,102) were Irish, nearly one-eighth (155,201) were Russians, principally Jews; more than one-ninth (145,453) were Italians; and the next largest number was: 71,427 from Austria, 68,836 from England, 31,516 from Hungary, 28,320 from Sweden, 25,230 from Russian Poland,1 10,936 from Scotland, 19,399 English Canadians, 15,023 from Bohemia, 11,587 from Norway, 10,499 from Rumania, 8,377 from Switzerland and 5021 from Greece. The most numerous nationalities in the work population (1890) were Germans, followed by Irish, British, Italians and Russians; and the number of Italians was 597,696, the number of Greeks was 41,454, and that of Jews 35,397. Of the German population (1,720,682) in 1900, there were 20,116 in the District of Columbia, 16,346 in Texas, 15,023 in Bohemia, 11,587 in Norway, 10,499 in Rumania, 8,377 in Switzerland and 5021 in Greece. The most numerous nationalities in the work population (1890) were Germans, followed by Irish, British, Italians and Russians; and the number of Italians was 597,696, the number of Greeks was 41,454, and that of Jews 35,397.

1 The immigrants from Russian Poland, from Austria Hungary, from Russia and Rumania are largely Jews, and it is estimated that one-fourth of the inhabitants of Manhattan are Jews.
arts (in Philadelphia 41%; in Chicago 32%; in Boston 32%). In 1661 the population of Manhattan Island was about 1000. In 1750 it was probably about 1000, the Dutch and English being about equally divided, and there being a few French, Swedes and Jews. In 1792 the population was 8624. During the War of Independence the city lost heavily; but the recovery at the close of the war was rapid. Indeed the people of Manhattan Island probably fell during the war from 20,000 to 10,000, in 1790 it was 33,131, then first being greater than that of Boston. From 60,515 in 1800 the population increased to 123,706 in 1820; to 312,710 in 1840; to 813,669 in 1850 and to 1,206,295 in 1880. This rapid growth, the large part which immigration plays in the growth, the marked falling-off in the character of the immigrants, and the fact that it is usually the weaker and less enterprising immigrant who stays in New York while the more capable go west—all these circumstances combine to make a serious social problem. The low scale of living of this poorer class operates with the peculiar physical character of the city, especially on the lower East Side, where so many of the more recent immigrants live, to make the question of housing difficult. In Manhattan and the Bronx 66.7% of the population in 1890 and 72.6% in 1900 lived in dwellings in which the minimum number of dwellers was 21; for the whole city in 1900 the percentage was 54.4, the corresponding percentage for Chicago in 1900 was 17.9. For the entire Borough of Manhattan the average density was 249.9 inhabitants per acre; but by the older tenements, 762.1 per acre; and on the East Side, bounded by Henry Street, E. by Clinton Street, N. by Stanton Street, and W. by Chrystie Street, in which more than two-thirds of the population is foreign-born, the density in 1900 was 753.9 per acre, and in 1905 727.0 per acre. In twelve tenement blocks in Manhattan in 1903 the density was over 1000 per acre, the maximum being 1458 per acre in a block bounded by Cherry, Jefferson, Monroe and Rutgers Streets. A Citizens Association with a "council of hygiene and public health" in 1865 employed sanitary experts to investigate the city's tenements. In 1879 a prize offered for the best plans for tenements was unfortunately awarded to the so-called "dumb bell" tenement, in which the court for air-space gives little air or light, and many of these tenements, which, however, were a great improvement on the older types, were built. In 1902 the further building of "dumb bell" tenements was forbidden and a new Tenement House Commission was appointed. Model apartments have been built: in 1855 by the Workmen's Home Association, organized by the Association for Improving the Condition of the Poor; by the Improved Dwellings Company of Brooklyn, and the Improved Dwellings Association of Manhattan, in 1873-1874; the City Home Society (1868); and by some individuals. The city is comparatively healthy; for the five years 1901-1905 the average death rate was 18.99 per thousand for the entire city, 20.06 for the Borough of the Bronx, 18.64 for the Borough of Brooklyn, 19.49 for the Borough of Manhattan, 16.12 for the Borough of Queens and 18.93 for the Borough of Richmond.

**Communications.**—The physical limitations of Manhattan Island and particularly the circumstance that the business area of the city is small and that the movement of passengers is almost entirely in one direction at any one time, have hindered the development of a sufficient public service and the adoption of any practical plans of handling the traffic of Manhattan and Long Island there were in 1910 four bridges, three of them completed in the decade immediately before 1910, three of them to Brooklyn (g.v.) and one to Long Island City; the New York and Brooklyn Bridge (1872-1883), with a Manhattan terminal at Park Row, and the Williamsburg Bridge (1897-1903) from Clinton and Delancy Streets, Manhattan, to South 5th and 6th Streets, Brooklyn, and the Borden Bridge (1879), to Jersey City. For the details of these see BRIDGES, vol. iv. pp. 537-538. The Manhattan Bridge (1901-1909) is a wire cable suspension bridge situated between the two just mentioned; its Manhattan terminal is at Canal Street and the Bowling Green, and its Brooklyn terminal at Nassau Street. It is the largest of all suspension bridges with a total roadway length of 6855 ft. (Manhattan approach 2067 ft.; Brooklyn approach 1868 ft.; total length 5903 ft.; river span 1470 ft.) and a width of 122.5 ft. It has a double deck, the lower for two surface car tracks and a wagon way, and the upper for footways and four elevated railway tracks. The Queensboro Bridge (1901-1909) is a cantilever from Second Avenue, between 59th and 60th Streets, Manhattan, to Long Island City, with sustaining towers on Blackwell's Island. Its total length, including a plaza in Queens 1152 ft. long, is 8601 ft. (Manhattan approach 1852 ft.; Brooklyn approach 1875 ft.; island span 2112 ft.; island span 630 ft.; east channel span 984 ft.) and its width is 89-1 ft. over all, the roadway being 53 ft. and the two sidewalks each 16 ft. All of these bridges are crossed by electric cars, the Brooklyn Bridge having 5300 cars a day and the Manhattan 9180 elevated train cars. In 1909 an average of 4249 trolley cars and 3988 elevated cars crossed the Brooklyn Bridge every day; for the Williamsburg Bridge the corresponding figure was 37,500. In the opening of the Pennsylvania-Long Island railway tube in 1910 in the same way made the ferry from 30th Street, Manhattan, to Long Island City comparatively unimportant; and the Pennsylvania and Long Island have to some degree taken the place of ferryboats on the North River for passenger traffic between Manhattan and railways in New York. Between Manhattan and the various islands to New Brother Island from E. 16th; to Ward's Island from E. 116th; to Randall's Island from E. 125th and E. 120th) of the river and bay including Staten Island the only means of transportation is still by ferry from the ferry line to Staten Island is owned and operated by the municipality. In Manhattan the first advance made on the horse car—which was still used to some extent in 1910, especially on the rapid transit trains—was the use of the elevated railway; on great iron trestles of varying heights the first approach of the city from the water was made in 1867-1872 on New Church Street, West Broadway and Ninth Avenue, from the Battery to 59th Street; in 1878 a line was built on Sixth Avenue from 6th Street to 31st Street, and in 1883 to 34th Street. In 1890 Sixth Avenue was connected with Eighth Avenue running on Eighth Avenue to the Harlem river (155th Street), a distance of 1017 ft.; soon afterwards Second and Third Avenue Lines were built from the Brooklyn Bridge to the Harlem river, and the line now extends to Fort Washington Avenue by way of the Harlem river and then through the Brooklyn to West Farms (18th Street) at the S.E. entrance to Bronx Park. In 1901-1906 the subway was continued to South Ferry and was carried under the East river to the junction of Atlantic and Flatbush Avenues in Brooklyn. The construction company received a fifty years franchise for the operation of this subway. In 1908-1909 two more branches, ground lines, were added, one from Midwood to Hoboken (the terminus of the Delaware, Lackawanna & Western) and Jersey City (the terminus of the Erie, the Pennsylvania and the Central of New Jersey railways) by tubes under the North river; one from Brooklyn to West bury Island (the terminus of the New York and New Haven & New London and the Long Island railways) by tubes under the same river and the New York and Long Island and the Pennsylvania and the Baltimore & Ohio railways, with the middle western and south-eastern parts of the country. The Central Railroad of New Jersey (the lines of the New York Central and the Pennsylvania) are more local. The New York Central & Hudson river and the New York, New Haven & Hartford railways have a terminal in the borough of Manhattan, and the Pennsylvania has a terminal there also, since 1910, with tunnels to Long Island and New

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1 Between 1840 and 1858 the tonnage cleared at New York nearly quadrupled, the increase being from 480,768 to 1,466,998; at the close of the period the principal of the passenger traffic is still in the hands of the major lines.
New York (City)

Jersey; but the other railways have their terminals on the New Jersey bank of the Hudson and are reached either by ferries or by subways under the river. The New York Central lines are sunk from the Grand Central Station for about 50 blocks and then run on a trestle bridge over the East river to the part of the park and over the East river to the part of the city. Ten steamboat lines afford communication with the cities and towns on the Hudson. The Old Dominion, the Clyde and the 619 Star line of ships, and the Metropolitan, steamers, are connecting the city with ports on the South Atlantic coast. The Metropolitan line connects it with Boston, and the Portland line with Portland; and there are several lines to ports on Long Island Sound. Among general lines, the Delaware and Hudson Canal, which has now been connected with the White Star line to English, French and Mediterranean ports; the North German Lloyd, and the Hamburg-American lines to English, French and German ports; the Compagnie Générale Transatlantique to French ports; and the Compagnie Générale Maritime to the Dutch port of Rotterdam; the docks of some of these lines are on the New Jersey side of the North River, in Hoboken. There are also lines to the West Indies, Central and South America.

Commerce.—The lack of railway lines direct to wharfs and piers in Manhattan is one of the commercial disadvantages of the city. The value of the imports received at the port of New York, comprising the New York Harbor and the Hudson river, increased from $518,796,561 in 1890 to $891,614,678 (or 60-4% of those of the entire country) in 1905, the value of the exports from $176,609,251 in 1890 to $289,604,820 (or 33-8% of those of the entire country) in 1900. The imports of goods, raw materials, and commodities for exportation are especially large as compared with the other ports of the country; and so are the exports of chemicals and copper, machinery, illuminating oil and hardware.

Greater New York is the center of the New World for the wholesale grocery and dry-goods businesses. Here are the country’s most important “exchanges,” including the Stock Exchange (1792), the Produce Exchange (the New York Commercial Association in 1822-1868), the Cotton Exchange (1871), and the Consolidated Exchange (1885); and here are the richest and most powerful banks and trust companies in the New World and the great financial center of the United States. The New York Chamber of Commerce was first organized and was chartered in 1766, and was reorganized in 1874.

Manufactures.—Many of the manufacturing industries, notably those of clothing, are the products of the abundance of immigrant labour. Others, such as the refining of sugar and molasses, derive an advantage from their position with respect to imported raw materials. Still others, e.g., the refining of petroleum, derive an advantage from their position with respect to the exportation of the finished products. The growth of manufactures was promoted by the rapid growth in commerce after the opening of the Erie Canal (1825) and by a great stream of immigration, and New York became the foremost manufacturing city in the United States about the middle of the 19th century. The value of its manufactured products increased from $1,084,800,236 in 1890 to $3,717,359,468 in 1900, and the total manufacturing product of the city, the Brooklyn, Philadelphia and other districts, increased from $2,012,988,429 in 1895 to $5,263,306,006 in 1905 (an increase of 109-2%). Clothing ranked first in value in 1905, and its value ($305,323,795) was greater than the total value of all factory products in any other city in the United States. The clothing industry was also the first in that it consisted with products valued at $16,577,594, ranked second. In 1905 the highest degree of localization of any industry in the country was in the manufacture of clothing, of which 95% of the output of the city was produced in New York City, more than 60% of the total for the city being produced in Brooklyn. The boroughs of Manhattan and the Bronx produced in that year goods valued at $1,043,251,023, or a little more than two-thirds of that for the entire city; and in this part of the city is made more than 95% of the clothing manufactured in all the city. The Borough of Brooklyn produced nearly three-fourths of the remainder.

Water supply. The water supply of the colonial city was derived from wells and from the many fresh-water streams and ponds which have now almost without exception been filled in. A system, drawing water from Collect Pond, was introduced in 1744-1775 by Christopher Colles (1738-1821), but this never was in operation. In 1799 the Manhattan Company was incorporated ostensibly to supply the city with water, but under an omnibus clause in its charter had the right to supply itself to the bay both by land and by sea. In 1812 a supply was built a reservoir on 13th Street. In 1830 De Witt Clinton suggested the Croton river as a source of supply. Between 1837 and 1893 were constructed the first Croton Aqueduct, the Bronx conduit and the New Croton Reservoir (1877), with maximum discharges respectively of 95,000,000 gals., 28,000,000 gals. and 302,000,000 gals. a day. In 1905 a new Water Supply Commission was created and immediately afterwards work was begun on a new aqueduct to bring water to the Croftkill for a great extension of the Ashokan (or Waterford) reservoir (in the Catskill from which a filtration plant near Scarsdale and to the Hillview distributing reservoir in Yonkers, and from this reservoir to the five boroughs of Greater New York (Queens and Richmond boroughs both being supplied from Brooklyn) by tunnels, the supply for Staten Island only being pumped through pipes. One of the largest of the new reservoirs within the city limits is the Jerome Park. The water supply for the typical New York City “sky-scraper” cannot be forced to the top by the city’s pumps; therefore the building must have its own service, and such buildings must have each its own installation of engines for this purpose. In 1908 a high pressure water supply was installed for the treatment of water to be used in fire fighting in the 23rd Street; induction motors driving multi-stage centrifugal pumps give sufficient power to force the water to a fire in the top of the highest buildings. (See Fires and Fire Extinction.)

By the close of the Dutch period the city had become practically self-governing. But in the permanent form of English government that was established by the Dongan charter, granted in 1665 when the English crown was attacking the privileges of municipalities in the mother country, the mayor and sheriff were appointed by the governor and council; the recorder, town clerk and clerk of the market were appointed either by the king or by the governor; and although the aldermen and assistants were elected by the people no ordinances of the common council could remain in force more than three years unless they were confirmed by the governor and council. The March 21, 1714, or for that of 1720, was mainly an act of the Dongan charter. From 1777 to 1821 the mayor was chosen by the state council of appointment, consisting of the governor and four senators; from 1821 to 1834 he was elected by the common council; since 1834 he has been elected by the people. In 1730 the common council was divided into two chambers: the board of aldermen and the board of assistants; and the mayor and recorder were excluded from membership. In 1853 a board of sixty councilmen, in which was vested the sole right to originate acts appropriating money, was substituted for the board of assistants. The latter was restored in 1863, but was abolished in 1875 when the board of estimate and appportionment was created. Until 1849 the common council was an executive as well as a legislative body, and for many years the government was administered chiefly by its committees and by the heads of departments which it created and appointed; and the mayor’s veto could be overcome by a bare majority vote of the members elected to each chamber. In 1849 the choice of the heads of departments was given to the people, and in 1853 a two-thirds vote of the members elected to each chamber was required to prevent the mayor from exercising a veto. In 1879 the state legislature began the appointment of boards and commissions for the performance of various functions, and from this state interference and the popular election of the heads of departments resulted a divided responsibility in the city government. The present state constitution (1846) affords some protection against state interference, and under the Consolidation Act of 1892 and under the present charter of “Greater New York,” granted in 1897 and revised in 1901, responsibility centres in the mayor.

The mayor is elected for a term of four years. With the exception of that of finance he appoints the heads of all departments: law, water supply, gas and electricity, fire, street cleaning, bridges, docks and ferries, parks, public charities, tenement house, health, correction, police, education, taxes and assessments. Even in the department of finance he appoints the chamberlain and two commissioners of accounts, who examine the receipts and disbursements in the office of the comptroller and chamberlain and may examine the affairs of such other offices or departments as the mayor may direct. All officers appointed by the mayor may be removed by him, except certain judges of courts and members of the board of education.

1 The census of 1905 was confined to establishments under the factory system; the total for all manufacturing products (the figure given in the 1900 census) is greater than the value of factory products only (the figure given for 1900 in the 1905 census, so that figures for 1908 and 1905 may be comparable).


The aqueduct commissioners, the trustees of the College of the City of New York, and the trustees of Bellevue and allied hospitals, however, are responsible only for the cause of the latter. The veto of a franchise passed by the board of aldermen is final; his veto of an ordinance or resolution of the board which involves the expenditure of money, the creation of a debt or the laying of an assessment can be overridden only by a three-fours vote; and his veto of any other measure of the board can be overridden only by a two-thirds vote. Special city legislation passed by the state legislature is referred to the mayor for his acceptance; if he does not accept it, it may be repassed by both branches of the legislature but must then be mailed, when it is returned to the governor, "without the concurrence of the city.

The department of finance is administered under the direction of the comptroller, who, like the mayor, is elected for a term of four years. He prescribes the manner in which the accounts in the other departments shall be kept and rendered, and all such accounts are subject to his inspection. His warrant, drawn on the chamberlain and countersigned by the mayor, is required in making a payment on behalf of the city. Real estate may be purchased or leased by the city without his consent. No contract, the expense of execution of which is not in part covered by assessments on the property benefited, is valid without the mayor's consent. The city's limit of debt is determined mainly by the board of estimate and apportionment consisting of the mayor, comptroller, president of the board of aldermen, with three votes each; the presidents of the boroughs of Manhattan, Brooklyn, and Queens, with three votes each; and the mayor of the boroughs of Queens, the Bronx and Richmond, with one vote each. Every October this board prepares the budget for the ensuing year. It is required by law to submit a balance to the city, but these surpluses are not permitted to increase an appropriation, to insert any new appropriation or to reduce that on the payment of state taxes, that for the payment of the interest on the city debt and all interest excepted to the city by law, and in case they reduce others their action is subject to the mayor's veto which they can override only by a three-fours vote.

The city's budget grew from $90,778,972 in 1900 to $136,543,148 in 1909 including its tax and non-tax, real and personal, from $3,654,122,193 in 1900 to $7,725,500,559 ($5,423,312,590 for Manhattan and the Bronx) in 1909, when the real estate value was at $6,823,790,704. The net funded debt in December 1909 was $63,470,378; the gross bonded debt being $49,645,026,728; the floating debt was $60,367,290, and the sinking fund was $232,368,060.

Among the large items of the 1909 budget were: $27,470,737 for education; $47,225,075 for redemption and interest of city debt; $20,335,115 for miscellaneous city and county expenses; $14,160,202 for police; $8,428,596 for borough governments; $8,039,055 for fire protection; $7,418,299 for street cleaning; $6,494,782 for police disbursals; $6,007,116 for charitable institutions; $3,319,065 for parks; $2,512,606 for public charities; and $2,484,859 for health. The state constitution of 1870 requires, in addition, that 

a) the entire school fund be reserved for the support of the public schools,
b) the amount reserved for the support of the poor be limited to the amount raised by taxation,
c) the amount reserved for the support of the police be limited to the amount raised by taxation,
d) the amount reserved for the support of the health department be limited to the amount raised by taxation,
e) the amount reserved for the support of the welfare department be limited to the amount raised by taxation,
f) the amount reserved for the support of the fire department be limited to the amount raised by taxation,
g) the amount reserved for the support of the street department be limited to the amount raised by taxation,
h) the amount reserved for the support of the water department be limited to the amount raised by taxation,
i) the amount reserved for the support of the gas department be limited to the amount raised by taxation,
j) the amount reserved for the support of the sanitation department be limited to the amount raised by taxation,
k) the amount reserved for the support of the parks department be limited to the amount raised by taxation,
l) the amount reserved for the support of the department of education be limited to the amount raised by taxation.

The board of aldermen, whose power is less than former, is composed of a president, elected on the city ticket for a term of four years; 84 aldermen, elected on the city ticket for a term of four years; and 73 aldermen, elected by districts for a term of two years. Each head of an administrative department is entitled to sit on the board but no vote; he is required to attend the board's meeting which is attended by all except the mayor to keep in touch with the department relating to his department. The board is required to meet once each month except in August and September. Each administrative department is responsible with the department of parks, the department of health and the department of education; and each head of a department has full power of appointing and removing subordinates except that a person holding a position in the classified civil service subject to competitive examination can be removed only for cause. The head of the department of parks is a board of three park commissioners: one for the boroughs of Manhattan and Richmond, one for the boroughs of Brooklyn and Queens, and one for the city. The commissioner is designated by the mayor as president of the board. The head of the department of health is also a board of three members; the commissioner of health, who is president of the board, the police commissioner, and the comptroller are the members of the board. Education is described in the paragraph on education. Gas and electric companies doing business within the city are subject to the extended control of a public service commission of five members who are appointed by the board of estimate and apportionment.

In New York county, which comprises the boroughs of Manhattan and the Bronx, there is no county court, but in its place are a city court and a county court. The sessions of the city court is a civil court, having jurisdiction over cases in which the amount involved does not exceed $2000, and is composed of seven justices elected for a term of ten years. The court of general session is a criminal court, having jurisdiction of all crimes including murder, and is composed of the city judge, the recorder and three justices of the sessions, each elected for a term of fourteen years. New York county elects a supt of schools, and Kings has two county judges; but in Queens and Richmond the county and surrogate courts are the same as in other counties of the state. In each of the twenty-eight districts into which the city is divided a municipal-court justice is elected for a term of four years. The municipal court, which has jurisdiction of civil cases in which the amount involved does not exceed $500, are held. For the administration of criminal justice by magistrates (justices of the peace) the city is divided into the boroughs of Manhattan, the Bronx, Kings and Richmond, and the other three boroughs constitute the second division. In each division there is a board of magistrates appointed by the mayor for a term of four years, and the magistrates hold the several courts of their division in rotation, according to such rules as they themselves establish. There is also in each division a court of special sessions consisting of six justices appointed by the mayor for a term of ten years; it has jurisdiction in all misdemeanour cases except libel and must be held by three justices. In the first division both the magistrates and the justices of the court of special sessions are required to hold a separate court for hearing charges against children under the age of sixteen years.

Each borough has a president with extensive power, and the city is divided into twenty-five local improvement districts, each having a board composed of the president of the borough and the alderman representing the district. The president appoints at his pleasure a commissioner of public works, who, subject to his control, directs his administration relating to streets, sewers, public buildings and supplies. The borough president prepares all contracts relating to his borough. In Queens and Richmond he directs the cleaning of the streets. In Manhattan, Brooklyn and the Bronx he is directed by the charter to appoint a superintendent of buildings, who, subject to the control of the board of aldermen, has charge of the construction, alteration and removal of buildings; in Queens and Richmond the board of aldermen may by an official act only authorized to do so by the board of aldermen upon the recommendation of the board of estimate and apportionment. A borough president is chairman of each of the local improvement boards.

History.—The discovery of New York Bay and the Hudson river by Verrazano in 1524 was followed by occasional visits of trading or exploring vessels until the arrival of Henry Hudson in 1609. Beginning with 1610, Dutch merchants despatched several vessels to engage in the fur trade with the Indians, and in 1614 a ship commander, Adriaen Block, having lost his vessel, built the "Onrust" or "Restless" on the shore of Upper New York Bay. About the same time a few huts were built at the south end of Manhattan Island. When New Netherland had been erected (1623) into a province of the West India Company (see New York), that body chose the south end of Manhattan Island for a trans-Atlantic shipping station and for the seat of government. In 1626 Peter Minuit, the director-general of the province, bought the entire island from the Indians for goods valued at 60 guilders (about $24 today). In 1641 were erected the two great buildings at the mouth of Fort Amsterdam; and at the close of the year the settlement, New Amsterdam, comprised thirty bark-covered dwellings. For several years it was maintained wholly in the interest of the Company, and to none of the inhabitants, all of whom were its agents or employees, were given any political rights, title to land or right to European trade on his own account. The company divided a large portion of the island into six farms of its own, and when by its Charter of Privileges and Exemption
(1629) it attempted to encourage agriculture in other parts of the province (see New York State) it reserved to itself the whole island. In 1633 New Amsterdam received a grant of "staple right" by which it could compel any vessel passing the port either to offer its cargo for sale or pay a duty; in 1638 the Company extended to all friendly European countries the privilege of trading with the province, and about this time it opened town lots for sale. The town rapidly assumed the cosmopolitan character for which it has ever since been noted, there being, according to a contemporary report, eighteen languages spoken by its 400 or 500 inhabitants in 1643. In 1641, to gain the necessary support to fight the Indians, Kieft had to yield to the demand for a popular voice in the government, and permitted the heads of families to choose a board of Twelve Men to confer with him. In 1643 he permitted the choice of a board of Eight Men, and when he refused its demands it was largely instrumental in effecting his recall. Under his successor, Peter Stuyvesant, a board of Nine Men was chosen, and this body, objecting to the customs duties which he imposed, sent three of its number with a petition to the States-General at Amsterdam.

In 1653 New Amsterdam was made a city with a government administered by a schout, two burgomasters and five schepens.

Chiefly with a view to protection from roving traders the great burgher-right and the small burgher-right were established in 1657; the great burgher-right being conferred on all who had been magistrates as well as on those then in office, on clergymen, on militia officers and on the male descendants of all such persons; and the small burgher-right being conferred on all native-born citizens, on the husbands of native-born women and their male children. The first board of aldermen and bailiffs was elected in 1656. Other persons approved by the magistrates were allowed to buy the great burgher-right for 50 guilders ($20) or the small burgher-right for 20 guilders ($8). Only burghers and employees of the West India Company could engage in commerce, work at a trade or practise a profession, and only great burghers could hold the more important offices. Originally Stuyvesant appointed the city officers, but in 1658 he permitted them to nominate their own successors. Besides engaging in the fur trade, the city was now exporting considerable timber and food-stuffs; in the coast trade it was beginning to reap the advantages of its situation on the route through Long Island Sound; and its trade with the Dutch West Indies was of some importance. But the city and the Company were always at odds. The duties exacted by the Company were a heavy burden and yet the Company did not keep the fort in good repair. Stuyvesant's arbitrary rule primarily in the interests of the Company was another grievance, and when in August 1664 there appeared in the harbour an English fleet sent by the duke of York for the conquest of the province, the city was in a defenceless condition. Richard Nicolls, the representative of the duke, easily won over the burgomasters and other prominent citizens; Stuyvesant, practically deserted, was driven to a formal surrender on the 8th of September; and New Amsterdam became New York.

In June 1665 Nicolls reorganized the government, vesting it in a mayor, aldermen and sheriff, to be appointed by the governor of the province for a term of one year; and extended the city's limits to include the whole of Manhattan Island. In 1666 he granted to New Harlem, founded in 1658, a charter which gave to it the status of a town within the city. Nicolls' successor, Governor Francis Lovelace, established a post-route from New York to Boston in 1673. On the 30th of July 1673 the city was surprised and captured by a Dutch fleet under Cornelis Evertsen and Jacob Bincakes. The captors renamed the city New Amsterdam and in January 1674 Anthony Colve, the newly appointed governor of the province, re-established the Dutch city government, but under the treaty of Westminster the English again took possession in November. In 1678 Governor Edmund Andros gave the city practically a monopoly within the province of commerce "over seas" and ordered that flour should be inspected nowhere else; two years later he required that all flour for export should be bolted and packed within the city. The duties established by order of the duke of York were still a grievance, and when in 1681, Governor Andros had sailed for England without renewing the ordinance imposing them, the merchants refused payment and demanded that they should thereafter be imposed by a representative assembly. The duke yielded and the first New York Assembly, called by Governor Thomas Dongan, met in the city on the 17th of October 1683. Less than three years later, on the 20th of April 1686, Dongan gave the city its first real charter, which is a historic instrument in the city government; it was succeeded only to a very small extent as late as 1830 (when there was a revision of the charter) and on it as a basis the later charters have been framed.

New York City with its numerous artisans, small traders, sailors and common labourers, such as usually compose the party of discontent, was the centre of the Leisler uprising (see New York State) incited by the English Revolution of 1688, and it was here that Leisler in the spring of 1690 called the first intercolonial assembly to plan an expedition against Canada. They so increased in number in the city that for the first time permitted to elect their own mayor, a privilege not subsequently granted until 1834. Before the close of the 17th century New York had become a favourite haunt of pirates; leading merchants assisted pirates as well as privateers in fitting out their vessels and shared in their plunder or at least welcomed them with their rich cargoes, and public officials, including one or more governors, were also implicated. The home government finally appointed Richard Coote, earl of Bellomont (1656-1701), governor with explicit instructions to deal with the piratical bands. Before long the famous Robert Livingston sent out William Kidd (d. 1701) with a frigate to capture the pirates. Kidd himself turned pirate, but was arrested in Boston in July 1699, was sent to England for trial and was hanged in May 1701. Bellomont met determined opposition among New York officers and merchants; but by the close of his brief administration (1698-1701) he had caught a number of the pirates and broken up the corrupt system by which they had been protected. The importation of negro slaves was begun in 1725 or 1726 and was somewhat encouraged by the States-General. Becoming prized as household servants in the early half of the 18th century they were not greatly outnumbered by the whites; the whites early began to fear a slave insurrection, and ordinances were passed forbidding negroes to gather on the Sabbath in groups of more than four, or to carry guns, swords or clubs; but one night in April 1712 some slaves met in an orchard near Maiden Lane, set fire to a building and killed nine men besides wounding several others who came to put out the fire. Soldiers then captured all the insurgents except six, who committed suicide, and after trial twenty-one were executed. When early in 1714 nine fires broke out within a few weeks and a negro was seen running from the last, the belief became general that the negroes had formed a plot to burn the town. A reward of £100 was offered for information exposing the plot, and the testimony of an indentured servant-girl, Mary Burton, that her master, mistress, a few other whites and a number of negroes were implicated in such a plot threw the city into a panic. Other confessions were extorted by threats, and on such worthless testimony four whites were executed, fourteen negroes were burned at the stake, twenty were hanged and seventy-one were transported. The frenzy was checked when Mary Burton began to accuse persons of consequence and above suspicion. The New York Gazette, the first newspaper of New York, established by William Bradford in 1725, was a semi-official organ. For criticizing the government in the New York Weekly Journal, which he established in 1733, John Peter Zenger was charged with libel in 1734, and by securing his acquittal in the following year the popular party established the freedom of the press (see New York). At the beginning of the Stamp-Act controversy John Holt's New York Gazette and Weekly Post-Boy, the successor of Bradford's Gazette, was the medium through which the popular leaders stirred the
people to resistance. The Stamp-Act Congress, called at the suggestion of Massachusetts, sat in the city from the 7th to the 28th of October 1765, and on the 31st of October the New York merchants started the non-importation movement which spread to the other colonies. Lieut.-Governor Cadwallader Colden prepared for the enforcement of the Act by strengthening Fort George (a later name for Fort Amsterdam) and increasing its garrison. The ship with the stamps arrived in the evening of the 23rd of October and on the following night threatening notices were posted on the doors of every public office and at the corners of streets. When the day (1st of November) came for the Act to be put in force, Governor Cadwallader Colden stationed the fort. Major James, the commander of the garrison, had threatened to enforce the Act; but the Sons of Liberty gathered a mob, broke into the governor’s coach-house, burned his coach and burned him in effigy, destroyed the furniture and other property of Major James and threatened to storm the fort. On the 5th, the governor delivered the stamps to the mayor and aldermen. No serious attempt was subsequently made to enforce the Act, and its repeal (16th of March 1766) was celebrated on the city common with noisy demonstrations and the ringing of hand-bells. A monument was subsequently erected for the erection of statues of the king and William Pitt. The Sons of Liberty opposed the passage by the Assembly of appropriations for the maintenance of the soldiers, and the latter retaliated by repeatedly cutting down liberty poles erected by the Sons of Liberty. Finally in a skirmish on the 18th of January 1770 the soldiers killed one man and severely wounded several others, and this bloodshed is memorable as the first in the struggle which culminated in the independence of the colonies. The tea shipped to New York for testing the right of parliament to tax the colonies did not arrive until four months after that shipped to Boston had been thrown over board, but when it did arrive (April 1774) the chests in one vessel were destroyed in the same manner as those in Boston and the other vessel was forced to carry its cargo back to London. The Act for punishing Boston stirred the New York merchants as well as the Sons of Liberty (chiefly mechanics and artisans), and when the latter again threatened violence the merchants resolved to guide the movement, and called a mass meeting and named a committee of correspondence of fifty-one members. This committee, on the 23rd of May 1774, proposed a Continental Congress chiefly with a view to obtaining an effective regulation of non-importation from England; it also named the New York delegates to that body.

During the greater part of the War of Independence the city was occupied by the British. Its capture was a part of the British plan to get control of the Hudson and separate New England from the southern colonies. Early in 1776 the Americans began to throw up fortifications at several points on both banks of the East river in the hope of closing the east water front to the enemy. Other fortifications were erected on Governor’s Island and at some points along the west water front to the upper end of Manhattan Island, where an attempt was made to close the passage of the Hudson by building Fort Washington on the New York bank and Fort Lee on the New Jersey bank and connecting them with a line of sunken ships fastened together with chains. To the north of the city proper, also, defences were constructed along the line of the present Grand Street, and to prepare for a retreat from the north end of the island a redoubt, which the British later called Fort George, was built on the prominence overlooking Kingsbridge from the south, and Fort Independence, in the heart of the Bronx, was built to command the approach from the mainland. After the battle of Long Island, fought within the present limits of Brooklyn Borough, Wash-ington, on the night of the 29th of August 1776, crossed to Manhattan Island. As the city was no longer tenable, some of the generals proposed burning it, but Congress would not give its consent and Washington, although withdrawing the greater part of his army behind fortifications on Harlem (now Washing-ton) Heights, continued to occupy it with about 5000 men under General Israel Putnam until the British general, Sir William Howe, began to show signs of attack. Troops also remained behind the batteries along the east water front, and it was on this occasion that Nathan Hale went on his fatal errand to ascertain Howe’s intentions, was discovered within the British lines and was hanged as a spy. On the 15th of September several British ships which had some days before passed the American batteries, as far as Montresor’s (now Randall’s) Island, entered Kipp’s Bay, at the foot of the present 34th Street, routed the militia posted behind the low breastworks there, and after landing narrowly missed cutting off the rear of Putnam’s retreating army. One portion of Howe’s army took possession of the city and garrisoned Forts Washington Heights along the east side of what is now Central Park while Putnam’s men were marching in nearly parallel columns on the west side of the park. On the 16th, in the battle of Harlem Heights (on what is now Morningside Heights), about 1800 Americans drove a somewhat smaller number of British troops from the field. In October Howe sailed up the East river, and Washington, to avoid being outflanked, retreated to the mainland, leaving only a garrison at Fort Washington. Howe landed at Pell’s Point (now within Pelham Bay Park), and on the 28th, a few miles below, in December he fought the battle of White Plains. Howe then turned westward or more southward and on the 36th of November captured Fort Washington. What is now Bronx Borough was within the “Neutral Grounds” which suffered greatly from the foraging parties of both armies. Six days after the British entered the city proper about one-fourth of it was destroyed by fire, and the desolation was extended by another large fire on the 3rd of August 1778. The British crowded their prisoners (who suffered terrible hardships) into several of the churches, the City Hall, the new gaol (later the Hall of Records), King’s College, the Livingston sugar house, and a number of ships moored in the harbour. The city was a refuge for Loyalists, but even they were treated with contempt by the British. The homes of Loyalists and Whigs alike were plundered, and when the British finally evacuated (25th of November 1783) they had robbed the city of its wealth and had destroyed its business.

For the first three or four years after the return of peace recovery in some directions was very slow; but only a few months after the British had gone an American merchantman sailed from the port bound for China and opened trade with that country. Trade was speedily resumed with European ports, and by 1788 it was not uncommon to see two or more vessels in the port either loading or unloading. On the question of enlarging the powers of the Federal government in 1787-1788, the city strongly supported Alexander Hamilton and John Jay against a determined opposition in other parts of the state, and the ratification of the Federal constitution in the state convention at Poughkeepsie was a triumph for New York City. The city was the Federal capital in 1789-1790 and under its strong Federalist influence the new government of the nation was organized. During the colonial era New York was always the seat of the provincial government and for twenty years it was at times the seat of the state government, but in 1797 Albany was made the permanent capital. In 1807 the success of steam navigation was assured by the trial trip of Robert Fulton’s “Clermont” from New York to Albany and return; but the city did not benefit immediately from this invention. On the contrary, the Embargo Act (1807-1809) threatened its commerce with ruin. It revived under the Non-Intercourse Act, but suffered again from the second war with Great Britain. In the first and second years of this war some merchant’s reaped profits from privateering against the British but in 1812-1813 the British stopped privateering by a closer blockade of the harbour and in 1814 they threatened to attack the city. In preparing to resist, the city erected or assisted in erecting elaborate fortifications, and Robert Fulton was busy in New York building a steam frigate with cannon-proof sides and heavy guns, but the war closed without a test of the fortifications and before the frigate was ready for action.

In 1817 the Erie Canal was begun and the first line of trans-Atlantic packet-ships was established. The canal, opened in
1825, insured the commercial supremacy of New York among American cities. The years immediately following the close of the second war with Great Britain also mark the beginning of a rapid increase in the number of European immigrants, and this stream of immigration, rising to a flood in the fourth decade and continuing high throughout the century, has been a dominant force in determining the city's social and political conditions. Although the city was a stronghold of the Federalists at the time the National government was organized, the Democrats, owing to the democratic management of Aaron Burr, were victorious in the elections of 1800 and 1801, and the city has continued to be normally Democratic owing largely to the activities of the Tammany Society or Tammany Hall (q.v.). This organization, founded in 1789, early espoused the cause of the unfranchised inhabitants, attended to the wants of the immigrants in various ways, led the movement for universal manhood suffrage and the election of city officers, and, after the office of mayor became elective (1834) and the last property qualifications for city voters were removed (1842), continued strong by reason of the support of the great mass of foreign-born citizens. Fraud and corruption were stated to have been tolerated by Tammany Hall; offices were used for the good of the organization rather than for the good of the city. Socially, the immigrants degenerated the city with vice, crime, misery and pauperism. The unsanitary conditions had already caused epidemics of yellow fever in 1795, 1798, 1822 and 1823, and the city was visited in 1832, 1834 and 1849 with epidemics of cholera in which several thousand lives were lost. These scourges together with a fire in 1835, which destroyed the East Side below Wall Street, hastened the construction of works for getting a supply of water from the Croton river. The immigrants represented various nationalities and religious sects, and Tammany, which was strong to 1871 the city was frequently disturbed by riots arising usually from national or religious antipathy. During the first mayorcy election (1834) there was rioting; and there were an abolitionist riot in the same year, a flour riot during the financial panic of 1837, and labour riots from time to time which were suppressed by the police. In 1857 the state legislature established a state of "metropolitan" police for the better protection of the city. The mayor, Fernando Wood, contending that the act was unconstitutional, resisted with the old municipal police, and another serious riot had begun when the Seventh Regiment of state troops was sent to the city; later, too, the court of appeals decided against the mayor.

Wood was still mayor at the outbreak of the Civil War, and in January 1861 he proposed to the Common Council that Manhattan Island, Long Island and Staten Island should secede and constitute a free city, to be named Tri-Insula. The Council approved. But when, in April, the city had been aroused by the bombardment of Fort Sumter the majority of the Democrats joined with the Republicans in discarding the proposal and in support of the Union. The native-born and loyal citizens joined the Union army in such large numbers that the city was left with inadequate protection from such of its inhabitants as had often constituted the mob. In this state of affairs the drafting of men for the army was begun in July 1863 in conformity with an act of Congress which exempted from its operation all who should make a money payment of $300. The New York proletariat and unscrupulous politicians complained that the measure was peculiarly oppressive to the poor, and the rioting with which it was resisted was protracted and bloody. The rioting began the 13th of July and continued for nearly five days. More than fifty buildings were burned. The mob was especially furious against the Negroes, a number of whom were hanged or beaten to death. The police fought bravely but were unequal to the emergency, and order was restored only after several regiments had returned to the city and had killed at least 500 of the rioters. In 1871 Irish Catholics threatened to prevent the Orangemen from parading the streets on the anniversary of the Battle of Boyne (12th of July). The superintendent of police also issued an order on the preceding day prohibiting the parade. Public opinion, however, was so strong in favor of the Orangemen that the order was revoked, and five regiment of militia were called out to protect the parade before it started; at the first assault the mob was scattered by a volley which killed 51 persons. The militia suffered a loss of three killed and several wounded.

The character of the population did not improve speedily, for while immigrants were coming in great numbers a large portion of the saving middle class was removing to the suburbs; and although Tammany Hall was discredited during the Civil War, it gained control of the state as well as the city government afterward. In 1871 the mayor, William M. Tweed, its ruler, organized the "Tweed Ring" which was plundering the city on a gigantic scale; when in 1873 its operations were exposed by the New York Times. The thefts of the "Ring" amounted to many millions of dollars, those in the election of the county court house alone to $8,000,000. Several of the malefactors were sent to prison and Tweed himself died there. Tammany, however, was victorious again in the second election (1874) after Tweed's fall, and in 1884, when rival companies were seeking to obtain a franchise for working a street railway on Broadway, this "ring" and other disorderly resorts, and from liquor sellers for permission to violate certain details of the excise laws, such as midnight and Sunday closing. There followed a great outcry against Tammany and it was driven from power for three years. During the reform administration, Colonel George Edward Waring (1833-1898), as head of the street cleaning department, quite revolutionized New York as respects cleanliness. The police service and the school system were also much improved. Tammany was successful in the election of 1897 when the opposition was divided. It again abused its power and was defeated in 1901. In 1903 and 1905 the Tammany ticket was elected, but the mayor, George B. McClellan, administered the government, especially during his second term (1906-1910), independently of Tammany Hall. With the exceptee of the mayor the Tammany ticket was defeated in 1909, and the mayor, William Jay Gaynor (b. 1851), was little in sympathy with Tammany Hall, having been nominated apparently for the purpose of insuring the election of loyal Tammany men on the county ticket.

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NEW ZEALAND


NEW ZEALAND, a British colonial Dominion (so named in 1857), consisting mainly of a group of islands lying in the south Pacific between 34° 25' and 47° 17' S., and between 166° 26' and 179° 23' W. It is situated eastward of Tasmania and Victoria, and Wellington, its capital and central seaport, is 1204 m. distant from Sydney. Of certain outlying clusters of small islands belonging to the colony, the Chathams (256 m. E. of Cook Strait), Auckland Islands and Campbell Island are alone of any value. All these are grassy and the Chathams are inhabited by sheep-farming colonists. The Auckland Islands contain two of the finest harbours in the Pacific. Six hundred miles north of Auckland, the volcanic Kermadecs, covering 8286 acres, are picturesquely clothed with vegetation. In Polynesia a number of small outlying islands, consisting of the Kermadecs, are believed to have been discovered by 1803. Ratotonga and Mangaia, in the Cook group, and Niué or Savage Island are the largest of these; Penrhyn and Suwarrow, though but small coral atolls, contain excellent harbours. Ratotonga is hilly, well watered, and very beautiful. Apart from these little tropical dependencies New Zealand has an area of 104,471 sq. m., of which its two important islands, called North and South, contain 44,468 and 58,523 respectively, while, divided from South Island by Foveaux Strait, Rakiraka or Stewart Island, mountainous and forest-clad, contains 521 sq. m. These three form a broken chain, North and South Islands being cut asunder by Cook Strait, a channel varying in width from 16 to 90 m.

North Island is 515 m. long and varies in breadth from 6 to 200 m. It is almost cleft in twain where the Hauraki Gulf penetrates to within 6 m. of Manukau Harbour. From the isthmus thus formed a narrow, very irregular peninsula reaches out northward for some 200 m., moist and semi-tropical, and beautiful rather than uniformly fertile. Rich strips of alluvial soil, however, seem a cold clay-marl, needing intensive cultivation to become highly productive. Buried in this clay-marl are found large deposits of the fossil resin which becomes the kauri gum of commerce; and on the surface extensive forests are still a great though diminishing source of wealth. Though a species of mangrove fringes much of this peninsula, its presence does not denote malaria, from which the islands are entirely free.

South of the isthmus aforesaid, North Island rapidly broadens out. Its central physical feature is the unbroken mountain chains running N.E. from Cook Strait to East Cape on the Bay of Plenty, ranges seldom under 3000 ft., but never attaining 6000 ft. in height. Ikurangi, their highest summit, though a fine mass, does not compare with the isolated volcanic cones which, rising W. of the main mountain system and quite detached from it, are among the most striking sights in the island. Ruapehu (10100 ft.) is intermittently active, and Ngauruhoe (7515 ft.) emits vapour and steam incessantly. Egmont (8340 ft.) is quiescent, but its symmetrical form and dense clothing of forest make it the most beautiful of the three. North of the two first-mentioned volcanoes Lake Taupo spreads over 238 sq. m. in the centre of a pumice-covered plateau from 1000 to 2000 ft. above the sea; and round and beyond the great lake the rugged chain of the thermal springs covers 3000 sq. m. and stretches from Mount Ruapehu to White Island, an ever-active volcanic cone in the Bay of Plenty. The most uncommon natural feature of the district, the Pink and White Terraces, was blown up in the eruption of Mount Tarawera in 1886, when for great distances the country was buried beneath mud and dust, and a chaos of m. long was opened in the earth. Fine lakes and waterfalls, innumerable pools, in temperature from boiling-point to cold, geysers, solfataras, fumaroles and mud volcanoes still attract tourists in large numbers. The healing virtue of many of the springs is widely known. The government maintains a sanatorium at Lake Rotorua, and there are private bathing establishments in other places, notably near Lake Taupo. In South Island there are hot pools and a state sanatorium at Hanmer Plains. Experience shows that the most remarkable cures effected by the hot waters are in cases of gout, rheumatism, diseases of the larynx and in skin disorders. Though, thanks to the overlying porous pumice, the Taupo plateau is not fertile, it has a good rainfall and is drained by unfining rivers running through deep terraced ravines. The Waikato and Waipa Rivers (N.E. of Taupo) and the Wanganui and Raganteke W. or S.W. The first named, the longest in the colony, though obstructed by a bar like all western,—and most eastern,—New Zealand rivers, is navigable for some 70 m. The Mokau and Wanganui run between ferny and forest-clad hills and precipices, often of almost incomparable beauty.

East of the Taupo plateau and south of Opotiki on the Bay of Plenty the steep thickly-timbered ranges held by the Urewera tribe still show scenery quite unspoiled by white intrusion. On the southern frontier of this mountainous tract Waikaré Moana extends its arms, the deepest and most beautiful of the large bays of the New Zealand coast.

From the mouth of the Waikato southward to about 25 m. from Cape Terawhiti on Cook Strait, and for a distance of from 20 to 40 m. inland, the western coast skirts fertile country well fitted for grazing and dairy-farming, to which it is being rapidly turned as the timber and fern are cleared away from its low hills, downs and rich valleys. On the east coast the same fertility is seen with less forest, and, round Hawke Bay, a hotter and drier summer. In the south centre, the upland plain of the Wairarapa, ending in a large but commonplace lake, has a climate adapted for both grazing and cereals. The butt-end of the island, of poor, rough, wind-beaten hills, is redeemed by the fine harbour of Port Nicholson, which vies with the Waiatemata in utility to New Zealand commerce. Broken as is the surface, poor as is the soil of certain tracts, there is but little of the island which will not ultimately be cultivated with profit as pumice and clay-marl yield to labour. Everywhere the settler may count on a sufficient rainfall, and—except on the plateau and the mountain highlands—mild winters and genial summers. The pleasant climate has certain drawbacks; the coastal farmer finds that blights and insect pests thrive in the comparative absence of hard frost and character. The country is free from the plague outside a few marshy localities. To pass Cook Strait and land in the middle province of South Island is to pass from Portugal to Switzerland, a Switzerland, however, with a sea-coast that in the east centre is a dull fringe of monotonous sand dunes or low cliffs. As a rule, nevertheless, the shores of South Island are high and bold enough. They are not too well served with harbours, except along Cook Strait, in Banks Peninsula, and by the grand but commercially useless fjords of the south-west. In the last-named region some fifteen salt-water gulfs penetrate into the very heart of the mountains, winding amid steep, cloud-capped ranges, and tall, richly-clothed cliffs overhanging their calm waters. The dominating features of south New Zealand are not ferny plateaus or volcanic cones, but stern chains of mountains. There the Southern Alps rise range upon range, filling the whole centre, almost or quite touching the western shore, and stretching from end to end of the island. West of the dividing crest they are forest clad; east thereof their stony grimness is but slightly softened by growths of scrub and tussock grass. Nineteen-twentieths of the colonists, however, live east of the dividing range, for to that side settlement was attracted by the open, grassy character of the country. The rivers are many, even on the drier eastern coast. But, as must be expected in an island but 180 m. across at the widest point and yet showing ridges capped with perpetual snows, the rivers, large or small, are mountain torrents, now swollen floods, anon half dry. Almost useless for communication or transport, they can be easily drawn upon for irrigation where, as in the east centre, water-races are useful. The largest river, the Clutha, though but 80 m. long in its course to the south-east coast, discharges a volume of water...
The following are the names of counties indicated by numbers:

North Island:
1. Bay of Islands
2. Northland
3. Auckland
4. Waikato
5. Taranaki
6. Manawatu
7. Wanganui
8. Wellington
9. Nelson
10. Marlborough
11. Canterbury
12. Otago
13. Southland
14. Westland
15. Stewart Island

South Island:
1. Buller
2. Nelson
3. Marlborough
4. Westland
5. Tasman
6. Nelson
7. Westland
8. Marlborough
9. Nelson
10. Westland
11. Marlborough
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29. Marlborough
30. Nelson

The names of other counties are the same as those of their chief towns, which in these cases are underlined.
estimated at nearly 1,100,000 cubic ft. a minute. On the west
the only two rivers of importance are the Buller and the Grey,
the former justly famous for the grandeur of its gorges. Large
and deep lakes fill many of the mountain valleys. Te Anau and
Wakatipu (m. i.) are the chief, though Manapouri is the most
romantic. Aorangi (Mt. Cook) is easily first among the
mountain peaks. Its height, 12,349 ft., is especially impressive
when viewed from the sea off the west coast. On the north-east
a double range, the Kaikouras, scarcely fall short of the Southern
Alps in height and beauty. Apart from the fjords and lakes the
chief beauties of the Alps are glaciers and waterfalls. The
Tasman glacier is 18 m. long and has an average width of 1 m.
13 chains; the Murchison glacier is 10 m. in length. To the west
of Aorangi glaciers crawl into the forest as low as 400 ft. above
sea-level. Among waterfalls the Sutherland is 1904 ft. high,
but has less volume than the Bolson river, which falls 3100 ft.
in a mountain gorge, the Otira, is also the chief route from the
east to the west coast. It begins on the western side of Arthur's
Pass, a gap the floor of which is 3100 ft. above the sea. Generally
the open and readily available region of South Westland extends
from the Kaikouras along the east and south-east coast to the
river Waiatoto in Southland. It has a mean breadth of some 30
m. In compensation the coal and gold, which form the chief mineral
wealth, are found in the broken and less practicable west
and centre, and these portions also furnish the water-power
which may in days to come make the island a manufacturing
country. (W. P. R. C.)

Geology.—New Zealand is part of the Australasian festoon, on
the Pacific edge of the Australasian area. Unlike Australia, its geological
structure is unusually varied, and owing to its instability, it includes,
for its size, an unusually complete series of marine sedimentary rocks.
It has, moreover, been a volcanic area of long-continued activity.
The physiographical New Zealand is closely connected with its
generally Jurassic core, and is dominated by two intersecting lines of
mountains and earth movements. The Southern Alps, the back-
bone of the South Island, rest on a foundation of coarse gneisses
and schists, that are quite unrepresented in the North Island.
The component portions of this line of old rocks is occupied by the basins of
the Wanganui river and Taupo. E. Suess therefore suggested that the
northern continuation of the Alps had foundered, and its summits
have been buried beneath the Pliocene marine rocks of the Wanganui
basin and the volcanic rocks of the Taupo area.
The oldest rocks are Archean, represented by the hand of gneisses
and schists exposed along the western foot of the Southern Alps.
To the south of the district in southern Westland, where the Alps
have passed out to sea, the Archeans become more extensive; for
they spread eastward and underlie the whole of the dissected table-
land of Otago. It has been suggested that the jasperoids and
diabases of the Tarawera Mountains on the North Island may be
Upper Archean age, from their resemblance to the Heathoidian
rocks of Australia. No Cambrian rocks have as yet been discovered,
but the Devonian system is represented by the Aoree beds in the
north-western part of the South Island. Here they contain
graptolites, including Tetragonoporus, Dichograptus and Didymograptus.
The Silurian system is represented by the Baton river beds to the west
east of the Taupara beds, occurring between the Wanganui river
which flows into Tasman Bay. The Devonian system is well
exposed in the Reefton mining field. The Carboniferous system
includes either the whole or a large part of the Maitai beds.
The Maitai beds include a thick mass of slates and sandstones, which form
the bulk of the Southern Alps, whence branches extend south-
eastward to the coast. The beds take their name from the Maitai
river near Nelson; they are largely developed in the mountains of the
Tararu-Ruhine-Raukumara range, on the eastern side of the
North Island; they occur in the Kaikoura Mountains, and an outlier
forms Mount Torlesse, near the eastern edge of the Southern Alps,
west of Christchurch. The Maitai beds have generally been considered to
be Carboniferous from the presence of species of products found in
the Permo-Carboniferous of New South Wales. But Professor
Park has obtained Jurassic fossils in the Maitai series; so that it will
probably be seen that the Carboniferous portion of the Carboniferous
of New Zealand consists of two systems, a New Zealand Permian, and of the Wairau
series, which is Triassic.

New Zealand includes representatives of all the three Mesozoic
systems. The Hokanui group comprises the Triassic Wairoa and
Otago beds, and the Jurassic Aorangi and Manapouri beds, which
includes marine limestones characterized by Mototis salinarum, and
the Otapara series is characterized by Spiriferina spatulata. The
Mataura beds are largely of estuarine formation; they contain oil
shales and gas seeps.
The Cretaceous system includes the Waipara series, a belt of chalky
limestones with some phosphate beds at Clarendon in eastern Otago.
Their fossils include belneymites, ammonites, scaphites and marine
saurians, such as Cimlokiosaurus. These Cretaceous limestones are
interbedded with glauconitic greensands, as at Moeraki Point in
eastern Otago. The second type of Cretaceous is a terrestrial
formation, and is important as it contains the rich coal seams of
Greytown, Westport and Seddonville, which yield a high quality
of steam coal. Cretaceous coals have long been worked in the North
Island, north of Auckland, on the shores of the Bay of Islands, where
the age of the coal is shown by its occurrence under the Whangarei
or Waimio limestone.

The Cainozoic system is represented by Oligocene, Miocene,
Pliocene and Pleistocene beds. The best-known Oligocene rocks
are the limestones of Oamaru and the brown-coal measure of
Waiato. The Oamaru limestones have been largely used for
building stones; they are a pure white limestone, largely made up of
granifera, bryozoa and shell fragments, and contain the teeth of
sharks (e.g. Carcharodon) and of toothed whales such as Squidodon
serratus. In southern Otago the Oligocene beds are brown coals
and lignites with oil shales, which, at Orepuki, contain 47% of oil
and gas, with 8% of water. The Miocene Pareora beds occur to
the height of 3000 or 4000 ft. above sea-level, in both the
North and South Islands. Some of its fossils also occur in the
Oamaru series, but the two series are unconfornmy. In Westland
the Miocene includes the Moutere gravels, which rest on the summit
of Mount Greenland, 4900 ft. above sea-level.

Marine beds of the Pliocene are best developed in the Wanganui
basin. They consist of fine clays with nodular calcareous concretions
rich in fossils. The Pleistocene system in the South Island includes
glacial deposits, which prove a great extension of the New Zealand
glaciers, especially along the western coast. The glaciers must have
reached the sea at Cascade Point in southern Westland. On the
eastern side of the Alps the glaciers appear to have been confined to
the mountain valleys. The Pleistocene glacial deposits are rich in
the bones of the moa and other gigantic extinct birds, which lived on
until they were exterminated by the Maori. The Cainozoic volcanic
history of New Zealand begins in the Oligocene, when the highest
volcanic domes of Dunedin and Banks Peninsula were built up.
The Dunedin lavas including tephrites and kenyrites correspond to
desite eruptions in the volcanic history of Victoria. The building
up of these domes of lavas of intermediate chemical type was followed by
the eruption of sheets of andesites and rhyolites in the Thames

New Zealand

Goldfield and the Taupo volcanic district. The volcanic activity of the Taupo district lasted into the Pleistocene, and the last eruptions contributed many of its chief geographical features.1

Climate.—Diversity of level and latitude cause many varieties of climate in the South Island provinces. The height and regularity of the mountain backbone increase the diversity. Only one pass, the Waiau (1716 ft.), crosses from Fife to Haast at a height of more than 5000 ft. In the west coast the climate resembles nothing in the British Islands so much as Cork and Kerry, for there are the same wet gales from a western ocean, the same clouds gathering on the dripping sides of wild mountains, an equal absence of severe frosts and hot sunshine, and a rich and evergreen vegetation. Elsewhere, sheltered Nelson has a more genial air than the Wellington district of Cook Strait. Foveaux Strait is as cold and windy as the Strait of Dover. The Canterbury plain has but 26 ins. of annual rainfall, less than a fourth of that along the western littoral. Very seldom indeed is moisture excessive in the eastern half; there is even a deficiency in unfavourable years, and dry, warm winds do damage to crops. Insect life is relatively not abundant; the air is brisk and bright with ample sunshine. The snow-line, which is at 3000 ft. on the eastern flank of the Alps, is 3700 ft. on the western.

The healthiness of the New Zealand climate in all parts is attested by the death-rate, which, varying (1856-1900) from 9 to 10 per 1000, is the lightest in the world. In 1896 it was as low as 9-10. In 1907, however, it was 10-91, the highest figure since the year 1856; from 1870 to 1896 the deaths were lower.

The rainfall in most of the settled districts ranges from 30 to 50 ins. a year. Meteorological statistics are collected at Auckland, Wellington, Christchurch, and Dunedin and eight other stations; and observations of rainfall, temperature, and wind-directions are received from eighteen stations of the second order. From the data thus obtained an isobaric map and a report are prepared for each day; and weather warnings are telegraphed to any part of the coast when necessary.

A system of inter-colonial weather exchanges has been agreed upon, and telegrams are daily exchanged between Sydney and Wellington.

Flora.—There are about one thousand species of flowering plants, of which about three-fourths are endemic. Most of those not peculiar to the country are Australian; others are South American, European, African; and some have Polygonum and other cryptogamic plants in great variety and abundance. The New Zealand flora, like the fauna, has been the subject of many investigations, and the more conspicuous flora differs very greatly from that of Australia, Polynesia, and temperate South America, and helps to give to the scenery a character of its own.

The New Zealand vegetation occupies the more than half the surface of the archipelago covered with dense, evergreen forest, a luxuriant growth of pines and beeches, tangled and intertwined with palms, ferns of all sizes, vines and other parasites, and a rank, bushy, mossed undergrowth. Though much of the timber is of commercial value—notably the kahikatea, totara, puriri, rimu, matai and kahikatea—this has not saved the forests from wholesale, often reckless, destruction. Two-fifths perhaps have already disappeared, and it is probable that in fifty years the only large tracts still standing will be sub-alpine woods and in state reserves. Meanwhile charred and rotted stumps give a melancholy and undutiful air to valleys and denuded hillsides, for instance, in the district near New Zealand trees are hard-wooded and take more than a generation to decay utterly. Compelled by the windy climate the colonists are doing something to repair these ravages. The plantations near Wellington, Cu-mara, and Australian and American trees; but it is only in the naturally open and grassy parts of the east and south-east that settlement as yet improves the landscape. There, before the colonists came, wide sweeps of dull green bracken or wiry yellow-green tussocks seemed bleak and monotonous enough. The swamps covered with flax and giant bulrushes were often deemed to be the eye sheets of golden-plumed toto-406, a kind of pampas grass.

Fauna.—The destruction of the forest is telling fatally on the

increase in New Zealand is over 17. To that, and to the annual gain by immigration, the fairly rapid rate of increase is due. Between 1885 and 1891 the colony lost more than it gained overseas; but from 1892 to 1908 the gain by immigration was 90,000. Probably, at least half of those represented Australians, immigrants who expect years of drought. England and Scotland supply the bulk of the remainder. The government has aided immigrant farmers and farm labourers having a certain sum of money, also female domestics, by paying part of their passage money.

The people of colour in 1906 numbered 53,000, including 2,000 Chinese and 6,000 Maori half-castes. An apparent increase of 7000 in the Maori and half-castes between 1891 and 1906 is, perhaps, partly due to more accurate computation. It seems probable that the number of Maori and half-castes taken together is about the same as it was thirty years ago, though the infusion of white blood is larger. The Public Health Department has exerted itself to improve the sanitation of native villages and combat the mischievous trickery of Maori wizards and "doctors."

Wealth.—The increase of wealth went on after 1879 in spite of dull times, and was only checked by the extraordinary depression of 1893 and the Australian and the Australian panic. The estimated private wealth of colonists fell from £236 per head in 1890 to £219 in 1895. It was computed in 1905 to have increased to £320. After deducting debts, the wealth of the public and private wealth of the colony is calculated to be about £420,000,000.

Of the five banks of issue doing business in the dominion three are situated in the island of South Island. The deposits of the three are £21,000,000 in 1907, as against £12,250,000 in 1892. At the same date more than £10,000,000 stood to the credit of small depositors in post office and private savings banks, nine-tenths in the former. The gross amount insured by policies in life insurance offices (ordinary and industrial) was over £29,000,000, of which the state office claimed two-fifths.

The annual export of sea-trade in recent years is shown by the larger size of the ocean-going vessels trading with the colony. The number of these only advanced from 598 to 629 between 1896 and 1906. But the increase of tonnage in the eleven years was from 61,230,000 tons to 121,140,000 tons. The coasting trade and trade with Australia are carried in New Zealand-owned vessels.

External trade has risen from £13,111,000 in 1887 to £27,377,000 in 1907. Before 1886 exports exceeded imports; but in the twenty subsequent years there was an invariant excess of exports, valued in all at £52,000,000.

The wool trade is stationary and extremely small. Trade with the United States grew from £877,000 in 1891 to £3,140,000 in 1907. Thanks to the tariff of the United States the balance of trade with North America is heavily against New Zealand. The same disparity exists between New Zealand and Germany (1879 £60,000; 1886 £29,000; 1891 £52,000; 1896 £40,000; 1899 £42,000) and France (1879 £40,000; 1886 £24,000; 1891 £59,000; 1896 £80,000). In 1870 the country had a trade surplus of £200,000 with the United Kingdom; the latter's share in 1906 was £26,811,000 of the whole.

Production.—Wool: (4,250,000 to 7,057,000 according to prices) remains at the head of the list of exports. The quantity grown increased by 70% in the twenty years 1887-1906. Moreover the export of sheep skins and pelts was valued at £680,000 in the last-mentioned year. But the description changes; there is much less merino, and more of the coarser and longer cross-bred. The number of sheep has increased from 16,364,000 in 1886 to 22,000,000 in 1908, though the increase has been almost all in North Island. The number of the flocks grows, and the average size diminishes ever more rapidly. The number of sheep and lambs was estimated in 1889 at 18,500—average size of each flock about 1050. The smaller size of the flocks and the breeding of sheep for meat rather than for wool, the cultivation of English grasses and of extensive sprays of clover (carried on only on rich lands), have all tended to change sheep-farming from the mere grazing of huge mobs on wide, unimproved runs held by pastoral licences. The "squatters" still occupy about half the land, but the area is less partitioned than in former days. How much more extensive is grazing—of the more scientific order—than agriculture, is seen at once from the figures of the amount of land broken up, for crops or other purposes, and the amount under English grasses. There were about 1,600,000 acres under crop in 1899. This is exclusive of the vast area of native-grass land. The area now occupied and utilized by whites is estimated at 29,000,000 acres. The character of the soil and the moist cool climate enable English grasses to be sown almost everywhere, and 13,000,000 acres are now laid down with these. The result is seen in the price obtained for New Zealand sheep in Smithfield Market, which is from 4d. to 1d. per lb higher than that given for frozen mutton from other countries. The figures below show the growth of the trade.

<table>
<thead>
<tr>
<th>Year</th>
<th>Raised in the Colony</th>
<th>Imported</th>
<th>Exported</th>
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<tbody>
<tr>
<td>1880</td>
<td>2,099,293</td>
<td>129,398</td>
<td>7,021</td>
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<tr>
<td>1885</td>
<td>3,571,397</td>
<td>110,939</td>
<td>34,404</td>
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<tr>
<td>1890</td>
<td>1,801,096</td>
<td>124,933</td>
<td>35,990</td>
</tr>
<tr>
<td>1897</td>
<td>1,831,099</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Four-sevenths of the coal is bituminous.

1 Excluding Coal for Fuel by Ocean Steamers.

Excelling as the quality of the best New Zealand coal is, the cost of mining and shipping it prevents the growth of any considerable export trade. Silver is chiefly extracted in the Thames district, but other mines containing silver ores have been found. There are many other valuable ores—copper, iron, lead, zinc, antimony, chrome and manganese. Petroleum springs have been tapped near New Plymouth. Building stones of various kinds and of excellent quality abound. Marble and cement stones occur in many places. There are extensive deposits of Kauri gum on the most easterly coast of the North Island, and of iron ore at Parapara in Nelson.

Manufactures.—Protected by a tariff wall which was repeatedly heightened between 1879 and 1907, manufactures made considerable progress. At the end of 1893 there were about 22,000 work people being employed in 1946 workshops, and the aggregate output was valued at six millions and three-quarters. Twenty years later the number of establishments had increased to the number of hands 50,000, and the output twenty-three millions and a half. A small deduction should be made from this apparent increase to allow for a changed system of classification. Male factory hands greatly outnumbered female, upper Thames. The number of persons employed grew from 1893 and 1896 wages fell. Between 1895 and 1906 they rose 15% on the average among males of all ages, and as much as 30% among women and girl workers. The disproportionate rise in the case of females is probably due to the policy of that side of the industry. The chief factory industries come under the following heads: meat-freezing and tallow; tanning and wool-scouring; flax mills, saw-mills and grain-mills; boots and shoes; woollen and clothing; butter and
cheese; breweries; printing houses; foundries; agricultural implement and machine shops; soap and candle works; coach-building and furniture; gas-works. Except in meat-freezing, wool-scouring, buttermaking, etc., the labour of children or child-manufacturing is almost entirely for consumption within the colony.

Government.—New Zealand was not colonized in the ordinary manner around one centre. There were in its early years six distinct settlements—Auckland, Wellington, Nelson, New Plymouth, Canterbury and Otago—between which communication was for several years irregular and infrequent. To meet their political wants the Constitution Act of 1852 created them into provinces, with elective councils and superintendents respectively. An Act of 1867, which united the provincial councils, established for the provincial system was abolished. The general assembly, as it is called, is composed of the governor, the legislative council, and the House of Representatives. The governor is appointed by the crown, but his salary, £7500, is paid by the colony. The legislative council consists of members appointed for seven years by the governor in council; the number of legislative councillors stays at or near forty-five. The House of Representatives consists of eighty members chosen by the electors. The members of both houses are paid. The franchise is adult suffrage, and women have it in the same degree as the men. At a rate per annum, including six months in the electoral district for which a claim to vote is registered. Each elector is qualified for election. Four members of the house must be Maori elected by their own race. The duration of the house is for three years, but it is subject to re-election whenever the governor dissolves the general assembly. Legislation is subject to disallowance by the crown, but that power is seldom exercised. Executive administration is conducted on the principle of English responsible or parliamentary government. The government is represented in England by a high commissioner. Local administration is vested in local elective bodies, such as municipal councils, county councils, road boards, harbour boards, charitable aid boards, and others, with power to levy rates. The colonial revenue is chiefly derived from customs, stamp duties, land tax, income tax, beer excise, postal and telegraphic services, railways, and crown land sales and rents. The proceeds of land sales are applied to surveys and public works. Customs duties, railways and stamps are by far the most important sources of revenue. They yielded £3,105,000, £2,765,000 and £2,355,000 respectively out of a total revenue of £6,056,000 in the financial year 1907-1908. The gross public debt had reached £66,500,000 in 1908. The money has chiefly been spent on railways, telegraphs, roads, bridges, land purchase from the native tribes and private estate owners, on loans to settlers and on native wars. The state railways (2500 m.) return about £600,000 after paying working expenses. This does not quite defray the interest on the cost of their construction and equipment, inasmuch as it barely comes to 3½% thereon, but rates and fares are deliberately kept low to encourage settlement and commerce.

Education.—Under the Education Act of 1877 state schools are established, in which teaching is free, secular and compulsory, with certain exceptions, for children between the ages of seven and thirteen. A capitation grant is given for every child in average daily attendance at the school. Grants are also made for scholarships from primary to secondary schools, for training institutions for teachers and for school buildings. Large reserves of public lands have been made for primary, secondary and university education. All primary and some secondary public schools are controlled by provincial education boards elected by school committees of the parents of pupils. The percentage of attendance has dwindled that in the last thirty years attended by state and native children. Native village schools are also provided by the state in native districts. There are, moreover, industrial schools, orphanages and institutions for unwed mothers and for the deaf and dumb and blind. There are also about ninety secondary schools, scattered throughout the country by the education endowments. The University of New Zealand is an examining body, and grants honours, degrees and scholarships. It is empowered by royal charter to confer degrees entitled to rank and consideration throughout the British dominions, as fully as if they were granted by any university in the United Kingdom. Colleges in the four chief towns and in Nelson are affiliated to the New Zealand University, which has about fifteen hundred undergraduates keeping terms. The state in no way controls or interferes with religious administration. Each denomination attends to the religious instruction of its own adherents. State school buildings can be, and sometimes are, used for religious instruction on days and hours other than those fixed by the governing body of the school, but no child can be required to attend, except at the wish of its parent or guardian. The government spends £350,000 a year on manual and technical instruction, and an average number of two hundred and fifty new classes are opened each year. The conditions of admission are the possession of an elementary degree and proof of control in writing. A school of engineering and an agricultural college are attached to the university college in the province of Canterbury, and there are several schools of mines elsewhere. There are about one hundred and twenty schools and colleges of one degree or another. Private schools claim about 10% of these. The annual parliamentary expenditure on education exceeds £700,000. In this connexion it may be claimed that the proportion of policemen to population (1 to 1375) is lower in New Zealand than in any other colony. The fixing of the legal minimum "factory age" for children at fourteen undoubtedly favours schools and the like.

Land.—Apart from gold-mining, coal-mining and gum-digging, the industries are still mainly the growing of food and raw material; and the occupation of the land is easily the chief of all economic pursuits. On the sixteenth of May 1840 the Legislature of New Zealand passed the Land Act, by which the crown, as against about six million acres rented from the state on permanent leasehold. Crown lands are still alienated, though but little is now sold for cash outright. The number of holdings of one acre and upwards is 11,000, and the area comprised is 25,837,539, and 72,335 in 1906; but the area held in estates of 5000 acres and upwards remains very large and has diminished but slowly despite the conversion of the great tithings of the early days into settlements or in settling lands have been tried. The best known of these, perhaps, is the repurchase of large pastoral estates for subdivision and lease in perpetuity. In the fourteen years 1893-1907 about a quarter million acres were bought under the Land Act, and were held under five millions and a half. Over 13,000 souls had been settled in this area, and the yearly rent received from them, about £200,000, with a substantial balance to the credit of the enterprise in the books of the New Zealand government. On the average, these settlers (who were encouraged with good years) were with very few exceptions prospering.

Old Age Pensions.—The Old Age Pensions law, enacted in 1898, provides that the first pension, amounting to £5 a year, to persons of sixty-five years and upwards who had lived for twenty-five years in the colony. Pensioners must be British subjects, poor, and not ex-criminals or of notoriously bad character. In 1905 the maximum pension was raised to £5 a year. Official figures show that the total number of applications for pensions up to that date had been 31,271, of which 23,877 had been granted. The number of pensioners then on the books of the Pensions Office was 13,257. In the three years after enactment of the law the number of pensioners was very rapid; in the next five it was remarkably slow—only 871 altogether. The proportion of whites capable of age and health for pension was 12½, or rather less than one-third (it had been 9¾% more in 1902). The reduction was due to stricter administration. Operations during the first year, a total sum paid out in eight and a quarter years had been a million and three quarters. The amount paid out on a half million and three quarters on the 1st of October, 1907, was £325,000. The money is found by the central government. The administration of the system, which is in the hands of a special department, costs a little over £5000. Frauds and evasions by applicants and pensioners, though they exist, are not believed to be numerous. Public thrift does not, so far, seem to have been diminished. Since the coming of the system the amount spent on outdoor relief in the colony had by 1906 diminished from £51,000 to £36,500, in face of an increase of nearly 25% in the population.

History.—The date, even the approximate date, of man's arrival in New Zealand is uncertain. All that can be safely asserted is that by the 14th century A.D. Polynesian canoe-men had reached its northern shores in successive voyages. By 1642 they had spread to South Island, for there Abel Jansen Tasman found them when, in the course of his circuitous voyage from Java in the "Heemskirk," he chanced upon the archipelago, coasted along much of its western side, though without venturing more than a few miles within it. It gave its name to the native children of the canoe. Cook, in the years thirty-seven years later, in the "Endeavour," gained a much fuller knowledge of the coasts, which he circumnavigated, visited again and again, and mapped out with fair accuracy. He annexed the country, but the British government disavowed the act. After him came other navigators, French, Spanish, Russian and American; and, as the 18th century neared its end, came sealers, whalers and trading-schooners in quest of flax and timber. English missionaries, headed by Samuel Marsden, landed in 1814, to make for many years but
slow progress. They were hindered by murderous tribal wars in which imported muskets more than decimated the Maori. Still, cruel experience and the persevering preaching of the missionaries gradually checked the fighting, and by the year 1839 it could be claimed that peace and Christianity were in the balance fairly between the whites and the Maori. Lord Chatham had resisted the considerable pressure brought to bear in Downing Street in favour of annexation. In vain Edward Gibbon Wakefield, organizer of colonizing associations, prayed and intrigued for permission to repeat in New Zealand the experiment tried by him in South Australia. Lord Glenelg, the colonial minister, had the support of the missionaries in withstanding Wakefield’s New Zealand Company, which at length resolved in desperation to send an agent to buy land wholesale in New Zealand and despatch a shipload of settlers thither without official permission. Before, however, the “Topi” had thus sailed for Cook Strait, it had become known to the English government that a French colonizing company—La Compagnie Nanto-Bordelaise—was forming, under the auspices of Louis Philippe, to anticipate or oust Wakefield. Further obstruction was manifestly futile, and the British authorities reluctantly instructed Captain Hobson, R.N., to make his way to northern New Zealand with a dormant commission of lieutenant-governor in his pocket and authority to annex the country to Australia by peaceful arrangement with the natives. Hobson landed in the Bay of Islands on the 22nd of January 1840, hailed the Union Jack, and had little difficulty in bringing the majority of the native chiefs to accept the queen’s sovereignty at the price of guaranteeing to the tribes by the treaty of Waitangi possession of their lands, forests and fisheries. Some French settlers, conveyed by a man-of-war, reached Akaroa in South Island in the May following. But Hobson had forestalled them, and those who remained in the country became British subjects. Meanwhile, a week after Hobson’s arrival, Wakefield’s colonists had sailed into Port Nicholson, and proposed to take possession of immense tracts which the New Zealand Company claimed to have bought from the natives, and for which colonists had in good faith paid the company. Other bands of company’s settlers in like manner landed at Nelson, Wanganui and New Plymouth, to be met with the news that the British government would not recognize the company’s purchases. Then followed weary years of ruinous delay and official inquiry, during which Hobson died after founding Auckland. His successor, Fitzroy, drifted into an unsuccessful native war. A strong man, Captain Grey, was at last sent over from Australia to restore peace and rescue the unhappy colony from bankruptcy and despair. Grey, much the best of the absolute governors, held his command between 1842 and 1849, and during the last years of his administration he bought large tracts of land for colonization, including the whole South Island, where the Presbyterian settlement of Otago and the Anglican settlement of Canterbury were established by the persevering Wakefield.

In 1852 the mother-country granted self-government, and, after much wrangling and hesitation, a full parliamentary system and a responsible ministry were set going in 1856. For twenty years thereafter the political history of the colony consisted of two long, intermittent struggles—one constitutional between the central government (first at Waitangi and Auckland in 1840) and the powerful provincial councils, of which there were nine charged with important functions and endowed with the land revenues and certain rating powers. The other prolonged contest was racial—the conflict between settler and Maori. The native tribes, brave, intelligent and fairly well armed, tried, by means of a league against land-selling and the election of a king, to retain their hold over at least the central North Island. But their kings were incompetent, their chiefs jealous and their tribes divided. Their style of warfare, too, caused them to throw away the immense advantages which the broken bush-clad island offered to clever guerrilla partisans. They were poor marksmen, and had but little skill in laying ambuscades. During ten years of intermittent marching and fighting between 1861 and 1871 the Maori did no more than prove that they had in them the stuff to stand up against fearful odds and not always to be worsted. Round Mount Egmont, at Okauku, at Tauranga and in the Wanganui jungles, they more than once held their own against British regiments and colonial riflemen. The storming of their favourite positions—stockades strengthened with Rifo-beds—was often costly; and a strange anti-Christian fanaticism, the Hau-Hau cult, encouraged them to face the white men’s bullets and bayonets. But even their fiercest fighting leaders, Rewi and Te Kooti, scarcely deserved the name of generals. Some of the best Maori fighters, such as the chiefs Ropata and Kemp, were enlisted on the white side, and with their tribesmen did much to make unequal odds still more unequal. Had General Pratt or General Cameron, who commanded the imperial forces from 1860 to 1865, had the rough vigour of their successor, General Chute, or the cleverness of Sir George Grey, the war might have ended in 1864. Even as it was the resistance of the Maori was utterly worn out at last. After 1871 they fought no more. The colonists too, taught by the sickness delay and the ruinous cost of the war to revert to conciliatory methods, had by this time granted the natives special representation in parliament. A tactful native minister, Sir Donald McLean, did the rest. Disarmament, roads and land-purchasing enabled settlement to make headway again in the North Island after twelve years of stagnation. Grey quarrelled with his masters in Downing Street, and his career in the imperial service came to an end in 1868. His successors, Sir George Grey and Sir Robert Brown, with the aid of the authorities in London, were content to be constitutional governors and to respect strictly the bethes of the colonial office. Meanwhile the industrial story of New Zealand may be summed up in the words wool and gold. Extremely well suited for sheep-farming, the natural pastures of the country were quickly parcelled out into huge pastoral crown leases, held by prosperous licensees, the squatters, who in many cases aspired to become a county gentry by turning their leases into freeholds. So profitable was sheep-farming seen to be that energetic settlers left the island to form New Zealand’s dependencies in the Cook Islands and New South Wales. But gold was at first so attractive that it brought many thousand diggers to the colony, most of whom stayed there. Pastoral and mining enterprise, however, could not save the settlers from severe depression in the years 1867 to 1871. War had brought progress in the north to a standstill; in the south wool-growing and gold-mining showed their customary fluctuations. For a moment it seemed as though the manufacture of hemp from the native Phormium tenax should become a great industry. But that suddenly collapsed, to the ruin of many, and did not revive for many years.

In 1870 peace had not yet been quite won; industry was depressed; and the scattered and scanty colonists already owed seven millions sterling. Yet it was at this moment that a political financier, Sir Julius Vogel, at that moment colonial treasurer in the ministry of Sir William Fox, audaciously proposed that the central government should borrow ten millions, make roads and railways, buy land from the natives and import British immigrants. The House of Parliament, the marquis of Raglan, presently voted four millions as a beginning. Coinciding as the carrying out of Vogel’s policy did with a rising wool market, it for a time helped to bring great prosperity, an influx of people and much genuine settlement. Fourteen millions of borrowed money, spent in ten years, were on the whole well
laid out. But prosperity brought on a feverish land speculation; prices of wool and wheat fell in 1879 and went on falling. Faulty banking ended in a crisis, and 1879 proved to be the first of sixteen years of almost unbroken depression. Still, eight prosperous years had radically changed the colony. Peace, railways, telegraphs (including cable connexion with Europe), agricultural machinery and a larger population had carried New Zealand beyond the primitive stage. The provincial councils had been swept away in 1876, and their functions divided between the central authority and small powerless local bodies. Politics, cleaved off from the cross-issues of provincialism and Maori warfare, took the usual shape of a struggle between wealth and radicalism. Sir George Grey, entering colonial politics as a Radical leader, had appealed eloquently to the workpeople as well as to the Radical "intellectuals," and though unable to retain office for very long he had compelled his opponents to pass manhood suffrage and a triennial parliament act. A national education system, free, non-religious and compulsory, was established in 1877. The socialistic bent of New Zealand was already discernible in a public trustee law and a state life insurance office. But the socialistic enthusiasts were not so much a matter of strength with Grey. He proved himself a poor financier and a tactless party leader. A land-tax imposed by his government helped to alarm the farmers. The financial collapse of 1879 left the treasury empty. Grey was manœuvred out of office, and Sir John Hall and Sir Harry Atkinson, able opponents, took the reins with a mission to reinstate the finances and restore confidence.

Roughly speaking, both the political and the industrial history of the colony from 1879 to 1908 may be divided into two periods. The dividing line, however, has to be drawn in different years. Sixteen years of depression were followed, from 1895 to 1908, by thirteen years of great prosperity. In politics nearly twelve years of Conservative government, or at least capitalistic predominance in public affairs, were succeeded by more than seventeen years of Radicalism. Up to January 1891 the Conservative forces which overthrew Sir George Grey in 1879 controlled the country in effect though not always in name, and for ten years progressive legislation was confined to a mild experiment in offering crown lands on perpetual lease, with a right of purchase (1882), a still milder instalment of local option (1881) and an inoffensive Factories Act (1886). In September 1888, however, Sir George Grey succeeded in getting parliament to abolish the contract service, the last remainder of pluri-voting. Finance was otherwise absorbed attention; by 1888 the public debt had reached £25,000,000, against which the chief new asset was 1300 m. of railway, and though the population had increased to nearly half a million, the revenue was stagnant. A severe property-tax and an increase of customs duties in 1879 only for a moment achieved financial equilibrium. Although taxation was seconded by a drastic, indeed harsh, reduction of public salaries and wages (which were cut down by one-tenth all round) yet the years 1884, 1887 and 1888 were notable for heavy deficits in the treasury. Taxation, direct and indirect, had to be further increased, and as a means of gaining support for this in 1888 Sir Harry Atkinson, who was responsible for the budget, gave the customs tariff a distinctly protectionist complexion.

During the years 1879-1890 the leading political personage was Sir Harry Atkinson. He, however, withdrew from party politics when, in December 1890, he was overthrown by the Progressives under John Ballance. Atkinson's party never rallied from this defeat, and a striking change came over public life, though Ballance, until his death in April 1893, continued the prudent financial policy of his predecessor. The change was emphasized by the active intervention of plural voting. In politics the trade unions. These bodies decided in 1889 and 1890 to exert their influence in returning workmen to parliament, and where this was impossible, to secure pledges from middle-class candidates. This plan was first put into execution at the general election of 1890, which was held during the industrial excitement aroused by the Australasian maritime strike of that year. It had, however, been fully arranged before the conflict broke out. The number of labour members thus elected to the general assembly was small, never more than six, and no independent labour party of any size was formed. But the influence of labour in the Progressive or, as it preferred to be called, Liberal party, was considerable, and the legislative results noteworthy. Ballance at once raised the pay of members from £150 to £240 a year, but otherwise directed his energies to constitutional reforms and social experiments. These did not interfere with the general lines of Atkinson's strong and cautious finance, though the first of them was the abolition of his direct tax upon all property, personal as well as real, and the substitution therefor of a land tax, half of which was to be in the £ on unimproved land values, and also of a graduated tax upon unimproved land values, and an income-tax also graduated, though less elaborately. The graduated land-tax, which has since been stiffened, rises from nothing at all upon the smaller holdings to 3d. in the £ upon the capital value of the largest estates—those worth £210,000 and upwards. Buildings, improvements, and live stock are exempted. In the case of mortgaged estates the mortgagor is exempted from ordinary land-tax in proportion to the amount of his mortgage. On that the mortgagee pays at the rate of 2d. in the £. In 1896 municipal and rural districts were not left without improved land values if authorized to do so by a vote of their electors, and by the end of 1901 some sixty bodies, amongst them the city of Wellington, had made use of this permission. The income-tax is not levied on incomes drawn from land. In 1891 the tenure of members of the legislative council or nominated Upper House, which had hitherto been for life, was altered to seven years. In 1892 a new form of land tenure was introduced, under which large areas of crown lands were leased for 999 years, at an unchanging rent of 4% on the average value. Crown tenants under this system had no right of purchase. In the same year a law was also passed authorizing government to repurchase private land for closer settlement.

On Ballance's sudden death in April 1893 his place was taken by Richard Seddon, minister of mines in the Ballance cabinet, whose first task was to pass the electoral bill of his predecessor, which granted the franchise to all adult women. This was adopted in September 1893, though the majority for it in the Upper House was but two votes. In 1893 was enacted the Alcoholic Liquor Control Act, greatly extending local option. In 1894 was passed the Advances to Settlers Act, under which state money-lending to farmers on mortgage of freehold or leasehold land was at once begun. The money is lent by an official agent, which deals with applications and manages the finance of the system. In thirteen years the board lent out over five millions and a half, and received repayment of nearly two millions of principal as well as over one million in interest at 5%. Borrowers must repay 3% of their principal half-yearly, and may repay as much more as they choose. Profits are paid over to an assurance fund. No losses were incurred during the thirteen years above mentioned. The net profit made by the board in 1906 was £145,000. The same year also saw the climax of a series of laws passed by the Progressives affecting the relations of employers and workmen. These laws deal with truck, employers' liability, contractors' workmen, the recovery of workmen's wages, the hours of closing in shops and merchants' offices, conspiracy amongst trade unionists, and with factories, mines, shipping and seamen. In 1895 a law controlling servants' registry offices was added. In 1897 all shipowners engaging in the coasting trade of the colony were compelled to pay the colonial rate of wages.

Meanwhile the keystone of the regulative system had been laid by the passing of the Industrial Conciliation and Arbitration Act, under which disputes between employers and unions of workers are compulsorily settled by state tribunals; strikes and lock-outs are virtually prohibited in the case of organized workpeople, and the conditions of employment in industries may be, and in many cases are, regulated by public boards and courts. The years 1896, 1897 and 1898 were marked by struggles over the Old Age Pensions Bill, which became law in November 1898. In 1898 the divorce law was amended on the lines of the Stephen Act of New South Wales, a change which helped to treble the number of petitions for divorce in the next seven years. In 1898 also the
municipal franchise, hitherto confined to ratepayers, was greatly widened; in 1900 the English system of compensation to workmen for accidents suffered in their trade was adopted with some changes, one of the chief being that contested claims are adjudicated upon cheaply and expeditiously by the same arbitration court that decides industrial disputes. In 1895 borrowing on a large scale was followed, and twelve years later the debt stood at £1,000,000, to be reduced to £500,000 by 1904.

New Zealand, with its large number of unemployed, was one of the first to organize a government insurance office in 1899, the year that the Bill was passed in 1897.

The outbreak of the Boer War in October 1899 was followed by a large increase in the colony's exports; the war lasted until 1902, and in that year the Bank of New Zealand opened its doors.

The Bank of New Zealand was established in 1855 as a joint stock bank, and it remained in that form until 1907, when it became a registered bank.

The Bank of New Zealand has been one of the leading institutions in New Zealand, and its history has been marked by many changes and developments.

NEXT FRIEND

The governor's salary, reduced in 1887, was restored to £7,500 a year in 1900. An Immigrants' Exclusion Act was passed by the general assembly in 1886, but it did not receive the royal assent; but, by arrangement with the colonial office, another measure, giving power to impose a reading test on aliens landing in the colony, became law in 1899.

The New Zealand franchise was first extended to women in 1919, and in the same year the first woman member of the House of Representatives was elected. The first woman member of the House of Commons was elected in 1922.

The New Zealand Expeditionary Force was sent to the South African War in 1901, and in the same year the first woman member of the House of Representatives was elected.
as if he were an ordinary plaintiff, but he is not entitled to be heard in person.

NEY, MICHEL, duke of Elchingen, prince of the Moskowa (1759–1815), marshal of France, was born at Saarlouis on the 10th of January 1769. His father was a cooper, and he received only a rudimentary education. In 1788 he went to Metz and enlisted in a regiment of hussars; in 1792 he was elected lieutenant; and in 1794 he became captain and was placed by Kléber at the head of a special corps of light troops. He was soon promoted chef de brigade, and in 1796, after repeatedly distinguishing himself in action, general of brigade. He then commanded the right wing of Hoche's army on the Rhine. At the battle of Jena on 14th October 1799 he was mortally wounded and in his surprise of Mannheim in 1799 received the grade of general of division. He distinguished himself and received three wounds in the Swiss campaign of Masséna, and when Masséna turned against the Russians, who were approaching from Italy, Ney was left in command of the holding detachment opposite the Austrians. He displayed great vigour and skill in this work, and was completely successful, although his opponent was the famous Archduke Charles. In 1800 he was present at Hohenlinden. In May 1800 he was on the Rhine and凤凰, August, where his yon the front of Bonaparte's operations in Italy.

This event marks a change in Ney's political opinions which can only be explained by reference to Napoleon's power of captivating men. He was henceforward as ardent and sincere an admirer of Napoleon as hitherto he had been of revolutionary principles, and was one of the very few officers of the Army of the Rhine who became a trusted lieutenant of the emperor. He soon afterwards carried out an important diplomatic mission in Switzerland, and in 1803 he was placed in command of the camp of Montreuil. It was while there that, in the name of the army, he begged Napoleon to declare himself emperor and on the establishment of the empire he was made marshal of France, and received the grand eagle of the Legion of Honour. In 1805 he commanded the VI. corps of the Grand Army, and his great victory at Elchingen (for which in 1808 he was made duke of Elchingen) practically secured the surrender of the Austrians at Ulm. He was then ordered to the upper Adige, and missed the battle of Austerlitz, but was present at Jena and Eylau and led the decisive attack at Friedland. His reputation for personal heroism was by now at its height, and after Friedland Napoleon gave him the title by which he is still known, "the bravest of the brave."

In 1808, after the first disaster to the French armies in Spain, Ney accompanied Napoleon thither as commander of the VI. corps. He took part in the Peninsula War from 1808 to 1811, commanding his corps in Napoleon's own operations of 1808–09, in the irregular operations of Galicia 1809–10, and under Masséna in the invasion of Portugal in 1810–11. In the last, however, he quarrelled bitterly with his former chief, and although he distinguished himself very greatly in command of the rearguard during the retreat from Torres Vedras—notably at Redinha—he was recalled to France by Napoleon and censured for his indiscretion. Almost immediately, however, he was re-employed with the Grande Armée in central Europe under Napoleon himself. In the 1812 expedition to Russia Ney commanded the centre at Borodino, and was created prince of the Moskova on the evening of the victory. In the retreat he was a tower of strength, animating the rearguard with his own sublime courage, keeping the harassed and famished soldiers together under the colours and personally standing in the ranks with musket and bayonet. He was the last to retreat from the frontier, and threw the remaining muskets into the Niemen. In 1813 he commanded a corps in the German campaign, fought at Lützen, Bautzen, Dennewitz and Leipzig, and in 1814 he shared in the victories and defeats of the campaign in France. At the fall of the Empire Ney was neither the first nor the last of the marshals to give up the struggle, but that he acted in the negotiations in concert with Macdonald and Caulaincourt is sufficient proof of his desire to avert the unreserved abdication that was forced upon Napoleon by other circumstances. Less satisfactory than his conduct at this crisis was his loud protestation of devotion to the Bourbons, when the Restoration was a fait accompli. But he was soon mortified by the disdain of the returned émigrés, and retired to his country seat. While on his way thence to take up a command at Besançon, he learned of the return of Napoleon. He hurried at once to pay his respects to Louis XVIII. and to assure him of his fidelity. With the famous remark that the usurper ought to be brought to Paris in an iron cage, he proceeded to Lons-le-Saulnier to bar Napoleon's progress. But instead of doing so, he deserted with his troops, and Napoleon's march became a triumphal progress. Ney's act was undeniably wrong, and for years afterwards as a toady of Carignan, and that his émigré detractors saw fit to imagine. The first voice of his language, his ineffective efforts to make constitutional guarantees the price of his adhesion to Napoleon, and his final surrender to the dominant personality of his old leader, all show him to have been "out of his depth" in this political crisis. Napoleon received him kindly, but did not give him a command at first. But when the Waterloo campaign was about to begin he summoned Ney to the northern frontier. The marshal gladly obeyed and took up the command of the left wing on June 18th. Ney himself was, however, a leading émigré, and he took part in the campaign successively in the rôle of strategists, tactician and soldier (see WATERLOO CAMPAIGN). Much controversy has raged over his actions of the 18th and 16th of June. At Waterloo he was of course subordinated to the personal command of Napoleon, but his advice as to the conduct of the battle was often offered and sometimes accepted, and he personally led several charges of the French up to the British squares. But when all was lost, his courage, instead of burning brightly as in the Moscow retreat, was extinguished. He made no attempt to second Davout and Grouchy in the last days of Napoleon's reign, and in despair at the restoration of the Bourbons. Finding that Louis XVIII. and his allies ignored his advances, he resolved to escape from France, but afterwards, believing himself protected by the terms of the convention concluded on the 3rd of June, he gave up the idea. Soon a fresh order was issued denouncing him by name, and after a half-hearted attempt to conceal himself he was arrested on the 8th of August. King Louis and his minister Decazes realized to the full the lasting unpopularity that would fall on the monarchy in consequence; they had done their best to facilitate the escape of the "traitors", and eloquent appeal of the young duc de Broglie, the result of the trial before the latter body was a foregone conclusion; as to Ney's treason there could be no doubt, and de Broglie was alone in voting for his acquittal. In the early morning of the 7th of December 1815 Ney was shot in the Luxembourg gardens, near the Observatory. He met his death quietly and with a perfect soldierly dignity that effaced the memory of his political extravagances, and made him, next to Napoleon himself, the most heroic figure of the time. Much has been said as to
the share of the duke of Wellington in the trial and execution, and, rightly or wrongly, he has been blamed for allowing the Bourbons, when restored by the foreign bayonets that he controlled, to proscribe the soldiers who as soldiers had been included in all the old King's army.

Ney left materials for memoirs, but in an incomplete state. The Mémoires du maréchal Ney, published in 1833, were collected from these papers by his brother-in-law Gamot and by General Foix. They cover only the earlier part of his career, and end with the battle of Elchingen (October 1805). An edition in English was published the same year.


NEZ PERCÉS (in allusion to their custom of wearing nose-rings, &c.), a tribe of North American Indians of Sahaptian stock. They call themselves Shaptin (whence the stock name) but to other tribes were known as Choppunnish. Their former range was a large tract in eastern Washington and Oregon and central Idaho. Until 1837 they had been at peace with the whites. In 1857 a portion of their reservation having been taken from them, owing to the allegation that they had not contented the trappers with sufficient furs, which, two years later, caused the Nez Percés War. The disaffected portion of the tribe, numbering some 400 or 500, held out for several months against all the forces the government could bring up, but were finally captured on the Sweet Grass Hills, northern Montana. They were placed in Indian Territory, but in 1858 transferred, owing to their decrease through disease, to a healthier locality in northern Washington. The main tribe are on a reservation in northern Idaho.

NGAMI, the central point of an inland water system of South Africa, once forming a lake 20 m. long and 10 m. wide, but now little more than an expanse of reeds growing in a soft treacherous soil, below which brackish water is found. It is cut by 20°S. and 23°E. Ngami is the lowest point of a large depression in the plateau which comprises nine-tenths of Africa south of the Zambezi. The area which drains to it is bounded S. by the basin of the Orange, E. by the Matabele hills, N. by the western alluvial of the Zambezi. The greater part of the Ngami water-system lies, however, N.W. of the lake (which for convenience it may still be called) in the tableland of Angola and German South West Africa. In the high plateau of Bibe, in the hinterland of Benguela, rise two large rivers, the Okavango and the Kwito, which unite and discharge their waters into Ngami. From the N.E. end of Ngami issued the Botelle or Zuga, a stream which runs S.E. and drains towards the Makarikari marsh, from which there is no outlet.

Although Ngami has dried up since 1890 the Okavango and its tributary the Kwito remain large rivers. The Okavango is known in its upper course as the Kubango. Its most remote source lies in about 12°30' S. and 16°E. and its length is over 900 m. It flows first S., then S.E. and E. In about 18°S. and 20°E. it is joined on the north bank by the Kwito, a large navigable stream rising almost as far north as the Okavango. Its general course is S.E., but between 15° and 17° S. it flows S. and even S.W. Below the Kwito the Okavango confluent the Okavango, which is also joined by various streams from the S.W. (German territory), is a rapid stream with an average breadth of over 100 yds., and generally navigable as far as the Popa falls, in 21°50' E. In the dry season, the water-level is from 4 to 20 ft. below the banks, but these are overflowed during the rains. At this period, April-June, some of the surplus water finds its way (in about 10° S.) by the Magwekwa to the Kwanza or Linyanti (Zambesi system), to which it is conjectured, the whole body of water may have once flowed. Below the Magwekwa outlet the Okavango, now called the Tauke or Tioque, turns almost due S., enters a swampy reed-covered plain and is broken into several branches. In this region the effects of desiccation are marked. Through the swamps the river formerly entered Ngami. The last 20 m. of the old channel are now dry and devoted to grain crops. Above this point the waters of the Okavango are diverted eastward through a channel called Tamalakane to the Botelle, the river which, as stated above, formerly flowed out on the A. E., and the Botelle above this point being merely a succession of pools. Below the junction the river bed is 150 to 200 yds. wide. The banks are 25 to 30 ft. high, and form steep white walls of sand compacted with lime, behind which the dark green forest rises. The stream is fringed with reeds harbouring countless water-fowl. The Botelle, whose bed is about 100 m. in length, loses itself in a system of salt-panns—round or oval basins of varying size sunk to a depth of 30 to 45 ft. in the sandstone, and often bounded by steep banks. The outer pans are dry for a large part of the year. Next, the water system being filled only at the height of the flood-season in August. The Botelle, which receives in addition the scanty waters of the northern Kalahari, at this season reaches the Makarikari marsh. This marsh, occupying the N.E. corner of Bechuanaoland, also has feeders from the Matabele hills in the direction of Bulawayo. During the rains the marsh is converted into a large lake. Much of the water is lost by evaporation; much of it sinks into some subterranean reservoir.

The evidence of travellers is conclusive that the country around Ngami is drying up. The desiccation appears to be rapid. In 1849 Passage of the Livingstone River. Dr. Livingstone said that the Okavango formed a large method of considerable extent. Later travellers reported progressive decrease in the size of the lake and in 1896 Sir F. D. Lugard Dr. Livingstone's son, is told by the natives that the cessation of the river's flow was caused, about 1890, by a blocking of the channel by thousands of rafts.

Although the river system below the Magwekwa outlet of the Okavango is drying up, above that point there are long stretches of navigable water both on the Okavango and the Kwito, in all considerably over 1000 m. The Popa falls are the last of a series of six in a distance of 40 m., but none present serious engineering difficulties. The Magwekwa connection with the Zambezi is a mere 100 m. long, and for more than half its course flows through a deep well-defined bed with a minimum width of 100 yards. The fall to the Linyanti affluent of the Zambezi is only a few feet and the country presents no obstacles to the construction of artificial channels.

Ngami is within the British BechuanaLand protectorate, about 50 m. E. of the frontier of German South-West Africa. The district is the home of the Batawana tribe of Bechuana, with whom is stationed a European magistrate. The tribes living along the lower Okavango are tributary to the Bechuana, and the blocking of the river referred to was occasioned by their bringing to Ngami their annual tribute of corn.

See BECHUANA LAND AND KALAHARI. An account of the Ngami district was given in 1902 by the Government Printer of BechuanaLand (1902). Early books of travel consult C. J. Anderson's Lake Ngami (London, 1856) and The Okavango River (London, 1861).

NGAN-HUI (An-hwai or Gan-jhwo), an easterly province of China, which, together with Kiang-su and Kiang-si, forms the vice-royalty of Kiang-nan. It is bounded N. by Ho-nan, E. by Kiang-su and Cheh-kiang, S. by Kiang-si and W. by Hu-peh and Ho-nan. It covers an area of 48,461 sq. m., and contains a population of 23,600,000. Its principal city is Ngan-king on the Yangtsze Kiang, besides which it numbers seven other prefectural cities. One district city, Ho-fei, is noted as having been the birthplace of Li Hungchang (1822–1901). The southern half of the province, that portion south of the Yangtsze Kiang, forms part of the Nan-shan, or hilly belt of the south-eastern provinces, and produces, besides cotton, coal and iron ore, large quantities of green tea. There are also considerable forest areas. Ngan-hui is one of the most productive provinces of China. Over the whole of its southern portion tea is largely grown, notably in the districts of Hui-chow Fu, Tung-lu, Ta-tung and Wu-hu. The Yangtsze Kiang is the principal river of the province, and is of great importance for foreign commerce, supplying direct water communication between some of the principal ports of China, the districts and the neighbourhood of Hang-chow. The only other river of importance is the Hwai-ho (see CHINA : The Country). Wu-hu on the Yangtsze Kiang is the only open port in this province. From this port a railway runs S.E. to Wen-chow—an open seaport in Cheh-kiang province.
NIAGARA, a river of North America, running northward from Lake Erie to Lake Ontario, and carrying the discharge of all the Laurentian or Great Lakes, except Lake Ontario (see St. Lawrence River). It constitutes part of the boundary between the United States and Canada, separating the state of New York from the province of Ontario. It is navigable from its head to Chippawa, 16 m., and from Queenston to its mouth, 6 m. The intervening 9 m. include a series of rapids and the Falls of Niagara. On the right bank are Buffalo, Tonawanda, Niagara Falls, Lewiston and Youngstown, of New York; on the left bank, Chippawa, Niagara Falls, Queenston and Niagara-on-the-Lake, of Ontario.

The Falls of Niagara are justly celebrated for their grandeur and beauty, and are viewed every year by from 800,000 to 1,200,000 visitors. They are in two principal parts, separated by an island. The greater division, adjoining the left bank, is called the Horseshoe Fall; its height is 153 ft., and the length of its curving crest line is about 2600 ft. The American Fall, adjoining the right bank, is 162 ft. high and about 1400 ft. broad. The water, being supplied by a lake, is free from sediment, and its clearness contributes to the beauty of the cataract. In recognition of the importance of the waterfall as a great natural spectacle, the province of Ontario and the state of New York have retained or acquired title to the adjacent lands and converted them into parks, which are maintained at public expense for the convenience and pleasure of visitors. The cataract is thus a great aesthetic asset of the people of the world; but its perpetuity has been threatened because it is also a great economic asset of the bordering nations. The flow of water in the river at mean stage is 222,000 cub. ft. per second, at low stage 176,000 cub. ft. The descent of this stream at the Falls, and in the rapids just above them, affords a theoretic water power equal to nearly four million horse power, and it is estimated that three-fourths of this is practically available. The annual value of the power must be reckoned in millions of pounds sterling, at least, and possibly in tens of millions. In the utilization of this natural power a beginning has been made; about 15,000 cub. ft. of water per second are now used for the development of electric power, and much larger appropriations have been authorized. As the full development of the economic value involves the diversion of the river from its channel and the destruction of the cataract, as a scenic feature, the economic and aesthetic interests are antagonistic. An agitation started by the champions of scenic beauty led to negotiations looking to the regulation of economic exploitation by international agreement.

The river has no valley. The belt of land it crosses consists of two plains separated by a high cliff or escarpment facing towards Lake Ontario. The stream runs half its length on the upper plain, drops at the falls into a narrow gorge through which it courses 7 m. to the escarpment, and then traverses the lower plain, and the adjacent escarpment. The crest of the escarpment is a bed of limestone, nearly level, and this bed is visible in both walls of the gorge to the falls, where it is 60 ft. thick. From this firm brink the cataract plunges down into a deep pool or basin hollowed from the soft shale, and the resulting agitation causes further wear of the shale and the continual undermining of the limestone, which breaks away in blocks. Thus the site of the cataract retreats up stream and the gorge is lengthened; the average rate, measured from 1842 to 1905 being about 5 ft. a year. It is evident that the whole gorge has been dug out by the river, and many attempts have been made to determine the time consumed in the work.

The problem of the river's age is of much interest to geologists, because its solution would aid in establishing a relation between the periods and ages of geologic time and the centuries of human chronology. The great Canadian glacier, which in the late Pleistocene alternately crowded forward over the Great Lakes region and melted back again, so modified the face of the land by erosion and by the deposit of drift that the entire area had to be reconformed. The Niagara river came into existence when the waning of the glacier laid bare the western part of the Ontario basin, and the making of the gorge was then begun. If it were supposed that the lengthening of the gorge proceeded at a uniform rate, the computation would be easy, but there are various modifying conditions. (1) The limestone is not equally thick all along the gorge; in one place it is 90 ft., and in several places as little as 35 ft. (2) The height of the cataract has varied from 150 ft. to more than 300 ft. (3) For a short distance at the whirlpool the limestone and shale were replaced by softer material, sand and clay. The river here touched a more ancient gorge, which had previously been dug out and concealed by deposit of morainic drift. (4) The diagram shows the breach in the escarpment at St. Davids directed towards the sharp turn of the river gorge at the whirlpool. (5) The size of the river has varied. While the glacier was gradually melting the lakes underwent a complicated series of metamorphoses, and there were two separate epochs when the discharge from all the basins beyond Lake Erie followed other routes, and during these epochs the Niagara drained only one-eighth of its present area. The variation in the size of the river is the most important of the modifying conditions, and at the same time least amenable to computation.

Of the falls excavated by the full river are now marked by deep pools, the powerful cataract having dug far down into the shale. The parts eroded by the depleted river are comparatively narrow and shallow, the weaker cataract having been unable to clear away the low banks of the walls of the full river. The cutting of the falls by the main division of the present cataract, called the Horseshoe Fall, which wore its cliff back 335 ft. in 63 years. The work of the depleted river is less adequately represented by the narrower and shallower American Fall; where the present rate of recession is about one-twenty-fifth as fast. In making two-thirds of the gorge the full river probably consumed between 5000 and 15,000 years. If the depleted river worked one-tenth as fast, the period required for the remaining third was five times as long; but the relative rate is wholly conjectural. A weighing of the evidence now available indicates 25,000 years as a lower limit for plausible estimates of the age of the river, but yields no upper limit.


NIAGARA, FORT, an American fortification, on the E. side and at the mouth of Niagara river, opposite the Canadian village
NIAGARA FALLS—NIAM-NIAM

of Niagara, or Niagara-on-the-Lake. Fort Niagara has a reservation of 288 acres, with fairly modern equipments, several historic buildings of the time of French and of British possession, in one of which, the old magazine (1757), Williams Morgan was imprisoned in 1826. Fort Niagara was being, especially during the French occupation of Canada, one of the most important forts in North America, being the key to the Great Lakes, beyond Lake Ontario. "This immense extent of inland navigation," says Parkman, "was safe in the hands of France so long as she held Niagara. Niagara lost not only the lakes but also the valley of the Ohio was lost with it." René Robert Cavelier, Sieur de la Salle, wintered here in 1678-9, built his ship the "Griffon," and established a trading post and Fort Conti, destroyed not long afterwards. Fort Denoville, built in 1685 by Jacques René de Breyssy, marquis de Denonville, governor-general of Canada, in his cruel campaign against the Iroquois, was abandoned in 1688, after the garrison, commanded by Pierre de Troyes (d. 1687), had been wiped out by an epidemic. The first Fort Niagara, to be so named, was built in 1725-1727 at the instance of Charles le Moyne, 1st baron of Longueuil (1659-1790), and became a very important military and trading post; the fort was re-built by François Pouchot (1712-1769) in 1756, but in July 1759, after a siege of about sixteen days, it was surrendered to Sir William Johnson of New York and the Mohawks in return for help in the time of General Sullivan's expedition into western New York in 1779. The fort was not surrendered to the United States until August 1796. In the War of 1812 it was bombarded by the guns of Fort George (immediately across the river in the town now called Niagara, then Newark) on the 13th and 14th of October 1812; was the starting-point of the American expedition which took Fort George on the 27th of May 1813; and on the 9th of December 1813 was surprised and taken by assault—most of the garrison being killed or taken prisoners—by British troops under General Broadhead (1758-1826) who had previously returned to Fort George. After the close of the war, on the 27th of March 1815, Fort Niagara was restored to the United States, and a garrison was kept there until 1826. The fort was regarrisoned about 1836.

See F. H. Severance, Old Trails on the Niagara Frontier (Buffalo, 1903), Parkman's works, especially Montcalm and Wolfe (2 vols., Boston, 1884), and The Conspiracy of Pontiac (2 vols., Boston, 1851); and a pamphlet by Peter A. Porter, A Brief History of Old Fort Niagara (Niagara Falls, 1896).

NIAGARA FALLS (formerly Clifton or Suspension Bridge), a town and port of entry of Welland county, Ontario, Canada, 40 m. S.S.E. of Toronto, on the west bank of the Niagara river and opposite the Falls. Pop. (1901) 4244. It is a station on the Grand Trunk, Michigan Central and St Catharines & Niagara Central railways, and has electric railway communication with the chief towns in the neighbourhood. Three large steel bridges connect it with the American town of Niagara Falls on the opposite side. Its importance is chiefly due to the tourist traffic, but the unrivalled water power is being more and more employed. Factories have sprung up, and power is transmitted to Toronto and other cities. A beautiful park, named after

Queen Victoria, extends along the bank of the river for 2 M. above the Falls.

NIAGARA FALLS, a city of Niagara county, New York, U.S.A., on the E. side of the Niagara river, at the Falls, 22 m. N.N.W. of Buffalo. Pop. (1900) 19,457, of whom 7326 were foreign-born, (1910 census) 30,445. The city is served by the New York Central & Hudson River, the Wabash, the Erie, the Lehigh Valley, the West Shore and the Michigan Central railways, and by the International Electric railway and the Niagara, St Catharines & Toronto (electric railway). The city extends along the level summit of the cliffs from above the Falls to some 3 m. below. The river is here crossed by three bridges; the upper (steel) arch bridge, built (1853) on the site of the former bridge, and the lower (steel) arch bridge (rebuilt in 1896, as a suspension bridge) near the Falls, is crossed by double carriage ways and by an electric railway, and is probably the longest bridge of the kind in the world, being 1240 ft. long with an arch span of 840 ft.; and 13 M. farther down the river are two railway bridges, the Michigan Central's cantilever bridge, completed in 1883, and the (lower) single steel arch bridge (completed in 1897, on the site of John A. Roebling's suspension bridge built in 1851-1856) of the Grand Trunk railway, which has a terminus at Niagara Falls (Clifton), Ontario, and connects here with the New York Central & Hudson River and the Lehigh Valley railways.

The principal buildings of the city are the Niagara Falls Memorial Hospital, the Federal Building and the Niagara Falls Power Co. Building. The city has a Carnegie library, De Veaux College (Protestant Episcopal, chartered in 1853), and Niagara University, a Roman Catholic institution, founded in 1856 by the priests of the Congregation of the Mission and incorporated in 1863 as the Seminary of Our Lady of Angels, a name still used for the theological department, but displaced, since the charter of the university in 1883, by the present name. In the extreme W., part of the city, is the state Niagara Park, which includes Goat Island immediately S., and several smaller islands, has been, since 1885, the "New York State Reservation at Niagara Falls." From the Falls, which gave the city its first importance as a stopping place for tourists, valuable electric and hydraulic power is derived (by a tunnel 29 ft. deep and 18 ft. wide, passing about 200 ft. under the surface of the city, from the upper steel arch bridge to a point 1 M. above the Fall, and by the canal of the Niagara Falls Hydraulic Power and Manufacturing Company). Niagara Falls is an important manufacturing city; the value of its manufactured products increased from $8,450,184 in 1900 to $16,015,786 in 1905, or 98.1%.

The city is the shipping centre for the W., part of Niagara county. The village of Niagara Falls was for a time called Manchester. In 1892 the village of Suspension Bridge (formerly Niagara City) was joined with it under a city charter, which has been frequently amended.

NIAM-NIAM (Zandeh, A-Zandeh), a people of Central Africa, of mixed Negroid descent. With kindred tribes, they stretch from the White Nile above the Sobat confluence to the Shari affluent of Lake Chad, and from the Bahr-el-Abar, about 10° N., nearly to the equator. Their political ascendancy, weakened by the incessant attacks of the Arab-Nubian slave-raiders, which followed the rise of the Sudanese maddi in 1888, was afterwards broken by the forces of the Congo Free State and the Anglo-Egyptian Sudan.

The term Niam-Niam appears to be of Dinka origin, meaning in that language "great eaters," with reference, as is supposed, to their cannibalistic propensities. They are called Babangures by the Mangbetu (Monhutta), A-Madyaka by the Diur, Mundo or Manyan at the Bongo, Makaraka or Kakarka by the Mittu. But Niam-Niam has been adopted and generalized by the Sudan and Nubian Mahommedans. Their native name is Zandeh (pl. A-Zandeh), which is current throughout the eastern Niam-Niam domain, a region estimated by Georg Schweinfurth, who visited the country in 1870, at about 48,000 sq. m., with a population of at least two millions. But these by no means constitute a uniform ethnic group, for within this area is the large Madi nation, differing altogether in speech and even
in some respects physically from the ordinary Niam-Niam type. Apart also from numerous tribal divisions, the eastern Niam-Niam proper form three very distinct branches. The bleak northern highlands bordering east on the Bongo and north on Dar-Ferrat are occupied by the Banda Niam-Niam. To the southwards are the dark races featuring the Niam-Niam, and very white the fertile hilly territory of the Nile-Congo watered. Very different from either are the so-called "White" Niam-Niam, neighbours of the Madi of the Makua-Welle river basin. Their complexion is of a lighter bronze tint, and they are distinguished from the other branches of the family by their tall stature, symmetrical figure, long kinked hair and beard and higher social culture. They wear cotton garments, obtained by barter for ivory, copper and iron, and have a tendency to political unity under one chief.1

There is, however, a very distinct Niam-Niam type, one of the most marked in the whole of Africa. "These beings," remarks Schweinfurth, on his first introduction to them, "stood out like creatures of another world... a people of a marked and most distinct nationality, and that in Africa and amongst Africans is saying much. They are of medium height and powerful build. The great space between the eyes, which are almond-shaped and slightly slanting, gives them a peculiar expression. They have a very short nose, with correspondingly long upper lip; woolly hair; a very round head, agreeing in this respect with the Bongo of the Bahr-el-Gazal but differing from the great majority of the Niam-Niam. Of this ethnical group, the jaw-projection and altogether more regular than the typical Negro; of a ruddy brown or chocolate colour, scarcely ever black, but occasionally bronze and even olive.

The average Niam-Niam is distinguished by some excellent qualities, such as frankness, courage, an instinctive love of art, and above all a genuine and lasting affection for his women, such as is betrayed by no other African race. By tribal custom the men are all hunters, armed with long knives and spears and carrying oblong shields of wicker-work; the women all tillers of the soil, with little toil yields abundant crops of cereals, yams, manioc, colocasia and Virginian tobacco. Both sexes wear large pins of ivory, iron, monkey or human bone stuck in their hair, and stain their skin with red camwood and the oil of a wild berry. The Niam-Niam are intelligent, skilful builders, and proficient in many native industries. Prominent among these are their earthenware vessels, which display considerable symmetry; iron smelting and metal work, such as swords, knives and spears; wood carvings, such as stools, benches, bowls and tobacco pipes, of varied and intricate design and often admirable works of art. They are great smokers, and very fond of music. Of the ox, horse, ass or camel they have no knowledge; the only domestic animals are poultry, and a breed of dogs, like small wolf-hounds, with smooth red hair, twisted tail like a pike's, large ears, pointed nose and four-clawed hind feet. These curious little "greyhounds" join in the chase with small wooden bells round the neck, and are thus soon found when lost in the woods.

The Niam-Niam are distinguished by their elaborate headdress dresses (they formerly wore a sort of big full-bottomed wig, and D.R.*, they are almost always with these), and their various tattoo markings—square patterns on forehead, temples or cheeks.

1 About the middle of the 19th century, most of the eastern Niam-Niam lands appear to have been subject to Yapati, son of Mabeche. But after his death they were distributed amongst his seven sons, Renji, Bala, Perkye, Tombo, Bazimby, Manuba; and in 1870 there were already fourteen reigning princes of this dynasty, besides several of doubtful relationship with the line of Mabeche. In the Niam-Niam districts visited by the traders from the Egyptian Sudan they lived at that time altogether as many as thirty-five independent chiefs. But reports were current of a very powerful "sultan" named Mofo, whose empire lay some 300 m. farther west. Another large state, founded in the Welle region by Kipa (Kita), brother of Yapati, also fell to the traders of this period. The powerful chiefs Bakangoi and Kanna, visited in 1883 by G. Casati, were sons of this Kipa, whose grave near Kanna's village was still watched by twenty-five "vestals," bound, under penalty of death, to keep a fire constantly burning, and to preserve their chastity inviolate (Esploratore, August 1883).
such crafts as weaving and metal-work, as well as in agriculture and road-making. Coco-nut oil is produced on Nias and also more especially on the Nako group. A Dutch commissioner is established at Gunong Sitolli on the east coast, a settlement of Macassar Chins.

**NIBELUNGENLIED, or DER NIBELUNGE NÖT, an heroic epic written in a Middle High German dialect. The story on which the poem is based belongs to the general stock of Teutonic saga and was very widespread under various forms, some of which are preserved. Thus it is touched upon in *Beowulf* and fragments of it form the most important part of the northern *Eddas*, the poems of which evidently assumed that the tale as a whole was well known and that their hearers would be able to put each piece in its proper place. In the prose *Edda*, or *Volsunga Saga*, which, though largely primitive in spirit, dates from the 12th century, it is set forth in full. The substance of this Norse version is as follows:—

The three Anses—Odin, Loki and Hóðr—sat an after devouring a salmon beside a waterfall. They killed and skinned the otter and, taking the skin with them, sought shelter for the night with Rodmar the giant. But Rodmar recognized the skin as that of his son, and demanded that the men should be given enough to last completely. Loki therefore went upon the road where Andvari was guarding a treasure, caught him in a net, and forced him to surrender his hoard. But the piled-up gold left one hair exposed, and Odin and the young hero Regin forced Andvari to append to his hoard a magic ring which had the virtue of breeding gold. Thereupon Andvari, enraged, laid upon the hoard and all who possessed it a curse. This curse, the *Lettomotiv* of the whole story, began with the extraction of the teeth of the treacherous queen, slain by his sons Fafnir and Regin; and Fafnir, seizing the whole, retired to a seashore and, in the form of a snake or dragon, bore the treasure and the hoard of his share, plotted vengeance and the conquest of the treasure.

To Regin, a notable smith, was sent Sigurd—son of the slay hero Sigmund the Volsung and his wife Hiortis, now wife of the Danish king FREDERIK, and because of him Sigurd told of Fafnir and the hoard, and the young hero offered to go out against the dragon if Regin would weld him a sword. But every brand forged by the smith broke under Sigurd's stroke; till at last he fetched the fragrant ash-wood of the oak. Regin wrought it into a sword, which had carefully treasured. These Sigurd forged into a new sword, so hard that with it he could cleave the anvil and so sharp that it would sever a flock of wool. Boating against it down stream; and, as so armed, he sought and slew the dragon. But while roasting Fafnir's heart, which Regin had cut out, Sigurd burned his finger with the boiling fat and, placing it to his lips, found that he could understand the language of birds and beasts. To him, being a lover of natural history and a fair seer, this was a treasure. The smiths of his time, to his mind, were only smiths—poor folk of the trade. Odlin, set out upon his travels.

Gudrun, the daughter of Attila, in whose story Sigurd found the Valkyrie Brunhild in an enchanted sleep, and ravished by her beauty awakened her; they plighted their troth to each other and, next morning, Sigurd left her. But when his journey took him to the hall of Guðrún, a king in the Rhine country, Sigurd formed a friendship with his three sons, Gunnar, Hogni and Góðrún; and, in order to retain so valuable an ally, it was determined to arrange a match between him and their sister Gudrún. Queen Grímnir, skilled in magic, therefore gave him an enchanted drink, which caused him to forget Brunhild. Gunnar, on the other hand, wished to make Brunhild his wife, and asked Sigurd to ride with him on this quest, which he consented to do on condition of receiving Gudrún to wife. They set out; but Gunnar was unable to pass the circle of fire round Brunhild's abode, the achievement that was the condition of winning her. So Sigurd, after a shape of the magic horse, and in sign of troth exchanged rings with the Valkyrie, giving her the ring of Andvari. So Gunnar and Brunhild were wedged, and Sigurd, resuming his own form, rode back with them to Gudrún. They gave on this occasion a splendour of festivity that was never equalled; but Brunhild was moody and suspicious, remembering her troth with Sigurd and believing that he alone could have accomplished the quest.

One day the two queens, while bathing in the river, fell to quarrelling. Their mothers in arms was the greater. Brunhild taunted Gudrun with the fact that Sigurd was Gudrun's vassal, whereupon Gudrun retorted by telling her that it was not Gunnar but Sigurd who was her husband and held the ring, which she had given to him. Then Brunhild "waxed as wan as a dead woman, and spoke no word the day long." Maddened by jealousy and wounded pride, she now incited the three kings to murder their wives' powers, their eldest, as bound to him by blood-brotherhood, refused; but the youngest, Gunnar, who had sworn oaths, consented to do the deed. Twice he crept into Sigurd's chamber, but died when he found the hero awake and gazing at him with flashing eyes.

The third time, finding him asleep, he stabbed him; but Sigurd, before he died, had just strength enough to hurl his sword at the murderer, whom it killed. Brunhild watched the deed with gathering of amazement, while Sigurd Gudrun waiting, laughed aloud. But her love for Sigurd was great as ever, and she determined not to survive him; distributing her wealth to her handmaidens, she Chantred Sigurd's funeral pyre, slew herself with his sword, and was burnt with him.

In course of time Gudrun married Atti (Attila), king of the Huns, Brunhild's brother. Atti, intent on getting hold of the hoard, which Gunnar and Hogni had managed to come to his court, though with the spite of her sister's warnings they came, after sinking the treasure in the Rhine. On their refusal to surrender the hoard, or to say where the treasure might be concealed, the three kings forced the! in which the followers of Gunnar and Hogni fell. Atti then offered to spare Gunnar's life if he would reveal his secret; but Gunnar refused to do so till he should see the heart of Hogni. The heart of a slave was his first present, and that he could not be Hogni's, since it quaked. Hogni's heart was then cut out, the victim laughing the while; but when Gunnar saw it he cried out that now he alone is where the hoard was and that he would never reveal the secret. His hands were then bound, and he was cast into a den of venomous serpents; but he played so sweetly on the harp with his toes that he charmed the reptiles, except one adder, by which he was stung to death. Gudrun, however, avenged the death of her brothers by slaying the sons she had borne to Atti and causing him unwittingly to drink their blood and eat their hearts. Finally, in the night, she killed Atti himself and burned his hall; then, leaping into the sea, the sacred waters to which his hands had consecrated the numberless adventures not connected with those recorded in the *Nibelungentia*.

This story, in spite of the late date of the *Volsunga Saga* and of added elements due to the imagination of its author, evidently represents a very primitive version. In the *Nibelungen* story, on the other hand, though its extant versions are of much earlier date, and though it contains elements equally primitive not found in the other, the spirit and the motives of the earlier story have to a large extent been transmuted by later influences, the setting of the story being—though by no means consistently—medieval rather than primitive. Thus the mysterious hoard is all but lost sight of; no mention is made of the curse attached to it; and it is only as an afterthought that Siegfried (Sifrit) is described as its master. Everywhere the supernatural elements are eliminated or subordinated, and the story becomes a drama of human motives, depending for its development on the interplay of human passions and activities.
The primitive setting of the northern version has vanished utterly. Sigurd is king of the Netherlands; the boy Siegfried is brought up by "wise men that are his tutors" (Avent. i.); and when, attracted by the fame of Kriemhild's beauty, he rides to Worms to woo her, it is as the typical handsomely, accomplished and chivalrous king's son of medieval romance.

It is at this point (Avent. iv.) that some of the primitive effects of the story are suddenly and awkwardly introduced. As Siegfried approaches Worms, Kriemhild's brothers, the Burgundian kings Gunther, Giselher and Gernot watch his coming, and to them their faithful retainer, "the grim Hagen," explains who he is. This, he exclaims, can be no other than the hero who slew the two kings of the Nibelungs, Schlubne and Nibelune, and seized their treasure, together with the sword Balmunc and the tarnkappe, or cape of darkness, which has the virtue of making him who wears it invisible. Another adventure, too, he can tell of him, namely, how he slew a dragon and how by bathing in its blood his skin became horn-like, so that no weapon could wound him, save in one place, where a Linden leaf had fallen upon him as he stooped, so that the blood did not touch this spot.

In spite of Hagen's distrust and misgivings, Siegfried now fights as the ally of the Burgundians against the Saxons (Avent. iv.), and undertakes, on condition of receiving Kriemhild to wife, to help Gunther to woo Queen Brunhild, who can only be won by the man who can overcome her in three trials of strength (Avent. vi.). Siegfried and Gunther accordingly go together to Brunhild's castle of Istenstein in Iceland, and there the hero, invisible in his tarnkappe, stands beside Gunther, hurling the spear and putting the weight for him, and even leaping with Gunther in his arms, far beyond the utmost limit that Brunhild can reach (Avent. vii.). Brunhild confesses herself beaten and returns with the others to Worms, where the double marriage is celebrated with great pomp (Avent. x.). But Brunhild is ill-content; though she saw Siegfried do homage to Gunther at Istenstein she is not convinced, and believes that Siegfried should have been her husband; and on the bridal night she vents her ill humour on the hapless Gunther by tying him up in a knot and hanging him on the wall. "I have brought the evil devil to my house!" he complains to Siegfried next morning; and once more the hero has to intervene; invisible in his tarnkappe he wrestles with Brunhild, and, after a desperate struggle, takes from her her girdle and ring before yielding place to Gunther. The girdle and ring he gives to his wife Kriemhild (Avent. x.).

One day, while Siegfried and his wife were on a visit to the Burgundian court, the two queens fell to quarrelling on the question of precedence, not in a river but on the steps of the cathedral (Avent. xiv.). Kriemhild was taunted with being the wife of a youthful knight, and with her youth and beauty; whereon, she showed Brunhild the ring and the golden girdle taken by Siegfried, proof that Siegfried, not Gunther, had won Brunhild. So far the story is essentially the same as that in the Volusunga saga; but now the plot changes. Brunhild drops out, becoming a figure altogether subordinate and shadowy. The death of Siegfried is compassed, not by her, but by the "grim" Hagen, Gunther's faithful henchman, who thinks the glory of his master unduly overshadowed by that of his vassal. Hagen easily persuades the weak Gunther that the supposed insult to his honour can only be wiped out in Siegfried's blood; he worms the secret of the hero's vulnerable spot out of Kriemhild, on pretence of shielding him from harm (Avent. xv.), and then arranges a great hunt in the forest, so that he may slay him when off his guard.

The 16th Aventiure, describing this hunt and the murder of Siegfried, is perhaps the most powerful scene in all epic poetry. To heighten the effect of the tragic climax the poet begins with a description of the hunting, and describes the high spirits of Siegfried, who captures a wild boar, rides back with it to camp, and there lets it loose to the great discomfiture of the cooks.

When the hunters sat down to feast, it was found that the wine had been forgotten. Hagen thereupon proposed that they should race to a spring of which he knew some way off in the forest. Siegfried readily agreed, and though handicapped by carrying shield, sword and spear, easily reached the goal first, but waited, with his customary courtesy, until the king had arrived and drunk before slaking his own thirst. Then, laying aside his arms, he stooped and drank. Hagen, seizing the spear, thrust it through the spot marked by Kriemhild on Siegfried's surcoat. The hero sprang up and, finding that his sword had been removed, attacked Hagen with his shield.

Though to death he was wounded he struck so strong a stroke That from the shattered shield-rim forthwith out there broke Showers of flashing jewels; the shield in fragments lay.

Then reproaching them for their cowardice and treachery, Siegfried fell dying "amid the flowers," while the knights gathered round lamenting. At this point two stanzas may be quoted as well illustrating the poet's power of dramatic characterization:

The king of the Burgundians he too bewailed his death: Then spake the dying hero: "Nay, now you waste your breath! You weep for an ill fortune that you yourself have wrought: That is a shameful sorrow: it were better you said nought!"

Then out spake the grim Hagen: "I know not why ye plain: This is for us the ending of sorrow and of pain. Full few are left of men that dare withstand us now. Glad am I that the hero was by this hand of mine laid low!"

This account of the death of Siegfried, which embodies the ancient German tradition, is far finer than the northern version, according to which Hagen kills the hero in his bed. The whole spirit of this Aventiure is Teutonic rather than medieval. The same is true, indeed, of the whole of the rest of the poem. Siegfried, to be sure, is buried with all the pomp of medieval Catholic rites; but Kriemhild, while praying for his soul like a good Christian, plots horrible vengeance like her pagan prototype. With this significant difference, however: Gutrun revenged upon her husband the death of her brothers; Kriemhild seeks to revenge upon her brothers the death of her husband. The Catholic bond of marriage has become stronger than the primitive Teutonic bond of kinship. Mistress now of the inexhaustible board of the Nibelungs, Kriemhild sought to win a following by lavish largesses; but this Hagen frustrated by seizing the treasure, with the consent of the kings, and sinking it in the Rhine, all taking an oath never to reveal its hiding-place, without the consent of the others, so long as they should live (Avent. xix.). At last, however, after thirteen years, Kriemhild's chance came, with a proposal of marriage from Etzel (Attila) king of the Huns, whom she consented to marry on condition that he would help her to vengeance (Avent. xx.). Then more years passed; old feuds seemed to be forgotten; but the Burgundian kings, in spite of Hagen's warnings, thought it safe to accept their sister's invitation to visit her court (Avent. xxiii.-xxiv.).

The journey of the Burgundians into Hunland is described by the poet at great length (Avent. xxv.-xxvii.). The story is full of picturesque detail and stirring incident, full also of interesting problems in folk-lore and mythology; and throughout it is dominated by the figure of the grim Hagen, who, twitted with cowardice and his advice spurned, is determined that there shall be no turning back and that they shall go through with it to the end. With Etzel he feigns friendship, and when he ferries the boat over the Danube and then, when the last detachment is crossed, destroys the boat, so that there may be no return. At Attila's court (Avent. xxviii.) it is again Hagen who provokes the catastrophe by taunting Kriemhild when she asks him if he has brought with him the board of the Nibelungs:

"The devil's what I bring you!" Hagen then replied, "What with this heavy harness and my shield beside, I had enough to carry: this helmet bright I brought: My sword is in my right hand, and that, be sure, I bring you not!"

The sword was Siegfried's. It is Hagen, too, who after the
first onslaught of the Huns strikes off the head of Orlieb, the son of Etzel and Kriemhild, and who, amid the smoke and carnage of the burning hall, bids the Burgundians drink blood if they are thirsty.

Besides Hagen, during the ride into Hunland and in the final fight, another figure comes to the front, that of Volkêr the Fiddler, so far only mentioned as a hero of the Saxon war in Avant. ii. He rides fiddling at the head of the host; he plays to the weary warriors in the intervals of the battle in the court of Etzel's palace; but he is also expert at performing other music, with "a strong fiddle-bow, mighty and long, like to a sword, exceeding sharp and broad." He is the type of the medieval knightly minstrel of the age of the Minnesang.

But for all their prowess, after a prolonged struggle (Avant. xxix.-xxxvii.), the Burgundians were at last overwhelmed. Most of the chief figures of heroic saga had come up against them: Attila, Hildebrand, the Ostrogoth Theodoric (Dietrich von Bern). To the last-named even Hagen armed with Siegfried's sword had to yield (Avant. xxxviii.). Kriemhild came to him as he lay in bonds and demanded the Nibelung treasure. He refused to reveal its hiding-place so long as Gunther, also a prisoner, should live. Gunther was accordingly slain by the queen's orders and his head was brought to Hagen, who cried out when he saw it that all had been accomplished as he had foretold: "Now none knows where the hoard is save God and I alone: The devil-woman, shall nevermore be known!"

Whereupon Kriemhild slew him with Siegfried's sword. But Kriemhild was not destined, like Gudrun, to set out on further adventures. Hildebrand, horrified at her deed, sprang forward and cut her to pieces with his sword.

In sorrow now was ended the king's high holiday, As ever joy in sorrow ends and must end alway.

To some MSS. of the Nibelungenlied is added a supplementary poem called the Klage or Lament, a sequel to 2160 short-line couplets, describing the lament of the survivors—notably Etzel—over the slain, the burying of the dead, and the carrying the news to the countries of the Burgundians and others. At the end it is stated that the story was written down, at the command of Bishop Pilgrim of Passau, by a writer named Konrad (Kuonrat) in Latin, and that it had since been sung (geleicht) often in the German tongue.

Sources of the Story.—The origin and nature of the various elements that go to make up the story of the Nibelungenlied have been, and continue to be, the subject of very lively debate. The view at one time most generally accepted was that first propounded by Karl Lachmann in his "Kritik der Sage von den Nibelungen " (Reichsmuseum für Philologie, Num. 249, 250, 1839), and published in his Zu den Nibelungen. Namely, that the story originated a myth of the northern gods, modified into a heroic saga after the introduction of Christianity, and intermingled with historical elements. This view is maintained by Richard von Muth in his Einleitung in das Nibelungenlied (Paderborn, 1877), who thus sums up the result of his critical researches: "The basis of all is an old myth of a beneficent divine being (Siegfried), who conquers daemonic powers (the Nibelungen), but is slain by them (the Burgundians turned Nibelungen); with this myth was connected the destruction of the Burgundian kingdom, ascribed to Attila, between 437 and 455, and later the legend of Attila's murder by his wife; in this form, after Attila and Theodoric had been associated in it, the legend penetrated, between 552 and 583, to the North, where its second part was developed in detail on the analogy of older sagas, while in Germany a complete change of the old motif took place." To this theory the objection is raised that it is but a theory; that it is unsupported by any convincing evidence; and that the process which it postulates, that, namely, of the transformation of the gods into heroes by the popular imagination, is contrary to all that we know of the fate of dechowned deities, who are apt to live on in fairy stories in very unheroic guise. So early as 1783 Johannes von Müller of Götttingen had called attention to the historical figures appearing in the Nibelungenlied, identifying Etzel as Attila, Dietrich of Bern as Theodoric of Verona, and the Burgundian kings Gunther, Giselhêr and Gérot as the Gun-daharius, Gislabarius and Godomar of the Lex Burgundorum; in 1820 Julius Leichtlen (Neuauflage eines Bruchstücks des Nibelungenliedes, Freiburg-im-Breisgau) roundly declared that "the Nibelungenlied rests entirely on a historical foundation, and that any other attempt to explain it must fail." This view was, however, overborne by the great authority of Lachmann, whose theory, in complete harmony with the principles popularized by the brothers Grimm, was accepted and elaborated by a long series of critics. It is only of late years that criticism has tended to revert to the standpoint of Müller and Leichtlen and to recognize in the story of the Nibelungen as a whole a misty and confused tradition of real events and people. Mythical elements it certainly contains; and to those figures which—like Siegfried, Brunhild, Hagen and the "good margrave" Ruedegir (Ruediger: the Burgundians cannot be traced definitively to historical originals, a mythical origin is still provisionally ascribed. But criticism is still busy attempting to trace these also to historical originals, and Theodor Abelting (Das Nibelungenlied, 1907) makes out a very plausible case for identifying Siegfried with Segeric, son of the Burgundian king Sigimund, Brunhild with the historical Brunichildis, and Hagen with a certain Hagnericus, who, according to the Life of St Columban, guided the saint (the chaplain of the Nibelungenlied), who had incurred the enmity of Brunichildis, safe to the court of her grandson Theoden von der Warn. Theodor Abelting has also suggested that the Nibelungen story is one among many; but, as it is one of the latest and not the least ingenious, it deserves mention. That the Icelandic Eddas contain the oldest versions of the legend, though divided and incomplete, is universally admitted. It is equally well established, however, that Iceland could not have been its original home. This Herr Abelting locates among the Franks of what is now southern France, whence the stories spread, from the 6th century onwards, on the one hand across the Rhine into Franiacon, on the other hand westwards and northwards, by way of Ireland—at the time in close intercourse with continental Europe—and the northern islands, to Iceland. Hence the two traditions, the German and the Icelandic, of which the latter alone is preserved in something of its primitive form,1 though primitive elements survive in the Nibelungenlied.

The basis of the story is then, according to this view, historical, not mythical: a medley of Franco-Burgundian historical traditions, overlaid with mythical fancies.2 The historical nucleus is the overthrow of the Burgundian kingdom of Gun-dahar by the Huns in 436; and round this there gathered an accretion of other episodes and details. These are, however, distorted by a naïve disregard of chronological possibility: the murder of Segeric (c. 525), the murder of Sigimund by the sons of Chrothildis, wife of Clovis (identified by Abelting with Kriemhild), the murder of Attila by his Burgundian wife Ildico (see Kriemhild). In the Eddas the identity of the original Franco-Burgundian sagas is fairly preserved. In the Nibelungenlied, on the other hand, the influence of other wholly unconnected stories is felt: thus Hildebrand appears during the final fight at Etzel's court, and Theodoric the Great (Dietrich von Bern; see Tritschauer), for whom he was called in the German legend, is sent him to exile there, and that he must have been there when the Burgundians arrived.

Origin of the Poem.—The controversy as to the underlying elements of the Nibelung legend extends to the question of the authorship and construction of the poem itself. It was from the first—whatever additions and interpolations may have

1 The Eddas were first written down, as is commonly assumed, by Bishop Saemund Sigfusson (1055—1133).
2 The process of this overlaying is easy to realize if we remember how usual it was to transfer characteristics and episodes drawn from immemorial folk-tore to successive historical personages. A good example is the "Swan-maiden" myth connected with the house of Bouillon (see Loiengrin). See also other interesting cases cited in the chapter on the "Geste of John de Courci" in Mr. J. H. Round's Fierzage and Pedigree (London, 1910).
followed—conceived as a single, coherent story, or is it based on a number of separate stories, popular ballads akin to the *Eddas*, which the original author of the *Nibelungenlied* merely collected and strung together? The answer to these questions has been sought by a succession of scholars in a critical comparison of the medieval MSS. of the poem still surviving. Of these 33 are now known, of which 10 are complete, the rest being more or less fragmentary. The most important are: (1) a first discovered, viz. the MSS. lettered C (Hohenems, 1755), B (Schloss Werdenberg, 1769), A (Hohenems, 1779); and round these the others more or less group themselves. They exhibit many differences: put briefly, C is the most perfectly finished in language and rhythm; A is rough, in places barbarous; B stands half-way between the two. Which is nearest to the original? Karl Lachmann (Zur den Nibelungen und zur Klage, Anmerkungen, 1836) decided in favour of A. He applied to the *Nibelungenlied* the method which Friedrich August Wolf had used to resolve the *Iliad* and *Odyssey* into their elements. The poem, according to Lachmann, consisted of two hundred popular ballads, originally handed down orally, but written down about 1190 or 1200. This original is lost, and A—as its roughness of form shows—is nearest to it; all other MSS., including B and C, are expansions of A. The great authority of Lachmann made this opinion the prevalent one, and it still has its champions. It was first seriously assailed by Adolf Holtzmann (Untersuchungen über das Nib., Stuttgart, 1834), who argued that the original could not have been strophic in form—the fourth lines of the strophes are certainly often of the nature of "padding"—that it was written by Konrad (Krohnert of the Klage), writer to Bishop Pilgrimm of Passau about 970–984, and that of existing MSS. C is nearest to this original, B the copy of a MS. closely akin to C, and A an abbreviated, corrupt copy of B. This view was adopted by Friedrich Zarncke, who made C the basis of his edition of the *Nibelungenlied* (Leipzig, 1856). A new hypothesis was developed by Karl Bartsch in his Untersuchungen über das Nibelungenlied (Leipzig, 1865). According to this the original was an assonance poem of the 12th century, which was changed between 1190 and 1200 by two separate poets into two versions, in which pure rhymes were substituted for the earlier assonances. The original of the *Nibelungenlied* and *Der Nibelung-Nôl* respectively, Bartsch’s subsequent edition of the *Nibelung-Nôl* (1st ed., Leipzig, 1870) was founded on B, as the nearest to the original. To this view Zarncke was so far converted that in the 1887 edition of his *Nibelungenlied* he admitted that C shows signs of recension and that the B group is purer in certain details. As a result of all this critical study Herr Abeling comes to the following conclusions. The poem was first written down by a wandering minstrel about 971 to 991, was remodelled about 1140 by Konrad, who introduced interpolations in the spirit of chivalry and was perhaps responsible for the metre; during the wars and miseries of the next fifty years manners and taste became barbarized and the fine traditions of the old popular poetry were obscured, and it was under this influence that, about 1190, a jongleur (Spielmann) revised the poem, this recension being represented by group B. After 1190, during the Golden Age of the art poetry (Kunstdichtung) of the Minnesingers (q.v.), a professional poet (Rudolf von Emst?) again remodelled the poem, introducing further interpolations, and changing the title from *Der Nibelung-Nôl* into *Das Nibelungenlied*, an version being the basis of the group C. The MS. A, as proved by its partial excellence, is based directly on Konrad’s work, with additions borrowed from B.

1 Bartsch and others ascribe its authorship, with much plausibility, to an Austrian knight of the race of Kurtenberg, the earliest of the courtly lyricists, whose verses are written in the Nibelungen strophe. Thus compare Kurtenberg’s lyric (Lachmann and Haupt, Des Minnesanges Frühling, 4th ed., F. Vogt, Leipzig, 1888)—

"Ich zoch mir einen valken mère dann ein jár"

with the *Nibelungen Nôl* (Bartsch) Art. I, 13:

"es trumte Kriemhilde.

Wie sie züge einen valken, stark soen‘ und wilde."

Theodor Abeling (Das Nibelungenlied und seine Literatur (Leipzig, 1907) gives a full bibliography, embracing 1272 references from 1756 to 1905. There are English translations of the poem in Barham (1887), Margaret Armour (prose, 1897) and Alice Horton (1898).

**NICEA, or NICE** (mod. Isnik., i.e. d’Isera) an ancient town of Asia Minor, in Bithynia, on the Lake Ascania. Antigonus built the city (316 B.C.) on an old deserted site, and soon afterwards Lystrimachus changed its name from Antigonia to Nicaea, calling it after his wife. Under the Roman empire it was the seat of Nicomedia the title of metropolis of Bithynia. Strabo describes the ancient Nicaea as built regularly, in the form of a square, with a gate in the middle of each side. From a monument in the centre of the city all the four gates were visible at the extremities of great cross-streets. After Constantine became the capital of the empire Nicaea grew in importance, and after the conquest of Constantinople by the Crusaders it was the temporary seat of the Byzantine emperor; the double line of walls with the Roman gates is still well preserved. The possession of the city was disputed between the Greeks and the Turks. It remained an important city for some time after its final incorporation in the Ottoman empire; but became subsequently an insignificant village.

**NICEA, COUNCIL OF.** The Council of Nicea (A.D. 325) is an event of the highest importance in the history of Christianity. Its convocation and its course illustrate the radical revolution which the position of this religion, within the confines of the Roman empire, had undergone in consequence of the Edict of Milan. Further, it was the first ECCUMENICAL council, and this fact shows that it was the first attempt to fix the criteria of Christian orthodoxy by means of definitely formulated pronouncements on the content of Christian belief—the acceptance of these criteria being made a *sine qua non* of membership of the Church. Moreover, it admitted the principle that the state might employ the secular arm to bring the Christian subjects of the Roman world-empire under the newly codified faith. Thus the Nicene Council is an important stage in the development of the state-church, though the completion of that edifice was delayed till the reign of Theodosius the Great. The relation of the emperor Constantine to the assembly was in itself a step in the direction of that independent treatment of ecclesiastical affairs, which, in the following centuries, created the peculiar type of the Byzantine state-church.

From his accession Constantine had shown himself the friend of the Christians; and, when his victory over Licinius (A.D. 323) gave him undisputed possession of the crown, he adhered to this religious policy, distinguishing and fortifying the Christian cause by gratuities and grants of privilege. This propitiatory attitude originated in the fact that he recognized Christianity—which had successfully braved so many persecutions—as the most vital and widening of religions, and as the power of the future. Consequently he directed his energies toward the establishment of a positive relationship between it and the Roman state. But the Church could only maintain its great value for the politician by remaining the same compact organism which it had proved itself to be under the stormy reign of Diocletian. Scarcely, however, did it find itself in the enjoyment of external peace, when violent feuds broke out in its midst, whose extent, and the virulence with which they were waged, threatened to dismember the whole religious body. Donatism in the West was followed by the Arian struggle in the East. The former had been successfully arrested, though it survived in North Africa till the 5th century. The conflict kindled by the
Nicæa, Council of

Alexandrian presbyter Arius (q.e.) assumed greater dimensions and a more formidable character. Constantine at first attempted to restore quiet in Alexandria by a formal denunciation of the epistle of Bishop Hosius of Cordova, but his admonitions were fruitless. Accordingly, since other debateable points were at issue, he had recourse to an institution previously evolved by the Christian Church—the convocation of a synod to pronounce on burning questions—qualifying it, however, to correspond with the altered circumstances. He convened a council, designed to represent the whole Church of the empire, at Nicæa in Bithynia, a town situated no great way from the imperial summer-residence of Nicomedia and within easy reach by sea of the Oriental bishops. Among the various estimates of the number of dele-
gates, the statement of Athanasius, who speaks of 318 members, has dominated the tradition. In consequence of the vast dis-
tances, the West was but weakly represented. From Spain, Hosius—the above-mentioned bishop of Cordova—made his appearance; from Gaul, Nicasius of Dijon; from Dalmatia, Domnus of Stridon; from Italy, Marcus of Calabria with two presbyters as deputies of the Roman bishop Silvester; and from North Africa, Cæcilian of Carthage. Thus an immense majority of the synod bailed from the East. The bishops of the three most important metropolitan sees of the West were not represented. The city of Alexandria, Eustathius of Antioch and Macarius of Jerusalem, while a prominent rôle was also played by Eusebius, bishop of the imperial city Nicomedia, and his erudite namesake, Eusebius of Caesarea. Of the other prelates not a few had distinguished themselves as confessors in the later persecution, and still bore the honourable traces of their sufferings. Since the bishops were accompanied by priests, Nicæa witnessed an array of clerics such as had never before been mustered in a single place. Among the attendant clergy, the still youthful deacon Athanasius, destined to succeed Alexander in the see of Alexandria, was prominent as the most powerful antagonist of the Arians (see ANTHANASII). The synod met in the imperial palace from the 20th of May to the 25th of July. What order of procedure obtained, and in whom the presidency was vested, are problems which admit of no certain solution: the one indisputable fact is that Constantine—who, at his appearance, was accorded a ceremonious reception, and himself delivered an address on the occasion—exercised a decided influence on the discussions. The deliberations on the Arian question passed through several distinct stages before the final condemnation of Arius and his doctrines. The first was the synod clearly standing in regard to this problem—the relationship of Christ to God—was held only by the attenuated group of Arians and a far from numerous section of delegates, who adhered without unshaken conviction to the Alexandrian view. The bulk of the members occupied a position between these two extremes. They rejected the formulae of Arius, and declined to accept those of his opponents; that is to say, they were merely competent to establish negations, but lacked the capacity, as yet, to give their attitude of compromi-
se a positive expression. In the main they perpetuated the line of Origen. That the majority of the council should have adopted this neutral tendency is easily intelligible when we consider the state of theology at that period. True, at Nicæa this majority eventually acquiesced in the ruling of the Alex-
drians; yet this result was due, not to internal conviction, but partly to indifference, partly to the pressure of the imperial will—a fact which is mainly demonstrated by the subsequent history of the Arian conflicts. For if the Nicæan synod had arrived at its final decision by the conscientious agreement of all non-Arians, then the confession of faith there formulated might indeed have evoked the continued antagonism of the Arians, but must necessarily have been characterised by all else. This, however, was not the case; in fact, the creed was assailed by those very bodies which had composed the laïques-faïre centre at Nicæa; and we are compelled to the conclusion that, in this point, the voting was no criterion of the inward convictions of the council. In the synod, an Arian confession of faith was first brought forward and read; but it aroused such a storm of indignation that obviously, in the interests of a restoration of ecclesiastical peace, there could be no question of its acceptance. On this, Eusebius of Caesarea dissolved the baptismal creed of his community; and this met with the imperial approval. Since the creed dated from a period anterior to the outbreak of the Arian struggle, its reception would have been equivalent to a declaration on the part of the council that it declined to define its position with reference to the controversy of the hour. That the greater number of delegates were not disinclined to adopt this subterfuge, so congenial to their standpoint, and to shelve the actual solution of the whole problems by recognition of this or some similar neutral formula, is extremely probable. But this Arius himself saw the thing, if the aforesaid prelates were eluded in any such mode, it was inevitable from the very nature of the case, that they should rise again in an accentuated form, and that consequently no pacification could be expected from this policy. Since the Eastern Church subscribed to the Alex-
drian solution of the question, he drew the natural deduction and concluded that he had here a genuine presentment of the feeling of the Church, which, if it received official sanction, might be justly expected to restore peace to the Christian community. But, in pronouncing for this view, he was careful not to elide himself from the formulation of a novel confession: for it was imperative to have the aforesaid points ascertained in the articles of faith. Accordingly he proposed that the Caesarean creed should be modified by the insertion of the Alexandrian passwords—as if for the purpose of more accurate definition— and by the deletion of certain portions. That he appreciated the import of these alterations, or realized that this revision was virtually the proclamation of a new doctrine, is scarcely probable. The creed thus evolved—the expression byōdiarios is of Western origin—was finally signed by all the deputies with the exception of the bishops Theonus of Marmarica and Secundus of Ptolemias: The Arians had submitted the two reluctant prelates with the presbyter Arius, were banished to Ilyria; Eusebius of Nicomedia and Theognis of Nicæa were also driven into exile, and at the same time the works of Arius were condemned to be burned under pain of death. But this artificial unity was no ratification of peace: in fact, it paved the way for a struggle which convulsed the whole empire. For it was the proclamation of the Nicene Creed that first opened the eyes of many bishops to the significance of the problem there treated; and its explanation led the Church to force itself by the submission of theoretical views in compliance with those principles, enunciated at Nicæa, to which, in the year 325, she had pledged herself without guile. In addition to the Arian impediment, there was the schism of Bishop Miletus of Lycopolis in the Thebaid, whose settlement Constantine had added to the programme of the council. He and Peter, bishop of Alexandria, had come into conflict over the treatment of the "backsliders" (laïps) in the Diocletian perse-
cution; and their strife acquired additional bitterness from the fact that it was extended to cover the prerogatives of the Alexandrian bishopric. Peter had composed a treatise advocating moderate principles and censuring the courtship of martyrdom for its own sake, then gone so far as to save himself by flight. Miletus, on the other hand, represented the most rigorous school, and allowed himself high-handed infringements of the law. When this had resulted in his deposition by a synod, a faction still adhered to him, and the Miletians became a schis-
matic community; and such they remained even after the death of Peter (321), who demonstrated by his martyrdom that his counsels of moderation were not prompted by cowardice. This Miletian schism made for disorder in the ecclesiastical life of Egypt all the more because its followers sided with Arius. The Nicene Council broke the strength of the movement by great concessions to the Miletian bishops, and, at the same time, expressly recognized the supreme rights of the Alexandrian see over Egypt, Libya and the Pentapolis. Since, in the resolution dealing with this point (canon vi.), reference was made to the analogous and undisputed suzerainty of the Roman see—over.
NICANDER—NICARAGUA

the ten suburban provinces, attached to the diocese of Rome and including middle and lower Italy, with the islands of Sicily, Corsica and Sardinia—this decision enshrines an important piece of evidence for the history of the papacy. On this opportunity, his ancient privileges were restored to the bishop of Jerusalem, who, in consequence of the political history of the Holy Land, had been subordinate to the metropolitan of Caesarea (canon vii.). The path was smoothed for the readmittance of the Novatians (Cathari) into the church, by recognizing, in this case, their clergy, with the bare stipulation that the laying-on of hands should follow their written promise to be faithful to the doctrine of the Catholic Church (canon viii.).

A final schism was to follow. The Pope, ante-dating the Coffe (16th century) had decided, as to the celebration of the Easter festival, the synod committed itself so as to pronoun in favour of the Alexandrine cycle—a settlement which entailed such important results in practical life that it was communicated to the Christian churches by Constantine in a circular letter. The problem, whether a baptism, performed by heretics in the name of Christ or the Trinity, should rank as a baptism or not, had given rise to an animated controversy between the Roman bishop Stephen, who answered in the affirmative, and Cyprian of Carthage, who gave an equally weighty negative answer. The Roman synod, merely declaring the nullity of baptisms imparted by the adherents of Paul of Samosata (canon xix.).

An important provision, in point of ecclesiastical law, was that the chiroty of a bishop required the presence of at least three other bishops of his province, while the confirmation of the choice remained at the disposal of the metropolitan (canon iv.). A further regulation was that two provincial synods should be held annually (canon vi.); but a law enacting the celibacy of the clergy was rejected at Nicea, since Faophutus; an aged bishop of Egypt who had been put to death in persecution, warned his colleagues against the danger of imposing too arduous a yoke upon the priesthood, and defended the sanctity of marriage.

As Constantine had convened the synod, so he determined its conclusion. A brilliant banquet in the imperial palace—of which Eusebius of Caesarea gives an enthusiastic account—marked its close, after which the bishops were granted their return. The admonitions to peace with which he dismissed them proved unavailing for the reasons indicated above; but the reputation of the first ecumenical council suffered no abatement in consequence.

NICANDER (2nd cent. B.C.), Greek poet, physician and grammarian, was born at Claros, near Colophon, where his family held the hereditary priesthood of Apollo. He flourished about Attalus III. of Pergamum. He wrote a number of works both in prose and verse, of which two are preserved. The lost, Theriac, is an hexameter poem (182 lines) on the nature of venomous animals and the wondrous which they inflict. The other, Alexipharmacis, consists of 630 hexameters treating of poisons and their antidotes. In his facts Nicander followed the physician Apollodorus. Among his lost works may be mentioned: Alexelica, a prose history of Aetolia; Lysimachena, a mythological epic, used by Ovid in the Metamorphoses and epitomized by Antoninus Liberalis; Georgica and Melissourgica, of which considerable fragments are preserved, said to have been imitated by Virgil (Quintilian x. 1. 56). The works of Nicander were praised by Cicero (De oratore, i. 16), imitated by Ovid, and frequently quoted by Pliny and other writers. His reputation does not seem justified; his works, as Plutarch says (De antididis poeotis, 16), have nothing poetical about them except the metre, and the style is bombastic and obscure; but they contain some interesting information as to ancient belief on the subjects treated.

Editions.—J. G. Schneider (1792, 1816): O. Schneider (1866) (with the Scholia); H. Klauer, "De Diicendi Genere nicheini—Nicandri" ( Dissertationes Philologicae Vindebonenses, vi. 1896).

The Scholia (from the Göttingen MS.) have been edited by G. Wentzel in Abhandlungen der k. Gesellschaft der Wiss., zu Göttingen, xxxvii. (1892). See also W. Vollrath, Nicander und Ovid (Groningen, 1909 fol.).

NICANOR, Greek grammarian, son of Hermias of Alexandria (200-240), lived during the reign of Hadrian. He chiefly devoted himself to the study of punctuation of which the difference of meaning caused by it. Hence he was nicknamed "the Punctuator" (δς otyyjaras). He is known to have written on the punctuation of Homer and Callimachus. He was possibly the author of a work Ιππει Μεροβογοον (On the Change of Names of Places), of which some fragments are preserved in C. W. Müller, Fragmenta Historiorum Graecorum., iii. 632.

Edition of the Ilid and Odyssyy fragments by L. Friedländer (1890) and W. Wentzel (1878) respectively.

NICARAGUA, Republic of Central America, bounded on the N. by Honduras, E. by the Caribbean Sea, S. by Costa Rica, and W. by the Pacific Ocean (for map, see CENTRAL AMERICA). Pop. (1905), about 550,000; area 49,200 sq. m. Nicaragua forms an irregular equilateral triangle with its base stretching for 280 m. along the Caribbean Sea from Cape Gracias à Dios southwards to the San Juan delta, and its apex at the Coseguina volcano, on the Bay of Fonseca, which separates Nicaragua on the Pacific side from Salvador. The frontier which separates the republic from Honduras extends across the continent from east-north-east to west-south-west. It is defined by the river San Juan which, about 2 m. from its mouth, flows into the Pacific, and is followed by the river Negro to the Bay of Fonseca. In accordance with the treaty of 1838, which was confirmed in 1888 by the United States president, acting as arbitrator, and more fully defined in 1896, the boundary towards Costa Rica is drawn 2 m. S. of the San Juan river and Lake Nicaragua, as far as a point parallel to the centre of the western shore of the lake. It is then continued northward for the short distance which intervenes between this point and the northwestern headland of Salinas Bay, on the Pacific.

Physical Features.—The coasts of Nicaragua are strikingly different in configuration. The low, swampy and monotonous shore of the Caribbean, with its numerous lagoons and estuaries, and its fringe of reefs and islets, contains only three harbours: Gracias à Dios, Bluefields or Blewfields, and Greytown (San Juan del Norte). Its length, from Cape Gracias à Dios to the San Juan delta, is nearly 300 m. The Pacific coast, measuring some 200 m. from the Bay of Fonseca to Salinas Bay, is bold, with numerous anchorages, of which the most important, the only safe anchorage, are the best harbours of the republic—the southern arm of the Bay of Fonseca (g.n.), Corinto, Brito and San Juan del Sur.

The surface of the country is naturally divided into five clearly distinct zones: (1) the series of volcanic peaks which extend parallel to the Pacific at a little distance inland; (2) the plains and lakes of the great depression which lies to the east of these mountains and stretches from sea to sea, between the Bay of Fonseca and the mouths of the San Juan; (3) the main cordillera, which skirts the depression on the east, and trends north-west from Monkey Point or Puerto Fredon on the Pacific to the river San Juan, on the borders of the Central American and the Mosquito Reserves, on the Pacific; (4) the plateaux which slope gradually away from the main cordillera towards the Caribbean; (5) the east or Mosquito coast, with its low-lying hinterland. The last-named region has to a great extent had a separate history; and it was only in 1894 that the Mosquito Reserve, a central enclave which includes more than half of the littoral and hinterland, was incorporated in the republic and renamed the department of Zelaya. (See MOSQUITO COAST.)

Though situated almost on the western edge of the country, and greatly inferior, both in continuity and in mean altitude, to the main mountains, the eastern cordillera is ainda in importance to the cordillera itself. It consists for the most part of isolated igneous peaks, sometimes connected by low intervening ridges which form a terminator or barrier, with the Coseguina range, and in the extreme south-east with the low wooded archipelago of Solentiname and Cichicaste near the head of the San Juan river. Between these two extremes the chief courses, proceeding southwards, are: the Matlices chain, comprising El Viejo (3400 ft.), Santa Clara, Telica, Orotte, Las Pilas, Axocod, Momotombo (4127 ft.), all crowded close together between the Bay of Fonseca and Lake
Managua; Masaya or Popocatepetl (which was active in 1670, 1782, 1857 and 1902, and attains a height of 2972 ft.), and Mommbacho (5933 ft.), near Granada; lastly, in Lake Nicaragua the two islands of Granada and Ometepe (flat topped, 5640 ft.) and Madera. On the 20th of January 1835 Coeiguena was the scene of one of the most tremendous eruptions on record. The outflow from Lake Nicaragua was entirely closed off by an impulsive accumulation of volcanic dust and ashes, first welling up as a vast area, which comprised Jamaica, southern Mexico and Bogotá. After a long repose Ometepe also burst out again on the 19th of June 1853, when the lavas from a new crater began to flow, but they were continued for some time to the west, and then directed over the whole island. In the Maribios district occur several volcanic lakes, such as that of Masaya, besides numerous infernolos, low craters or peaks still emitting sulphurous vapour and smoke, and at night often lighting up the whole land with bluish flames.

In the great lacustrine depression of Nicaragua is collected all the drainage of the whole southern part of the continent. There are 19 basins, of which the sheet basin of Lake Nicaragua, the depression is partly escaped by the sheet river, is itself formed by the orographic basin of the river Dint, which runs through the whole length of the country.

The accumulation of waters which pour down into the depression are gathered into the two basins of Lake Managua and Lake Nicaragua. Both basins have a maximum depth of some 260 ft. Lake Managua, the more northerly, has a length of 30 m., and varies in breadth from 8 to 10 m. Its area is about 575 sq. m., and the river Dint, a portion of its overflow escapes southwards into the larger and Lake Nicaragua, through the Panayloa channel. Steamers ply on both lakes, and there are rail connections between the town of Tipitapa, at its northern extremity. Here there is a waterfall of 13 ft. The existence of ancient lacustrine surfaces, upheaved between the two basins by volcanic agencies or left dry by some event, seems to indicate that the lakes were formerly united. Now, however, Lake Managua is almost a closed basin in the dry season, when the stream in parts of the Panayloa channel sinks to a mere rivulet. The surface of Lake Nicaragua is maintained after the rains is 110 ft. above sea-level. The lake is 100 m. long, and has a maximum breadth of 45 m. and an area of 2970 sq. m. It is thus the largest sheet of water in Central America, and bordering the borders of Bolivia and Peru. Towards the San Juan outlet its depth decreases to 6 or 8 ft., owing to the vast accumulation of the silt washed down into the lake by its principal Costa Rican affluent, the Rio Grande, and the lake is again shallow. Under the influence of the intermittent trade-winds Lake Nicaragua rises and falls regularly, whence the popular notion that it was a tidal lake. It is also exposed to the dangerous Papagayos tornadoes, caused by the prevailing north-westly winds meeting opposite currents from the Pacific. It is drained on the south by the San Juan river, which flows generally east by south to the Caribbean Sea.

The distance from the lake to the principal or Colorado mouth of the river is 95 m., and the average width of the channel 1500 ft. Near its mouth the main stream branches out into a wide delta. Navigation is greatly impeded by shifting banks of silt, and especially by five large islands which traverse the river near its delta. It is often asserted that these rapids were artificially formed by the Spaniards themselves to prevent the buccaneers from penetrating to Lake Nicaragua. But Herrera (Dc. iii. book 2, chap. 3) speaks of the campesinos and Cordillera Cordobeses, the Circumnavigators of the lake, from descending the San Juan in 1522; and although the English traveller Gage states that in his time (17th century), at least, the Indians were familiar with the whole route, there is little doubt that the rapids are natural obstructions.

The main Nicaraguan cordillera, which flanks the depression on the east, has often been called the Cordillerada de los Andes, from its supposed continuity with the mountain-chains of Panama and the west coast of South America, but this supposition is not sustained. The San Juan valley completely separates the mountains of Panama from the main Nicaraguan system. This severance, it is true, may be accounted for geologically and some geologists see, in the five rapids of the San Juan, remnants of a connecting ridge which the river has swept away. But the evidence for past continuity is inconclusive, while there can be no doubt about the present severance of the two massifs, which is distinctly visible from different parts of Nicaragua. Thus the important section which terminates at Monkey Point is commonly called the Cordillerade Oyolita. The summits of the main cordillera seem nowhere to exceed 8000 ft.; the declivity is through the lakes, and gradual towards the Caribbean. Along the shores of the lakes the cordillera may be described as an extensive range consisting of two northern, which are divided by a great longitudinal valley. The lower series, which adjoins the lakes, rises near Lake Managua, and marches parallel to the main crest of the cordillera as far as the northern base of the Yola, which is situated near the village of Nueve, due east of Managua, where the eastern ridge of the Yola section has a more easterly direction.

On the east, the main cordillera abuts upon the region of plateaux and savannas, which occupies nearly half of the area of Nicaragua. It is likely that this region was once a uniform tableland, level still sinks. But the relief of the tableland has been wholly changed by fluvial action. The great rivers which flow eastward to the sea have cut valleys, which are the fundamental features of the region. The cultivated areas of Nicaragua are generally flat and interspersed with high plateaus, ridges and isolated hills. Large tracts of these uplands have never been adequately explored, and consist of virgin forest and prairie. The principal river is the Segovia, which rises in the Cordillera de los Moscos, near the town of Prinzapolca, and passes the town of Yolita, where it rises as far as 85° W., and constitutes the frontier until it reaches the sea at Cape Gracias a Dios, after a course of more than 450 m., during which it receives many tributaries. Its basin is narrow and its headwaters are formed by the internal drainage of the main upland. Its nomenclature, like that of many lesser streams in the plateau region, is somewhat confusing; for while the Spanish colonists were settling beside its headwaters the mid-streams were hardly known except to the native Indians, and the lower reaches were frequented by buccaneers, often of British or Dutch origin. In addition to the three names of Segovia, Coco or Cocos, and Wanks, which are applicable to the whole, different parts have from time to time received the names of Caballub, Cenbraga, Cape River, Encuentro, Gracias, Herbias, Oro, Pantasma, Portillo Liso, Tapacap, Tepaneca, Somoro, Yankes and Yoro. Other important names of the country are the Mayal, the Carona and the Ometepe island, which is of great importance in the vicinity of the Rio spite.

Geology, fauna and flora of Nicaragua may be studied in connection with that of the neighbouring countries (see CENTRAL AMERICA). The climate is mild and healthy for Europeans on the uplands, such as those of Segovia and Chontales, which have a mean elevation of 2000 to 3000 ft. above sea-level. But elsewhere it is distinctly tropical, with two seasons—hot from May to November and cool from December to April. The rainfall is greatest to the north and dry throughout the winter months. The mean annual temperature is about 80° Fahr., falling to 70° at night and rising to 90° at noon in summer. Nicaragua comes within the zone of the wet north-east trade-winds, which sweep inland from the Atlantic. The rainfall is heavy along the west side of the lacustrine basin, with an annual mean at Ixvas of 106 in., but this figure is sometimes greatly exceeded on the east coast, where rain is common even in the dry season. Observations made at Greytown in 1890 showed the extremes of temperature to be 89° Fahr. in September for the maximum and 70° Fahr. in January for the minimum; the rainfall for the whole year was 106 in., and the minimum 10 in., while the maximum (52 sq. in.) and the driest, May (4-9 in.). Earthquakes are felt at times on the Pacific slope, but in Nicaragua they are less violent than in the neighbouring countries.

Inhabitants.—Accurate statistics as to the growth and distribution of the population cannot be given, and the figures given below are based on estimates which can only be approximately correct. The census of 1882 gave the total as 275,816; this appears to have risen in 1890 to 375,000, in 1900 to 500,000, and in 1905 to 550,000, or 11 inhabitants per sq. m. There can thus be no doubt that the population is increasing with extraordinary rapidity, although there is hardly any immigration. The population of Europeans is estimated to be about 1200, and tends to increase. Spanish and German elements preponderate in the foreign colonies. The most densely peopled region and the focus of civilization is the lacustrine depression and the surrounding uplands. Here are all the large towns, and bither European settlers were attracted from the first by the temperate climate, rich soil, and natural waterways. The development of Nicaragua, unlike that of most American countries (notably Brazil and the United States), has been hastened by the great river, the Segovia, the east coast of Central America being the point termed the residences of the first Spanish conquerors, many of whom were Galicians, and the negro slaves introduced during the colonial period. Intermarriage with British, Dutch, and French with Caribs and Creoles has further complicated the ethnology of the country, producing "Indians" with fair hair and blue eyes, and half-castes with European features and Indian or negrooid coloration, or with European
coloration and Indian or negroid features. The prevailing language is a degenerate form of Spanish, nearer to Galician than to Castilian. Most of the native dialects have ceased to exist, but a corrupt form of English is spoken on parts of the east coast. All who speak Spanish are classed as Ladinos; the half-castes generally are termed Mestizos; and the name of Sambos or Zambo is confined to the descendants of Indian and negro parents; these are also incorrectly called Caribs. The number of the uncivilized Indians, whose villages are situated in distant parts of the plateau, is usually estimated at 30,000; but this would seem to be an exaggeration. Pure-blooded Indians are not numerous, as whole districts were depopulated and whole tribes exterminated by the Spanish colonists and the buccaneers. A few may be descendants of the Aztecs and Mayas, whose temples, sculptures, burial-grounds, &c., have not yet been fully explored. For a general account of this ancient civilization and of the Indian tribes see Central America and Mexico: Archaeology. A collection of Nicaraguan antiquities is preserved in the National Museum at Washington, U.S.A.; and the archaeological collection brought to Europe by Dr W. Lehmann in 1910 was exhibited in the Berlin Museum of Fine Arts.

Chief Towns and Communications.—The capital is Managua (pop. 1905, about 30,000); other important towns are Leon (45,000), Granada (25,000), Masaya (20,000), Chinandega (12,000), and the seaport of Bluefields (about 8,000). The smaller towns are described in separate articles. At the beginning of the 20th century, Nicaragua had few good roads, and none at all east of the main cordillera. Transport in the plateau region was mainly effected by means of mules, over the roughest of tracks. But between 1900 and 1905 contracts were signed for the construction of three highways, leading respectively from Matagalpa, from Nueva Segovia and from the Piso mining district to the head of steam navigation on the Segovia, about 160 m. above Cape Gracias. These highways were to be linked to the western system by 79 m. of road connecting Matagalpa with Momotombo. For the construction and upkeep of these new roads 10 per cent. of the tolls collected on all caravans and ox convoys over eighteen years old. There are 160 m. of state railways, running from Corinto to Leon, Managua, Granada and Dirizamba, with branches to El Tambo and Montebello. Contracts for additional lines were signed between 1900 and 1905. The steamers which ply on the great lakes and the San Juan, besides other vessels which visit the principal Caribbean and Pacific ports, are national property; but from the 1st of January 1905 all the state railways were leased to a syndicate for fifteen years and the steamers for twenty-five years. There are also 20 m. of private railway near the mouth of the Rio Grande, and private steam tramways on the western shore of Lake Nicaragua. Corinto is the principal point of entry for foreign trade and is visited by a large number of vessels. About 2,100 of the 2,100 vessels of 550,000 tons (including coasters) which annually enter the ports of the republic. The coasting trade is restricted to vessels of under 250 tons. At the beginning of the 20th century most of the ocean-going steamers were owned by British, French, or the United States; British enterprise being chiefly represented by schooners trading from Jamaica to Bluefields and Grijalva. Nicaragua is a member of the international postal union, and the several provinces have a fairly complete telegraphic and telephonic system.

Industries and Commerce.—The principal agricultural product is coffee, the yield of which increased from 4,282,300 lb in 1880 to 11,382,300 lb in 1890, and 28,400,000 lb in 1900. Coffee is grown principally in the Matagalpa region, on the uplands of the interior. The plantations are chiefly owned and managed by Germans, and the product is of good quality; but coffee-planting, like most Nicaraguan industries, suffers from the scarcity of labour. On the Caribbean coast bananas are cultivated and largely exported to the United States. In 1903 more than 2,000,000 banches were consigned to the United States. The production of sugar cane has been often tried but with little success. Sugar is grown and there are many small sugar factories, but little of the output is exported. The cacao export is also small; tobacco, rice, beans and other crops are grown for local consumption. The citrus fruits, which have been formed. Dye-woods and indigo are exported, but the demand for vegetable dyes has decreased. Cattle-rearing is successful, but the cattle are small and of little value. The fishing industry and the fisheries being important articles of export. Cheese and butter are manufactured in large quantities for home consumption. Horses and pigs are also reared, but not sheep. In 1899 the government sold about 3,500 acres of public land for 9,900/. The cattle and live-stock of the republic is of high quality. The drinking-water is derived from the natural springs. The fact that Nicaragua has not a state monopoly. From the 1st of January 1904 it was leased to a syndicate of distillers for six years. Gold-mining is carried on along the Caribbean littoral. In 1898 the gold dust and bar exports from Bluefields were of the value of £2,576; in 1900, £62; and in 1907, £65,000. Copper, coal, petroleum, silver and precious stones are also found, and there seems little reason to doubt that the mineral resources of the republic are exceedingly rich. Nicaragua possesses a number of iron mines, besides those of Honduras. Other industries include manufactures of leather, boots and shoes, furniture, bricks and pottery, cigars and cigarettes, beer, wine and spirits, candles and soap. The largest and most important of these is the sugar industry. The principal crops of the country are sugar cane, coffee, maize, tobacco, rice, beans, cotton, and rubber. There are also many industries connected with cattle and hides, dyes and other products. The principal imports are cotton and woolen goods, machinery and hardware, flour, beer, wine, spirits and drugs. The United States and Great Britain send annually about 60% and 10% respectively of the imports. The value of 8% of the exports. The average yearly value of the foreign trade is about £1,200,000—exports, £700,000; imports, £500,000.

Money, Weights, and Measures.—There is one bank of issue, the Bank of London and Central America, which has a capital of £260,000 (£130,300 paid). The monetary unit is the silver peso or dollar of 100 cents, which weighs 25 grammes, .900 fine. The current coinage, however, present no continuous or clear view of the national receipts and disbursements. Revenue and expenditure vary considerably, but neither often falls below £300,000 or rises above £500,000. In 1886 the republic contracted a railway loan in London to a limit of £285,000 at 6% interest, and in July 1894 the interest fell into default. In 1895 an arrangement was made for the purchase of the interest at 80% of its face value, and the creation of "coffee warrants" to be used in lieu of direct tax duties. In the four years 1897–1900 the sales of these warrants amounted to 1,028,990 gold pesos or (at 3d., the average rate for this period) £61,600. In July 1905 the outstanding amount of the debt was £253,600. In 1905 a further loan of 12,500,000 francs (£500,000) was raised in Paris at 5% The internal debt amounts to about £400,000.

Constitution and Administration.—The former constitution, proclaimed on the 4th of July 1845 and amended on the 10th of December 1866, was superseded on the 30th of March 1895, when a new constitution was promulgated. By this instrument the legislative power is vested in a single chamber of 36 members (instead of 40, as under the old constitution), elected by universal male suffrage for six years (instead of four). The executive is entrusted to a president similarly chosen for six years (instead of four) and aided by a cabinet representing the five ministries of foreign affairs and education, finance, internal administration and justice, war and marine, and public works. For administrative purposes the republic is divided into 13 departments and 2 comarcas, each under a political head who acts as military commandant and controls education, finance, &c. The administration of justice is entrusted to numerous courts of first instance, three courts of appeal, and a supreme court. The active army of 4,000 men can be increased to 40,000 in war. All able-bodied citizens between the ages of seventeen and fifty-five are compelled to serve one year with the colours and are then enrolled in the reserve. Roman Catholicism is the prevailing religion and the Roman Catholic church has the religious endowment or other special privilege from the state. The bishop of Leon, whose diocese is included in the archiepiscopal province of Guatemala, is the spiritual head of the Roman Catholics. There are numerous elementary schools, at which the teaching is free and compulsory, besides ten colleges for secondary or technical education, and two universities.

History.—For a general account of the Spanish administration during the colonial period, i.e. up to 1821, and of the subsequent attempts to unite all the Central American republics in a single
Dr Roberto Sacasa. Under Carazo's administration the boundary question between Nicaragua and Costa Rica had been settled by arbitration, the president of the United States acting as arbitrator. While Dr Sacasa was president of Honduras, Salvador and Guatemala signed a treaty, under which the United States of Central America were to be formed. The president of Nicaragua adhered to this treaty, but the National Congress refused to ratify it. Sacasa was overthrown by a revolution in 1893, and was succeeded by a provisional government, which in its turn was deposed soon after by another uprising, at the head of which was General José Santos Zelaya. His position was strengthened by the facts that he was related to President Barrios by marriage and that he was president in 1898 for another term of four years. Under his government the incorporation of the Mosquito Reserve into the territory of Nicaragua took place. In 1895 occurred the Hatch incident, which led to the occupation of the port of Corinto by a British fleet. Mr Hatch, British pro-vice-consul at Bluefields, being accused of conspiracy against the Nicaraguan government, was arrested, along with other British subjects, and expelled. For this action Nicaragua was required to pay an indemnity of $15,000. An attempt to overthrow Zelaya was made in February 1897, but it was crushed after several days of fighting. There were occasional disturbances, subsequently, but none sufficient to overturn President Zelaya, who was again re-elected in 1902 and 1906.

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1 General Medina and other officers were tried by a Nicaraguan court-martial for the murder of Grace and Cannon, but were acquitted on the 28th of January 1910.
west coast from Naples to Reggio di Calabria. Pop. (1901) 13,671 (town), 18,150 (commune). It is situated on the isthmus between the gulfs of S Eufemia and of Squillace, the narrowest part of Calabria, 970 ft. above sea-level, and commands a fine view. The ruined castle served as the place of imprisonment of Frederick II.'s son Henry. The place suffered greatly from the earthquake of 1638, which also destroyed the Benedictine abbey of S Eufemia, founded by Robert Guiscard.

NICCOLI, NICCOLO DE' (1365—1437), Italian humanist, was born and died at Florence. He was one of the chief figures in the company of learned men which gathered round Cosimo de' Medici, who played the part of Augustus to Niccolò Machiavelli. His scholarship and classical literature consisted in his work as a copyist and collator of ancient MSS.; he corrected the text, introduced divisions into chapters, and made tables of contents. His lack of critical faculty was compensated by his excellent taste; in Greek (of which he knew very little) he had the assistance of Ambrogio Traversari. Many of the most valuable MSS. in the Laurentian library are by his hand, amongst them those of Lucrètius and of twelve comedies of Plautus. Niccoli's private library was the largest and best in Florence; he also possessed a small but valuable collection of ancient works, which, after a course of lapsed time, had been replaced and enlarged to an inestimable critic, and could not bear the slightest contradiction; his quarrels with Filippo, Guarino and especially with Traversari created a great sensation in the learned world at the time. His hypercritical spirit (according to his enemies, his ignorance of the language) prevented him from writing or speaking in Latin; his sole literary work was a short tract in Italian on Latin Orthography, which he withdrew from circulation after it had been violently attacked by Guarino.

See the Life in Traversari Epistolae (ed. L. Mehus, 1759); G. Voigt, Die Wiederbelebung des klassischen Alterthums (1893); G. Zippel, Nicolò Niccoli (Florence, 1890).

NICOLITE, a mineral consisting of nickel arsenide, NiAs, containing 43.9% nickel and 56.1% arsenic. Crystals are hexagonal, but are rare and indistinct. It usually occurs as compact masses. A characteristic feature is the pale copper-red colour, with metallic lustre, on the uneven fractured surfaces. It is opaque and brittle, and the streak is brownish-black. The specific gravity is 7.3, and the hardness 5. Small quantities of sulphur, iron and cobalt are usually present, and sometimes the arsenic is largely replaced by antimony. Nicolaite contains variable amounts of copper and iron, and forms an isomorphous species breithauptite (nickel antimonide). Niccolite occurs with ores of cobalt, silver and copper at Annaberg and Schneeberg in Saxony, at Sangerhausen and Mansfeld in Prussian Saxony and other localities; it has occasionally been found in Cornwall and Scotland. The original arite (aarite) is from Mount Ar (Aar) near Pic du Midi d'Ossau in the Pyrenees.

The names niccolite (J. D. Dana, 1868) and nickeline (F. S. Beudant, 1832) refer to the presence of nickel (Lat. nicolum). Owing to its copper-red colour the mineral is commonly called "copper-nickel," the German equivalent of which, Kupfernickel, was used as early as 1604.

(L. J. S.)

NICE, a city of France, the chief town of the department of the Alpes Maritimes, and previous to 1860 the capital of the county of Nice (Nizza) in the province of Sardinia, 739 m. by rail from Paris. Pop. (1901) 127,027, of whom 105,109 were permanent residents; in winter-time there is a large influx of visitors. It occupies a fine position at the mouth of the Paillon (Pailleone): a stream (often dried up in summer) which, after a course of over 10 m., enters the northern end of the Baie des Anges. A steep, isolated limestone hill, 308 ft. in height, running back for some distance from the shore, forms the historical nucleus of the town. Formerly crowned by a castle, which, previous to its destruction by the duke of Berwick in 1706, was one of the strongest fortresses on the coast, it is now laid out as a public pleasure-ground, and planted with aloes, cactus, agave and palm. Towards its south-west corner stands a tower (Tour Bellelade or Clérisy) dating, it is said, from the 4th century. The old town stretches along the western base of the hill; the "town of the 18th century" occupies the ground farther west, which slopes gently towards the Paillon; and away to the north-east and north and west beyond the stream lie the ever-growing quarters of the modern city. To the east of the hill, and thus out of sight of the more fashionable districts, the commercial quarter surrounds the port. The whole frontage of Nice is composed of fine embankments: the Quai des Ponchettes, constructed in 1770 round the base of the castle hill, is continued westward by the Quai du Midi to the public gardens and the municipal casino, whence the Promenade des Anglais (so called because it was begun in 1822—1824 at that time, the French were regarded as Englishmen) a boulevard 55 ft. wide, extends for more than a mile to the suburbs. The cliff Quai du Voeu, a modern Gothic building with two towers 213 ft. high, erected by the town in 1835 to commemorate its preservation from cholera. The secular buildings include the town hall, the prefecture, the theatres, the hospitals, the lycée (founded by the Jesuits in the 17th century), the natural history museum, the library (especially rich in theology), and, at some distance from the town, the astronomical and meteorological observatory on Mont Gros (1220 ft.). The industrial establishments comprise perfumery factories, distilleries, oil-works, furniture and woodwork factories, confectionery works, soap-works, tanneries and a national tobacco factory employing several hundred persons. Besides the vine, the trees principally cultivated in the neighbourhood are the olive, the orange, the mulberry and the carob; and the staple exports are oil, agricultural produce, fruits and flowers.

Nice now joins on the north-east the ancient episcopal town of Cimiez, in which are situated the largest and most elegantly appointed hotels. Reckoning from east to west the town is surrounded by a girdle of beautiful towns—Carabacel, St Etienne, St Philippe and St Beaufremettes, on the hill of the Porte d'armée and Montboron, Riquier and St Roch, the last partly occupied by barracks. The entrances to the port of Nice and the outer pier have been improved; that of the outer port is 300 ft. wide, and that of the inner 220 ft. The area of the port is about 75 acres, the length of quayage available 3380 ft., the depth of water 20 ft., its trade, mostly coastal, being shared principally between French and Italian vessels, the arrivals being about 1235 vessels of some 300,000 tons annually. Nice is an episcopal see (first mentioned at the end of the 4th century) which since 1860 is in the ecclesiastical province of Aix en Provence. It is the headquarters of a military division formed part of the corps d'armée of Marseilles. Protected towards the north by hills which rise stage behind stage to the main ridge of the Alps, Nice is celebrated for the mildness of its climate. The mean temperature is 60°Fahr., that of winter being 49°, of spring 60°, of summer 72° and of autumn 63°. For a few nights in winter the mercury sinks below freezing point, but snow is practically unknown, falling, on an average, only half a day in the year. The highest reading of the thermometer is rarely above 90°. There are sixty-seven days with rain in all the year but it usually falls in heavy showers which soon leave the sky clear again, though the whole annual amount exceeds 32 in. Fine days and rainy days are almost equally distributed throughout the different seasons. The winds are very variable, sometimes changing several times a day. Apart from the ordinary land and sea breezes, the most frequent is the east wind, which is especially formidable during autumn. The south-west wind (called Libeccio, or wind of Lybia) is moist and warm; the north-east (or Gregaou, Greek), which is happily
NICE—NICEPHORUS

rare, brings storms of hail and even snow in winter. The mistral (from the north-west) and the tramontana (from the north) are generally stopped by the mountains; but when they do reach the city they raise intolerable dust-storms. For two thousand years the climate of Nice has been considered favourable in chest complaints. Those who are requiring rest, and those suffering from gout, asthma, catarrh, rachitic affections, scrofula, gout, also experience benefit; but the reverse is the case when heart disease, nervous disorders or ophthalmia are concerned. Autumn is the best season; in spring the sudden changes of temperature demand great care. Means of passing the time pleasantly are fairly abundant. The city is at its liveliest during the carnival festivities, in which, as at Rome, battles are waged with sweetmeats and flowers.

History.—Nice (Nicoæa) was founded about two thousand years ago by the Phocæans of Marseilles, and received its name in honour of a victory (sieg) over the neighbouring Ligurians. It soon became one of the busiest trading stations on the Ligurian coast; but as a city it had an important rival in the town of Cemenelum, which continued to exist till the time of the Lombard invasions, and has left its ruins at Cimiez, 2½ m. to the north. In the 7th century Nice joined the Genoese league formed by the towns of Liguria. In 729 it repulsed the Saracens; but in 859 and 880 they pillaged and burned it, and for the most part of the 10th century remained masters of the surrounding country. During the middle ages Nice had its share in the wars and disasters of Italy. As an ally of Fisa it was the enemy of Genoa, and both the Genoese and the Fisans endeavoured to subdue it; but in spite of all it maintained its municipal liberties. In the course of the 13th and 14th centuries it fell more than once into the hands of the counts of Provence; and at length in 1388 it placed itself under the protection of the counts of Savoy. The maritime strength of Nice now rapidly increased till it was able to cope with the Barbary pirates; the fortifications were largely extended and the roads to the city improved. During the struggle between Francis I. and Charles V. great damage was caused by the passage of the armies invading Provence; pestilence and famine raged in the city for several years. It was in Nice that the two monarchs in 1558 concluded, through the mediation of Paul III., a truce of ten years; and a marble cross set up to commemorate the arrival of the pope still gives its name, Croix de Marbre, to part of the town. In 1543 Nice was attacked by the united forces of Francis I. and Barbarossa; and, though the inhabitants, with admirable courage, repulsed the assault which succeeded the terrible bombardment, they were ultimately compelled to surrender, and Barbarossa was allowed to pillage the city and to carry off 2500 captives. Pestilence appeared again in 1550 and 1580. In 1660 Nice was taken by the duke of Guise. By opening the ports of the cession to all nations, and proclaiming full freedom of trade, Charles Emmanuel in 1656 gave a great stimulus to the commerce of the city, whose noble families took part in its mercantile enterprises. Captured by Catinat in 1691, Nice was restored to Savoy in 1696; but it was again besieged by the French in 1705, and in the following year its citadel and ramparts were demolished. The treaty of Utrecht in 1713 once more gave the city back to Savoy; and in the peaceful years which followed the "new town" was built. From 1744 till the peace of Aix-la-Chapelle (1748) the French and Spaniards were again in possession. In 1775 the king of Sardina, Histoire de Nîmes et des Alpes Maritimes depuis 21 siècle (Paris, 1862); E. Tiessrand, Histoire civile et religieuse de la cité de Nice (2 vols., Nice, 1862); Cartulaire de l'ancienne cathédrale de Nice (Tunis, 1888).

NICE, an adjective which in present usage has two main meanings: (1) fastidious, particular, precise or scrupulous, and (2) pleasant, kind or agreeable. The first meaning has been common since the 16th century, the second only since the end of the 18th. In O. Fr., from which the English form was adapted, the word is niche or nice, which are derivatives of Lat. necius, not knowing, ignorant. The development in meaning is doubtful; some authorities take it as (1) foolish, (2) foolishly precise, (3) delicate, (4) pleasant. Skeat suggests an early confusion with the word "nesh," soft, delicate, still surviving dialectically.

NICEPHORUS, the name of three emperors of the East. NICEPHORUS I., emperor 802–811, was a native of Selceucia in Pisidia, who was raised by the empress Irene to the office of logothetes or lord high treasurer. With the help of the patricians and eunuchs he contrived to dethrone and exile Irene, and to be elected emperor in her stead. His sovereignty was endangered by Bardanes, one of his ablest generals, who revolted and received support from other commanders, notably the later emperors Leo the Armenian and Michael the Amorian. But Nicephorus gained over the latter two, and by inducing them and Bardanes to disband completed the submission of Bardanes, who was relegated to a monastery. A conspiracy headed by the patrician Arsaber had a similar issue. Nicephorus, who needed large sums to strengthen his military force, set himself with great energy to increase the empire's revenue. By his rigorous imposts he alienated the favour of his subjects, and especially of the clergy, whom he otherwise sought to control firmly. In 803 and 810 he made a treaty with Charlemagne, by which the limits of the two empires were amicably fixed. Venice, Istria, the Dalmatian coast and the islands of the coast of the East, while Rome, Ravenna and the Pentapolis were included in the Western realm. By withholding the tribute which Irene had agreed to pay to Harun-al-Rashid, Nicephorus committed himself to a war with the Saracens. Compelled by Bardanes's disloyalty to take the field himself, he sustained a severe defeat at Crasus in Phrygia (805), and the subsequent inroads of the enemy into Asia Minor induced him to make peace on condition of paying a yearly contribution of 30,000 gold pieces. By the death of Harun in 809, Nicephorus was left free to deal with the Bulgar king, Krum, who was harassing his northern frontiers. In 811 Nicephorus invaded Bulgaria and drove Krum to ask for terms, but in a night attack he allowed himself to be surprised and was slain along with a large portion of his army. Krum is said to have made a drinking-cup of Nicephorus's skull.

NICEPHORUS II. (Phocas), emperor 963–969, belonged to a Cappadocian family which had produced several distinguished generals. He was born about 912, joined the army at an early age, and, under Constantine VII., became commander on the eastern frontier. In the war with the Saracens he began with a severe defeat (956), which he retrieved in the years following by victories over the Saracens. In 961 a peace was made with Krum, who was defeated at Pegana, and in 964 Nicephorus invested the Cappadocian province. After receiving the usual honors of a triumph, he returned to the east with a large and well-equipped army. In the campaigns of 962–63 by brilliant strategy he forced his way through Cilicia into Syria and captured Aleppo, but made no permanent conquests. Upon the death of Romanus II. he returned to Constantinople to defend himself against the intrigues of the minister Bringas. With the help of the regent Theophano and the patriarch, he received supreme command of the eastern forces, and became proclaimed emperor by these emperors. In 967 he stormed Constantinople, deposed the domestic patrician and crowned himself emperor. When he returned to the east, he was opposed by the patrician Nicephorus, who opposed the election of Michael II. as co-emperor. After recovering the city and being crowned he continued to wage numerous wars. In 964–66 he definitely conquered Cilicia and again overran Mesopotamia and Syria, while the patrician Nicephorus recovered Cyprus. In 968 he reduced most of the fortresses in Syria, and after the fall of Antioc and Aleppo (969), which were recaptured by his lieutenants, secured his triumph by a peace. After retiring to the retired frontier he began a war against the Bulgarians, to whom the Byzantines had of late been paying tribute (967), and by instigating an attack from the
NICEPHORUS CALLISTUS—NICHOLAS, ST.

Russians distracted their attention effectively. Nicephorus was less successful in his western wars. After renouncing his tribute to the Fatimite caliphs, he sent an expedition to Sicily under Nicetas (964–65), but was forced by defeats on land and sea to evacuate that island completely. In 970 he made peace with the Saracens of Kairawan and turned to defend himself against their common enemy, Otto I. of Germany, who had attacked the Byzantine position in Italy; but after some initial successes his generals were defeated and driven back upon the southern coast. Owing to the care which he lavished upon the proper maintenance of the army, Nicephorus was compelled to exercise rigid economy in other departments. He retrenched the court largesses and curtailed the immunities of the clergy, and although himself of an ascetic disposition forbad the foundation of new monasteries. By his heavy imposts and the debasement of the coinage he forfeited his popularity with the rest of the community, and gave rise to riots. Last of all, he was forsaken by his wife, and, in consequence of a conspiracy which she headed with his nephew John Zimisces, was assassinated in his sleeping apartment.

Nicephorus was the author of an extant treatise on military tactics which contains valuable information concerning the art of war in his time.

NICEPHORUS III. (Botaniates), emperor 1078–1081, belonged to a family which claimed descent from the Roman Fabii and rose to be commander of the troops in Asia. He revolted in 1078 from Michael VII, and with the connivance of the Turks marched upon Nicaea, where he assumed the purple. In face of another rebellious general, Nicephorus Bracciano, his election was ratified by the clergy of Nicaea. With the help of Alexius Comnenus he drove out of the field Byzantines and other rivals, but failed to clear the invading Turks out of Asia Minor. Nicephorus ultimately quarrelled with Alexius, who used his influence with the army to depose the emperor and banish him to a monastery.

In the years of his reign he had entirely given himself over to debauchery.

See Gibbon, Decline and Fall (ed. Bury, 1896); Finlay, Hist. of Greece; Bury, A History of the Later Roman Empire (1893); and G. Leonardt, Kaiser Nicephorus II. (Halle, 1887).

NICEPHORUS CALLISTUS XANTHOPoulos, of Constantinople, the last of the Greek ecclesiastical historians, flourished 1310–1315. His Historia Ecclesiastica, in eighteen books, brings the narrative down to 610; for the first four centuries the author is largely dependent on his predecessors, Eusebius, Socrates, Sozomen, Theodoret and Evagrius, his additions showing very little critical faculty; for the later period his labours, based on documents now no longer extant, to which he had free access, though he used them also with small discrimination, are much more valuable. A table of contents of other five books, continuing the history to the death of Leo the Philosopher in 911, also exists, but whether the books were ever actually written is doubtful. Some modern scholars are of opinion that Nicephorus appropriated and passed off as his own the work of an unknown author of the 10th century. The plan of the work is good and, in spite of its fables and superstitious absurdities, contains important facts which would otherwise have been unknown. The history of the Latin Church receives little attention. Only one MS. of the history is known; it was stolen by a Turkish soldier from the library at Bud and was taken to Constantinople, where it was bought by a Christian and eventually reached the imperial library at Vienna. Nicephorus was also the author of lists of the emperors and patriarchs of Constantinople, of a poem on the capture of Jerusalem, and of a synopsis of the Scriptures, all in fables; and of commentaries on liturgical poems.

Works in J. P. Migne, Patrologia Graeca, ccxxv–ccxvii; see also F. C. Baur, Die Epochen der kirchlichen Geschichtsschreibung (1852); C. Krumbacher, Geschichte der byzantinischen Literatur (1897); Wetzer and Welte's Kirchenlexikon, ix. (Freiburg im Breisgau, 1893).

PATRIARCHA (c. 758–829). Byzantine historian and patriarch of Constantinople (806–815). His father Theodorus, one of the secretaries of the emperor Constantine Copronymus, had been scourged and banished for his zealous support of image-worship, and the son inherited the religious convictions of the father. He was secretary to the imperial commissions at the council of Nicaea in 787, which witnessed the triumph of his opinions; but, feeling dissatisfied with court life, he retired into a convent. In 806 he was suddenly raised by the emperor Nicephorus I. to the patriarchate of Constantinople, and this office he held until 815, when he accepted deposition and banishment. The patriarchate of Nicephorus I. was a general knapsack which was passed on and which at last was filled with the body of Leo the Armenian in the previous year. He retired to the cloister of St Theodore, which he himself had founded, and died there in 829. After his death he was included among the saints of the orthodox church.

Nicephorus is the author of a valuable compendium (Breviarium Historicum) of Byzantine history from 602 to 770, of a magnum Chronologia ecclesiastica, and a compendium of the history of the Turks, in J. P. Migne, Patrologia Graeca, c.; edition of the compendia and life by C. de Boor (1880), Teubner series; see also F. Hirsch, Byzantinische Studien (1876); H. Hergenrother, Photos (1867); and Krumbacher, Geschichte der byzantinischen Literatur (1897); Wetzer and Welte's Kirchenlexikon, ix. (Freiburg im Breisgau, 1893).

Niche (through Fr. niche from Ital. nicchia, nicchio, shell; possibly from Lat. nilius, a sea-shell; cf. "napkin" from mappa), in architecture a recess sunk in a wall, generally for the reception of a statue. The niche is sometimes terminated by a bracket or corbel, but more commonly by a canopy, and was an interesting element and a tabernacle.

NICOL, JOHN (1833–1894), Scottish man of letters, son of the astronomer J. P. Nicol (1804–1889), was born on the 8th of September 1833, and educated at Glasgow and Balliol College, Oxford, where he had a brilliant career. After taking his first-class in classics, he remained at Oxford as a coach. With Albert Venn Dicey, Thomas Hill Green, Swinburne and others, he formed the Old Mortality Society for discussions on literary matters. In 1863 he was made professor of English literature at Glasgow. He had already made a reputation as an acute critic and a successful lecturer, and his influence at Glasgow was very marked. He visited the United States in 1865, and in 1882 he wrote the article on American literature for the ninth edition of the Encyclopedia Britannica—a article which is a good example of his pungent (sometimes unduly pungent) style. He left Glasgow for London in 1884, and died on the 11th of October 1894. Among his best works were his drama Hannibal (1873), The Death of Themistocles, and other Poems (1881), his Byron in the "English Men of Letters" series (1886), his Robert Burns (1882) and Carlyle's Character (1890).

A Memoir by Professor Knight was published in 1896.

NICHOLAS, ST., bishop of Myra, in Lycia, a saint honoured by the Greeks and the Latins on the 6th of December. His cult is celebrated on the basis of his history. All the accounts that have come down to us are of a purely legendary character, and it is impossible to find any single incident confirmed historically. The main facts of his life are usually given as follows. He was bishop of Myra in the time of the emperor Diocletian, was persecuted, tortured for the faith, and kept in prison until the more tolerant reign of Constantine, and was present at the council of Nicaea. It should be observed that this last circumstance is ignored by almost all the Latic authors, and that St Athanasius, who knew all the notable bishops of the period, never mentions Nicholas, bishop of Myra. The oldest known monument of the cult of St Nicholas seems to be the church of SS Priscaus and Nicholas built at Constantinople by the emperor Justinian (see Procopius, De aedifici. i. 6). In the West, the name of St Nicholas appears in the 9th century martyrologies, and churches dedicated to him are to be found at the beginning of the 11th century. It is more especially, however, from the time of the removal of his body to Bari, in Apulia, that his cult became popular. The inhabitants of Bari organized an expedition, seized his remains by means of a ruse, and transported them to Bari, where they were received in triumph on the 9th of May.
Nicholas, the name of five popes, and one anti-pope.

Nicholas I., sometimes called The Great, and certainly the most commanding figure in the series of popes between Gregory I. and Gregory VII., succeeded Benedict III. in April 858. According to the annalist Prudentius of Troyes, "he owed his election less to the choice of the clergy than to the presence and favor of the emperor Louis II. and his nobles—who could hardly have foreseen with what ability and persistency the rights of the Holy See as supreme arbiter of Christendom were to be asserted even against themselves by the man of their choice. Of the previous history of Nicholas nothing is recorded. His pontificate of nine years and a half was marked by at least three memorable contests which have left their mark in history. The first was that in which he supported the claims of the unjustly degraded patriarch of Constantinople, Ignatius; the history of the conflict cannot be related here, but two of its incidents, the excommunication of Photius, the rival of Ignatius, by the pope in 855, and the counter-deposition of Photius himself, who had been absolved by Nicholas, by Photius in 867, were steps of serious moment towards the permanent separation between the Eastern and the Western Church. The second great struggle was that with Lothair, the king of Lorraine (second son of the emperor Lothair I., and brother of the emperor Louis II.), about the divorce of his wife Theutberga or Thietberga. The king, who desired to marry his mistress Waldrada, had brought a grave charge against the life of his queen before her marriage; with the help of Archbishops Gunther of Cologne and Thietgaud of Treves, a confession of guilt had been extorted from Thietberga, and after the marriage, that of Aix-la-Chapelle finally authorized Lothair, on the strength of this confession, to marry again. Nicholas ordered a fresh synod to try the cause over again at Metz in 863; but Lothair, who was present with his nobles, anèré secured a judgment favourable to himself, whereupon the pope not only quashed the whole proceedings, but excommunicated and deposed Gunther and Thietgaud, who had been audacious enough to bring to Rome in person the "libellus" of the synod. The archbishops appealed to Louis II., then at Benevento, to obtain the withdrawal of their sentence by force; but, although he actually occupied the Leonine city (864), he was unsuccessful in obtaining any concession, and had to withdraw to Ravenna. Thietberga herself was now induced to write to the pope a letter in which she declared the invalidity of her own marriage, and urged the cause of Lothair, but Nicholas, not without reason, refused to accept statements which had too plainly been extorted, and wrote urging him to maintain the truth steadfastly, even to the death if need were; for, since Christ is the truth, whosoever dies for the truth assuredly dies for Christ. The objection of Lothair was prevented only by the death of Nicholas. The third great ecclesiastical cause which marks this pontificate was that in which the indefeasible right of bishops to appeal to Rome against their metropolitans was successfully maintained in the case of Rothad of Soissons, who had been deposed by Hincmar of Reims. It was in the course of the controversy with the great and powerful Neustrian archbishop that papal recognition was first given (in 863) to the False Decretals, which had probably been brought by Rothad to Rome in the preceding year (see Decretals). At an early period in his reign it also became necessary for Nicholas to administer discipline to John of Ravenna, who seems to have relied not only on the prestige of his famous see but also on the support of Louis II. After lying under excommunication for some time he made a full submission. Nicholas was the pope to whom Boris, the newly converted king of Bulgaria, addressed himself for practical instruction in some of the difficult moral and social problems which naturally arose during a transition from heathenism to Christianity. The pope's letter in reply to the hundred and six questions and petitions of the barbarian king is perhaps the most remarkable literary relic of Nicholas I. now extant. He died on the 3rd of November 867, and was succeeded by Adrian II. The epistolae of Nicholas I. are printed in Migne, Patrologia Lat., vol. LIX, p. 769 seqq. See F. Gregorovius, Rome in the Middle Ages, vol. iii. (Eng. trans., London, 1900-1902); H. Lämmer, Nikolaus I. und die byzantinische Staatskirche seiner Zeit (Berlin, 1857); J. Roy, Saint-Nicolas I. (Paris, 1900); J. Richerich, Papi Nikolaus I. (Bern, 1903); A. Greimser, Die Anschauungen des Papstes Nikolaus I. über das Verhältnis von Staat und Kirche (1909). (X.)

Nicholas II., pope from December 1058 to July 1061, was a Burgundian named Gerard, who, at the time of his election to the bishopric of Florence. He was set up by Hildebrand, with the support of the emperor-regent Agnes and of the powerful Duke Godfrey of Lorraine, against Benedict X., the nominee of the Roman nobles, and was crowned at Rome, after the expulsion of Benedict, on the 24th of January 1059. His pontificate was signalized by the continuance of the policy of ecclesiastical reform associated with the name of Hildebrand (afterwards Gregory VII.). To secure his position he at once entered into relation with the Normans, now firmly established in southern Italy, and later in the year the new alliance was cemented at Rome. On the 5th of September Nicholas II. accompanied by Hildebrand, came to Treves. There, the abbot Humbert and the abbot Desiderius of Monte Cassino, solemnly invested Robert Guiscard with the duchies of Apulia, Calabria and Sicily, and Richard of Aversa with the principality of Capua, in return for oaths of fealty and the promise of assistance in guarding the rights of the Church. The first fruits of this arrangement, which was based on no firmer foundation than the forged "Donation of Constantine" (q.v.), but destined to give to the papacy a position of independence towards both the Eastern and Western Empires, was the reduction in the autumn, with papal aid, of Lucca, where the anti-pope had taken refuge, and the end of the subordination of the papacy to the Roman nobles.

Meanwhile, Peter Damian and Bishop Anselm of Lucca had been sent by Pope Nicholas to Milan to adjust the difference between the Patarenes and the archbishop and clergy. The result was a fresh triumph for the papacy, Archbishop Wido, in face of the ruinous conflict in the Church of Milan, being forced to submit to the terms proposed by the legates, which involved the principle of the subordination of Milan to Rome; the new relation was advertized by the unwilling attendance at Milan of Wido and the other Milanese bishops at the council summoned to the Lateran palace in April 1059. This council not only continued the Hildebrandine reforms by sharpening the discipline of the clergy, but marks an epoch in the history of the papacy by its famous regulation of future elections to the Holy See (see
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Lateran Councils, and Conclave). Its most important immediate result was the revival of strained relations with the empire, due to the fact that the emperor's traditional rights in the matter of papal elections had been completely ignored. Stephen, cardinal priest of S. Chrysogonus, was sent to the German court to attempt to allay the consequent ill-feeling, but was not received. Pope Nicholas, moreover, had offended the German bishops by what they regarded as arbitrary interference with their rights: he had refused to send the pallium of Archbishop Siegfried of Mainz; he had sent a sharp letter of admonition to Archbishop Anno of Cologne. The resulting opposition culminated in a synod of German bishops, perhaps early in 1061 (its date and place of meeting are unknown), at which the decrees of the pope, including the new electoral law, were annulled, while he himself was deposed and his name ordered to be expunged from the canon of the Mass. That these resolutions were not followed by any further action was due to the war of parties in Germany, which enabled the papacy to ignore a demonstration of opinion to which no effect could be given.

Nicholas II. died at Florence in July 1061. Personally he was one of the least important of the popes, and the great importance of the events of his pontificate is due to the fact that, as Peter Damian wrote (Epist. i. 7), he possessed in Hildebrand, Cardinal Humbert and Bishop Boniface of Albano acumen et potentiam, nesciendum est ad quos réturnus usque sese revocet. His Diplomata, epistolae, decreta are in Migne, Patrologia, Lat. 143, pp. 1301-1366. See the article "Nikolaus II." by C. Mihrt in Herzog-Hauck, Realencyklopädie (3rd ed., Leipzig, 1903), with bibliography. A complete edition of Potthast's edition, with editio princeps, is in Hist. Med. Acta. (2d ed., Berlin, 1896), p. 856; and Ulysses Chevalier, Répertoire des sources hist. bibliogr. (Paris, 1905), vol. 3447, s.v. "Nicolaus II." (X.)

Nicholas III. (Giovanni Gaetano Orsini), pope from the 25th of November 1277 to the 22nd of August 1280, was a Roman nobleman, who served as papal legate and cardinal-deacon of St Nicola in carceri Tulliano by Innocent IV., protector of the Franciscans by Alexander IV., inquisitor-general by Urban IV., and succeeded John XXII., largely through family influence, after a six-months' vacancy in the Holy See. His brief pontificate was marked by several important events. A born politician, he greatly strengthened the papal position in Italy. He concluded a concordat with Rudolph of Habsburg in May 1278, by which the Romagna and the exarchate of Ravenna were guaranteed to the pope; and in July he issued an epoch-making constitution for the government of Rome, which forbade foreigners taking civil office. Nicholas issued the bull Exultat on the 14th of August 1279 to settle the strife within the Franciscan order between the parties of strict and loose observance. He repaired the Lateran and the Vatican at enormous cost, and erected a beautiful country house at Soriano near Viterbo. Nicholas, though a man of learning and strength of character, brought just reproach on himself for his efforts to found principalities for his nephews and other relatives. He died from a stroke of apoplexy and was succeeded by Martin IV. See "Les Registres de Nicolas III." published by Jules Gay in Bibliothèque des écoles françaises d' Athènes et de Rome (Paris, 1896-1905); A. Potthast, Regesta pontificum Romana, vol. 2 (Berlin, 1875); A. Vemski, "Pape Nicolas III. in Kritischer Geschichte der Staatshandlung (Münster, 1900); F. Gregorovius, Rome in the Middle Ages, vol. 5, trans. by Mrs G. W. Hamilton (London, 1900-1902); Fr. Wertz, Die Besuche Rudolphs von Habsburg zu Rom, Kuirie bis zum Tode Nikolaus III. (Bochum, 1880); G. Palmieri, Introiti ed esily di Papa Niccolò III. (Rome, 1889). (C. H. Ha.)

Nicholas IV. (Girolamo Masci), pope from the 22nd of February 1288 to the 4th of April 1292, a native of Ascoli and a Franciscan monk, had beenlegate to the Greeks under Gregory X. in 1272, succeeded St Bonaventura as general of his order in 1274, was made cardinal-priest of Sta Prassede and Latin patriarch of Constantinople by Nicholas III., cardinal-bishop of Palestrina by Martin IV., and succeeded Honorius IV. after a término of two years in the papacy. He was a pious, pénitent-loving monk with no ambition save for the church, the crusades and the extirpation of heresy. He steered a middle course between the factions at Rome, and sought a settlement of the Sicilian question. In May 1280 he crowned Charles II. king of Naples and Sicily after the latter had expressly recognized papal suzerainty, and in February 1291 concluded a treaty with Alphonso III. of Aragon and Philip IV. of France looking toward the possibility of a crusade to recover the holy land. The loss of Prolemas in 1291 stirred the pope to renewed energy for a crusade. He sent the celebrated Franciscan missionary, John of Monte Corvino, with some companions to labour among the Tartars and Chinese. He issued an important constitution on the 18th of July 1289, which granted to the cardinals one-half of all income accruing to the Roman see and a share in the financial management, and thereby paved the way for that independence of the college of cardinals which, in the following century, was to be of detriment to the papacy. Nicholas died in the palace which he had built beside Sta Maria Maggiore, and was succeeded by Celestine V.


Nicholas V. (Tommaso Parentucelli or Tommaso da Carpi, later of Sarnazzia), pope from the 6th of March 1447 to the 24th of March 1455, was born at Sarnazzia, where his father was a physician, in 1398. He early studied at Bologna, where the bishop, Nicholas Albergati, was so much struck with his ardour for learning that he gave him the chance to pursue his studies further, by sending him on a tour through Germany, France and England. He distinguished himself at the council of Ferrara-Florence, and in 1444 was made bishop of Bologna by Pope Eugenius IV., who soon afterwards named him as one of the legates charged to negotiate at the convention of Frankfort an understanding between the Holy See and the Empire with regard to the re-forming decrees of the council of Basel. His successful diplomacy was rewarded, on his return to Rome, with the title of cardinal priest of Sta Susanna (December 1446). He was elected pope in succession to Eugenius IV. on the 6th of March of the following year, taking the name of Nicholas in honour of his early benefactor.

The eight years of his pontificate were important in the political, scientific and literary history of the world. With the German king, Frederick III., he made the Concordat of Vienna, or Aschaffenburg (February 17, 1448), by which the decrees of the council of Basle were abrogated so far as Germany was concerned; and in the following year he secured a still greater triumph when the resignation of the anti-pope Felix V. (April 7), and his own recognition by the rump of the council of Basel, assembled at Lausanne, put an end to the papal schism. The next year, 1459, Nicholas held a jubilee at Rome; and the offerings of the numerous pilgrims who thronged to Rome gave him the means of furthering the cause of culture in Italy, which he had so much at heart. In March 1452 he crowned Frederick III. as emperor in St Peter's, the last occasion of the coronation of an emperor in sacred Rome.

Under the generous patronage of Nicholas humanism made rapid strides. He employed hundreds of copyists and scholars, giving as much as ten thousand guénden for a metrical translation of Homer, and founded a library of nine thousand volumes. Nicholas himself was a man of vast erudition, and his friend Aeneas Silvius (later Pope Pius II.) said of him that "what he does not know is outside the range of human knowledge." He was compelled, however, to add that the lustre of his pontificate would be forever dulled by the tragic fall of Constanctipole, which the Turks took in 1453. The pope bitterly felt this catastrophe as a double blow to Christendom and to Greek letters. "It is a second death," wrote Aeneas Silvius,
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"to Homer and Plato." Nicholas preached a crusade, and endeavoured to reconcile the mutual animosities of the Italian states, but without much success.

Nicholas conceived great plans for beautifying and developing Rome. He restored the walls and numerous churches, and began the rebuilding of the Vatican and St Peter's. In undertaking these works Nicholas was moved by no vulgar motives, his idea being "to strengthen the weak faith of the people by the greatness of that which it sees." The Romans, however, appreciated neither his motives nor their results, and in 1452 a formidable conspiracy for the overthrow of the papal government, under the leadership of Stefano Porcaro, was discovered and crushed. This revelation of disaffection, together with the fall of Constantinople, darkened the last years of Nicholas; "As Thomas of Sarzana," he said, "I had more happiness in a day than now in a whole year." He died on the 24th of March 1455.


Nicholas V. (Pietro Raimonducci), antipope in Italy from 1328 to 1330 during the pontificate of John XXII. At Avignon, was a native of Corbara in the Abruzzi. He joined the Franciscan order after separating from his wife in 1316, and became famous as a preacher. He was elected through the influence of the excommunicated emperor, Louis the Bavarian, by an assembly of priests and laymen, and consecrated at St Peter's on the 12th of May 1328 by the bishop of Venice. After spending four months in Rome, he withdrew with Louis to Viterbo and thence to Pisa, where he was guarded by the imperial vicar. He was excommunicated by John XXII. in April 1329, and sought refuge with Count Boniface of Donoratico near Fiambio. Having obtained assurance of pardon, he presented a confession of his sins first to the archbishop of Pisa, and then (25th of August 1330) to the pope at Avignon. He remained in honourable imprisonment in the papal palace until his death in October 1333.


Nicholas (1841—), King of Montenegro and the Berda, was born at the village of Nieghus, the ancient home of the reigning family of Petrovitch-Nieghus, on the 25th of September 1841. His father, Mirko Petrovitch, a celebrated Montenegrin warrior, was elder brother to Danilo II., who led no male offspring. After 1653, when land Hungarians arrived, the bishop, became hereditary in the Petrovitch family, the sovereign power had descended from uncle to nephew, the vladikas belonging to the order of the "black clergy" who are forbidden to marry. A change was introduced by Danilo II., who declined the episcopal office, married and declared the principality hereditary in the direct male line. Mirko Petrovitch having resigned his claim to the throne, his son was nominated heir, and the old system of succession was thus accidentally continued. Prince Nicholas, who had been trained from infancy in martial and athletic exercises, spent a portion of his early boyhood at Trieste in the household of the Kutchfitch family, to whom his mother belonged, the princess Darinka, wife of Danilo II., belonged. The princess was an ardent advocate of French culture, and at her suggestion the young heir of the vladikas was sent to the academy of Louis le Grand in Paris. Unlike his contemporary, King Milan of Servia, Prince Nicholas was little influenced in his tastes and habits by his Parisian education; the young mountaineer, whose keen patriotism, capability for leadership and poetic talents early displayed themselves, showed no inclination for the pleasures of the French capital, and eagerly looked forward to returning to his native land. He was still in Paris when, in consequence of the assassination of his uncle, he succeeded as prince (August 13, 1860). In 1862 Montenegro was engaged in an unfortunate struggle with Turkey; the prince distinguished himself during the campaign, and on one occasion narrowly escaped with his life. In the period of peace which followed he carried out a series of military, administrative and educational reforms. In 1867 he met the emperor Napoleon III. at Paris, and in 1868 he undertook a journey to Russia, where he received an affectionate welcome from the tsar, Alexander II. He afterwards visited various parts of Berlin and efforts to enlist the sympathies of the Russian imperial family were productive of important results for Montenegro; considerable subventions were granted by the tsar and tsaritsa for educational and other purposes, and supplies of arms and ammunition were sent to Cettigne. In 1871 Prince Dolgorouki arrived at Montenegro on a special mission from the tsar, and distributed large sums of money among the people. In 1869 Prince Nicholas, whose authority was now firmly established, succeeded in preventing the impetuous mountaineers from his kingdom from an insurrection against the Russian government (see CATTARO); similarly in 1870 he checked the martial excitement caused by the outbreak of the Greco-Turkish War. In 1876 he declared war against Turkey; his military reputation was enhanced by the ensuing campaign, and still more by that of 1877-78, during which he captured Nikshitch, Antvari and Dulceingo. The war resulted in a considerable extension of the Montenegrin frontier and the acquisition of a seaboard on the Adriatic. In 1883 Prince Nicholas visited the sultan, with whom he subsequently maintained the most friendly relations; in 1896 he celebrated the bicentenary of the Petrovitch dynasty by a splendid gala. The same year he attended the coronation of the tsar Nicholas II; in May 1898 he visited Queen Victoria at Windsor. In 1900 he assumed the title of "Royal Highness." On the 28th of August 1910, during the celebration of his jubilee, he assumed the title of king, in accordance with a petition from the Skupshina. He was at the same time gazetted field-marshal in the Russian army, an honour never previously conferred on any foreigner except the great duke of Wellington. The descendant of a long line of warriors, gifted with a fine physique and a commanding presence, a successful military leader and a graceful poet, King Nicholas possessed many characteristics which awoke the enthusiasm of the impressionable Servian race, while his merits as a statesman received general recognition. His system of government, which may be described as a benevolent despotism, was perhaps that best suited to the character of his subjects. His historical dramas, poems and ballads hold a recognized place in contemporary Slavonic literature; among them are—Balkanska Tsrarica and Knjaz Arsonilii (dramas); Haidana, Polini Avensarego and Penik i Vila (poems); Skuphine Pesme i Nova Kola (miscellaneous poems). In November 1870 Prince Nicholas married Milena, daughter of the vevoie Petar Vukotich. Of his three sons, the eldest, Prince Danilo, married (July 27, 1890) Duchess Julita (Militza) of Mecklenburg-Strelitz; of his six daughters, Princess Militza married the Duke Peter Nikolaievich, Princess Stana, Duke George of Leuchtenberg, Princess Helena, King Victor Emmanuel III. of Italy, and Princess Anka, Prince Francis Joseph of Battenberg. (J. D. B.)

Nicholas I. [Nikolai Pavlovich], emperor of Russia (1796-1855), eighth child of the emperor Paul I. and his wife Maria Fyodorova, was born at Tsarskoie-Selo on the 25th of June (July 6, N.S.) 1776. He was only five years old when his father's murderer brought his brother Alexander I. to the throne (1801). In the following year his education was entrusted to M. von Lambsdorff, director of the 1st cadet corps and ex-governor of Courland, a man of character and wide knowledge, who superintended it for the next fifteen years. But Nicholas had as little taste for learning as his brother Constantine. The royal pupils spent their lesson hours, as Nicholas afterwards confessed, partly in dreaming, partly in drawing all sorts of nonsense, in the end "cramming just enough to scrape through their examinations without discredit." His chief bent was in the direction of everything connected with military
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matters. Religious training was confined to instruction in the forms of the Orthodox Church and the repetition of prayers by rote; dogmatic questions Nicholas neither understood nor cared about; and, in spite of his reverence for his brother Alexander, the latter’s mysticism had not the faintest influence upon him.

Though a colonel in his cradle and a general since 1808, the grand-duke Nicholas did not see any active service until 1815 when he was allowed to join the Russian head-quarters in France but not to take part in any fighting. It is characteristic of him that from this time onwards he never wore civilian dress. In 1815 he was with the Allies in Paris, and in the following year set out on the grand tour, visiting Moscow and the western provinces of Russia, Berlin (where his engagement to Princess Charlotte Louise, daughter of Frederick William III., was arranged) and England, where his handsome presence and charming address created a profound impression. On the 1/13th of July 1817 took place at St Petersburg his marriage to Princess Louise (Alexandra Feodorovna), the beauty. When those intimate relations between the courts of Berlin and St Petersburg which were later to become of great international importance. On the 17/20th of April 1818 their first child, the future emperor Alexander II., was born. In the autumn Nicholas was placed in command of the 2nd brigade of the 1st division of the Guard. In 1819 the emperor Alexander first mentioned his intention to abdicate in favour of Nicholas, Constantine consenting to stand aside; but he took no steps to initiate his prospective heir in affairs of state, and the grand-duke continued to be confined to the leisurely duties of a youth. In 1820 a further important step in the matter of the succession was taken in the divorce of Constantine from the grand-duchess Anne and his re-marriage to Johanna Grudzinska (see CONSTANTINE PAVLOVICH). In January 1822 it was decided in a family council, with the knowledge though not in the presence of Nicholas, that Constantine’s petition to be relieved of the burden of the crown, for which he felt himself unfitted, should be granted. It was not, however, until August 1823 that the emperor drew up the necessary papers, in the presence of the metropolitan Philaret and other witnesses, and deposited them in sealed packets, to be opened at his death. Nicholas was taken to open the sealed packets, and he himself took the oath to Constantine, and, with characteristic contempt for constitutional forms, usurped the functions of the senate and council of state by himself ordering its imposition on the regiments stationed in St Petersburg. But Constantine refused to come to St Petersburg, or to do more than himself take the oath to Nicholas as emperor, and write assuring him of his loyalty. The result was a three weeks’ interregnum, of which the discontented spirits in the army took advantage to bring to a head a plot that had long been hatching in favour of constitutional reform. When on the 14th of December the troops who had already taken the oath to Constantine were ordered to take another to Nicholas, it was easy to persuade them that this was a treasonable plot against the true emperor. The Moscow regiment refused to take the oath, and part of it marched, shouting for Constantine and “Constitution,” to the square before the Senate House, where they were joined by a company of the Guard and the sailors from the warships. In this crisis Nicholas showed high personal courage, if little decision and initiative. It was entirely uncertain how many, and which, regiments could be trusted. For hours he stood, or sat on horseback, amid the surging crowd, facing the mutinous soldiers—who had loaded their muskets and formed square—while effort after effort was made to bring them to reason, sometimes at the cost of life—as in the case of Count Mlodorovich, military governor of St Petersburg, who was established within a few yards of the riot while arguing with the mutineers. Nicholas was saved by the very belief of the conspirators in the universal sympathy of the army with their aims. Had the mutinous troops early in the day received the order to attack, they would have carried the waverers with them; but they hesitated to fire on comrades whom they expected to see march over to their side; and when at last the emperor had steadied his heart to use force, a few rounds of grape-shot sufficed to quell the mutiny. The chief conspirators—Prince Shchepkin-Kostovski, Suthoff, Ryleyev, Prince Sergius Trubetskoi, Prince Obolenski and others—were arrested the same night and interred in the fortress of St Petersburg. In the meantime, however, the army was too large for the whole of it to be involved in the mutiny. So, though they were 121 of them and their trial had concluded by the 12th of June. Some were condemned to death, others to solitary confinement in fortresses, others to the Siberian mines and colonies. Of the latter many were accompanied by their wives, though the Russian law allows divorce in the case of such sentences; the emperor unwillingly allowed the devoted wives to go, but decreed that any children born to them in Siberia would be illegitimate. Firmly seated on his throne, Nicholas proceeded to fill up the gaps in his education by studying the condition of his empire. In spite of his reverence for his brother’s memory, he made a clean sweep of “the angel’s Bible.” Societies, and other paraphernalia of official hypocrisy; as for Alexander’s projects of reform, the pitiful legacy of a life of unfulfilled purposes, these were reported upon by committees, considered and shelved. Nicholas too saw the need for reform; the Decembrist conspiracy had burnt that into his soul; but he had his own views as to the reform needed. The state was corrupt, disorganized; what was wanted was not more liberty but more discipline. So he put civil servants, professors and students into uniform, and for little offences had them marched to the guard-house; thought was disciplined by the censorship, the army by an unceasing round of parades and inspections. The one great gift of Nicholas I. to Russia, a gift which he really believed would be welcome because it would bring every subject into immediate contact with the throne, was—the secret police, the dreaded Third Section. The crowning fault of Nicholas was, however, that he would not delegate his authority; whom could he trust but himself? In this he resembled his contemporary the emperor Francis I. But Francis would “sleep upon” a difficult problem; Nicholas never slept. His constitution was of iron, his capacity for work prodigious; reviews and parades, receptions of deportations, visits to public institutions, then eight or nine hours in his

1 See Stockmar, Denkwürdigkeiten (Brunswick, 1872), p. 98 seq.; and, for a later impression, Queen Victoria to the king of the Belgians, 4th of June 1840, in Queen Victoria’s Letters.
2 They had been told that this was the name of Constantine’s wife.
3 From Russ. Dekabr, December.
4 The Holy Scriptures distributed with an absurd profusion in a country where the clergy itself is hardly able to understand and explain them “had been the “prime source of all the secret societies established in the empire.” Pièce remise par S.M. l’Empereur Nicolas, in Nesselrode vi. 275.
5 i.e. of the Private Chancery of the emperor.
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cabinet reading and deciding on reports and despatches—such
was his ordinary day's work. Yet, in spite of all this, his activity
could not but prove the narrow limits of autocratic power.
Under the "Iron Tsar" the outward semblance of authority
was perfectly maintained; but behind this imposing façade
the whole structure of the Russian administrative system con-
tinued to rot and crumble. The process was even hastened;
for the emperor's stern discipline crushed out all independence
of initiative and silenced all honest criticism. The secret police
provided but a poor substitute for the assistance which an
argus-eyed and articulate public opinion gives to the efficient
working of a constitutional system; for the greatest of autocrats
has but two eyes, and it is no difficult task to deceive him.
Thus it came about that, as Professor Schiemann puts it,
"Potemkin's scenery was brought out again," and Nicholas
walked with conscious self-approval through a Russia seemingly
well ordered, but in fact merely temporarily prepared for each
stage of his progress.

War is the ultimate and sharpest test of the soundness of a
state, and to this test Russia was submitted soon after the
accession of Nicholas, who could not be blind to the revelations
that resulted, though he drew the wrong moral. These re-
velations had, indeed, begun before the outbreak of the war
with Turkey in 1828. The new tsar had devoted especial
attention to the reform and reconstruction of the navy, which
under Alexander I. had been suffered to decay. Yet the newly
organized squadron which in 1827 set out on the cruise which
ended with the battle of Navarino only reached Plymouth with difficulty,
and there had to be completely refitted. The disastrous Balkan
campaign of 1828 was an even more astounding revelation of
corruption, disorganization and folly in high places; and the
presence of the emperor did nothing to mitigate the attendant
evils. He was indefatigable, in war as in peace, in parading and
inspecting; the weary and starving soldiers were forced to turn
out amid the marshes of the Dobrudzcha as spick and span as on
the parade grounds of St Petersburg; but he could do nothing
to set order in the confusion of the commissariat, which caused
the troops to die like flies of dysentery and scurvy; or to remedy
the scandals of the hospitals, which inflicted on the wounded
unspeakable sufferings. On the other hand, his presence was
sufficient to hamper the initiative of Prince Wittgenstein,
the nominal commander-in-chief; for Nicholas was constitutionally
incapable of leaving him a free hand. This was one reason
for the failure of the opening campaign.1 Another was more
creditable to the tsar's heart than to his head; he turned from
the sight of wounds and blood, and would not make up his
mind to sanction operations which, at the cost of a few hundred
lives, would have saved thousands who perished miserably of
disease.2

These were the leading principles which underlay
Nicholas's domestic and foreign policy from first to last:
to discipline Russia, and by means of a disciplined Russia to
discipline the world. So far as the latter task was concerned,
he again sharply divided the issues which Alexander had con-
fused. The mission of Russia in the West was, in accordance
with the principles of the Holy Alliance as Nicholas interpreted
them, to uphold the cause of legitimacy and autocracy against
the Revolution; her mission in the East was, with or without
the support of Europe, to advance the cause of Orthodox
Christianity, of which she was the natural protector, at the
expense of the decaying Ottoman empire. The sympathy of
Europe with the insurgent Greeks gave the tsar his opportunity.
The duke of Wellington was sent to St Petersburg in 1826 to
congratulate the new tsar on his accession and arrange a concert
in the Eastern Question. The upshot proved the diplomatic
value of Nicholas's apparent sincerity of purpose and charm of
manner; the "Iron Duke" was to the "Iron Tsar" as soft
iron to steel; Great Britain, without efficient guarantees for the
future, stood committed to the policy which ended in the de-
struction of the Ottoman sea-power at Navarino and the march
of the Russians on Constantinople. By the treaty of Adrianople
in 1829 Turkey seemed to become little better than a vassal
state of the tsar, a relation intensified, after the first revolt of
Mehemet Ali, by the treaty of Unkia-Skelessi in 1833 (see
MEHEMET ALI). In the West, meanwhile, the revolutions of
1830 had modified the balance of forces. Nicholas himself
proposed an armed intervention of the Alliance in order "to
restore order in Belgium and France;" and when his allies
held back even proposed to intervene alone, a project rendered
impossible by the outbreak of the great insurrection in Poland,
which tied the hands of all three powers (see POLAND: History).
In the circumstances, Nicholas was forced to give a grudging
recognition to the title of Louis Philippe as king of the French;
his recognition of that of Leopold, king of the Belgians, was
postponed until King William of the Netherlands had finally
resigned his rights. Then, the insurrection in Poland once
crushed, and Poland itself scarce surviving even as a geographical
expression,4 he drew the three eastern autocratic powers together
in a new "Holy Alliance" by the secret convention of Berlin
(3rd Oct. 1833) reaffirming the right and duty of intervention at
any moment of a dismembered or divided Ottoman empire.
Nicholas, whose relations with Austria, cemented at Münchgrätz and Berlin, was
renewed, after the accession of the emperor Ferdinand, at
Prague and Töplitz (1835); on the latter occasion it was decided
"without difficulty" to suppress the republic of Cracow, as
a centre of revolutionary agitation.5 The Triple Alliance
was now, in the tsar's opinion, "the last anchor of safety for the
monarchical cause." To its maintenance he had sacrificed his
religious convictions and the traditions of Russian policy
in consenting to uphold the integrity of Turkey; a sacrifice
perhaps the less hard to make since, as he added, the Ottoman
empire no longer existed.6 He allowed himself to be persuaded
by Metternich to support the cause of Don Carlos in Spain,7
and so early as May 1837, in view of the agitation in Hungary,
he announced that "in every case" Austria might count on
Russia.

These cordial ties were loosened, however, by the fresh crisis
in the Eastern Question after 1838. Metternich was anxious
to summon a European conference to Vienna, with a view to placing
Turkey under a collective guarantee. To Nicholas this seemed
to be a blow aimed at Russia, and he refused to be a party to it.8
Moreover, in view of the tendency of Austria to forget the con-
ventions of Münchgrätz and Töplitz, and to approach the
maritime powers, he determined to checkmate her by himself
coming to an agreement with Great Britain, in order to settle
the Eastern Question according to his own views: a double gain,
if by this means Queen Victoria (a "legitimate" sovereign) could
be drawn away from her unhappy alliance with the Jacobin Louis
Philippe. This is the explanation of those concessions in the
Eastern Question which ended in the Quadruple Alliance
of 1840 and the humilication of Louis Philippe's government (see
Europe, 1840, vii. p. 178; 9).

The new Anglo-Russian entente led in 1844 to a visit of the

1 Martens, Russia, viii. 164, &c., especially the autograph mem.
of the tsar on the English nurse, Miss Lyon, of her sufferings
during the siege of Warsaw in 1794—Schiemann, i. 181.
2 This convention was not acted upon till 1846.
3 Conversation with Count Cieolomel (Feb. 13, 1833) in Martens
4 Ib. p. 475.
5 Ib. p. 481.
6 Nicholas himself ascribed his hatred of Poles and Jews to the
stories told him by his English nurse, Miss Lyon, of her sufferings

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Nicholas was soon to have personal experience of the perjury of Austria. It was a small matter that Count Prokesch-Osten, the Austrian ambassador, was discovered to be supplying a "foul Jew" editor with copy; more serious was Austria's attitude in the troubles that led up to the Crimean War. Gratitude, in the tsar's opinion, should have made her neuter not friendly; the revelation of her ingratitude came upon him with the shock of a painful surprise. The first cause of all the evils that followed was his attitude towards Napoleon III. He was forced to recognize the new French empire, but he would recognize no more than the fact of its existence (du fait en lui-même); he refused to address the emperor of the French as a brother sovereign. He attempted, moreover, to revive the function of the triple alliance as guardian of Europe against French aggression. The resentment of Napoleon awakened the slumbering Eastern Question by recalling to him the ancient claims of Russia to the succession of the Holy Places, and this aroused the pride of the Orthodox tsar, their guardian by right of faith and in virtue of a clause of the treaty of Kucha Kainardji (1774), as interpreted in the light of subsequent events. Nicholas could not believe that Christian powers would renounce his claim to protect the Christian subjects of the sultan; he believed he could count on the friendship of Austria and Prussia; as for Great Britain, he would try to come to a frank understanding with her (hence the famous conversations with Sir Hamilton at the Foreign Office on the 9th and 14th of January 1853, reviving the "Sick Man of Europe") in the light of his assurance of Baron Brunnow, his ambassador in London, that the influence of Cobden and Bright, the eloquent apostles of peace, was enough to prevent her from appealing to arms against him.

The disillusionment that followed was profound. In October 1853 Nicholas met his brother monarchs of the triple alliance at Warsaw for the last time. In December, at the conference of Vienna, Austria had already passed over to the enemy. Prussia was wavering, neutral indeed, but joining the other powers in a guarantee of the integrity of Turkey (4th April 1854), urging the tsar to accept the decisions of the Vienna conference, and on his refusal signing a defensive alliance with Austria (April 20, 1854), which included among the casus belli the incorporation in Russia of the banks of the Donube and a Russian march on Constantinople. Thus Nicholas, the pillar of the European alliance, found himself isolated and at war, or potentially at war, with all Europe. The invasion of the Crimea followed, and with it a fresh revelation of the corruption and demoralization of the Russian system. At the outset Nicholas had grimly remarked that "Generals January and February" would prove his best allies. These acted, however, impartially; and if thousands of British and French soldiers perished of cold and disease in the trenches before Sevastopol, the tracks leading from the centre of Russia into the Crimea were marked by the bones of Russian dead. The revelation of his power was the spirit of the Iron Tsar, and on the end of March 1855 he threw away the life which a little ordinary care would have saved.

The character of the emperor Nicholas was summed up with great insight by Queen Victoria in a letter to the king of the Belgians, written during the tsar's visit to England (June 11, 1844). "He is stern and severe—with fixed principles of duty which nothing on earth will make him change; very clever I do not think him, and his mind is an uncivilized one; his education has been neglected; politics and military concerns are the only things he takes great interest in; the arts and all softer occupations are of no importance to him. There is no great man, even in his most despotic acts, from a sense that that is the only way to govern; he is not, I am sure, aware of the dreadful cases of individual misery which he so often causes, for I can see by various instances that he is kept in utter ignorance of many things, which his people carry out in most corrupt ways, while he thinks that he is extremely just . . . and I am sure much never reaches his ears, and (as you observed) how can it? He is, I should say, too frank, for he talks so openly before people, which he should not do, and with difficulty restrains himself. There is no man who should be beloved; there is no man who would desire me to remove him. . . . I am inclined to believe; then his feelings are very strong; he feels kindness deeply. . . . He is not happy, and that melancholy which is visible in the countenance made me sad at times; the sternness of the eyes goes very much off when you know him, and changes according to his being put out or not. . . . He is bald now, but in his cherisher Garde uniform he is magnificent still, and very striking." The emperor was a kind husband and father, and his domestic life was very happy. He had seven children: (1) the emperor Alexander II. (g.v.); (2) the grand-duchess Maria (1819-1876), Duchess of Leuchtenberg; (3) the grand-duchess Ekaterina (1829-1892), consort of King Charles of Würtemberg; (4) the grand-duchess Alexandra (1832-1844), married to Prince Frederick of Hesse-Cassel; (5) the grand-duke Constantine Nikolayevich (1827-1892); (6) the grand-duke Nicholas Nikolayevich (1831-1891); (7) the grand-duke Michael Nikolayevich (b. 1832). The second son of the latter, the grand-duke Michael Mikhailovich (b. 1861), who was morganatically married, his wife bearing the title of Countess Torby, took up his residence in England.

Authorities.—All other works on Nicholas I. have been more or less superseded by Professor Theodor Schiemann's Geschichte Russlands unter Kaiser Nikolaus I., of which the 1st vol. Kaiser Alexander I. und die Ergebnisse seiner Lebensarbeit, was published at Berlin in 1904; the 2nd, carrying the history of Nicholas's reign down to the revolutions of 1830, in 1908. It is based on a large mass of published material, and compiled from many of the chief archives. Many of the accession of Nicholas and of the Decabrist conspiracy given in chapte. xiii. of vol. x. of the Cambridge Modern History, and tells for the first time that the Decabrist movements in the Russian-Turkish War of 1828-29. The great Recueil des traités conclus par la Russie of T. T. de Martens (St Petersburg, 1874-1900) contains admirable introductory essays, based on the unpublished Russian archives, and giving much information and character. The study, though not completed, is still in course and contains many documents are published for the first time in Schiemann's work; some, from the archives of Count Nessedorfe, are published in the Lettres et papiers du Chancelier Comte de Nessedorfe, t. vi. sec. For other works see bibliographies attached to the chapters of Russia in vol. x. and xi. of the Cambridge Modern History.
Nicholas II. (1868–1918), emperor of Russia, eldest son and successor of Alexander III., was born at St Petersburg on the 18th of May 1868. He received the ordinary education of Russian grand-dukes, under the direction of General Danovich, assisted by M. Pobédonostsev and other eminent professors. Among these was an Englishman, Mr Charles Heath, for whom he had great respect and affection. By the death of his grandfather, Alexander II., in 1881, he became heir-apparent (cesarevich). Though he received, like all the heirs-apparent to the Russian throne, a certain amount of military training, his personal tastes did not lie in that direction, nor did he show any inclination for the study of Russian literature and history, which he continued to pursue with zeal and success. In the month he married Princess Alix of Hesse (a grand-daughter of Queen Victoria), to whom he had been betrothed in the presence of his father during the latter's last illness. Eighteen months later the coronation took place at Moscow with great pomp, but a gloom was thrown over the festivities by the unfortunate incident of the Khodinsko Polye, a great open space near the city, where a popular fête had been prepared and where, from defective police arrangements, a large number of men, women and children, roughly estimated at 2000, were crushed and trampled to death. Nicholas II., followed in the footsteps of his father, seeking to preserve peace in foreign relations, and continuing in home affairs, though in a much milder form, the policy of centralization and Russification which had characterized the previous reign. His pacific tendencies were shown by his systematic opposition to all bellicose excitement, by his maintaining M. de Giens in the post of minister of foreign affairs, by his offering the post, on the death of that statesman, to M. de Staël, by his restraining France from dangerous adventures, and by initiating the Peace Conference at the Hague. To these ought perhaps to be added the transformation of the Franco-Russian entente cordial into a formal alliance, since the alliance in question might be regarded as favourable to the preservation of the status quo in Europe. In the internal administration during the first years of his reign he introduced by his personal influence, and without any great change in the laws, a more humane spirit towards those of his subjects who did not belong by language and tradition to the dominant nationality, and who were not members of the Eastern Orthodox Church; but he disappointed the men of liberal views by giving it to be clearly understood soon after his accession that he had no intention of circumscribing and weakening the autocratic power by constitutional guarantees or parliamentary institutions. In spite, however, of his desire for peace he let his country drift into the disastrous war with Japan; and notwithstanding his sincere attachment to the principles of bureaucratic autocracy, it was he who granted the constitutional reforms which altered the whole political outlook in Russia (see Russla).

Nicholas of Basel (d. 1397), a prominent member of the Beghard community, who travelled widely as a missionary and propagated the teachings of his sect. Though vigorously sought after by the Inquisition he eluded its agents for many years until in 1307 he was seized in Vienna, and burned at the stake as a heretic, together with two of his followers, John and James. A considerable legend has attached itself to Nicholas through the persistent but mistaken identification of him with the mysterious "Friend of God from the Oberland," the "double" of Rulman Merswin, the Strassburg banker who was one of the leaders of the 14th-century German mystics known as the Friends of God. In Merswin's Story of the First Four Years of a New Life, he writes: "Of all the wonderful works which God had wrought in me I was not allowed to tell a single word to anybody until the time when it should please God to reveal to a man in the Oberland to come to me. When he came to me God gave me the power to tell him everything." The identity and personality of this "Friend of God," who bulks so largely in the great collection of mystical literature, and is everywhere treated as a half supernatural character, is one of the most difficult problems in the history of mysticism. The tradition, dating from the 15th century and supported by the weighty authority of the Strassburg historian Karl von den Hoven (Von der Wathen), is founded on a statement by Nicholas, but is now discredited by all scholars. A. Jundt (Les Amis de Dieu, 1879) shared Preger's view that the Friend was a great unknown who lived in or near Chur (Coire) in Switzerland. But since Denifle's researches (see especially Der Gottesfreund im Oberlande und Nikolaus von Basel, 1870) the belief has gained ground that the "Friend" is not a historical personage at all. Apart from the collection of literature ascribed to him and Merswin there is no historical evidence of his existence. The accounts of his life say that about 1343 he was forbidden to reveal his identity to anyone save Rulman Merswin. And all the particulars of the life of a single author which have been assumed, especially by Denifle, that "the Friend of God" was a literary creation of Merswin and that the whole collection of literature is the work of Merswin (and his school), tendency-literture designed to set forth the ideals of the movement to which he had given his life. Thus "the great unknown" from the Oberland is the ideal character, "who illustrates how God does his work for the world and for the church through a divinely trained and spiritually illuminated layman," just as William Langland in England about the same time drew the figure of Robin Goodfellow.

To rescue Merswin from the charge of deceit involved in this theory, Jundt puts forward the suggestion, more ingenious than convincing, that Merswin was a "double personality," who in his primary state wrote the books ascribed to him, and in his secondary state became "the Friend of God from the Oberland," writing the other treatises. A third hypothesis is that advanced by Karl Rieder (Der Gottesfreund von Oberland, Innsbruck, 1905), who thinks that not even Merswin himself wrote any of the literature, but that his secretary and associate Nicholas of Löwen, head of the House of St John at Grindelwald, after the retreat founded by Merswin for the circle, worked over all the writings which emanated from different members of the group but bore no author's names, and to glorify the founder of the house attached Merswin's name to some of them and out of his imagination created "the Friend of God from the Oberland," whom he named as the writer of the others. As his design took shape he expanded the supernatural element and made the narratives autobiographical. There is much in this contention that is sound, but Rieder seems to go unnecessarily far in denying altogether that Merswin wrote any of the mystical books. The conclusion remains that the literature must be treated as tendency-writing and not as genuine biography and history.


Nicholas of Guildford (fl. 1250), English poet, the supposed author of The Owl and the Nightingale, an English poem of the 13th century. This work, which displays genuine poetical and imaginative qualities, is written in the south-western dialect, and is one of the few 13th-century English poems not devoted entirely to religious topics. The nightingale sitting on a branch covered with blossom sees the owl perched on a bough overgrown with ivy, and proceeds to abuse him for his general habits and appearance. The birds decide to refer the consequent dispute to Master Nicholas de Guildford, who is skilled in such questions, but they first of all engage in a regular débat in the French fashion. The owl is the best logician, but the nightingale has a fund of abuse that equalizes matters. Finally, when the argument threatens to become a fight, the wren
interferes, and the two go to the house of Master Nicholas at Port-
	
tisham in Dorset. He judges, they say, many right judgments, and

compiles and writes much wisdom, and it is lamentable that so

learned and worthy a man should gain no prebent from his

bishop. The poet, whoever he was, wrote the octosyllabic

couplet with ease and smoothness. He borrows something from

Alexander of Neckham's De naturis rerum, and was certainly

familiar with contemporary French poetry. The piece is a

general allegory of the contest between asceticism and a more

cheerful view of religion, and is capable of a particular applica-
tion to the differences between the regular orders and the secular

clergy. The quatrain immediately before that is a place of song and mirth,

while the owl maintains that much weeping for his many sins is man's best

preparation for the future.

There are two MSS. of the Hyle and the Nightingale, MS. Cotton

Caligula A ix. (British Museum), dating from the first half of the 13th

century, and MS. Arch. I. 29, Jesus College, Oxford, written

about half a century later. In the Jesus College MS. the poem is

immediately preceded by a religious poem entitled La Passyunn Jhu

Christ, which, according to a note on it, once possessed an additional

quaternion insertion. It was written by John of Guildford, perhaps a

relation of Nicholas.

The Owl and the Nightingale has been edited from the Cotton MS.

chiefly for the Roxburghe Club (1838) by Joseph Stevenson, and for

the Percy Society (1845) by T. Wright; the best modern edition

is that of T. Stratmann (Krefeld, 1868), who collated the two MSS.

See also B. Ten Brink, Early English Literature (trans. H. M. Kennedy, pp. 214-

218); Coxe, English Prose Writers (Cambridge, 1832), and

in the Cambridge History of Literature, vol. i. For some textual

criticism see A.E. Egge in Modern Language Notes (Baltimore, January,

1887).

Nicholas, Sir Edward (1593–1666), English statesman, eldest

son of John Nicholas, a member of an old Wiltshire family,

was born on the 4th of April 1593. He was educated at Salisbury

grammar school, Winchester College and Queen's College, Oxford. After

studying law at the Middle Temple, Nicholas became secretary to Lord

Loud, warden and admiral of the Cinque ports, in 1618, and continued in a similar

employment under the duke of Buckingham. In 1625 he became secretary to the

admiralty; shortly afterwards he was appointed an extra

clerk of the privy council with duties relating to admiralty

business, and from 1633 to 1641 he was one of the clerks in

ordinary to the council. In this situation Nicholas had much

business to transact in connection with the levy of ship-money;

and in 1641, when Charles I. went a hunting, a heavy

liability rested on the secretary who remained in London to keep

the king informed of the proceedings of the parliament. On

the return of Charles to the capital Nicholas was knighted, and

appointed a privy councillor and a secretary of state, in which

capacity he attended the king while the court was at Oxford,

and carried out the business of the treaty of Uxbridge. Through-

out this troubled period he was one of Charles's wisest and most

loyal advisers; he it was who arranged the details of the king's

surrender to the Scots, though he does not appear to have had

advised or even to have approved of the step; and to him also

fell the duty of treating for the capitulation of Oxford, which

included permission for Nicholas himself to retire abroad with his

family. He went to France, being recommended by the

king to the confidence of the prince of Wales. After the king's

death Nicholas remained on the continent concerting measures on

behalf of the exiled Charles II. with Hyde and other royalists,

but the hostility of Queen Henrietta Maria deprived him of any

real influence in the councils of the young sovereign. He lived

at the Hague and elsewhere in a state of poverty which hampered

him power to serve Charles, but which the latter did nothing

to relieve. He returned to England at the Restoration; but

although Charles had formally appointed him secretary of state in

1654, this office was now conferred on another, and Nicholas

had to content himself with a grant of money and the offer of a

peergage, which his poverty compelled him to decline. He

retired to a country seat in Surrey which he purchased from

a son of Sir Walter Raleigh, and here he lived till his death in

1660. By his wife Jane, a daughter of Henry Jay, an alderman of

London, he had several sons and daughters; his younger

brother Matthew Nicholas (1594–1661) was successively dean of

Bristol, canon of Westminster and dean of St Paul's.

See The Nicholas Papers, edited by G. F. Warner (Camden Society, London,

1886–1897), containing Nicholas's correspondence and some

autobiographical memoranda. Private correspondence between

Nicholas and Charles Davenant at the times of John Evelyn,

edited by W. Bray (London, 1827); The Edgerton MSS., and

the Ormonde Papers contain many references to Nicholas.

Nicholas (or Nicles), Henry (or Hendrik) (c. 1501–c.

1580), founder of the sect called "the Family of Love," was born

in 1501 or 1502, at Münster, where he was married and carried

on the business of a ferryman. As a boy he was subject to visions,

and at the age of twenty-seven charges of heresy led to his

imprisonment. About 1530 he removed with his family to

Amsterdam, where he was again imprisoned on a charge of

complicity in the Münster revolution of 1534–1535. About 1539

he experienced a call to found his "Familia Caritatis." Remov-

ing to Embden, he lived there and prospered in business for

twenty years, though he travelled with commercial as well as

missionary objects into the Netherlands, England and elsewhere.

The date of his sojourn in England has been placed as early as

1552 and as late as 1569. In 1579 he was living at Loving

College, where probably he died a year or two later. His

documents seem to have been derived largely from the Dutch

Anabaptist David Joris or George, who died in 1556; but they have

mainly to be inferred from the jotted accounts of hostile writers. The

outward trappings of his system were merely Anabaptist; but he

anticipated a good many later speculations, and his followers

were accused of asserting that all things were ruled by nature

and not directly by God, of denying the dogma of the Trinity,

and repudiating infant baptism. They held that no man should

be put to death for his opinions, and apparently, like the later

Quakers, they objected to the carrying of arms and to anything

like an oath; and they were quite impartial in their repudiation

of all other churches and sects, including Brownists and

Baptists.

Nicholas's principal disciple in England was one Christopher

Vitel, and towards 1579 the progress of the sect especially in the

eastern counties provoked literary attacks, proclamations and

parliamentary bills. But Nicholas's followers escaped the

gallows and the stake, for they combined with some success the

wisdom of the serpent and the harmlessness of the dove. They

would only discuss their doctrines with sympathizers; they

showed every respect for authority, and considered outward con-

formity a duty. This quietist attitude, while it saved them from

molestation, hampered propaganda; and though the "Family"

existed until the middle of the 17th century, it was then swallowed

up by the Quakers. In the eyes of the Unitarians, all of which
denominations may have derived some of their ideas through the "Family" from the

Anabaptists.

The list of Nicholas's works occupies nearly six columns in the

Dict. Nat. Biog. See also Bellfort Bax, Rise and Fall of the

Anabaptists, pp. 327–380 (1903); and Strype's Works, General

Index. (A. F. P.)

Nicholas, John (1745–1826), English printer and author,

was born at Islington on the 2nd of February 1745. He edited

the Gentleman's Magazine from 1788 till his death, and in the

pages of that periodical, and in his numerous volumes of

Anecdotes and Illustrations, he made invaluable contributions to the personal

history of English men of letters in the 18th century. He

was apprenticed in 1757 to "the learned printer," William Bowyer,

whom he eventually succeeded. On the death of his friend and

master in 1777 he published a brief memoir, which afterwards

grew into the Anecdotes of William Bowyer and his Literary

Friends (1789). As his materials accumulated a work of

anecdotal literary history of the century, based on a large

collection of important letters. The Literary Anecdotes of the

18th Century (1812–1815), into which the original work was

expanded, forms only a small part of Nicholas's production. It

was followed by the Illustrations of the Literary History of the

18th Century, consisting of Authentic Memoirs and Original

Letters of Eminent Persons, which was begun in 1817 and com-

pleted by his son John Bowyer Nichols (1779–1863) in 1858.
The Anecdotes and the Illustrations are mines of valuable information on the authors, printers and booksellers of the time. Nichol's other works include: A Collection of Royal and Noble Wills (1780); Select Collection of Miscellaneous Poems (1782), with subsequent additions, in which he was helped by Joseph Warton and by Bishops Percy and Lowth; Bibliotheca Topographica Britannica (1780–1790); with Richard Gough, The Progresses and Public Processions of Queen Elizabeth (1788); and the important History and Antiquities of the Town and County of Leicester (1795–1815). Nichol's was a fellow of the Society of Antiquaries, a trustee of many city institutions, and in 1804 he was master of the Stationers' Company. He died on the 26th of November 1826. John Bowyer Nichol continued his father's various undertakings, and wrote, with other works, A Brief Account of the Guildhall of the City of London (1810). His eldest son, John Gough Nichol (1806–1873), was also a printer and a distinguished antiquary, who edited the Gentleman's Magazine from 1851 to 1856, and the Herald and Genealogist from 1863 to 1874, and was one of the founders of the Camden Society.

A full Memoir of John Nichols by Alexander Chalmers is contained in the Illustrations, and a bibliography in the Anecdotes (vol. vi.) is supplemented in the later work. See also R. C. Nichols, Memoirs of J. & J. Nichols (1874).

NICHOLSON, Henry Alleyne (1844–1899), British palaeontologist and zoologist, son of Dr John Nicholson, a biblical scholar, was born at Penrhyn on the 11th of September 1844. He was educated at Appleby Grammar School and at the universities of Göttingen (Ph.D., 1866) and Edinburgh (D.Sc., 1867; M.D., 1866). Geology had early attracted his attention, and his first publication was a thesis for his D.Sc. degree On the Geology of Cumberland and Westmoreland (1868). In 1871 he was appointed professor of natural history in the university of Toronto, in 1874 professor of biology in the Durham College of Science and in 1875 professor of natural history in the university of St Andrews. This last post he held until 1882, when he became regius professor of natural history in the university of Aberdeen. He was elected F.R.S. in 1897. His original work was mainly on fossil invertebrata (graptolites, stomatoparids and corals); but he did much field work, especially in the Lake district, where he laboured in company with Professor R. Harkness and afterwards with Dr J. E. Marr. He was awarded the Lyell Medal by the Geological Society in 1888. He died at Aberdeen on the 19th of January 1899. There are discussions of his work in the Publications—Biographical and Life-History of the Earth (1877); Manual of Zoology (of which there were 7 editions) and other text-books of Zoology; Manual of Palaeontology (1872, 3rd ed., 2 vols., with R. Lydekker, 1883); Monograph of the Silurian Fossils of the Gower District; in A Sce., with R. A. Lydekker (1878–1880); Monograph of the British Stomatoparids in Palaeograph Soc. (1886–1892).

Obituary, by Dr G. J. Hinde, in Geol. Mag. (March 1899).

NICHOLSON, John (1822–1857). Anglo-Indian soldier and administrator, son of Alexander Nicholson, a north of Ireland physician, was born on the 11th of December 1822 and educated at Dunganon College. He was presented with a cadetship in the Bengal infantry in 1839 by his uncle Sir James Hogg, and served in the first Afghan War of 1839–42; he distinguished himself in the defence of Ghazni, and was one of the prisoners who were carried to Bamiyan and escaped by bribing the guard upon General Pollock's successful advance. It was in Afghanistan that Nicholson first met Sir Henry Lawrence, who got him the appointment of political officer in Kashmir and subsequently on the Punjab frontier. In 1847 he was given charge of the Sind Sagar district, and did much to pacify the country after the first Sikh War. On the seizure of Multan by Mulraj, he rendered great service in securing the country from Attock, and was wounded in an attack upon a tower in the Margalla Pass, where a monument was subsequently erected to his memory. On the outbreak of the second Sikh War, he was appointed political officer to Lord Gough's force, when he rendered great service in the distribution of intelligence and in furnishing supplies and boats. On the annexation of the Punjab he was appointed deputy commissioner of Bannu. He became a kind of legendary hero, and many tales are told of his stern justice, his tireless activity and his commanding personality. In the course of five years he reduced the most turbulent district on the frontier to such a state of quietude that no crime was committed or even attempted during his last year of office, a condition of things never known before or since. On one occasion, being attacked by a gharzi, he snatched the musket from the hand of a sentry and shot the man dead; on another occasion he put a price on the head of a notorious outlaw, and finding every one afraid to earn it, rode single-handed to the man's village, met him in the street and cut him down. But besides being a severe ruler, Nicholson was eminently just. A criminal had no chance of escaping him, so able and determined was his investigation; and a corrupt official could not long evade his vigilance; but he was never delinquent in his punishments, and gave offenders a chance to redeem their character. He would go personally to the scene of a crime or a legal dispute and decide the question on the spot. Every man in his district, whether mountain tribesman or policeman, felt that he was controlled by a master hand, and the natives said of him that "the tramp of his war-horse could be heard from Attock to the Khyber." Lord Roberts says of him in Forty-One Years in India: "Nicholson impressed me more profoundly than any man I had ever met before, or have ever met since. I have never seen any one like him. He was the beau ideale of a soldier and a gentleman." It is little wonder that the natives worshipped him as a god under the title of Nikalsain. Nicholson, however, had a fiery temper and a contempt for red tape, which made him a somewhat intractable subordinate. He had a serious quarrel with Sir Neville Chamberlain, and was continually falling out with Sir John Lawrence, who succeeded his brother Henry as ruler of the Punjab.

It was when the Mutiny broke out in May 1857 that Nicholson was able to show the metal that was in him, and he did more than any other single man to keep the Punjab loyal and to bring about the fall of Delhi. When the news of the rising at Meerut arrived, Nicholson was with Edwardes at Peshawar, and they took immediate steps to disarm the doubtful regiments in that cantonment. Together they opposed Sir John Lawrence's proposal to abandon Peshawar, in order to concentrate all their strength on the siege of Delhi. In June Nicholson was appointed to the command of a movable column, with which he again disarmed two doubtful regiments at Phillaur. In July he made a forced march of 41 miles in a single day in the terrific heat of the Punjab summer, in order to intercept the mutineers from Sialkot, who were marching upon Delhi. He caught them on the banks of the Ravi near Gurdaspur, and utterly destroyed them, thus successfully achieving what hardly any other man would have attempted. In August he had pacified the Punjab and was free to reinforce General Wilson on the Ridge before Delhi. An officer of the 2nd served in the Sikh army under his brother, who gave the following word picture of him as he appeared at this time:

"He was a man cast in a giant mould, with massive chest and powerful limbs, and an expression ardent and commanding, with a dash of roughness; features of stern beauty, a long black beard, and deep sombre voice. There was something of immense strength and talent and resolution in his whole frame and manner, and a power of ruling men on high occasions which no one could escape noticing. He was a man in whom manhood was combined with sin, who was never found out in one of less imposing mien, sometimes as an offence to the more unbending of his countrymen, but made him almost worshipped by the plant Asians."

Before Nicholson's arrival the counsels of the commanders based at Delhi, like those in India, suffered from irresolution and timidity. As General Wilson's health declined, his caution became excessive, and Nicholson was specially sent by Sir John Lawrence to put more spirit into the attack. His first exploit after his arrival was the victory of Najafgarh, which he won over the rebels who were attempting to intercept the British siege train from Ferozepore. After marching through a flooded country scarcely practicable for his guns, Nicholson, with a force of 3500 troops, defeated 6000 disciplined sepoys after an hour's fighting, and thenceforth put an end to all attempts of the enemy to get in the rear of the British position on the Ridge. Nicholson grew fiercely impatient of General Wilson's
procrastination, and at one time was thinking of appealing to the army to set Wilson aside and elect a successor; but at last, on the 13th of September, he forced Wilson to make up his mind to the assault, and he himself was chosen to lead the attacking column. On the morning of the 14th he led his column, 1000 strong, in the attack on the Kashmir gate, and successfully entered the streets of Delhi. But in trying to clear the ramparts as far as the Lahore Gate, he undertook a task beyond the powers of his weary troops. In encouraging them as they hesitated, he turned his back on the advancing line of shot and was shot in the back. The wound was mortal, but his magnificent physique allowed him to linger for nine days before finally succumbing on the 23rd of September.

His best epitaph is found in the words of Sir John Lawrence's Mutiny Report:

"Brigadier-General John Nicholson is now beyond human praise and human reward. But so long as British rule shall endure in India his fame can never pass. He seems especially to have been raised up for this juncture. He crowned a bright, though brief, career by dying of the wound he received in the moment of victory at Delhi. The Chief Commissioner does not hesitate to affirm that without John Nicholson Delhi could not have fallen."

See J. L. Trotter, Life of John Nicholson (1904); Sir John Kaye, Lives of Indian Officers (1889); Bosworth Smith, Life of Lord Lawrence (1889); Dobed, History of Sir Herbert Edwardes (1886); and S. S. Thorburn, Banna (1876).

**NICHOLSON, WILLIAM** (1753-1813). English writer on natural philosophy, was born in London in 1753, and after leaving school made two voyages as midshipman in the East India service. He subsequently entered an attorney's office, but, having become acquainted, in 1775, with Josiah Wedgwood, he lived for some years at Amsterdam as agent for the sale of pottery. On his return to London, he was induced by Thomas Chalmers to devote himself to the composition of light literature for periodicals, assisting that writer also with some of his plays and novels. Meanwhile he employed himself on the preparation of An Introduction to Natural Philosophy, which was published in 1781 and was at once successful. A translation of Voltaire's Elements of the Newtonian Philosophy soon followed, and he now entirely devoted himself to scientific pursuits and philosophical journalism. In 1784 he was appointed secretary to the General Chamber of Manufacturers of Great Britain, and he was also connected with the Society for the Encouragement of Naval Architecture, established in 1773 to aid the improvement of machinery and its construction of various machines for comb-cutting, file-making, cylinder printing, &c.; he also invented an arreometer. In 1800 he began in London a course of public lectures on natural philosophy and chemistry, and about this period he made the discovery of the decomposition of water by the voltaic current. In 1797 the Journal of Natural Philosophy, Chemistry and the Arts, generally known as Nicholson's Journal, the earliest work of the kind in Great Britain, was begun; it was carried on till 1814. During the later years of his life Nicholson's attention was chiefly directed to waterworks engineering at Portsmouth, at Gosport and in Southwark. He died in London on the 21st of May 1815.

Besides considerable contributions to the Philosophical Transactions, Nicholson wrote translations of Fourcroy's Chemistry (1785) and Chaptal's Chemistry (1798), First Principles of Chemistry and a Chemical Dictionary (1795); he also edited the British Encyclopaedia, or Dictionary of Arts and Sciences (6 vols. 8vo, London, 1809).

**NICHOLSON, WILLIAM** (1784-1844). Scottish painter, was born at Newcastle-on-Tyne. Having settled in Edinburgh, he painted portraits both in oil and water-colour; and along with Thomas Hamilton the architect he was one of the founders and most vigorous promoters of the Scottish Academy, of which he became the first secretary (1826-1833). In 1818 he published a series of etchings entitled Portraits of Distinguished Living Characters of Scotland, including Sir Walter Scott, Lord Jeffrey, Robert Burns and Professor Wilson.

**NICIAS** (d. 414 B.C.), a soldier and statesman in ancient Athens, inherited from his father Niceratus a considerable fortune invested mainly in the silver mines of Laurium. Evidence of his wealth is found in the fact that he had no less than 1000 slaves whom he hired out. He gravitated naturally to the aristocratic party, and was several times colleague with Pericles in the strategia. On the death of Pericles he was left leader of the aristocrats against the advanced party of Cleon (q.v.). He made use of his wealth both to buy off enemies (especially informers) and to acquire popularity by the magnificent way in which he discharged various public services, especially those connected with the state religion, of which he was a strong supporter. In the field he displayed extreme caution, and prior to the great Sicilian expedition achieved a number of minor military successes. In 421 he took a prominent part in the涂抹 of the Peloponnesian War (q.v.). He now entered with varying success upon a period of rivalry with Alcibiades, the details of which are largely matters of conjecture. So bitter was the strife that the ostracism of one seemed inevitable, but by a temporary coalition they secured instead the banishment of the demagogue Hyperbolus (417). In 415 he was appointed with Alcibiades and Lamachus to command the Sicilian expedition, and, after the flight of Alcibiades (q.v.) and the death of Lamachus, was practically the sole commander, the much more capable Demosthenes, who was sent to his aid, being apparently of comparatively little weight. How far it is just to attribute to his excessive caution and his blind faith in omens the disastrous failure it is difficult to say. At all events it is clear that the management of so great an enterprise was a task far beyond his powers. He was a man of conventional respectability and mechanical piety, without the originality which was required to meet the crisis which faced him. His popularity with the aristocratic party in Athens is, however, strikingly shown by the lament of Thucydides over his death: "He assuredly, among all Greeks of my time, least deserved to come to so great a pitch of ill-fortune, considering his exact performance of established duties to the divinity" (vi. 8; Grote's version).

Besides Thucydides see Plutarch's Nicias and Diod. xii. 83; also the general authorities on the history of Greece, and the article Peloponnesian War.

**NICIAS, son of Nicomedes**, an Attic painter of the 4th century B.C. Pliny (xxv. 131) gives a list of his works. He was associated with Praxiteles, whose statues he coloured, thus adding to their value.

**NICKEL** (symbol Ni). Atomic weight 58-69 (O = 16)), a metallic element. It has been known from the earliest times, being employed by the Chinese in the form of an alloy called pakfong. It was first isolated in an impure condition in 1751 by A. F. Cronstedt from nickelite, and his results were afterwards confirmed by T. O. Bergman in 1775 (De niccolo, opusc. 2, p. 231; 3. p. 459; 4. p. 374). It occurs in the uncombined condition and alloyed with iron in meteorites; as sulphide in millerite and nickel blende, as arsenide in niccolite and coanithite, and frequently in combination with arsenic and antimony in the form of complex sulphides. In recent years it has been found in considerable quantities in New Caledonia in the form of a hydrated silicate of nickel and magnesia approximating to the constitution NiO, MgOSiO2-nH2O (J. Garnier, 1865), and in Canada in the form of nickelferous pyrrhotines, which consist of sulphides of iron associated with sulphides of nickel and copper, embedded in a matrix of gneiss. At the present time nickel is obtained practically entirely from garnierite and the nickelferous pyrrhotines. When the former is used it is roasted with calcium sulphate or alkali waste to form a matte which is then blown in a Bessemer converter or heated in a reverberatory furnace with a silicone flux with the object of forming a rich nickel sulphide. This sulphide is then by further heating converted into the oxide and finally reduced to the state of metal by ignition with carbon in clay crucibles. The process adopted for the Canadian ores, which are poor in copper and nickel, consists in a preliminary roasting in heaps and smelting in a blast furnace in order to obtain a matte, which is then further smelted with a silicious flux for a rich matte. This rich matte is then mixed with coke and salt-cake and melted down in an open heart furnace. The nickel sulphide so obtained is then roasted to oxide and reduced to metal. For a wet method of extraction
of the matte see Christolfe and Boulhiet, French Patent 111591 (1876). L. Mond (Jour. Soc. Chem. Ind. 1895, p. 945) has obtained metallic nickel from the Canadian mattes by first roasting them and then eliminating copper by the action of sulphuric acid, the product so obtained being then exposed to the reducing action of producer gas at about 180–200°C, where it decomposes, the nickel being deposited and the carbon monoxide returned to the volatilizer. For an electrolytic method of treating mattes, see T. Uike, Moniteur scient., 1897, 49, p. 450. The metal as obtained by industrial methods rarely contains more than about 99.995% of nickel, the chief impurities being copper, iron, cobalt, silicon and carbon.

The following tables show the output of nickel from Canada and the shipments of nickel ore from New Caledonia in recent years:

<table>
<thead>
<tr>
<th>Production (lb.)</th>
<th>Export (lb.)</th>
<th>Production (lb.)</th>
<th>Export (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900</td>
<td>7,050,227</td>
<td>13,493,239</td>
<td>1905</td>
</tr>
<tr>
<td>1901</td>
<td>9,189,047</td>
<td>9,337,558</td>
<td>1906</td>
</tr>
<tr>
<td>1902</td>
<td>10,663,410</td>
<td>8,085,284</td>
<td>1907</td>
</tr>
<tr>
<td>1903</td>
<td>12,505,510</td>
<td>9,053,544</td>
<td>1908</td>
</tr>
<tr>
<td>1904</td>
<td>14,574,885</td>
<td>12,229,973</td>
<td></td>
</tr>
</tbody>
</table>

The reduction of the oxide by hydrogen may be accomplished either by direct reduction or by two stages. The firststage is the reduction of the oxide to nickel by hydrogen at about 100°C, the second stage is the decarburization of the reduced nickel by hydrogen at about 450°C. The reduced nickel is then passed into a "volatilizer" and exposed to the action of carbon monoxide at about 80°C, the nickel carbonyl so formed being received in a chamber heated to about 350°C, where it decomposes, the nickel being deposited and the carbon monoxide returned to the volatilizer. For the electrolytic method of treating mattes, see T. Uike, Moniteur scient., 1897, 49, p. 450. The metal as obtained by industrial methods rarely contains more than about 99.995% of nickel, the chief impurities being copper, iron, cobalt, silicon and carbon.

Nickel Oxides. - Several oxides of nickel are known. A suboxide, NiO (7), described by W. Muller (Ber., 1889, 2, p. 1159), is not yet known. The monoxide, NiO, occurs naturally as bunsenite, and is obtained artificially when nickel hydroxide, carbonate, nitrate or sulphate is heated. It may also be prepared by the action of oxygen on nickel metal in nickel oxide with hydrogen at about 200°C (H. Moissan, Ann. Chem. Phys., 1897, 21, p. 190), or by heating nickel chloride with sodium carbonate and extracting the fused mass with water. It is a green powder which becomes yellow when heated. It dissociates at a red heat, and is readily reduced to the metal when heated with carbon or in a current of hydrogen. It is readily soluble in acids, forming salts, the rate of solution being rapid if the oxide is in the amorphous condition, but slow if the oxide is crystalline. The hydroxide, Ni(OH)₂, is obtained in the form of a greenish amorphous powder when nickel salts are precipitated by the caustic alkalies. It is readily soluble in water, forming a solution of a moderately alkaline character. Nickel chloride with hydrogen peroxide at about 50°C. It has all the reactions of hydrogen peroxide, and S. Tanatani (Ber., 1909, 42, p. 1510) regards it as Ni₃O₄. An oxide of nickel and nickel carbide has been obtained by heating nickel chloride in a current of moist oxygen at about 400°C (H. Bäubing, Comptes rendus, 1878, 87, p. 1082), or by heating the sesquioxide in a current of hydrogen at about 150°C (H. Moissan, Ann. Chem. Phys., 1890, 21, p. 199). The former method yields greyish, metallic-looking, microscopic crystals, the latter a grey amorphous powder. A hydrated form, NiO₂·2H₂O, is obtained when the monoxide is fused with a solution of nickel peroxide at a red heat and the fused mass extracted with water.

Nickel Salts. - Only one series of salts is known, namely those corresponding to the monoxide. In the anhydrous state they are usually of a yellow colour, whilst in the hydrated condition they are green. They may be recognized by the brownish violet colour they impart to a borax beam when heated in an oxidizing flame. The caustic alkalies added to solutions of nickel salts give a pale green precipitate of the hydroxide, insoluble in excess of the precipitant. This latter reaction is hindered by the presence of many organic acids (tartaric acid, citric acid, &c.). Potassium cyanide gives a green precipitate of the hydroxide, insoluble in excess of potassium cyanide, forming a double salt, Ni(CN)₂·2KCN, which remains unaltered when boiled with excess of potassium cyanide in presence of air (cf. COBAL). Ammonium sulphide precipitates black nickel sulphide in part, which is soon converted by the excess of potassium cyanide, forming a dark-coloured solution. Ammonium hydroxide gives a green precipitate of the hydroxide in solution.

The following tables show the output of nickel from Canada and the shipments of nickel ore from New Caledonia in recent years:

<table>
<thead>
<tr>
<th>Metric tons</th>
<th>1900</th>
<th>1901</th>
<th>1902</th>
<th>1903</th>
<th>1904</th>
<th>1905</th>
<th>1906</th>
<th>1907</th>
<th>1908</th>
</tr>
</thead>
<tbody>
<tr>
<td>100,319</td>
<td>133,676</td>
<td>129,653</td>
<td>77,360</td>
<td>98,665</td>
<td>175,289</td>
<td>130,688</td>
<td>101,708</td>
<td>120,028</td>
<td></td>
</tr>
</tbody>
</table>

See Rothwell's Mineral Industry (1908), pp. 666, 670. The metal may also be obtained on the small scale by the reduction of the oxide by hydrogen or by carbon, by ignition of the oxalate or of nickel ammonium oxalate (J. J. Berzelius), by reduction of the chloride in a current of hydrogen (E. Pélégot), by electrolysis of nickel ammonium sulphate (Winkler, Zeit. anorg. Chem., 1894, 3, p. 241), and by reduction of the chloride with calcium carbide.

It is a greyish white metal, and is very malleable and ductile. Its specific gravity varies according to the method employed for its preparation, the extreme values being 8.279 and 9.25. It melts between 1400–1600°C. Its specific heat increases with rise of temperature, the mean value from 15° to 1000°C being approximately 0.534°C (A. Naccari, Gaz., 1888, 18, p. 13). It is magnetic, but loses its magnetism when heated, the loss being complete at about 340–350°C. On the physical constants see H. Copaux, Comptes rendus, 1905, 140, p. 651. Nickel occludes hydrogen readily, is attacked by the halogen elements, and oxidizes easily when heated in air. In the massive state it is unacted upon by dry air, but if moistened with acidified water, oxidation takes place slowly. When obtained by reduction processes at a low temperature as possible the finely divided metal so formed is pyrophoric, and according to P. Schützenger (Comptes rendus, 1891, 113, p. 172) dry hydrochloric acid gas converts this form into nickel chloride and a volatile compound of composition NiHCl. It decomposes water at a red heat. According to E. St Edme (Comptes rendus, 1886, 106, p. 1079) sheet nickel is passive to nitric acid, and the metal remains passive even when heated to redness in a current of hydrogen. On the reduction of organic compounds by hydrogen in the presence of metallic nickel see P. Sabatier and J. B. Senderens, Ann. Chim. Phys., 1905 [8], 4, pp. 319, 433. It rapidly oxidizes when fused with caustic soda, but is scarcely acted upon by caustic potash (W. Dittmar, Jour. Soc. Chem. Ind., 1884, 3, p. 10). Hydrochloric and sulphuric acids are almost without action on the metal, but it dissolves readily in dilute nitric acid. Nickel salts are antiseptic; they arrest fermentation and stop the growth of plants. Nickel carbonyl, however, is extremely poisonous. On the toxic properties of nickel salts see A. Riche and Laborde, Jour. Pharm. Chem., 1888, [5], 17, pp. 1, 59, 97.

Nickel is used for the manufacture of domestic utensils, for crucibles, coinage, plating, and for the preparation of various alloys, such as German silver, nickel steels such as invar (nickel, 35.7%; carbon, 0.4%, 94.3%), and has a negative coefficient of thermal expansion, and constant (nickel 45.7%, copper, 35.3%), which has a negative thermal coefficient of its electrical resistance.

Compounds.
Nickname—Nicobar Islands

(Liebig). M. Illinski and G. v. Knorre (Ber., 1858, 15, p. 159) separates the metals by adding nitric acid to a solution of cobalt nitrate, precipitating the precipitate with potassium carbonate, warming to dryness, and dissolving in a 10% solution of hydrochloric acid. Nickel hydroxide is obtained by precipitation of the precipitate with ammonia and warming to dryness. The final product is nickel carbonate, which is obtained by treating the nickel hydroxide with a 20% solution of hydrochloric acid. Nickel carbonate is then heated in a muffle furnace at 600°C for 4 hours, resulting in the formation of metallic nickel, which is the reducing agent effecting the reduction of oxygen to water. Nickel is obtained by dissolving the nickel carbonate in a 20% solution of hydrochloric acid.

Nickel fluoride, NiF₃, obtained by the action of hydrofluoric acid on nickel chloride, crystallizes in yellowish green prisms which volatilize at 130°C. Nickel fluoride is dissolved in water with the alkaline fluorides to form double salts. Nickel chloride, NiCl₂, is obtained in the anhydrous condition by heating the hydrated salt to 140°C, or by gently heating the finely divided metal in a current of chlorine gas, forming golden yellow scales. It is easily reduced when heated in hydrogen. It forms crystalline compounds with ammonia and the organic bases. It is soluble in alcoholic solution, the hydrates of which are known, viz. monohydrate, dihydrate, and trihydrate; the latter being formed by reacting the material with the solution of the oxide or carbonate in hydrochloric acid. Nickel chloride in solution is soluble in water, forming a black compound which readily oxidizes in moist air, forming a basic nickel sulfate. The precipitated precipitate is soluble in phosphoric acid and some other acids. Nickel chloride is obtained from nickel carbonate in water solution. The precipitate is formed as a black powder when any of its hydrates are heated. When heated with carbon it is reduced to the chloride. It forms hydrated compounds containing one, two, five, and six molecules of water. The heptahydrate is obtained by dissolving the metal or its oxide, hydroxide or carbonate in water and adding alcohol, allowing the solution to crystallize between 10° and 20°C. It is a yellow crystalline powder which readily oxidizes in moist air.

Nickel sulfate, NiSO₄·6H₂O, is obtained by dissolving the metal in dilute nitric acid and concentrating the solution between 40° and 50°C. It crystallizes in green mobile liquid by passing carbon monoxide over reduced nickel at a temperature of about 60°C. L. Mond, Langer and Quincke, Journ. Chem. Soc., 1893, 71, p. 427. It decomposes with explosive violence when heated rapidly. Dewart and Jones, Journ. Chem. Soc., 1903, p. 203, have made an exhaustive study of the subject related that nickel sulfate, dissolved in water, forms nickel hydroxide and liberating hydrogen and carbon monoxide. Hydrochloric and hydrobromic acids are without action; hydroiodic acid decomposes slowly. With aromatic hydrocarbons in the presence of anhydride of sulfuric acid, a large evolution of hydrochloric acid gas, and an aldehyde is formed; at 100°C, on the other hand, anthraquinone derivatives are produced.
supplementing the information obtained from the Andamanese regarding cyclones in the Bay of Bengal. From 1869 to 1888 an observer was stationed in the Nicobar, and in Nanquet the climate was frosty but not excessively so. During the first year observations were recorded only in a more or less desultory way until 1897, when the station was removed to Mus in Car Nicobar. The climate is unhealthy for Europeans. The islands are exposed to the strong South-West monsoon and after the precipitation has ceased it has not been subjected to a systematic examination by the Indian Forest Department like that of the Andamans, and indeed the forests are fewer in quantity and quality, and their value is much less. The absence of a large number of species of fruit-trees has been compensated by the introduction of the European and American varieties, and the fruit-trees are carefully and successfully cultivated. As with the geology and the flora, certain phases of the fauna of the islands have been extensively reported. The mammals are not numerous. In the Outer Nicobarese areas are a large number of shrews (Cladosobates nuc.), bats, and flying-foxes, but it is doubtful if the "wild" pig is indigenous; cattle, when introduced and left, have caused much damage. The native birds include the rare Leed, the megapod (Megalopodius nuc.), edible-nest-building swallows (Collocalia nidificus), the hackled and pied pigeons (Caloenas nuc. and Carphophaga bicolor), a parrot (Psittacornis caniceps) and an oriole (Orchis macarronia). Owls, snake and thrush have been identified, and the fresh-water fish are reported to be of the types found in Sumatra.

Notices. —The Nicobarese may be described as a Far Eastern race, having generally the characteristics of the less civilized tribes of the Malay Peninsula and the south-eastern portion of the Asiatic continent, and speaking varieties of the Mon-Khmer group of languages, though the several dialects that prevail are mutually unintelligible. Their figure is not graceful, and, owing to their habit of diluting the lips by betel-chewing, the adults of both sexes are often repulsive in appearance. Though short according to the standard of whites (average height, man, 5 ft. 3 in.; woman, 5 ft.), the Nicobarese are a fine, well-developed race, and live to seventy or eighty years of age. Their mental capacity is considerable, though there is a great difference between the sluggish inhabitant of Great Nicobar and the keen trader of Car Nicobar. The religion is an undisguised animism, and all their frequent and elaborate ceremonies and festivals are connected with their religion. For a long time they were noted for their piracy and cruel, cruel, and though they show great want of feeling in the "devil murders" —ceremonial murders of one of themselves for grave offences against the community, which are now being gradually put down —still on the whole the Nicobarese are a quiet, inoffensive people, friendly to each other, and not quarrelsome, and by inclination friendly and not dangerous to foreigners. The old charge of cannibalism may be generally said to be quite untrue. Tribes can hardly be distinguished, but there are distinctively chieftain territorial. All the different dialects observed in the mainland have had several kinds of Nicobarese may with some confidence be referred to habitat and the physical difficulties of communication. Such government as there is, is by the village; but the village chiefs have not usually much power, though such authority as they have has always been maintained by the foreign Powers who have possessed the islands. The clothing, when not a caricature of European dress, is of the scantiest, and the wagging tails in which the loin cloths are tied behind early gave rise to fanciful stories that the inhabitants were naked and tailed. The houses are good, and often of considerable size. The natives are well fed, live with them, and they never cultivate cereals, exercise some care and knowledge over the coco-nut and tobacco, and have had much success with the foreign fruits and vegetables introduced by the missionaries. The staple article of trade has always been the ubiquitous coco-nut, of which it is computed that 15 million are produced annually, 10 million being taken by the people, and 5 million exported about equally from Car Nicobar and the rest of the islands. The usual cheap European goods are imported, the foreign trade being carried on with the native traders of the neighbouring Asiatic countries. There is an established internal trade, chiefly between the older islands and Chowra, for pots (which are only made there) and racing and other canoes.

History. —The situation of the Nicobars along the line of a very ancient trade route has caused them to be reported by traders and seamen through all historical times. In the 17th century the islands began to attract the attention of missionaries. At various times France, Denmark, Austria and Great Britain all had more or less shadowy rights to the islands, the Danes being the most persistent in their efforts to occupy the group, until in 1869 they relinquished their claims in favour of the British, who, at once began to put down the piracies of the islanders, and established a penal settlement, numbering in all about 350 persons, in Nancowry harbour. The health of the convicts was always bad, though it improved with length of residence and the adoption of better sanitary measures; and an attempt to found a Chinese colony having failed in 1884 through mismanagement, the settlement was withdrawn in 1888. There are native agencies at Nancowry harbour and on Car Nicobar, both of which places are gazetted ports. At the latter is a Church of England mission station under a native Indian catechist attached to the diocese of Rangoon.

Authorities. —E. H. Man, Dictionary of the Central Nicobarese Language (London, 1889); F. Maurer, Die Nikobaren (Berlin, 1886); Dr Svoboda, Die Bewohner des Nikobaren-Archipels (Leiden, 1893); J. L. Lee, Die Sprachen und Dichter der Nicobaren (1884); S. K. Saha, Descriptive Tour through the Nicobars (Government, Rangoon, 1897); J. B. Clunies Ross, In the Andamans and Nicobars (London, 1902); A. Alcock, A Naturalist in the Indian Seas (London, 1902). (R. C. T.)

NICOL, J.—NICOL, W.

NICOL, JAMES (1810–1870), Scottish geologist, was born at Traquair, near Innerleithen, in Peeblesshire, on the 12th of August 1810. His father, the Rev. James Nicol (1769–1810), was minister of Traquair, and acquired some celebrity as a poet. Educated at Edinburgh University (1829), James Nicol attended the lectures of Jameson, and thereby gained a keen interest in geology and mineralogy, and he pursued their study in the universities of Bonn and Berlin. After returning home he worked zealously at the local geology and obtained prizes from the Highland Society for essays on the geology of Peeblesshire and Roxburghshire; he subsequently extended his researches over various parts of Scotland, and in 1844 published his able Guide to the Geology of Scotland. In 1847 he was appointed assistant secretary to the Geological Society of London, in 1849 professor of geology in Queen's College, Cork, and in 1853 professor of natural history in the University of Aberdeen, a post which he retained until a few months before he died, on the 8th of April 1879. During these years he carried out important researches on the southern uplands of Scotland and on the structure of the Highlands. In the former region he gave the first clear account of the succession of the fossiliferous Lower Palaeozoic rocks (1848–1852); and when he came to deal with the still older Highland rocks he made out the position of the Torridon sandstone and Durness limestone and their relations to the schists and gneisses. His matured views, although advanced by Mr. Arthur Murison, have subsequently been substantiated by Professor C. Lyell and others.

The more important of his papers were: "On the Structure of the North-Western Highlands" (Quart. Journ. Geol. Soc., 1861), and "On the Geological Structure of the Southern Grampians" (ib., 1865). He contributed the articles "Mineralogy" and "Mining" to the ninth edition of the Encyclopaedia Britannica. Among his other works were Manual of Mineralogy (1849); Elements of Mineralogy (1858, 2nd ed., 1871); Geology of the Highlands of Scotland (1858); and Geology and Scenery of the North of Scotland (1863).
1851. Nothing is known of his early history beyond the fact that, after amassing a small competence as a popular lecturer on natural philosophy, he settled in Edinburgh to live a very retired life in the society of his apparatus alone. Besides the invention of the prism known by his name ("A method of increasing the divergence of the two rays in calcareous spars, so as to produce a single image," New Edin. Journ., 1828), he devoted himself chiefly to the examination of fluid-filled cavities in crystals, and of the microscopic structure of various kinds of fossil wood. His skill as a working lapidary was very great; and he prepared a number of lenses of garnet and other precious stones, which he preferred to the achromatic microscopes of the time.

NICOLAI, CHRISTOPH FRIEDRICH (1733–1811), German author and bookseller, was born on the 18th of March 1733 at Berlin, where his father, Christoph Gottlieb Nicolai (d. 1752), was the founder of the famous Nicolaische Buchhandlung. He received a good education, and in 1749 went to Frankfort-on-Oder to learn his father's business, finding time also to become acquainted with English literature. In 1752 he returned to Berlin, and began to take part in literary controversy by defending Milton against the attacks of J. C. Gottsched. His Briefe über den feinern Zustand der schönen Wissenschaften in Deutschland, published anonymously in 1755 and reprinted by G. Ellinger in 1804, were directed against both Gottsched and Gottsched's Swiss opponents, Johann Jakob Bodmer and Johann Jakob Breitinger; his enthusiasm for English literature won for him the friendship of Lessing and Moses Mendelssohn. In 1758 Mendelssohn established in 1759 the Bibliothek der schönen Wissenschaften, a periodical which he conducted until 1760. With Lessing and Mendelssohn Nicolai founded in 1759 the famous Briefe, die neueste Literatur betreffend; and from 1765 to 1792 he edited the Allgemeine deutsche Bibliothek. This latter periodical served as the organ of the so-called "popular philosophers," who warred against authority in religion and against what they conceived to be extravagance in literature. The new movement of ideas represented by Herder, Goethe, Schiller, Kant and Fichte, Nicolai was incapable of understanding, and he made himself ridiculous by foolish misrepresentation of the aims of these writers. Of Nicolai's independent works, perhaps the only one which has some historical value is his Anekdoten von Friedrich II. (1788–1792). His romances are forgotten, although Das Leben und die Meinungen des Herrn Magistrus Sebaldis Nutshanker (1775–1778), and his satire on Goethe's Werther, Freuden des jungen Werthers (1775), had a certain reputation in their day. Between 1788 and 1796 Nicolai published in 12 vols. a Beschreibung einer Reise durch Deutschland und die Schweiz, which bears witness to the narrow conservatism of his views in later life. He died in Berlin on the 11th of January 1811.

Nicolai's Bildniss und Selbstbiographie was published by M. S. Löwe in the Bildnisse jetz lebender Berliner Gelehrter, in 1806. See also L. F. G. von Gocking, F. Nicolai's Leben und literarischer Nachlass (1800); J. Minck, Lessings Jugendfreunde in J. Kürscher's Deutsche Nationalliteratur, vol. xxii. (1835); O. Hoffmann, Herders Briefwechsel mit Nicolai (1887); E. Friedel, Zur Geschichte der Nicolaischen Buchhandlung (1894); and E. Altenkrüger, F. Nicolai's Jugendjahre (1894).

NICOLAI, OTTO (1810–1840), German composer, was born on the 9th of June in Königsberg. He studied music in Berlin and in 1833 became organist to the German embassy in Rome. There his operas Enrico II (1839) and II Temporale (1840) were produced, besides some church music, a series of songs, and a number of compositions for the pianoforte. He was subsequently appointed Hof Kapellmeister at the Berlin Opera House; and there, only two days before he died (on the 11th of March 1840), was performed his brilliant opera, The Merry Wives of Windsor, which is now remembered.

NICOLAS, SIR NICHOLAS HABERT (1700–1840), English antiquary, fourth son of John Harris Nicolais (d. 1844), was born at Dartmouth on the 10th of March 1790. Having served in the navy from 1812 to 1816, he studied law and was called to the bar at the Inner Temple in 1825. His work as a barrister, however, was confined principally to peccage cases before the House of Lords, and his time was mainly devoted to genealogical and historical studies. In 1831 he was made a knight of the order of the Guelphs, and in 1832 chancellor and knight-commander of the order of St Michael and St George, being advanced to the grade of the grand cross in 1840. He became a member of the council of the Society of Antiquaries in 1826, but soon began to criticize the management of the society's affairs, and withdrew in 1828. He then criticized the Record Commission, which he regarded as too expensive. These attacks, which brought him into controversy with Sir Francis Palgrave, led in 1836 to the appointment of a select committee to inquire into the public records. He was also responsible for several reforms at the British Museum. In 1852 Nicolas married Sarah (d. 1867), daughter of John Davison of Loughton, Essex, a reputed descendant of the Tudor statesman William Davison. By her he left two sons and six daughters. Pecuniary difficulties compelled him to leave England, and he died near Boulogne on the 3rd of August 1848. Although a sharp and eager controversialist Nicolas was a genial and generous man, with a great knowledge of genealogical questions.


NICOLAI DAMASCENUS, Greek historian and philosopher of Damascus, flourished in the time of Augustus and Herod the Great, with both of whom he was on terms of friendship. He instructed Herod in rhetoric and philosophy, and had attracted the notice of Augustus when he accompanied his patron on a visit to Rome. Later, when Herod's conduct aroused the suspicions of Augustus, Nicolai was sent on a mission to bring about a reconciliation. He survived Herod, and it was through his influence that the succession was secured for Archelaus; and since his death the title of his birth, is withdrawn. These fragments of his universal history (Ἰστορία καθολικὴ) from the time of the Assyrian empire to his own days, his autobiography, and his life of Augustus (Βίος Καράποο) have been preserved, chiefly in the constants of Constantine Porphyrogenitus. Nicolai also wrote comedies and tragedies, paraphrased and wrote commentaries on parts of Aristotle, and was himself the author of philosophical treatises.

FRAGMENTS IN C. MILLER, Fragmenta historiorum Graecorum, iii.; see also F. NAVET, Nicolai von Damascus (1853), containing an account of his life and writings, and translation of the fragments.

NICOLAUS OF LYRA (c. 1265–1349), French commentator, was born in Lire, now Vieille-Lyre, in the department of Eure, Normandy. He entered the Franciscan order at Verneuil about 1300, and studied at Paris, where, becoming a doctor some time before 1309, he taught for many years. From 1319 he was provincial of his order in France, and was present in that capacity at the general chapter at Périgueux (1322). In 1325 he was provincial of Burgundy, and as executor of the estate of Jeanne of Burgundy, widow of King Philip VI, he founded the college of Burgundy at Paris, where he died in the autumn of 1349, being buried in the chapter hall of the convent of the Cordeliers. Among the authentic works of Nicolaus of Lyra are: (1) two commentaries on the whole Bible, one (Postilla literaria, 1322–1331) following the literal sense, the other (Postilla mystica seu moralis, 1339) following the mystic sense. There are numerous editions (1342–1542; Douai, 1617; Antwerp, 1634). (2) Tractatus de genetivis et nominativis (Lat. vulg. Hebraica veritatis, 1333. (3) Two treatises against the Jews. (4) A theological treatise on the Beatific Vision, directed against pope John XXII. (1334), unpublished. (5)
Contemplatio de vita S. Francisci, a book of devotions. Nicolas was above all a commentator. His exegesis, which was dominated by his polemics against the Jews, is characterized by a fidelity to the literal sense, the comparison with the Hebraic text, the direct use of Jewish commentators, a very independent attitude towards traditional interpretations, and a remarkable historical and critical sense. In all this he resembled Roger Bacon. His works, especially the Postilla litteralis, were very popular in the 14th and 15th centuries, but produced few imitators.


NICOLAY, the name of a French family of Vivarais which came rapidly into legal prominence at the end of the 15th century. Jean Nicolay (d. 1527), son of a bailli of Bourg-Saint-Andéol, became councillor at the parliament of Toulouse and afterwards at the Grand Council, chancellor of the kingdom of Naples, Maître des Requêtes, and, finally, first president of the Chambre des Comptes of Paris (1506). This last post was filled continuously up to the Revolution by his descendants. Antoine Chrétien de Nicolay (1712-1777) became marshal of France in 1775. His brother, Aymar Chrétien François Michel (1721-1760), bishop of Verdun, was first almoner of Marie Josephe of Saxony, wife of the dauphin Louis (d. 1762), and her influential counsellor. Aymar's bibliographic justifications pour servir à l'histoire des premiers présidents de la Chambre des Comptes (1873), and Histoire de la maison de Nicolay (1875).

NICOLE, PIERRE (1625-1695), one of the most distinguished of the French Jansenists, was the son of a provincial barrister, and was born at Chartres. Sent to Paris in 1642 to study theology, he soon entered into relations with the Jansenist community at Port Royal (q.e.) through his aunt, Marie des Anges de Soulaire, who was for a short time abbess of the convent. Some scruple of conscience forbade him to proceed to the priesthood, and he remained throughout life a “clerk in minor orders,” although a profound theological scholar. For some years he was a master in the “little school” for boys established at Port Royal, and had the honour of teaching Greek to young Jean Racine, the future poet. But his chief duty was to act, in collaboration with Antoine Arnauld, as general editor of the controversial literature put forth by the Jansenists. He had a large share in collecting the materials for Pascal’s Provincial Letters (1656); in 1658 he translated the Lettres into Latin, under the title of Dialogus de foris Christianismi. When Arnauld began a series of letters, Les Imaginaires, intended to show that the heretical opinions commonly ascribed to the Jansenists really existed only in the imagination of the Jesuits. His letters being violently attacked by Desmarets de Saint-Sorlin, an erratic minor poet who professcd great devotion to the Jesuits, Nicole replied to him in another series of letters, Les Visionnaires (1666). In the course of these he observed that poets and dramatists were no better than “public poisoners.” This remark stung Racine to the quick; he turned not only on his old master, but on all his friends, and declared that he had told him — did more honour to his heart than to his head. About the same time Nicole became involved in a controversy about transubstantiation with the Huguenot Claude; out of this grew a massive work, La Perpétuité de la foi de l’église catholique touchant l’eucharistie (1669), the joint effort of Nicole and Antoine Arnauld. But Nicole’s most popular production was his Essais de morale; a series of short discussions on practical Christianity. The first volume was published in 1671, and was followed at irregular intervals by others; altogether the series numbers fourteen volumes. In 1691 a translated version of this work in the French was forced to fly to Belgium in company with Arnauld. But the two soon parted. Nicole was elderly and in poor health; the life of a fugitive was not to his taste, and he complained that he wanted rest. “Rest,” answered Arnauld, “when you have eternity to rest in!” In 1683 Nicole made a rather ambiguous peace with the authorities, and was allowed to come back to Paris. There he continued his literary labours up to the last; he even composed, in opposition to the Jesuits, when death overtook him on the 16th of November 1695.

Nicole was one of the most attractive figures of Port Royal. Many stories are told of his quaint absent-mindedness and unreadiness in conversation. His books are distinguished by exactly opposite qualities; they are singularly simple and copious to excess. Hence they were exceedingly popular with Mme de Sévigné and readers of her class. No other Jansenist writer, not even Pascal, was so successful in impressing the possession of Port Royal before the world. And although a modern appetite quells before fourteen volumes on morality, there is much solid sense and practical knowledge of human nature to be found in the Essais de morale. Several abridgments of the work were made, notably a Choix des essais de morale de Nicole, ed. Silvestre de Sacy (Paris, 1857).

Nicole’s life is told at length in the 4th volume of Sainte Beuve’s Port-Royal. (St. C.)

NICOLLE, ROBERT (1814-1877), Scottish poet, was born on the 7th of January, 1814, at the farm of Little Tullybeltane, in the parish of Auchtergaven, Perthshire. When Robert was five years old his father was reduced to poverty. He became a day-labourer, and was only able to give his son a very slight education. At sixteen the boy was apprenticed to a grocer and wine-merchant at Perth. In 1833 he began to contribute to Johnstone’s Magazine (afterwards Tall’s Magazine), and in the next year his apprenticeship was cancelled. He visited Edinburgh, and was kindly received there, but obtained no employment. He then tried his fortune in the printing business, but in 1836 he became editor of the Leeds Times. He held pronounced Radical opinions, and overtaxed his slender physical resources in electioneering work for Sir William Molesworth in the summer of 1837. He was obliged to resign his editorship, and died at the house of his friend William Tait, at Trinity, near Edinburgh, on the 7th of December 1837, in his twenty-fourth year. He had published a volume of Poems in 1835; and in 1844 appeared a further volume, Poems and Lyrics, with an anonymous memoir of the author by Mrs C. I. Johnstone. The best of his lyrics are those written in the Scottish dialect. They are simple in feeling and expression, genuine folk-songs.

An eloquent appreciation of his character and his poetry was included in Charles Kingsley’s article on “Burns and his School” in the North British Review for November 1851. See also P. R. Drummond, Life of Robert Nicolle, Poet (1884).

NICOLL, SIR WILLIAM ROBERTSON (1853— ), Scottish Nonconformist divine and man of letters, was born at Auchindoir, Aberdeenshire, on the 10th of October 1851, the son of a Free Church minister. He graduated M.A. at Aberdeen in 1870, and studied for the ministry at the Free Church College there until 1874, when he was ordained minister of the Free Church at Dufftown. Three years later he moved to Kelso, and in 1884 became editor of the Expositor. In 1886 he founded the British Weekly, a Nonconformist organ which obtained great influence over opinion in the free churches. Robertson Nicoll secured many writers of exceptional talent for his paper, to which he was himself a considerable contributor, the papers signed "Claudius Clear" being among those from his hand. He also founded and edited the Bookman (1891, &c.), and acted as chief literary adviser to the publishing firm of Hodder & Stoughton. Among his other enterprises were The Expositor’s Bible and The Theological Educator. He edited The Expositor’s Greek Testament (1897, &c.), and a series of Contemporary Writers (1894, &c.), and of Literary Lives (1904, &c.). He wrote a history of The Victorian Era in English Literature, and edited, with T. J. Wise, Literary Anecdotes of the Nineteenth Century. The knighthood bestowed on him at the birthday honours in 1906 was an apt recognition of his long and able devotion to the “journeyman work” of literature.

A list of his publications is included in a monograph on Dr Nicoll by Jane T. Sollister ("New Century Leaders," 1903).

NICOLAS RICHARD, Sir Richard, Lord of the Manor of Fenchurch and Notting Hill, an English governor, was born probably at Amthill, Bedfordshire, England, in 1624. He commanded a royalist troop of horse during the Civil War, and on the defeat of the king went into exile. Soon after the Restoration he became governor of the Bedchamber to the duke of
York, through whose influence he was appointed in 1664 on a commission with Sir Robert Carr (d. 1667), George Cartwright and Samuel Maverick, to conquer New Netherland from the Dutch and to regulate the affairs of the New England colonies and settle disputes among them. The expedition set sail from Portsmouth on the 25th of May 1664, and New Amsterdam was surrendered to Nicolls on the 8th of September. Under authority of a commission from the duke of York, Nicolls assumed the position of deputy-governor of New Netherland (New York). His policy was vigorous but tactful, and the transition to the new regime was made smoothly and with due regard to the interests of the conquered people. They were guaranteed in the retention of their property rights, their laws of inheritance, and the enjoyment of religious freedom. The English system of law and administration was at once introduced into Long Island, Staten Island and Westchester, where the English element already predominated, but the change was made much more slowly in the Dutch sections. A code of laws, known as the "Duke's Laws," drafted by the governor with the help of his secretary, Matthias Nicolls (c. 1630-1687), and dated the 12th of March, was proclaimed at Hempstead, Long Island, on the 1st of March 1665, and was immediately put in force. The code, which was compiled from the codes of the New England colonies, and it provided for trial by jury, for proportional taxation on property, for the issuance of new patents for land and for land tenure only by licence from the duke. Nicolls returned to England in the summer of 1668 and continued in the service of the duke of York. He was killed in the naval battle of Southwold Bay on the 28th of May 1672.


Nicolson, William (1655-1727), English divine and antiquary, was educated at Queen's College, Oxford (M.A., 1679; fellow, 1679-1682). After visiting Leipzig to learn German he was made prebendary of Carlisle in 1681, archdeacon in 1682. Twenty years later he was appointed bishop of the same diocese, where he remained until his translation to Derry in 1718. In 1727 he was nominated archbishop of Cashel and Emly, but died before he could assume charge. Nicolson is remembered by the impulsion of his temperament, which led him into a good deal of strife as a bishop, and more happily by his zeal in collecting and guarding manuscripts and other official documents. For this purpose he had special rooms built at Derry. His chief works were the Historical Library (English, 1696-97-99; Scottish, 1703; Irish, 1724; complete later editions, 1732 and 1776), and LegeS Marchandiorum, or Border Laws (1703, new ed., 1747).

Nicomachus, a Neo-Pythagorean, was an imitated and assigned position mathematician, born at Gerasa in Arabia Petraea, flourished about a.d. 100. In his musical treatise he mentions Thrasylus (d. 36), the astrologer and confidant of Tiberius, and his Arithmetical was translated by Apuleius, who wrote under Antoninus Pius and Marcus Aurelius. He is the author of two extant treatises: (1) Ἀριθμητικὴ εἰσαγωγή (Introduction to Arithmetic), a metaphysical account of the theory and properties of numbers, and the first work in which arithmetic was treated quite independently of geometry, and (2) Μαθηματικὴ ἀρμοδιότης (Manual of Harmony), complete in one book, to which are erroneously appended as a second book some fragments probably belonging to a larger treatise On Music now lost. It is the oldest authority on the Pythagorean theory of music. Photius (cod. 187) also mentions a work by Nicomachus called Ἀριθμητικὴ εἴσαγωγή Α'. Matthias may have been a cousin of Richard Nicolls; his family were of Islip, Oxford; he was secretary of the province, held various judicial positions, and was mayor of New York City in 1672. Matthias's son William (1657-1723), a lawyer, was a member of the New York assembly in 1702-1703 and 1707-1708; he received a royal patent for what is now the town of Islip on Long Island. Descendants of Richard and of Matthias Nicolls spell the name "Nicol.

Θεολογία (The Theology of Arithmetic), written in a spirit of Pythagorean mysticism and Oriental superstition, and setting forth the application of arithmetic, or rather of the first ten numbers, to the origin and attributes of the gods. But the extract from Photius is now generally attributed to Iamblichus. Other works of Nicomachus were: a Life of Pythagoras and a Collection of Pythagorean Doctrines, the chief source of the life of Pythagoras and the account of his philosophy by Iamblichus. Eutropeus—Introduction to Arith. by R. Hoche (1866); Manual of Harmony, by C. de Jan in Musici scriptores Graeci (1895), with account of Nicomachus and his works, and French translation, with bibliography and notes, by C. E. Ruelle (1881); Theology of Arithm. by A. Pistelli, (according to Photius, G. Pistelli, and G. Cantor, Vorlesungen über Geschichte der Mathematik, i. (1894) p. 400, and J. Gow, A Short History of Greek Mathematics (1884), p. 88, both of whom give summaries of the Arithm.}

Nicomachus, of Thebes, Greek painter, of the early part of the 4th century, was a contemporary of the greatest painters of Greece; Vitruvius observes that if his fame was less than theirs, it was the fault of fortune rather than of demerit. Pliny (xxxv. 108) gives a list of his works; among them a "Rape of Persephone," "Victory in a Quadriga," a group of Apollo and Artemis, and the "Mother of the Gods seated on a Lion." Pliny tells us that he was a very rapid worker and used but four colours (the last seems impossible). Plutarch mentions his paintings as possessing the Homerímerit of ease and absence of effort.

Nicomedes I., son of Zipoetes, king of Bithynia (c. 275-248 B.C.). He made himself master of the whole country and put to death his brother, who had set himself up as an independent ruler. He reorganized and enlarged the kingdom, founded the great city of Nicomedia as the capital, and fought successfully for some time with Antiochus of Syria. His reign seems to have been prosperous and uneventful; the year of his death is uncertain.

Livy xxxvii. 16; Justin xxv. 2; Mommsen in C. Müller, Frag. hist. Graec. iii. 535.

Nicomedes II., Epiphanes, king of Bithynia, 140-92 B.C., fourth in descent from Nicomedes I., was the son of Prusias II. He was so popular with the people that his father sent him to Rome. Here he was so much favoured by the senate that Prusias sent an emissary to Rome with secret orders to assassinate him. But the emissary revealed the plot, and persuaded the prince to rebel against his father. Supported by Attalus II., king of Pergamum, he was completely successful, and ordered his father to be put to death at Nicomedia. During his long reign Nicomedes adhered steadily to the Roman alliance, and assisted them against Aristonicus of Pergamum. He made himself for a time master of Paphlagonia, and in order to have the claim on Cappadocia (on the death of Attalos VI.), who had fled to him when Mithradates the Great endeavoured to annex the country. When her two sons died, Nicomedes brought forward an impostor as aclaimant to the throne; but the plot was detected. The Romans refused to recognize the claim, and required Nicomedes to give up all pretensions to Cappadocia and to abandon Paphlagonia.

Appian, Mithrad. 4:7; Strabo xiii. 624, 646; Diod. Sicc. xxxii. 20, 21; Justin xxxiv. 4:4 xxxvii. 1:2.

Nicomedes III., Philopator, king of Bithynia, 91-74 B.C., was the son and successor of Nicomedes II. His brother Socrates, assisted by Mithradates, drove him out, but he was reinstated by the Romans (90). He was again expelled by Mithradates, who defeated him on the river Amuceus (or Amnias) in Paphlagonia. This led to the first Mithradatic War, as the result of which Nicomades was again restored (84). At his death he bequeathed his kingdom to the Romans, a legacy which subsequently brought about the third Mithradatic War.

Justinian ii, Apian, Mithrad. 7. 10-20, 57, 60; Mommsen in C. Müller, Frag. hist. Graec. iii. 541; Plutarch, Sulla, 22, 24; Eutropius vi. 6.

Nicomedia [mod. Izmil], an ancient town at the head of the Gulf of Astacus, which opens on the Propontis, was built in 264 B.C. by Nicomedes I. of Bithynia, and has ever since been one of the chief towns in this part of Asia Minor. It was the metropolis of Bithynia under the Roman empire (see Nicæa), and
Diocletian made it the chief city of the East. Owing to its position at the convergence of the Asiatic roads to the new capital, Nicomedia retained its importance even after the foundation of Constantinople and its own capture by the Turks (1338).

See C. Texier, Asie mineure (Paris, 1839); V. Cécet, Turquie d'Asie (Paris, 1894).

NICOPOLIS, or ACTIA NICOPOLIS, an ancient city of Epirus, founded 31 b.c. by Octavian (Augustus) in memory of his victory over Antony and Cleopatra at Actium. The colony, composed of settlers from a great many of the towns of the neighbouring countries (Ammbracia, Anactorium, Calydon, Argos Amphphilicum, Leucas, &c.), proved highly successful, and the city was considered the capital of southern Epirus and Acarnania, and obtained the right of sending five representatives to the Amphictyonic council. On the spot where Octavian's own tent had been pitched he erected a sanctuary to Neptune adorned with the beaks of the captured galleys; and in further celebration of his victory he instituted the so-called Actian games in honour of Apollo Actius. The city was restored by the emperor Julian, and again after the Gothic invasion by Justinian; but in the course of the middle ages it was supplanted by the town of Prevesa. The ruins of Nicopolis, now known as Palaeo-prevesa (Old Prevesa), lie about 3 m. north of that city, on a small bay of the Gulf of Arta (Sinus Ambracius) at the narrowest part of the isthmus of the peninsula which separates the gulf from the Ionian Sea. The site is remarkable, and several objects are two theatres (the larger with twenty-seven rows of seats) and an aqueduct which brought water to the town from a distance of 27 m.

Nicopolis was also the name of (1) a city in Cappadocia in the valley of the Lycus, founded by Pompey on the spot where he defeated Mithrdates; (2) a city in Egypt, founded by Octavian 24 B.C. to commemorate his final victory over Antony; and (3) a city in Thrace (Nikup) at the junction of the latrus with the Danube, founded by Trajan in memory of his victory over the Dacians.

NICOSIA, the capital of Cyprus, situated in the north central part of the island. Pop. (1901) 14,752 (Moslem, 601; Christian, 8759). Its earliest name was Ledra, but Leucos, son of Potelyme Soter (280 B.C.), is said to have restored it and changed its name to Leuteon, Leucothen or Levcosia. A mile S.W. of the town lies the very large Bronze Age necropolis known as Hagia Paraskevi, which has been repeatedly explored with valuable results. The circuit of the city was reduced in 1567, under the direction of the Venetian engineer G. Savorgnano, from 9 m. to 3 m.; eighty churches and a number of fine houses were sacrificed. The new walls were given a circular shape, with eleven bastions and three gates. Water is supplied to the city from the qanat at the foot of the central range. The residence of the high commissioner, the government offices, hospital, central prison and the new English church are without the walls. The fosse has been planted, and part of it used as an experimental garden. Carriage roads have been completed to Kyrenia, Xytraia, Famagusta, Larnaca, Limassol and Morphou. The principal monuments of the Lusignan period are the fine cathedral church of St Sophia, an edifice of French Gothic, at once solid and elegant (the towers were never completed); the church of St Catherine, an excellent example of the last years of the 12th century (both these are now mosques); and the crypt of St Nicolas of the English (now a grain store), built for the order of the Knights of St Thomas of Acre. A gateway of no great importance is nearly all that remains of the palace last used by the Venetian provveditori. It dates from the end of the 15th century. There is a museum, with a valuable catalogue. The chief industries are tanning and hand weaving, both silk and cotton.

NICOSIA, a city and episcopal see (since 1816) of Sicily, in the province of Catania, 21 m. by road N. of the railway station of Leonforte (which is 49 m. W. of Catania) and 42 m. W.N.W. of Catania direct, 880 ft. above sea-level. Pop. (1911) 16,004.

The town retains a thoroughly medieval appearance, with a fine Norman cathedral and some other interesting churches, among them S. Maria Maggiore, with a reredos by Antonio Gagini.

A Lombard dialect is still spoken here, and the town is less modernized in every respect than any other in Sicily. The Sicel town of Herbita is usually placed here, but without sufficient reason, and the origin of Nicosia is unknown. It was destroyed by the Saracens and repopulated by the Normans.

NICOTERA, GIOVANNI (1828-1894), Italian patriot and politician, was born at San Biagio on the 9th of September 1828. Joining the party of young Italy he was among the combatants at Naples in May 1848, and was at San Pancrazio with Garibaldi during the defence of Rome. After the fall of Rome he fled to Piedmont, where he organized the expedition to Sapi in 1857, but shortly after his arrival there he was defeated and severely wounded by the Bourbon troops. Condemned to death, but reprieved through the intervention of the British minister, he remained a prisoner at Naples and at Favignana until 1860, when he joined the Franco-Sicilian expedition to Palermo. Sent by Garibaldi to Tuscany, he attempted to invade the Papal States with a volunteer brigade, but his followers were disarmed and disbanded by Ricasoli and Cavour. In 1862 he was with Garibaldi at Aspromonte; in 1866 he commanded a volunteer brigade against Austria; in 1867 he invaded the Papal States from the south, but the defeat of Garibaldi at Mentana put an end to his enterprise. His parliamentary career dates from 1860.

During the first ten years he engaged in violent opposition, but from 1870 onwards he joined in supporting the military reforms of Ricasoli. Upon the ascent of the Left in 1876, Nicotera was rewarded with the post of Minister of the Interior, and with remarkable firmness. He was obliged to resign in December 1877, when he joined Crispi, Cairoli, Zanardelli and Baccarini in forming the "pentarchy" in opposition to Depretis, but he only returned to power thirteen years later as minister of the interior in the Rudini cabinet of 1891. On this occasion he restored the system of unimomial constituencies, resisted the socialist agitation, and pressed, though in vain, for the adoption of drastic measures against the false bank-notes put in circulation by the Roman bank. He fell with the Rudini cabinet in May 1892, and died at Vico Equense on the 10th of June 1894.

See V. Giordano, La vita ed i discorsi di Giovanni Nicotera (Salerno, 1878); Mauro, Biografia di Giovanni Nicotera (Rome, 1886; German trans., Leipzig, 1886); and Mario, In memoria di Giovanni Nicotera (Florence, 1894).

NICOTINE, C15H24N2, an alkaloid, found with small quantities of nicotinamide, C15H14N2O, nicotinic, C15H23N2, and nicotelline, C15H18N3, in tobacco. The name is taken from Nicotiana, the tobacco plant, so called after Jean Nicot (1530-1600), French ambassador at Lisbon, who introduced tobacco into France in 1560. These four alkaloids exist in combination in tobacco chiefly as malates and citrates. The alkaloid is obtained from an aqueous extract of tobacco by distillation with slaked lime, the distillate being acidified with oxalic acid, concentrated to a syrup and decomposed by potash. The free base is extracted by ether and fractionated in a current of hydrogen. It is a colourless oil, which boils at 247° C. (754 mm.), and when pure is almost odourless. It has a sharp burning taste, and is very poisonous. It is very hygroscopic, dissolves readily in water, and rapidly undergoes oxidation on exposure to air. The free alkaloid is strongly laevorotatory. F. Ratz (Monats., 1905, 26, p. 1241) obtained the value [α]D = -169·54° at 20°; its salts are dextro-rotatory. It behaves as a di-acid as well as a di-tertiary base.

On oxidation with chromic or nitric acids, or potassium permanganate, it yields nicotinic acid or β-pyridylcarboxylic acid, C5H5O2N; alkaloid potash, C15H18N3O2; nicotinamide, C15H23N2O, and hydrogen peroxide oxycyanidine, C15H16N4O. Oxidation of its isomethylhydroxide with potassium permanganate yields trigonelline, C1H12N2O (A. Pictet and P. Ganequand, Ber., 1897, 30, 2117). It gives rise to various decomposition products such as pyridine, picoline, &c., when its vapour is passed through a red-hot tube. The hydrochloride on heating with hydrochloric acid gives methyl chloride (B. Blau, Ber., 1893, 26, p. 531). Hydroiodic acid and phosphorus at high temperature give a dihydro-complex, whilst sodium and alcohol give hexa- and octo-hydro derivatives. Nicotine may be recognized by the addition of a drop of 30% ferric chloride, the mixture being allowed to stand for one hour and the solid residue then moistened by a drop of concentrated

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sulphuric acid, when an intense rose-red colour is produced (L. Schindelmesser, Pharm. Zentralh. 1899, 40, 740).

The constitution of nicotine, which was first described by A. Pinner (see paper in the Berichte, 1891 to 1895). With bromine in acetic acid solution at ordinary temperature, nicotine yields a perbromide, 

$$\text{C}_9\text{H}_7\text{Br}_2\text{N}_2\text{O}_2\text{Br}_2$$

which with sulphur dioxide, followed by potassium tetrachloroplatinate, gives a violet colloid. From which 

$$\text{C}_9\text{H}_7\text{N}_2\text{O}_2\text{Br}_2$$

is obtained by distillation over zinc dust. By heating nicotine with bromine in hydrobromic acid solution for some hours at 100°C., dibromocotinine hydrobromide, 

$$\text{C}_9\text{H}_7\text{N}_2\text{O}_2\text{Br}_2$$

is formed. Bromocotinine on hydrolysis yields oxalic acid, methylamine, and \(\beta\)-methyl pyridyl ketone: 

$$\text{C}_9\text{H}_7\text{Br}_2\text{N}_2\text{O}_2\text{H}+\text{O}^+ = \text{H}_2\text{CO}_2+\text{CH}_3\text{NH}_2+\text{C}_4\text{H}_4\text{N}^-\text{COCH}_2+2\text{HBr};$$

whilst dibromocotinine yields methylamine, malonic acid, nicotine, and nicotine, from which cotinine, 

$$\text{C}_9\text{H}_7\text{N}_2\text{O}_2+\text{4H}^+ = \text{CH}_3\text{NH}_2+\text{C}_4\text{H}_4\text{N}^-\text{COOH}+\text{C}_4\text{H}_4\text{N}^-\text{COH}+2\text{HBr},$$

or if heated with zinc and caustic potash, methylamine and pyridyl-\(\beta\)-dioxobutyric acid. Thus the groupings 

$$\text{C}-\text{C}-$$

exist in the molecule, and the alkaloid is to be represented as \(\text{C}-\text{pyridyl-N-methyl-pyrollidine.}\)

This result has been confirmed by its synthesis by A. Pictet and P. Crépeux (Comptes rendus, 1903, 137, p. 860) and Pictet and Rountree (Chem. News, 1903, 37, p. 1325). Acetyl nicotine condenses when boiled in its mucate, which by dry distillation gives \(\text{N}-\beta\)-pyridylpyrrol.

By passing the vapour of this compound through a red-hot tube, it yields the isomeric \(\alpha\)-pyridylpyrrol, the potassium salt of which with methylamine gives a substance identical both in the pyridyl and pyrrol nuclei. By distillation over lime, the methyl group is removed from the pyridyl ring, and the resulting \(\alpha\)-pyridyl-N-methylpyrrol gives nicotine on reduction. This base is resolved into its active component by \(\beta\)-tartratic acid, \(\text{N}-\text{nicotine-d-tartrate.}\)

Nicotine crystallizes on cooling in needles which melt at 147°C. and is readily soluble in hot water.

NICHEROY, or Niteroi, a city of Brazil and capital of the state of Rio de Janeiro, on the E. shore of the Bay of Rio de Janeiro, opposite the city of that name. Pop. (1890) 34,669, (1900 estimate) 35,000. A railway connects the city with the interior, following the Cantareira line, now a part of the Lopo-ldina system, a branch of which runs north-eastward to Macabé, on the coast, and another northward from Nova Friburgo to a junction with the railway lines of Minas Gerais. Niteroi is practically a residential suburb of Rio de Janeiro. It occupies, in great part, the low alluvial plain that skirts the shores of the bay and fills the valleys between numerous low wooded hills. The site is shut off from the sea coast by a range of high rugged mountains. The shore line of the bay is broken by large, deeply indented bays (that of Jurujuba being nearly surrounded by wooded hills), shallow coves, and sharp promontories. Within these bays are beaches of white sand, called praias, such as the Praia da Icarahy, Praia das Flechas and Praia Grande, upon which face low tile-covered residences surrounded with gardens. The city consists of a number of these partially separated districts—Praia Grande, Sao Domingos, Icarahy, Jurujuba, Santa Rosa, Sao Lourenco, Ponta d'Airea and Barreto—all together covering 8 or 9 m. of the shore. An electric street railway connects all the outlying districts with the city and serves as the terminal stations of Praia Grande and Sao Domingos. The city is characterized by the construction and style of its buildings—low, heavy walls of broken stone and mortar, plastered and coloured outside, with an occasional facing of glazed Lisbon tiles, and covered with red tiles. Among the public buildings are several churches and hospitals (including the Jurujuba yellow-fever hospital and the Barreto isolation hospital), the government palace, a municipal theatre and a large Salesian college situated in the suburbs of Santa Rosa on an eminence overlooking the lower bay. Several large islands fill the upper bay near the eastern shore; some are used as coal deposits for the great steamship companies, and one (Flores) is used as an immigrants' depot. There is a small, rocky and picturesque island nearer the harbour entrance, which is crowned by a small chapel, dedicated to Nossa Senhora da Boa Viagem. Manufactures include cotton and woollen fabrics, tobacco, spirits, soap and tiles. The first settlement on the east side of the Bay of Rio de Janeiro dates from 1671, when a chapel was erected at Praia Grande, in the vicinity of an Indian village. The settlement did not become a village until 1819, when it was named Villa Real da Praia Grande. In 1834 the city and municipal district of Rio de Janeiro was separated from the province, and Praia Grande became the capital of the latter in the following year. In 1836 it was raised to the dignity of a city and received the appropriate name of Nictheroy, from the Indian name Nytari, “hidden water.” In the naval revolt of 1893-94 the older districts of the city suffered much damage from desultory bombardments, but the insurgents were too few to take possession. Soon afterwards the seat of government was removed to Petropolis, where it remained until 1903, when Nictheroy again became the capital of the state.

NIDIFICATION (from Lat. nidus), the process of making a nest, (see NEST). Nidification is with most birds the beginning of the breeding season, but with many it is a labour that is scamped if not shirked. Some of the auk tribe place their single egg on a bare ledge of rock, where its peculiar conical shape is but a precarious safeguard when rocked by the wind or stirred by the thronging crowd of its parents' fellows. The stone-curlew and the goatsucker deposit their eggs without the slightest preparation of the soil on which they rest; yet this is not done at haphazard, for no birds can be more constant in selecting, almost to an inch, the very same spot which year after year they choose for their procreative nest. In marked contrast to such artless care stand the wonderful structures which others, such as the tailor-bird, the bottle-titmouse or the fantail-warbler, build for the comfort or safety of their young. But every variety of disposition may be found in the class. The apteryx seems to entrust its abnormally big egg to an excavation among the roots of a tree-fern; while a band of female ostriches scrape holes in the desert-sand and therein promiscuously drop their eggs and leave the task of incubation to the male. Some megapodes bury their eggs in sand, leaving them to come to maturity on the surface of the sand. The foster and then raise a huge hobbled of dead leaves wherein they deposit their eggs, and the young are hatched without further care on the part of either parent. Some of the grebes and rails seem to avail themselves in a less degree of the heat generated by vegetable decay and, dragging from the bottom or sides of the waters they frequent fragments of aquatic plants, form of them a rude half-floating mass which is piled on some growing water-weed— but these birds do not spurn the duties of maternity.

Many of the gulls, sandpipers and plovers lay their eggs in a shallow pit which they hollow out in the soil, and then as incubation proceeds add straw and leaves to form a low breastwork of earth. The ringed plover commonly places its eggs on shingle, which they so much resemble in colour, but when breeding on grassy uplands it paves the nest-hole with small stones. Pigeons mostly make an artless platform of sticks so loosely laid together that their pearly treasures may be perceived from beneath by the inquisitive observer. The magpie, as though self-conscious that its own thieving habits may be imitated by its neighbours, surrounds its nest with a hedge of thorns. Very many birds of almost every group bore holes in some sandy cliff, and at the end of incubation add soil or leaves to cover the low breastwork of earth. Such breeding, too, is very various in character: thus, while the shelduck and the sand-martin supply the softest of materials—the one of down from her own body, the other of feathers collected...
by dint of diligent search—the kingfisher forms a couch of the undigested spiny fish bones which she ejects in pellets from her own stomach. Other birds, such as the woodpeckers, hew holes in living trees, even when the timber is of considerable hardness, and therein establish their nursery. Some of the swifts secrete from their salivary glands a fluid which rapidly hardens as it dries on exposure to the air into a substance resembling isinglass, and thus furnish the "edible birds' nests" that are the delight of Chinese epicures. In the architecture of nests, however, the secrete seems to play an important part. By its aid they are enabled to moisten and bind the otherwise refractory twigs and strands, and glue them to their place. Spiders' webs also are employed with great advantage for the purpose last mentioned, but perhaps chiefly to attach fragments of moss and lichen so as to render the whole structure less obvious to the eye of the spoiler. The tailor-bird deliberately spins a thread of cotton and therewith stitches together the edges of a pair of leaves to make a receptacle for its nest. Beautiful, too, is the felt fabricated of fur or hairs by the various species of titmouse, while many birds ingraft it into a compact mass both animal and vegetable fibres, forming an admirable non-conducting medium which guards the eggs from the extremes of temperature outside. Such a structure may be open and cup-shaped, supported from below as that of the chaffinch and goldfinch, domed like that of the wren and bottle-titmouse, sling hammock-wise as in the case of the golden-crested wren and the orioles, or suspended by a single cord as with certain grosbeaks and humming-birds.

Certain warblers (Aeslon Thamnolia) invariably lay a piece of snake's slough in their nests—to repel, it has been suggested, marauding birds who may thereby fear the neighbour-hood of a deadly enemy. The clay-built edifices of the swallow and martin are known to everybody, and the nuthatch plasters up the gaping mouth of its nest-hole till only a postern large enough for entrance and exit, but easy of defence, is left. In South America the oven-birds (Furnaridae) construct on the branches of trees globular ovens, so to speak, of mud, wherein the eggs are laid and the young hatched. The flamingo erects in the marshes it frequents a mound of earth sometimes 2 ft. in height, with a cavity atop. The females of the hornbills submit to incarceration during this interesting period, the males frequenting them by a barrier of mud, leaving only a small window to admit air and food.

But though in a general way the dictates of hereditary instinct are rigidly observed by birds, in many species a remarkable degree of elasticity is exhibited, or the rule of habit is rudely broken. Thus the falcon, whose ordinary eyrie is on the beetling cliff, will for the convenience of procuring prey condescend to lay its eggs on the ground in a marsh, or appropriate the nest of some other bird in a tree. The golden eagle, too, remarkably adapts itself to circumstances, now rearing its young on a precipitous ledge, now on the arm of an ancient monarch of the forest and again on a treeless plain, making a humble home amid grass and herbage. Herons will breed according to circumstances in an open fen, on sea-banks or (as is most usual) on lofty trees. Such changes are easy to understand. The instinct of finding food for the family is predominant, and where most food is there will the feeders be gathered together. This explains, in all likelihood, the associated bands of ospreys or fish-hawks, which in North America breed (or used to breed) in large companies where sustenance is plentiful, though in the Old World the same species brooks not the society of anything else. But there are of eminently social predilections. In Europe, apart from sea-fowls—whose congregations are universal and known to all—only the heron, the fieldfare and the rook habitually flock during the breeding season; but in other parts of the world many birds unite in company at that time, and in none possibly is this habit so strongly developed as in the ains of the neotropical region, the republican swallow of North America and the sociable grosbeak of South Africa, which last joins nest to nest until the tree is said to be broken down under the accumulated weight of the common edifice.

In the strongest contrast to these amiable qualities is the parasitic nature of the cuckoos of the Old World and the cowbirds of the New. The egg of the parasite is introduced into the nest of the dupe, and after the necessary incubation by the fond fool of a foster-mother the interloper successfully counterfeits the heirs, who perish miserably, victims of his superior strength. The whole process has been often watched, but the reflective naturalist will pause to ask how such a state of things came about, and there is not much to satisfy his inquiry. Certain it is that some birds, whatever by mistake, or perhaps by design, do not infrequently lay their eggs in the nests of others. It is within the knowledge of many that pheasants' eggs and partridges' eggs are often laid in the same nest, and gulls' eggs have been found in the nests of eider-ducks and vice versa; a redstart and a pied flycatcher will lay their eggs in the same convenient hole—the forest being rather deficient in such accommodation; an owl and a duck will resort to the same nest-box, set up by a scheming woodman for his own advantage; and the starling, which constantly dispossesses the green woodpecker, sometimes discovers that the rightful heir of the domicile has to be brought up by the intruding tenant. In all such cases it is not possible to say which species is so constituted as to obtain the mastery, but it is not difficult to conceive that in the course of ages that which was driven from its home might thrive through the fostering of its young by the invader, and thus the abandonment of domestic habits and duties might become a direct gain to the evicted householder.

(A. N.)

Nests and Coloration.—The correlation between nests and the coloration of the birds has been investigated by A. R. Wallace. According to the different kinds of dwellings, the eggs are of different colors, the males being duller than the females, the eggs of the males being of the same color as the nest, the females' eggs differing from the nest and from one another. The correlation, however, is not always steady; the eggs of certain species are of the same color as the nest, and these are always females. The Eskimo eggs are of the same color as the nest, and the male is usually the duller of the two, while the female's eggs are of a different color. The nests of the birds are usually of the same color as the eggs, and they are usually dull in color. The eggs of the birds are usually of a different color from the nest, and the male is usually the duller of the two, while the female's eggs are of a different color from the nest and from one another. The correlation, however, is not always steady; the eggs of certain species are of the same color as the nest, and these are always females. The Eskimo eggs are of the same color as the nest, and the male is usually the duller of the two, while the female's eggs are of a different color from the nest and from one another.
whether they be deposited in holes in the bare ground or in open nests in a tree. The eggs of the goshawk are white, but those of its small relation, the sparrowhawk, are always bloomed, the nest of both being similar. In the same kind of position, but regarding the almost common cases of spotted eggs in holes or covered nests, of which so many groups of birds furnish examples either wholly or in part, it has been suggested that the species in question has been in many instances digitally renovated and not yet got rid of the ancestral habit of secreting and despositing pigment.

**Length of Time of Incubation.**—Most of the smaller Passeres seem to hatch their young in from 13-15 days. The shortest period, only 10 days, is recorded of the small *Zosterops coelestes*; the largest, amounting to about 8 weeks, is that of some of the larger Ratitae, penguins, and Ostriches. The development of the young of the long-tailed ducks, is that by W. Evans (*Ibis*, 1891, pp. 52-53; and 1892, pp. 55-58). Speaking broadly, the largest birds lay the largest eggs and require the longest time for incubation, but there are very many exceptions, and only birds of the same group can be scholar and each other. The domestic fowl takes 21 days, but the pheasant, though so very nearly allied, takes 2 or 3 days longer, and even the small partridge requires 24 days. The mallard takes 26, the domestic duck, the musk duck 35 days, like most of the swans. The commonest with 13 to 14 days, seems to have adapted itself to the short period of its foster parents.

The naturalist still affords ample opportunities of experimental investigation and comparison. The condition of the newly hatched birds also varies extremely. The *Nidifuga* are born with their eyes open, are thinly clothed with neosplines of simple structure, leave the nest, and feed all day. The young of the *Nidifugi* take time to be born blind, remain a long time in the nest and have to be fed by their parents. As a whole, the *Nidifuga* comprise most of the phylogenetically older groups; but many of these may include some close relatives having a development of the *Nidifuga*: for instance, some Aegidae, the pigeons, Spheniscus, Tubinares, Ciconiace. For detail see *Birds: Classification*. While in the first category the sense organs, tegumentary and locomotory organs are far advanced, these are retarded in the *Nidifuga*, the development of these structures being shifted on to the postembryonic period. Yet the length of the incubation is by no means always long as the *Nidifuga*, when compared with equal-sized birds.


**Niebuhr, Barthold Georg** (1776-1831), German statesman and historian, son of Karsten Niebuhr (q.v.), was born at Copenhagen on the 27th of August 1776. From the earliest age young Niebuhr was distinguished by extraordinary curiosity, and from 1794 to 1796, being already a finished classical scholar, was acquainted with several modern languages, he studied at the University of Kiel. After quitting the university he became private secretary to Count Schimmelmann, Danish minister of finance. But in 1798 he gave up this appointment and travelled in Great Britain, spending a year at Edinburgh studying agriculture and physical science. In 1799 he returned to Denmark, where he entered the state service; in 1800 he married and settled at Copenhagen. In 1804 he became chief director of the National Bank, but in September 1806, he resigned this for a similar appointment in Prussia. He arrived in Prussia on the eve of the catastrophe of Jena. He accompanied the fugitive government to Königsberg, where he rendered considerable service in the commissariat, and was afterwards still more useful as commissioner of the national debt and by his opposition to ill-considered schemes of taxation. He was also for a short time Prussian minister in Holland, where he endeavoured without success to obtain a contract to loan the arm. The extreme sensibilities of his temperament, however, disqualified him for politics; he proved impracticable in his relations with Hardenberg and other ministers, and in 1810 retired for a time from public life, accepting the more congenial appointment of royal historiographer and professor at the university of Berlin.

He commenced his lectures with a course on the history of Rome, which formed the basis of his great work *Römische Geschichte*. The first two volumes, based upon his lectures, were published in 1812, but attracted little attention at the time owing to the absorbing interest of political events. In 1813 Niebuhr's own attention was diverted from history by the uprising of the German people against Napoleon; he entered the *Landwehr* and ineffectually sought admission into the regular army. He edited for a short time a patriotic journal, called the *Coriolan*, and then, in 1815, returned to his native soil and engaged in various minor negotiations. In 1815 he lost both his father and his wife. He next accepted (1816) the post of ambassador at Rome, and on his way thither he discovered in the cathedral library of Verona the long-lost *Institutes of Gaius*, afterwards edited by Savigny, to whom he communicated the discovery under the impression that he had found a portion of *Ulpian*. During his residence in Rome Niebuhr discovered and published fragments of Cicero and Livy, aided Cardinal Mai in the publication of *Ciceronis De Republica*, and shared in framing the plan of the great work on the topography of ancient Rome by Christian J. von Bunsen and Ernst Platner (1773-1855), to which he contributed several chapters. He also, on a journey home from Italy, deciphered in a palimpsest at St Gall the fragments of Flavius Merobaudes, a Roman poet of the 5th century. In 1823 he resigned the embassy and established himself at Bonn, where the remainder of his life was spent, with the exception of some visits to Berlin as councillor of state. He here rewrote and republished (1827-1828) the first two volumes of his *Roman History*, and composed a third volume, bringing the narrative down to the end of the First Punic War, which, with the help of a fragment written in 1811, was edited after his death (1832) by Johannes Classen (1805-1871). He also assisted in August Bekker's edition of the Byzantine historians, and delivered courses of lectures on ancient history, ethnography, geography, and on the French Revolution. In February 1830 his house was burned down, but the greater part of his books and manuscripts were saved. The revolution of July in the same year was a terrible blow to him, and filled him with the most dismal anticipations of the future of Europe. He died on the 2nd of January 1831.

Niebuhr's *Roman History* counts among epoch-making histories both as marking an era in the study of its special subject and for its momentous influence on the general conception of history. "The main results," says Leonhard Schmitz, "arrived at by the inquiries of Niebuhr, such as his views of the ancient population of Rome, the origin of the plebs, the relation between the patricians and plebeians, the real nature of the ager publicus, and many other points of interest, have been acknowledged by all his successors." Other alleged discoveries, such as the construction of early Roman history out of still earlier ballads, have not been equally fortunate; but if every positive conclusion of Niebuhr's had been refuted, his claim to be considered the first who dealt with the ancient history of Rome in a scientific spirit would remain unimpaired, and the new principles introduced by him into historical research would lose nothing of their importance. He suggested, though he did not elaborate, the theory of the myth, so potent an instrument for good and ill in modern historical criticism. He brought in inference to supply the place of discredited tradition, and showed the possibility of writing history in the absence of original records. By his theories of the disputes between the patricians and plebeians arising from original differences of race he drew attention to the immense importance of ethnological distinctions, and contributed to the revival of these divergences as factors in modern history. More than all, perhaps, since his conception of ancient Roman story made laws and manners of more account than shadowy lawgivers, he undesignedly influenced history by popularizing that conception of it which lays stress on institutions, tendencies, and social traits to the neglect of individuals.

Niebuhr's personal character was in most respects exceedingly attractive. His heart was kind and his affections were strong;
he was magnanimous and disinterested, simple and honest. He had a kindling sympathy with everything lofty and generous, and framed his own conduct upon the highest principles. His chief defect was an over-sensitiveness, leading to peevish and unreasonable behaviour in his private and official relations, to hasty and unbalanced judgments of persons and things that had given him annoyance, and to a despondency and discouragement which might perhaps have been avoided had he might have effected as a philo-

The principal authority for Niebuhr's life is the Lebensnachrichten über B. G. Niebuhr, aus Briefen desselben und aus Erinnerungen einiger seiner nächsten Freunde, by Dorothea Hersler (3 vols., 1838–

Niebuhr, Karsten (1723–1815), German traveller, was born at Lüdingworth, Lauenburg, on the southern border of Holstein, on the 17th of March 1733, the son of a small farmer. He had little education, and for several years of his youth had to do the work of a peasant. His bent was towards mathematics, and he managed to obtain some lessons in surveying. It was while he was working at this subject that one of his teachers, in 1760, proposed to him to join the expedition which was being sent out by Frederick V. of Denmark for the scientific exploration of Egypt, Arabia and Syria. To qualify himself for the work of surveyor and geographer, he studied hard at mathematics for a year, and after that he set out, with the intention of acquiring some knowledge of Arabic. The expedition sailed in January 1761, and, landing at Alexandria, ascended the Nile. Proceeding to Suez, Niebuhr made a visit to Mount Sinai, and in October 1762 the expedition sailed from Suez to Jeddah, journeying thence overland to Mocha. Here in May 1763 the philologist of the expedition, van Haven, died, and was followed shortly after by the naturalist Forskål. Sana, the capital of Yemen, was visited, but the remaining members of the expedition suffered so much from the climate or from the mode of life that they returned to Mocha. Niebuhr seems to have saved his own life, by adopting the native habits as to dress and food. From Mocha the ship was taken to Bombay, the artist of the expedition dying on the passage, and the surgeon soon after landing. Niebuhr was now the only surviving member of the expedition. He stayed fourteen months at Bombay, and then returned home by Muscat, Bushire, Shiraz and Persepolis, visited the ruins of Babylon, and thence went to Bagdad, Mosul and Aleppo. After a visit to Cyprus he made a tour through Palestine, crossing Mount Taurus to Brussa, reaching Con-

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stantinople in February 1767 and Copenhagen in the following November. He married in 1773, and for some years held a post in the Danish military service which enabled him to reside at Copenhagen. In 1778, however, he accepted a position in the civil service of Holstein, and went to reside at Meldorf, where he died on the 26th of April 1815.

Niebuhr was an accurate and careful observer, had the instincts of the scholar, was animated by a high moral purpose, and was rigorously conscientious and anxiously truthful in recording the results of his observation. His works have long been classics on the geography, the people, the antiquities and the archaeology of much of the district of Arabia which he traversed. His first volume, Beschreibung von Arabien, was published at Copenhagen in 1777, 4to, 2 vols., and was intended to defraying the expenses of the abundant illustrations. This was followed in 1774–1778 by two other volumes, Reisebeschreibung von Arabien und anderen umliegenden Ländern. The fourth volume was not published till 1837, long after his death, under the editorship of Niebuhr's daughter. He also undertook the task of bringing out the work of his friend Forskål, the naturalist of the expedition, under the titles of Descriptions animalium, Flora Aegyptiaco-Arabica, and Icones rerum naturalium (Copen-

hagen, 1775–1776). To a German periodical, the Deutschen Museum, Niebuhr contributed papers on the interior of Africa, the political and military condition of the Turkish empire, and other subjects.

French and Dutch translations of his narratives were published during his lifetime, and a condensed English translation, by Robert Heron, of the first three volumes in Edinburgh (1792). His son Boris, who published above the title of his father a memoir written by Sir George Cornwall Lewis's Essay on the Credibility of the Early Roman History. See further J. E. Sands, History of Classical Scholarship (1908), i. pp. 75–82.

Niederbronn, a town of Germany, in the imperial province Alsatia-Lorraine, on the Falkensteiner Bach, situated under the eastern slope of the Voges, 12 m. N.W. from Haguenau by rail. Pop. (1905) 3120. It contains an Evangelical and a Roman Catholic church, a convent of the Sisters of the Divine Redeemer, and a high-grade and other schools. Niederbronn is one of the best-known watering-places in the Voges. Its brine springs, with a hydrophatic establishment attached, are specific in cases of gout, obesity and liver disorders. Here, on the 26th of July 1813, the first engagements between the French and in the Franco-German war took place. There are several ruined castles in the neighbourhood, the most noteworthy of which is one on the Wesenburg (1415 ft. high) erected in the 14th century. Various Celtic and Roman antiquities have been found around Niederbronn.

See Kuhn, Les Eaux de Niederbronn (3rd ed., Strassburg, 1860); Mathis, Aus Niederbronn's Alten Zeiten (Strassburg, 1901); and Kriehn, Das Wassertal Niederbronn (Strassburg, 1902).

Niederlahnstein, a town of Germany, in the Prussian province of Hesse-Nassau, situated on the right bank of the Rhine at the confluence of Lahn, 3 m. S.E. from Coblenz by the railway to Ems, and at the junction of lines to Hochheim and Cologne. Pop. (1905) 4551. It has two Roman Catholic churches. The chief industries are the making of machinery and shipbuilding. Niederlahnstein obtained civic rights in 1332, and was until 1803 on the territory of the electors of Trier. Here on the 1st of January 1814 a part of the Russian army crossed the Rhine. In the vicinity are the Johanniskirche, a Romanesque church restored in 1857, and the Allerheiligenberg, where stands a chapel, once a famous place of pilgrimage.

Nieder-Selters, a village of Germany, in the Prussian province of Hesse-Nassau, situated in a well-wooded country on the Ems, 12 m. S.E. from Limburg by the railway to Frankfort-on-Main. Pop. (1900) 1339. Here are the springs of the famous Selters or Seltzer water, employed as specific in cases of catarrh of the respiratory organs, the stomach and bladder. Until 1866 the springs belonged to the duke of Nassau; since this date they have been the property of Prussia. They became famous in the earlier part of the 19th century, although they had been known many times previously.

See Grossmann, Die Heilquellen des Taunus (Wiesbaden, 1887).

Niederwald, a broad hill in Germany, in the Prussian province of Hesse-Nassau, on the right bank of the Rhine, between that river and the Weser, opposite Bingen, forming the south-western apex of the Taunus range. Its summit is clothed with dense forests of oak and beech, while its southern and western sides, which descend sharply to Rüdesheim and Assmannshausen on the Rhine, are covered with vineyards, and produce some of the finest wines of the district. At the edge of the forest, on the crest of the hill above Rüdesheim, stands the gigantic "Germania" statue, the national monument of the war of 1870–71, which was unveiled on the 28th of September 1883 by the emperor William I, in the presence of all the rulers in Germany or their representatives. It was designed by Johannes Schilling, and the bronze figure of Germania is 33 ft. high; the
pedestal is adorned with allegorical figures and portraits of German princes and generals. Cogtooth mountain railways run up the hill from Rüdesheim and Assmannshausen. See Spielmann, *Niederland und Nationaldenkmal* (Wiesbaden, 1898).

**Niehaus, Charles Henry** (1855— ), American sculptor, of German parentage, was born at Cincinnati, Ohio, on the 24th of January 1855. He was a pupil of the McMicken School of Design, Cincinnati, and also studied at the Royal Academy, Munich, returning to America in 1881; in 1885, after several years in Rome, he established his studio in New York City. In 1906 he became a National Academician. His principal works are: a statue of President Garfield, for Cincinnati; the Hahnemann Memorial, in Washington; Moses* and *Gibbons,* for the Congressional Library, and "James A. Garfield," "John J. Ingalls," "William Allen," and "Oliver P. Morton," for Statuary Hall, Capitol, Washington; "Hooker" and "Davenport," Statu-Hoys, Hartford, Connecticut; the Astor Memorial doors, Trinity Church, New York; "General Forrest," Memphis, Tennessee; Generals Sherman and Lee, and William the Silent; "The Scraper; or Greek Athlete using a Strigil;" statues of Lincoln, Farragut and McKinley, at Muskegon, Michigan; a statue of McKinley and a lunette for McKinley's tomb, at Canton, Ohio; and "The Driller," at Titusville, Pennsylvania, in memory of Colonel E. L. Drake, who, in 1859, sank the first oil well in Pennsylvania.

**Nieul, Alexandre** (1802—1869), marshal of France, was born at Metz on the 4th of October 1802, and entered the École Polytechnique in 1821, whence he passed to the engineer school at Metz, becoming lieutenant in the Engineers in 1827 and captain in 1833. At the storming of Constantinople he led the engineer detachment with one of the storming parties, and his conduct gained for him the rank of *chef de bataillon* (1837). In 1840 he was promoted lieutenant-colonel, and in 1846 colonel, and his next war service was as chief of staff to General Vaillant during the siege of Rome (1849), after which he was made general of brigade and director of engineer services at headquarters. In 1851 he became a member of the Committee of Fortification, and in the following year a member of the council of state, and in 1853 general of division. In the first part of the Crimean War he was employed in the expedition to the Baltic, and directed engineer operations against Bomarsund, but early in 1855 he was sent to the Crimea, where he succeeded General Bizot as chief of engineers. For some years he had been the most trusted military advisor of Napoleon III., and he was now empowered to advise the generals on the spot in accordance with the wishes of the sovereign and the home government. This delicate and difficult task Nieul managed to carry out with as much success as could be expected, and he had the credit of directing the large operations against the Malakoff (see Crimean War). His reward was the grand cross of the Legion of Honour. From 1855 to 1859 he was employed at headquarters, and also served in the senate. In the war against the Austrians in the latter year (see *Italian Wars*) Nieul commanded the IV. corps, and took a brilliant part in the battles of Magenta and Solferino. On the field of battle of Solferino he was made a marshal of France. After service for some years in a home command, he became minister of war (1867). In this capacity he drafted and began to carry out a far-reaching scheme of army reform, based on universal service and the automatic creation of large reserves, which needed only time to mature. He also rearmed the whole of the army with the chassepot rifle. But he did not live to complete the development of his system. He died on the 13th of August 1869 in Paris, and a year later the Franco-German War destroyed the old imperial army upon which the new formations were to have been grafted.

**Niello** (the Italian form of Lat. *nigellum,* diminutive of *niére,* "black;" Late Gr. *μελανέω,* a method of producing delicate and minute decoration on a polished metal surface by incised lines filled with a black metallic amalgam. In some cases it is very difficult to distinguish niello from black enamel; but the black substance differs from true enamel in being metallic, not vitreous. Our knowledge of the process and materials employed in niello-work is derived mainly from four writers,—Eracus the Roman (a writer probably of the 11th century), Theophilus the monk, who wrote in the 12th or 13th century, and, in the 16th century, Benvenuto Cellini* and Giorgio Vasari.* The design was cut with a sharp graving tool on the smooth surface of the metal, which was usually silver, but occasionally gold or even bronze. An alloy was formed of two parts silver, one-third copper and one-sixth lead; to this mixture, while fluid in the crucible, powdered sulphur in excess was added; and the brittle amalgam, when cold, was finely pounded, and sealed up in large quills for future use. A solution of borax to act as a flux was brushed over the metal plate and thoroughly worked into its incised lines. The powdered amalgam was then shaken out of the quills on to the plate, so as to completely cover all the engraved pattern. The plate was now carefully heated over a charcoal fire, fresh amalgam being added, as the powder fused, upon any defective places. When the powder had become thoroughly liquid, so as to fill all the lines, the plate was allowed to cool, and the whole surface was scraped, so as to remove the superfluous niello, leaving only what had sunk into and filled up the engraved pattern. Last of all the nielloed plate was very highly polished, till it presented the appearance of a smooth metal surface enriched with a delicate design in fine grey-black lines. This process was chiefly used for silver work, on account of the vivid contrast between the whiteness of the silver and the darkness of the niello. As the slightest scratch upon the metal received the niello, and became a distinct black line, ornament of the most minute and refined description could easily be produced.

The earliest specimens of niello belong to the Roman period. Two fine examples are in the British Museum. One is a bronze statuette of a Roman general, nearly 2 ft. high, found at Barking Hall in Suffolk. The dress and armour have patterns partly inlaid in silver and partly in niello. The dark tint of the bronze rather prevents the niello from showing out distinctly. This statuette is apparently a work of the 1st century. The other example is not earlier than the 4th century. It is a silver casket or lady's toilet box, in which were found an ampulla and other small objects, enriched with niello-work.

From Roman times till the end of the 6th century the art of working in niello was never lost, and was constantly practised in some part at least of Europe, while in Russia and India it has survived to the present day. From the 6th to the 12th century a large number of massive and splendid works in the precious metals were produced at Byzantium or under Byzantine influence, many of which were largely decorated with niello; the silver dome of the baldacchino over the high altar of S. Sophia was probably one of the most important of these. Niello is frequently mentioned in the inventories of the treasures belonging to the great basilicas of Rome and Byzantium. The Pala d'Oro at St. Mark's, Venice, 10th century, owes much of its refined beauty to niello patterns in the borders. This art was also practised by Bernward, artist-bishop of Hildesheim (ob. 1023); a fine silver paten, decorated with figures in niello, attributed to his hand, still exists among the many rich treasures in the church of Hanover Palace. Other nielli, probably the work of the same bishop, are preserved in the cathedral of Hildesheim. In France, too, judging both from existing specimens of ecclesiastical plate and many records preserved in church inventories, this mode of decoration must have been frequently applied all through the middle ages: especially fine examples once existed at Notre Dame, Paris, and at Cluny, were the columns of the sanctuary were covered with large plaques of silver in the 11th century, each plaque being richly ornamented with designs in niello. Among the early Teutonic and Celtic races, especially from the 8th to the 11th centuries, both in Britain and other countries, niello was

2 Trattato dell' orficeria.
3 Tre arti del disegno.
frequently used to decorate the very beautiful personal ornaments of which so many specimens enrich the museums of Europe. The British Museum possesses a fine fibula of silver decorated with a simple pattern in niello and thin plates of repoussé gold. This, though very similar in design to many fibulae from Scandinavia and Britain, was found in a tomb at Kerch (Panticapaeum). Several interesting gold rings of Saxon workmanship have been found at different times, on which the owner's name and ornamental patterns are formed in gold with a background of niello. One with the name of Ethelwulf, King of Wessex (837–840), is now in the British Museum (see figure). Another in the Victoria and Albert Museum has the name of Allstan, who was bishop of Sherborne from 823 to 867. The metal-workers of Ireland, whose skill was quite unrivalled, practised largely the art of niello from the 10th to the 12th century, and possibly even earlier. Fine croziers, shrines, vessels, and other objects of Irish workmanship, and of niello-work, exist in considerable numbers. From the 13th to the 16th century but little niello-work appears to have been produced in England. Two specimens have been found, one at Matlask, Norfolk, and the other at Devizes, which seem the character of niello-work for which appear to be English. They are both of gold, and seem to be the covering plates of small pendant reliquaries about 1 in. long, dating about the end of the 15th century. One has a crucifix between St John the Baptist and a bishop; the other, that found at Devizes, contains the two latter figures, but no crucifix. It is, however, in Italy that the art of niello-work was brought to greatest perfection. During the whole medieval period it was much used to decorate church plate, silver altar-frontals, and the like. The magnificent frontals of Pistoia cathedral and the Florence baptistery are notable instances of this. During the 15th century, especially at Florence, the art of niello-work was practised by almost all the great artist-goldsmiths of that period. Apart from the beauty of the works they produced, this art had a special importance and interest from its having led the way to the invention of printing from engravings on metal plates (see LINE-ENGRAVING). Vasari's account of this invention, given in his lives of Pollaiuolo and Maso Finiguerra, is very interesting, but he is wrong in asserting that Maso was the first worker in niello who took proofs or impressions of his plates. An important work of this sort, described at length by Vasari and wrongly ascribed by him to Maso Finiguerra (g.v.), still exists in the Opera del Duomo at Florence. It is a pax with a very rich and delicate niello picture of the coronation of the Virgin; the composition is very full, and the work almost microscopic in minuteness; it was made in 1452. Impressions from it are preserved in the British Museum, the Louvre and other collections. The British Museum possesses the finest existing example of 15th-century German niello. It is a silver beaker, covered with graceful scroll-work, forming medallions, in which are figures of cupids employed in various occupations (see Shaw's Dresses and Decorations of the Middle Ages, 1858, vol. ii.).

AUTHORITIES.—The Archaeological Journal of 1862 (vol. xii. p. 329) has an excellent monograph on the subject, see also vol. xii. p. 79 and vol. iv. p. 247: Archaeologia, xxxi. 240; Merrifield, Ancient Practice of Painting, vol. i. (1849) (gives MSS. of Erasmus and other early writers); Catalogue of Museum of Royal Irish Academy: Let Nielles à la cath. d'Avignon (Paris, 1890); Alvin, Nielles de la bibliothèque roy. de Belgique (1857); Duchesne, Nielles des orfèvres florentins (1826); Passavant, Le Peintre-graveur (1860–1884); Ottley, History of Engraving (1816) and Collection of Facsimiles of Prints (1826); Cresson, Seu et sculptura Niellorum (Genoa, 1858); (Prato, 1823), and Storia della calcolografia (Prato, 1831); Lanzi, Storia pittorica, ep. i. sec. iii. (1809); Baldinucci, Professioni dei disegni (1670); L'Arte del foggiare e Origini dell' incisione a rame (1802); Labarte, Arts of the Middle Ages (1855); Texier, Dictionnaire de l'orfèvrerie p. 1822 (Paris, 1857); Bartsch, Le Peintre-graveur, xiii. 1-35; Rumohr, Untersuchung der Gründe für die Annahme, &c. (Leipzig, 1841); Lessing, Collectanea zur Literatur (vol. xii. art. "Nielium"); C. Davenport, in Journal of Soc. of Arts (1901), vol. xxxv., p. 424 (J. H. M.)

NIEM, NIEJM (Niem, or Niemczewicz), Dietrich op (c. 1345–1418), medieval historian, was born at Niecehim, a small town subject to the see of Paderborn. He became a notary of the papal court of the rota at Avignon, and in 1376 went with the Curia to Rome. Urban VI. here took particular notice of him, made him an abreviarius to the papal chancery, and in 1383 took him with him on his visit to King Charles at Naples, an expedition which led to many unpleasant adventures, from which he escaped in 1385 by leaving the Curia. In 1387 he is again found among the court of the pope, and in 1395 Pope Boniface IX. appointed him to the bishopric of Verden. His attempt to see, however, met with successful opposition; and he had to resume his work in the chancery, where his name again appears in 1403. In the meantime he had helped to found a German hospice in Rome, which survives as the Instituto dell' Anima, and had begun to write a chronicle, of which only fragments are extant. His chief importance, however, lies in the part he took in the controversies arising out of the Great Schism. He accompanied Gregory XII. to Lucca in May 1406, and, having in vain tried to draw the popes together by moderation, he joined the Roman and Avignon electors at Pisa, the pope elected by the council of Pisa (Alexander V.) and to his successor John XXIII., resuming his place at the Curia. In view of the increasing confusion in the Church, however, he became one of the most ardent advocates of the appeal to a general council. He was present at the council of Constance as adviser to the German "nation." He died at Maastricht on the 22nd of March 1418.

Niem wrote about events in which he either had an intimate personal share or of which he was in an excellent position to obtain accurate information. His most important works are the Nemus unionis and the De schismate. Of these the first, compiled at Lucca after his death with the help of his son-in-law, is incomplete, and the latter, which had fallen into his hands during the negotiations for union : papal pronouncements, pamphlets, letters written and received by himself, and the like. The De schismate libri III., completed on the 29th of May 1416, describes the history of events since 1376 as Niem himself had seen them. It was continued in the Historia de vita Johannes XXIII. Other works are De bono regimine Rom. pontificis, dedicated to the new pope (John XXIII.;); De modis uniiundi ac reformandii ecclesiam et De difficultate reformations in concilio universalis, advocating the convocation of a council, to which the pope is to bow; Contra dumpossas Wiclifœcum Pragae, against the Hussites; In quo ac principe imperii, a glorification of the empire, in view of the convocation of the council of Constance: Aviamenta pulcherrima de unione et reformatione membrorum et capitis fenda, a programme of church reform based on his experiences of the evils of the Italian system.

For bibliography see Potthast, Bibl. hist. medii aevi (2nd ed., Berlin, 1896), p. 851, s.n. "Theodoricus de Niem"; and generally see the article on Niem by Theodor Lindner in Allgemeine deutsche Biographie (Leipzig, 1886); and Erel, Dietrich von Nieheim (Leipzig, 1887).

NIEMCEWICZ, JULIAN USRIN (1758–1841), Polish scholar, poet and statesman, was born in 1757 in Lithuania. In the earlier part of his life he acted as adjutant to Kosciusko; was among those who, with them at the fatal battle of Maczkowce (1772), and shared his captivity at St Petersburg. On his release he travelled for some time in America, where he married. After the Congress of Vienna he was secretary of state and president of the constitutional committee in Poland, but in 1830–1831 he was again driven into exile. He died in Paris on the 21st of April 1841. Niemcewicz tried many styles of composition. His comedy The Return of the Deputy (1790) enjoyed a great reputation, and his novel, John of Tenczyn (1829), in the style of Scott, gives a vivid picture of Polish life of the 16th century.

Niemcewicz published a collection of memoirs for ancient Polish history (6 vols., 1822–1825). But he is now best remembered by his Historical Songs of the Poles (Warsaw, 1816), a series of lyrical compositions in which the chief heroes are of the golden age of Sigismund I., and the reigns of Stephen Bathori and Sobieski.

His collected works were published in 12 vols. at Leipzig (1838–1840).
NIENBURG ON THE SAALE—NIETZSCHE

NIENBURG, a town of Germany, in the duchy of Anhalt, situated at the influx of the Bode into the Saale, 6 m. N. of Bernburg on the railway Calbe-Könnern. Pop. (1908) 3748. It contains a beautiful Gothic Evangelical church, an old castle, once monastery (founded 975, dissolved 1540), and now devoted to secular uses, and a classical school. The industries embrace iron-founding and machine-making, malting and tanning.

NIENBURG ON THE WESER, a town of Germany, in the Prussian province of Hanover, situated on the Weser, 33 m. N.W. from Hanover by the railway to Bremen. Pop. (1906) 9638. It has an Evangelical and a Roman Catholic church, a classical school and an agricultural college. Its industries consist chiefly in glass-blowing, distilling, biscuit-making and the manufacture of manures. The town is mentioned as early as 1225. It was fortified in the 12th century, obtained municipal rights in 1569, and passed in 1842 to the house of Lüneburg. It was occupied by the imperialists from 1572 to 1634, and by the French during the Seven Years' War. The walls were dismantled by order of Napoleon I. in 1807.

See Gade, Geschichte der Stadt Nienburg an der Weser (1862).

NIEPCE, JOSEPH NICÉPHORE (1765–1833), French physicist, and one of the inventors of photography, was born at Châlon-sur-Saône on the 7th of March 1765. In 1792 he entered the army as a sub-lieutenant, and in the following year he saw active service in Italy. Ill-health and failing eyesight compelled him to resign his commission before he had risen above the rank of lieutenant; but in 1795 he was nominated administrateur des domaines of the district of Nice, and he held the post until 1801. Returning in that year to his birthplace, he devoted himself along with his elder brother Claude (1763–1828) to mechanical and chemical researches; and in 1811 he directed his attention to the rising art of lithography. In 1813 the idea of obtaining sun pictures first suggested itself to him in this connexion; and in 1816 he learned that L. J. M. Daguerre was working in the same direction. In 1829 the two united their forces, and to perfecter au perfectionnement de la découverte inventée par M. Niepce et perfectionnée par M. Daguerre” (see also PHOTOGRAPHY). Niepce died at Gras, his property near Châlon, on the 3rd of July 1833. A nephew, CLAUDE FÉLIX ABEIL NIEPCE DE SAINT-VICTOR (1805–1870), served with distinction in the army, and also made important contributions towards the advancement of the art of photography; he published Recherches photographiques (Paris, 1855) and Traité pratique de gravure héliographique sur acier et sur verre (Paris, 1860).

NIEREMBERG, JUAN EUSEBIO (1595–1658), Spanish Jesuit and mystic, was born at Madrid in 1595. In 1614, joined the Society of Jesus, and subsequently became lector in Scripture at the Jesuit seminary in Madrid, where he died on the 7th of April 1658. He was highly esteemed in devout circles as the author of De la afición y amor de Jesús (1630), and De la afición y amor de María (1630), both of which were translated into Arabic, Flemish, French, German, Italian and Latin. These works, together with the Prodigios del amor divino (1641), are now forgotten, but Nieremberg's version (1656) of the Imitation is still a favourite, and his eloquent treatise, De la hermosura de Dios y su amabilidad (1649), is the last classical manifestation of mysticism in Spanish literature. Nieremberg has not the enraptured vision of St Theresa, nor the philosophic significance of Luis de León, and the unvarying sweetness of his style is cloying; but he has exaltation, intuition, insight, and his book forms no unworthy close to a great literary tradition.

NIERSTEIN, a village of Germany, in the grand duchy of Hesse-Darmstadt, on the left bank of the Rhine, 8 m. S. from Mainz by the railway to Worms. Pop. (1905) 4445. It contains a Roman Catholic and a Protestant church, an old Roman bath—Stronabath—between the springs. It is famous for its wines, in which a large export traffic is carried on. Originally a Roman settlement, and was a royal residence under the Carolingian rulers. Later it passed from the emperor to the elector palatine of the Rhine.

NIETZSCHE, FRIEDRICH WILHELM (1844–1900), German philosopher, was the son of the pastor at Rücken, near Leipzig, where he was born on 15th October 1844, He was educated at Schulpolte, and studied the classics at the universities of Bonn and Leipzig. In 1869, while still an undergraduate, he was, on F. W. Ritschel's recommendation, appointed to an extraordinary professorship of classical philology in the university of Basel, and rapidly promoted to an ordinary professorship. Here he almost immediately began a brilliant literary activity, which gradually assumed a more and more philosophical character. In 1876 eye (and brain) trouble caused him to obtain sick leave, and, finally, in 1879, to be pensioned. For the next ten years he lived in various health resorts, in considerable suffering (he declares that the year contained for him 200 days of pure pain), but dashing off, at the pressure, the brilliant essays on which his fame rests. Towards the end of 1888, after recovering from an earlier attack, he was pronounced hopelessly insane, and in this condition he remained until he died on the 25th of August 1900. Nietzsche's writings must be understood in their relation to these circumstances of his life, and as the outcome of a violent revolt against them on the part of an intensely emotional and nervous temperament. His philosophy, consequently, is neither systematic in itself nor expounded in systematic form. It is made up of a number of points of view which successively appeared acceptable to a personality whose self-appreciation varies more and more upon the imagination, and exhibits neither consecutiveness nor consistency. Its natural form is the aphorism, and to this and to its epigrammatic brilliance, vigour, and uncompromising revolt against all conventions in science and conduct it owes its persuasiveness. Revolt against the whole civilized environment in which he was brought up is the keynote of Nietzsche's literary career. His revolt against Christian faith and morals turns him into a profoundly atheist "free-thinker," and preacher of a new “master” morality, which transposes the current valuations, deposes a somewhat venerated Antichrist, and ruthlessely tramples under foot the servile herd of the weak, degenerate and poor in spirit. His revolt against the theory of state supremacy turns him into an anarchist and individualist; his revolt against modern democracy into an aristocrat. His revolt against conventional culture leads him to attack D. F. Strauss as the typical "Philistine of culture"; his revolt against the fashion of pessimism to demand a new and more robust affirmation of life, not merely although, but because, it is painful. Indeed, his very love of life may itself be regarded as an ingenuine revolt against the toils that were inexorably closing in around himself. Indeed, effects are more or less spiritual revolt also against the sources of his own inspiration: he turns his back upon the man, whose intimate friend and enthusiastic admirer he had been, and denounces him as the musician of decadent emotionalism; he rejects his "educator" Schopenhauer's pessimism, and transforms his will to live into a "Will to Power." Nevertheless his reaction does not in this case really carry him beyond the ground of Schopenhauerian philosophy, and his own may perhaps be most truly regarded as the paradoxical development of an inverted Schopenhauerism. Other influences which may be traced in his writings are those of modern naturalism and of a somewhat misinterpreted Darwinism ("strength" is generally interpreted as physical endowment, but it has sometimes to be reluctantly acknowledged that the physically feeble, by their combination and cunning, prove stronger than the "strong"). His writings in their chronological order are as follows: Die Geburt der Tragödie aus dem Geiste der Musik (1872); Umzäumung der Betrachtungen (1873–1876) (Strass—Vom Nutzen und Nutzlosen der Geschichte für das Leben—Schopenhauer als Erlieber—Richard Wagner in Bayreuth); Menschliches, Allzumenschliches (1876-1880); Morgenröte (1881); Die fröhliche Wissenschaft (1882); Also sprach Zarathustra (1883–1884); Duskens von Gott und der Welt (1880); Zur Genealogie der Moral (1883); Der Fall Wagner (1888); Göttersdämmerung (1888); Nietzsche contra Wagner, Der Antichrist, and Poems first appeared in the complete edition of his works, which also contains the notes for Wille
The Nièvre was the arrondissements town of Nièvre an
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in somewhat a popular character. G. Brandes first
drew European attention to Nietzsche by his famous essay in 1889;
then an enormous literature has grown up round the subject. See
especially L. Andreas Salomé, F. Nietzsche in seinen Werken
A. Riehl, F. Nietzsche (1897; 3rd ed., 1901); F. Tönnies, Nietzsche-
Kultur (1897); H. Ellis, F. Nietzsche (in Affirmations, 1898); H.
Lilienthal, F. Nietzsche and the Nineteenth Century (1899); E.
Horner, Vorträge über F. Nietzsche (1900); T. Ziegler, F.
Nietzsche (1906); J. Zeitler, Nietzsche's Asthetik (1900); F.
Deussen, Erinnerungen an F. Nietzsche (1901); R. Richter, F.
Nietzsche, sein Leben und sein Werke (1903); G. Simmel, Schopenhauer
und Nietzsche (1907). For an estimate of his moral theory see
Ethics, ad fin.

NIEPOORT (Flem. Nieuwpoort), a town of Belgium in
the province of West Flanders. Pop. (1904) 3780. It was
the port of Ypres, and is situated on the Yser about 10 m. S.
of Ostend. It was strongly fortified in the middle ages and its
siege by the French in 1488–1489 is an episode of its heroic period.
Under its walls in 1600 Maurice of Nassau defeated the Archduke
Albert and the Spaniards. It contains an ancient cloth market,
a fine town-hall and an old church, and outside is a lighthouse
dating from 1276. Nièvre was raised to a lordship in 1165, and the
firstdiseased of the town dates only from 1526. It has a fine
pier extending 1500 yds. out to sea and flanking the entrance
to the Yser, which has been canalized. The bathing is excellent,
and in the season the place is largely frequented by visitors.

NIÈVE, a department of central France, formed from
the old province of Nivernais with a small portion of the Orléanais.
It is bounded N.W. by Loiret, N. by Yonne, E. by Côte d'Or,
E. and S.E. by Saône-et-Loire, S. by Allier and W. by Cher.
Pop. (1906) 313,972. Area, 2639 sq. m. Nièvre falls into three
regions differing in elevation and in geological formation. In
the east are the granitic mountains of the Morvan, one of the
most picturesque portions of France, containing Mont Prénélay
(2787 ft.) and several lesser heights. The north and centre are
occupied by plateaux of Jurassic limestone with a maximum elevation
of 1400 ft. The west and south-western part of the
department is a district of plains, composed mainly of tertiary
formations with alluvial deposits, and comprising the valleys
of the Loire and the Allier. The lowest level of the department
is 446 ft., at the exit of the Loire. Nièvre belongs partly to the
basin of the Loire, partly to that of the Seine. The watershed
dividing these two basins follows the general slope of the depart-
ment from S.E. to W.—from Mont Prénélay to the Puisaye,
the district in the extreme north-west. Towards the west the
limits of Nièvre are marked by the Allier-Loire valley—the
Loire striking across the south-west corner of the department
by Decize and Nevers and then continuing the line of its great
affluent the Allier northwards by Fourchambault, La Charité,
Pouilly and Cosne. Secondary feeders of the Loire are the
Nièvre, which gives its name to the department, and the Aron,
whose valley is traversed by the Nivernais Canal. The largest
tributary of the Seine in Nièvre is the Yonne, which rises in
the south. An Engle's by Clamecy, and carried along with it
the northern part of the Nivernais Canal. The Cure, the principal
affluent of the Yonne (which, however, it does not unite
till after it has left the department), is the outlet of a lake, Lac
des Settons, which serves as a reservoir for the regulation of
the river and the canal. Owing to its greater elevation and the
retention of the rain-water on its impermeable surface in the
shape of ponds and streams, Morvan shows a mean temperature
6° F. lower than that of the western district, which, in the valley
of the Loire, is almost identical with that of Paris (52° F.).
At Nevers the annual rainfall amounts to only 21 in., but
in Morvans it is nearly three times as great.

The principal cereals are oats and wheat; potatoes are
also largely grown. Much land is given over to pasture and
the cultivation of various kinds of forage, and the fattening
of cattle is a thriving agricultural industry. The Nivernais
and Cherolais are the chief breeds. The rearing of sheep and
draught-horses is also of importance. Vines are grown in the
valley of the Loire and in the neighbourhood of Clamecy.
The white wines of Pouilly on the Loire are widely known. Nièvre
abounds in forests, the chief trees being the oak, beech, hornbeam,
elm and chestnut. Coal is mined at Decize, and gypsum, building
stone, and kaolin are among the quarry products. The best-
known mineral springs are those of Pouyges and St Honoré.
Of the iron-works for which Nièvre is famous, the most important
are those of Fourchambault. At Imply there are large steel-
works. The government works of La Chaussade at Guérigny
make chains, anchors, armour-plates, &c. There are also
manufactories of agricultural implements and hardware, pottery,
manufactories of porcelain, and faience (at Nevers), tile-works,
chemical works, paper-mills and saw-mills, as well as numerous
tanneries, boot and shoe factories, cloth manufactories and oil
works (colza, poppy and hemp). In the Morvan district a large
part of the population is engaged in the timber industry; the
logs carried down by the streams to Clamecy are then put into
boats and conveyed to Paris.

A great deal of the traffic is by water: the canal along the
left bank of the Loire runs through the department for 38 m.,
and the Nivernais canal extends 48 m. The Paule canal, owned
by the Paris-lyons-Méditerranée Company, whose main line
to Nîmes follows the valley of the Loire and Allier throughout
the department. Nièvre is divided into 4 arrondissements
(Nevers, Château-Chinon, Clamecy and Cosne being its capitals),
25 cantons, 313 communes. It forms the diocese of Nevers,
and part of the educational district of Dijon and of the
region of the VIII. corps d'armée. Its court of appeal is at Bourges.
The most noteworthy towns are Nevers, the capital, Clamecy,
Fourchambault, Cosne, La Charité and Decize. Varzy and
Tannay have fine churches of the 14th, 15th, 16th centuries respectively, and there is an interesting church,
chiefly Romanesque in style, at St Pierre-le-Moûtier.

NIFO, AGOSTINO [Augustinus Niphus] (c. 1473–1538
or 1545). Italian philosopher and commentator, was born at Japoli
in Calabria. He settled for a time at Sezza and subsequently
proceeded to Padua, where he studied philosophy. He lectured
at Padua, Naples, Rome and Pisa, and won so high a reputation
that he was deputed by Leo X. to defend the Catholic doctrine
of Immortality against the attack of Pomponazzi and the
Alexandrians. In return for this he made Count Palatine,
with the right to call himself by the name Medici. In his early
thoughts he followed Averroes, but afterwards modified his
views so far as to make himself acceptable to the orthodox
Catholics. In 1495 he produced an edition of the works of
Averroes; with a commentary compatible with his acquired
orthodoxy. In the great controversy with the Alexandrians
he opposed the theory of Pomponazzi that the rational soul
is inseparably bound up with the material part of the individual,
and hence that the death of the body carries with it the death
of the soul. He insisted that the individual soul, as part of
absolute intellect, is indestructible, and on the death of the
body is merged in the eternal unity.

His principal philosophical works are De immortality animi
(1518 and 1524); De intellectu et daemonibus; De infinitate primiti
motoris quaesito et Opuscula moralia et politica. His numerous
commentaries on Aristotle were widely read and frequently reprinted,
the best-known edition being one printed at Paris in 1654 in fourteen
volumes (including the Opuscula).

NIGDEH (Arab. Nakdkah), the chief town of a sanjak of
the same name in the Konia vilayet of Asia Minor, situated on
the Kaisariye-Cilician Gates road. It is remarkable for the beauty
of its buildings, dating from almost all ages of the Seljuk period.
After the fall of the Cilician state (of which it was one of
the principal cities), Nigdeh became independent, and,
according to Ibn Batuta, ruined, and did not pass into Ottoman
hands till the time of Mahomed II. It represents no classical
town, but, with Bor, has inherited the importance of Tyana,
whose site lies about 10 m. S.W. A Hittite-inscribed monument, brought perhaps from Tyana, has been found at Nigel. The population (20,000) includes a large Greek and a small Armenian community. The Orthodox metropolitan of Iconium resides here.

NIGEL (d. 1169), bishop of Ely, head of the exchequer in the reigns of Henry I. and Henry II., was brought into the exchequer in early life (1130). Soon after his uncle Roger of Salisbury secured him the bishoppate of Ely, much to the disgust of the monks. Nigel was at first retained in Stephen's service; but, like his uncle and his brothers, incurred the suspicion of leaning towards the Angevin interest, when Roger of Salisbury and Alexander of Lincoln were arrested by Stephen (January 1130). Nigel attempted to maintain himself in his see by force of arms, but he was forced to fly to the empress at Gloucester. He was reconciled to Stephen in 1145 and restored to his see; but he now became involved in a quarrel with the powerful Henry of Winchester. Ranulph, his first treasurer and representative at Ely, had been extortionate and dishonest, and the monks accused Nigel, probably with some justification, of spending the estates and treasures of the see in maintaining knights and gaining court influence. Henry of Winchester, who can have had little sympathy with bishops of Nigel's type, took up their quarrel, and Nigel was forced to go to Rome. Fortunately, both in these quarrels and in all his difficulties with Stephen, he secured the strong and uniform support of the Roman Curia. At the accession of Henry II. (1154) he himself was summoned to reorganize the exchequer. He was the only surviving minister of Henry I., and his knowledge of the exchequer business was unrivalled. This was the great work of his life. It is to the work of his son Richard, the Dialogus de Scaccararie, that we are indebted for our knowledge of the procedure of the exchequer as it was left by Nigel. The bishop took little part in politics, except as an administrator. In 1166 his health was broken by a paralytic seizure. Except for another quarrel with his monks, who accused him of despoiling their church and gained the ear of Pope Adrian, the last part of his life was laborious and uneventful.

See Dr Liedermann's Einleitung in den Dialogus de Scaccararie; J. H. Round's Geoffrey of Mandeville.

NIGER, GAIUS PESCENNIIUS, governor of Syria under the emperor Commodus. On the death of Pertinax (A.D. 193), he was saluted emperor by the troops at Antioch, but unaccountably delayed marching on Rome until he learned that Septimius Severus, one of the rival claimants, had assumed the offensive. He then strongly garrisoned Byzantium and the principal towns of Asia Minor, but after his legate Aemilianus had been defeated and slain near Cyzicus he himself was driven from Nicaea and routed near the Cilician Gates. Having failed in an effort to escape towards the Ephrates, he was brought back and put to death in 194.

Aelius Spartianus, Pescennius Niger; Dio Cassius lxiii. 8; lxiii. 13. 14.

NIGER, a great river of West Africa, inferior only to the Congo and Nile among the rivers of the continent, and the only river in Africa which, by means of its tributary the Benue, affords a waterway uninterrupted by rapids, and available for all kinds of draught steamers, to the far interior. Rising within 150 m. of the mouth of a mountainous zone which marks the N.E. frontiers of Sierra Leone and French Guinea, it traverses the interior plateaus in a vast curve, flowing N.E., E. and S.E., until it finally enters the Gulf of Guinea through an immense delta. Its total length is about 2600 m. About 250 m. from its mouth it is joined by the Benue, coming from the east from the mountainous region of Adamawa. From its mouth to the limit of navigability from the sea the river is in British territory; above that point it flows through French territory.

The source of the Niger lies in 9° 5' N. and 10° 47' W., and the most northerly point of the great bend is about 17° N. The area of the Niger basin, excluding the arid regions with a slope towards the stream, has been calculated by Dr. A. Bludau at 584,000 sq. m. The river is known locally under various names, the most common being Joliba (a Mandingo word meaning Great River) and Kworra or Quorra. By the last name the Niger was known in its lower reaches before its identity with the upper river was established. The stream considered the chief source of the Niger is called the Tembi. A narrow watershed separates it from the headwaters of the streams flowing south-west through Sierra Leone. The birthplace of the Niger is in a deep ravine 2800 ft. above sea-level. From a moss-covered rock a tiny spring issues and has made a pool below. This little stream is the Tembi, which within a short distance is joined by two other rivulets, the Taminconco and Falico, which have their origin in the same mountainous district. After flowing north for about 100 m., the river turns eastward and receives several tributaries from the south. At its confluence with the Tankisso (a northern tributary), 210 m. from its source, the river has attained dimensions sufficient to earn for itself the title Joliba. Taking at this point a decided trend northward, the Niger, 100 m. lower down, at Bamako—the first considerable town on its banks—has a depth of 6 ft. with a breadth of 1300 ft. Seven or eight miles below Bamako the Satuba rocks mark the end of what may be considered the upper river. From this point the navigable portion of the Niger begins. Thirty miles below Satuba are the rapids of Tulimandio, but these are navigable when the river is at its highest, namely from July to October. A little lower down is Kullkoro, from which point the bed of the stream for over 1000 m. is fairly free from impediments, and the river is navigable to the point where it turns to the left on the main stream, with which they are connected by channels conveying the water in one direction or the other according to the season. At high water most of these are united into one general inundation. The largest lake, Faguibini, is nearly 70 m. long by 12 m. broad, has high shores and reaches a depth exceeding, in parts, 160 ft. It is not until Kabara, the port of Timbuktu, is reached, a distance of 450 m. from Sansandig, that the labyrinth of lakes, creeks and backwaters ceases. Below Kabara the river reaches its most northerly point. At Bamba it is shut in by steep banks and narrows to 600 to 700 yds., again spreading out some distance down. At Barka (200 m. from Timbuktu) the stream turns south-east and preserves that direction throughout the remainder of its course. At Tossaye, just before the bend becomes pronounced, the Baror and Chabar rocks reduce the width of the river to less than 500 ft., and at low water the strength of the current is a serious danger to navigation. Below Timbuktu for a considerable distance the Niger receives no tributaries; from the north none until the region of the Sahara is passed. In places the desert approaches close to the river on both banks and immense sand deserts extend far into the interior.

At Ansongo, 430 m. below Timbuktu, the navigable reach of the middle Niger, in all 1057 m., ends. Four huge flint rocks bar the river at Ansongo and effectually prevent further navigation except in very small vessels. From Ansongo to Say, some 250 m., the river flows through several rocky passes, the current attaining great velocity. Throughout this distance the river is a hopeless labyrinth of rocks, islands, reefs and rapids. From Say, where the stream is about 700 yds. in breadth, to Bussa, there is another navigable stretch of water extending 300 m. After the desert region is past the Niger receives the waters of the river Sokoto, a considerable stream flowing from the north-east. Some distance below this confluence are the Bussa rapids, which can only be navigated with considerable difficulty. These
rapids—though not such a hindrance to navigation—are of a more dangerous character than any encountered between Ansongo and Say. In one pass, some 34 yds. wide, shut in between two large reefs, a good half of the waters of the Niger flings itself over with a tremendous roar” (Hourst). The rapids extend for 50 m. or more; in a less obstructive form they continue to Rabbaba, but light-draught steamers ascending the stream during flood season experience little difficulty in reaching Bussu. A little above Rabbaba the river makes a loop south-west, at the head of the loop being (right bank) Jebba. Here the river is bridged by the railway from Lagos. Sixty miles lower down is the mouth of the (left hand) tributary the Kaduna, a river of about 500 m., which gives access to Zungeru, the headquarters of the British administration in Northern Nigeria. The head waters of the Kaduna are not far from Kano. Below the mouth of the Kaduna, on the right bank of the Niger, is Baro, the starting-point of a railway to Kano. In 7° 40' N. 6° 45' E., the Niger is joined by its great tributary the Benue. At their confluence the Niger is about three-quarters of a mile broad and the Benue rather more than a mile. The united stream forms a lake-like expansion about 2 m. in width, dotted with islands and sandbanks; the peninsula at the junction is low, swampy, and intersected by numerous channels. On the whole, the Niger is an easily navigable river, on which large and light-draught vessels (g.o.), an important commercial centre. The stream, as far south as Idah (Ida), a town on the east bank, rushes through a valley cut between the hills, the sandstone cliffs at some places rising 150 ft. high. Between Idah and Onitsha, 80 m., the banks are lower and the country flatter, and to the south of Onitsha the whole land is laid under water during the annual floods. Here may be said to begin the great delta of the Niger, which, extending along the coast for about 120 m., and 140 or 150 m. inland, forms one of the most remarkable of all the swampy regions of Africa. The river breaks up into an intricate network of channels, dividing and subdividing, and intercrossing not only with each other but with the branches of other streams, so that it is exceedingly difficult to say where the Niger delta ends and another river system begins. The Rio Nun is a direct continuation of the line of the undivided river, and is thus the main mouth of the Niger.

From the sea the only indication of a river mouth is a break in the dark green mangroves which here universally fringe the coast. The crossing of the bar requires considerable care, and the ebbs and tides the outward current of 35 knots per hour. For the first 20 m. (or as far as Sunday Island), the limit of the sea tide in the dry season) dense lines of mangroves 40, 50, or 60 ft. in height shut in the channel; then palm and other trees begin to appear, and the widening river has regular banks. East of the Nun the estuaries known as the Brasse, Sombrero, New Calabar, Bonny, Opobo or (Iro), &c. (with the exception, perhaps, of the first-named), seem to derive most of their water from independent streams such as the Orashi, rising in about 0° N., which is, however, linked with the Niger by the Onita Creek in 5° N. Behind the town of Okrika, some 30 m. up the Bonny river, the swampy ground gives place to firm land, partially forest-clad. West of the Nun all the estuaries up to the Forcados seem to be true mouths of the great river, while the Benin river, though linked to the others by transverse channels, may be more properly regarded as an independent stream. (See BENN.) In this direction the largest mouth is the Forcados, a noble stream with a safe and relatively deep bar. Its banks in its lower course are densely wooded, but the beach is sandy and almost free from marsh and malaria. The mouth is 2 m. wide. It has supplied the Nun river as the chief channel of the Niger system till about 12 m. above the point where the river flows for 1000 ft. It has a more or less uniform character throughout, but there are as the Nun mouth. Moreover, the Forcados bar shifts little laterally, and within the bar is a natural harbour with an area of 3 to 4 sq. m. having a depth of 30 ft. at low water spring tides. From the mouth of the Forcados to the main stream is 105 m., with a minimum depth in the dry season of 7 ft. A northern arm affords ocean-going vessels access to Wari and Sapele. The other western mouths of the Niger have as a rule shallow and difficult bars. The delta is the largest in Africa and contains about 14,000 sq. m.

The Benue is far the most important of the affluents of the Niger. The name signifies in the Batta tongue ‘Mother of Waters.’ The river rises in Adamawa in about 7° 40' N. and 13° 15' E., the Benue. It is joined by the stream of the Buri-Buri, which ascends nearly to 3000 ft. above the sea, being separated by a narrow water parting from one of the headstreams of the Logone, whose waters flow to Lake Chad. In its upper course the Benue is a mountain torrent, over 2000 ft. above sea level, and flows over it is connected by the Kebbi or Mayo Kebbi, a right-hand tributary whose confluence is in about 9° 8' N., 13° 4' E. The Kebbi, fed by many torrents rising in the eastern versant of the Mandara Hills, issues from the densely forested end of the hills, and, flowing north-east, occupies an extensive depression in the moderately elevated plateau east of the Mandara Hills, and are cut by 10° N., 15° E. The central part of the marshes forms a deep lake, whence there is a channel going northward to the Logone and navigable for some months during the year. The Kebbi flows west, and soon after leaving Tuburi passes through a rocky barrier marked by a series of rapids and a fall of 165 ft. Below these observations it is almost useless for navigation with the Benue has a depth of not less than 6 ft. In places, at Lere and Bifara, it widens into lake-like dimensions. Below the Kebbi the confluence of the Benue, now a considerable river, turns north-west, but during the dry season is only interrupted by a confluence of lakes and springs, and the next year round by boats drawing not more than 23 ft. For some 40 m. below the confluence the river has an average width of 180 to 200 yds., and flows with a strong steady current, although a broad strip of wateredy only on one side. At Calabar, where the river is joined by the Jarobi, which, rising in the Adamawa Mountains S.E. of Ngaundere, flows almost due north. About 50 m. below the junction of the Faro will, the course of the river changes southward, and the current of the Benue forms the lower course of the river from the sea and at an altitude of 600 ft. Here the width of the stream increases at flood time to 1000 or 1500 yds., and though it narrows at the some river changes rapidly, the Brown’s Bank, the Cameroons, is never more than 13 ft. below normal, where it widens into a large Several other tributaries both from the north and the south, but they are not of great importance. It flows downwards to the Niger with comparatively unconstricted current, its valley, wider for the most part, is marked by chains, but the middle of the salt-water lagoon, the remnant of an arm of the sea which in the tertiary age covered the northern Sudan and southern Sahara as far east as Blima. Lake Fagubini is regarded as a remnant of the
ancient course of the upper river. When the upper Niger had this
direction, the Wadi Taifassasent, now a dried-up river of the central
Sahara, which rose in the Ahbaran mountains, is believed to have
formed the upper course of the existing lower Niger. While the
upper and lower parts of the Niger have all the appearance of ancient
streams, the middle Niger is the product of a "it has not past, it scarcely has a present" (see R. Chudeau, Sahara
soudanais, Paris, 1900).

Vague ideas of the existence of the river were possessed by the
ancients. The great river flowing eastward reached by the
Nasamomians as reported by Herodotus can be no
other than the Niger. Pliny mentions a river Nigiris,
of the same nature with the Nile, separating Africa
and Libya, and founded for the Nile in its northward
progress, and it is improbable that this is the modern Niger. In
Ptolemy, too, appears along with Girs (possibly the Shari) a
certain Niger (Nirap) as one of the largest rivers of the interior;
but so vague is his description that it is impossible definitely
to identify it with the Niger. Arabian geographers, such as
Ibn Batuta, who were acquainted with the middle course of
the river, called it the Nile of the Negroes. At the same time
contradictory opinions were held as to the course of the stream.
It was supposed by some geographers to run west, an opinion
probably first stated by Idrisi, which was followed by the
geoographers of the 11th century, Western Europe,
given by the geographers of Egypt and the Niger of the Negroes a
common source in the Mountain of the Moon. Fountains from the
mountain formed two lakes, whence issued streams which
united in a very large lake. From this lake two streams issued
to the east, between 15° and 20° E. (see Rennell's map in
Horne-mann's Travels, 1802). To Rennell the Benue was an east-
flowing continuation of the Niger. The imagined existence
of mountains—called Keng in the west and Komri (Lunar) in the
east—stretching in a high and unbroken chain across Africa
and inhabited by the negroes gave rise to the expectations of
possible southern bend to the Niger.

That the vast network of rivers on the Guinea coast, of which
the Nun was the chief, known as the Oil Rivers, formed the delta
of the Niger does not appear to have been suspected before the
beginning of the 19th century. Consequentially it was from the
direction of its source that the river was first explored in modern
times. In 1795 Mungo Park (57.) was sent out by the African
Association, and was the first European to see and describe the
upper river. Park landed at the Gambia, and struck the Niger
near Bagu (a town some distance above Sannasand) on the
20th of July 1796, where he beheld it " glittering in the morning
sun as broad as the Thames at Westminster and flowing slowly
to the eastward " (Travels, 1st ed. p. 194). He descended the
river some distance, and on his return journey went up stream
as far as Bamako. In 1805 Park returned to Africa for the
purpose of descending the Niger to its mouth. He started as
before from the Gambia, reached the Niger, sailed down the
river past Timbuktu, and on the eve of the successful accomplish-
ment of his undertaking lost his life during an attack on his boat
by the natives at Bussa (Nov. or Dec. 1805). Park held to the
Nile as the connexion of the two Niles, in 1800 he had
C. G. Reichard, a German geographer, had suggested that the
Rio Nun was the mouth of the Niger. Owing to Park's death
the results of his second journey were lost, and the work had to
be begun afresh. In 1822 Major A. G. Laing (who had reached
Timbuktu by way of Tripoli) obtained some accurate information
concerning the sources of the river, and in 1828 the French
explorer René Caillié went by boat from Jenné to the port of
Timbuktu. In 1826 Bussa was reached from Benin by Hugh
Clapperton, and his servant Richard Lander. On Clapperton's
return to Leiden, and his brother John led in 1830 an
expedition which went overland from Badagy to the Niger.
Canoing down the river from Yawari—60 m. above Uma—
to the mouth of the Rio Nun they finally settled the doubt as to
the lower course of the stream. In 1832 Macgregor Laird established
the African Steamship Company, and Richard Lander and
R. A. K. Oldfield (as members of its first expedition) ascended
the Niger to Rabba, and the Benue as far as Dagbo (80 m.).
In 1841 an expedition, consisting of three steamers of the British
navy, under Captain (afterwards Admiral) H. D. Trotter,
went up to Ega (Egam), but was forced to return owing to sickness
and conduct.

Heinrich Barth (1851–1854) made known to Europe
the course of the river from Timbuktu to Say. Barth sailed down
from Sarajaya (situated on a tributary stream south-west of
Timbuktu) to Kabara; then skirted the left bank to a small
town called Bornu in 10° N., and the right thence to Say. In
1850–1851 the German E. R. Flegel ascended the Niger
to Gomba opposite the confluence of the Sokoto river with the
main stream, and about 70 m. below Barth's southmost point.
Zweifel and Moustier, sent out by M. Vermineck, a Marseilles
sailor and navigator (1853), reached the southern part of the Niger
in 1885 the Tembi source was visited by Captain Brouet, a French
officer. Indeed the additions to the knowledge of the Niger
during the last two decades of the 19th century were largely
the work of French officers engaged in the extension of French
influence throughout the western Sudan. From 1880 onwards
Colonel (afterward General) Gallieni took a leading part in the
operations on the upper river, where in 1883 a small gunboat, the
Niger, was launched for the protection of the newly established
French posts. In 1885 a voyage was made by Captain Delanneau
in 1816 James McQueen correctly divined that there was a
great west-flowing tributary (the Benue) to the Niger, and that after
its confluence the river ran south to the Atlantic. See his View of
Northern Central Africa (1801) and Geographical Survey of Africa
(1803).
past the ruins of Sansandig, as far as Diafarabe. In 1887 the gunboat made a more extended voyage, reaching the port of Timbuktu, and correcting the mapping of the river down to that point. In 1894-1895 attention was directed to the middle and lower Niger, to which several expeditions started from the coast of Guinea. A still more important expedition, under Lieutenant Hurst, the Kehbi from Timbuktu in January 1896, navigated the Niger from that point to its mouth, executing a careful survey of the river and the various obstructions to navigation. A voyage made in 1897 by Lieutenant de Chevigné showed that at low water the section between Timbuktu and Ansongo presents great difficulties, but the voyage from Timbuktu to Say was again successfully accomplished in 1899 by Captain Grandeyre. In 1901 Captain E. Lenfant ascended the river with a flotilla from its mouth to Say, and he demonstrated the normal practicability of the route, despite the Bussa rapids. This delta of the Niger has been partially surveyed since it became British territory by various ship captains, officials of the Royal Niger Company and others, including Sir Harry Johnston, sometime British consul for the Oil Rivers.

In addition to the main stream, the Niger basin was made known by exploration during the last quarter of the 19th century and the early years of the 20th. The journeys of the German traveller G. A. Krause (north from the Gold Coast, 1886-1887) and the French Captain Binger (Senegal to Ivory Coast, 1887-1889) first defined its southern limits by revealing the unexpected northward extension of the basins of the Guineo-coast streams, especially the Volta and Komoe, a fact which explained the absence of important tributaries within the Niger bend. This was crossed for the first time, in its fullest extent, by Colonels P. L. Monteil (French) in 1890-1891. At the eastern end of the basin much light has been thrown on the system of the Benue. In 1851 Barth crossed the Benue at its junction with the Faro, but the region of its sources was first explored by Flegel (1882-1884), who traversed the whole southern basin of the river and reached Goundane. Other German travellers added to the knowledge of the southern tributaries, the Tschoppa, Donga, and others, which drain the rains bring down a large body of water from the highlands of southern Adamawa. British travellers who have done work in the same region are Sir W. Wallace, L. H. Moseley, W. P. Hewby, P. A. Talbot and Captain Claud Alexander. The last-named two were members of an expedition led by Lieut. Boyd-Alexander, who himself crossed Africa from the Niger to the Nile. Messrs Talbot and Claud Alexander surveyed the country between Ibi on the Benue and Lake Chad, mapping (1904) a considerable part of the Gongola.1 In 1854 the Benue itself was ascended 400 m. by the "Pléiad" expedition, and in 1878-1879 an English river vessel ascended the Benue (afterwards "Sir Claude") Macdonald, further progress towards the Tuburi marsh being prevented by the shallowness of the water. The upper basin of the Benue was also traversed by the French expeditions of Mizon (1892) and Maistre (1892-1893), the latter passing to the south of the Tuburi marsh without definitely settling the hydrographical question connected with it. This was accomplished by Captain Lenfant in 1905. He ascended the Kehbi and discovered the Lafa fall, continuing up the river to its point of issue from Tuburi. Crossing the marshes he found and navigated the river leading to the Lafa fall, the Kehbi, and the Kebbi to Ibara by Majiast (afterwards Sir Claude) Macdonald, further progress towards the Tuburi marsh being prevented by the shallowness of the water. The upper basin of the Benue was also traversed by the French expeditions of Mizon (1892) and Maistre (1892-1893), the latter passing to the south of the Tuburi marsh without definitely setting the hydrographical question connected with it. This was accomplished by Captain Lenfant in 1905. He ascended the Kehbi and discovered the Lafa fall, continuing up the river to its point of issue from Tuburi. Crossing the marshes he found and navigated the river leading to the Lafa fall, the Kehbi, and the Kebbi to Ibara by Majiast (afterwards Sir Claude) Macdonald, further progress towards the Tuburi marsh being prevented by the shallowness of the water.

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The Nile, a British protectorate in West Africa occupying the lower basin of the Niger and the country between that river and Lake Chad, including the Fula empire (i.e. the Hausa States) and the greater part of Bornu. It embraces most of the territory in the square formed by the meridians of 5° and 14° E. and the parallels of 14° and 14° N., and has an area of about 338,000 sq. mi. The protectorate is bounded W., N. and E. by French possessions (Dahomey, Upper Senegal and Niger colony, and Chad territory), S.E. by the German colony of Cameroon and S. by the Atlantic.

Physical Features.—The country is divisible, broadly, into three zones running parallel with the coast: (1) the delta, (2) forest region, giving place to (3) the plateau region. The coast line, some 500 m. in length, extends along the Gulf of Guinea from 2° 46' 55" E. to 8° 45' E. ending at the Rio del Rey, the point where the great bend eastwards of the continent ceases and the large inland basins of the confluence of the Congo and Ubangi rivers begins. This delta is divided into three parts at its N.W. corner and flows thence S.E. to the Atlantic, receives, 250 m. from the sea, the Benue, which, rising in the mountains of Adamawa south of Lake Chad, flows west across the plateau. Into the huge delta of the Niger several other rivers (the "Oil Rivers") empty themselves; the chief being, on the west, the Benin (q.v.), and on the east the Brass. East of the Niger delta is that formed by the Imo or Opobo, Bonny and other streams, and still farther east is the Calabar estuary, mainly formed by the Cross river (q.v.). West of the Niger delta are several inland streams forming a large inland drainage system which here line the coast. The most westerly of these streams, the Ogun, enters the Lagos lagoon, which is connected by navigable waterways with the Niger (see Lagos).

The delta region is swampy, and forms, for a distance of from 40 to 70 m. inland, a network of interlacing creeks and broad sluggish channels fringed with monotonous mangrove forests. The main rivers are navigable for ocean-going steamers for a distance of from 15 to 40 m. from their mouths. Beyond the delta firm ground takes the place of mud and the mangroves disappear. The land rises gradually at first, becoming, however, in places very steep. The rivers on the eastern side are much obstructed by rapids.

The Niger at its confluence with the Benue is not more than 250 ft. above the sea. North of this point are hills forming the walls of the plateau which extends over the centre of the

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1 Captain Claud Alexander died of fever in northern Nigeria on the 30th of November 1904. His brother, Lieut. Boyd Alexander, in a subsequent expedition across Africa was murdered in Wadai on the 2nd of April 1910.
protectorate and is part of the great plateau of North Africa. This plateau, broken only by the valleys of the rivers, does not attain an elevation approaching that of the plateau of the southern half of the continent, the culminating point (apart from particular mountain districts), situated in about 10° N., reaching a height of 3000 ft. only. The valleys of the Niger and Benue, especially the latter, are very much lower, the town of Yola on the Benue, some 400 m. inland, lying at an altitude of little over 600 ft. The surface is generally undulating, with isolated "table mountains" of granite and sandstone often rising abruptly from the plain. It is clothed largely with thin forest, but becomes more open to the north until, near the French frontier, the arid steppes bordering the Sahara are reached. Much of the country north of Zaria (11° N.) is covered with heavy loose sand. The most mountainous districts are northern Bauchi (a little north of 10°), where heights of 6000 to 7000 ft. occur; parts of Muri, along the north bank of the Benue; and the southern border of the Benue basin, where the hills (consisting of ironstone, quartz and granite) appear rich in minerals. The mountainous area covers some 50,000 sq. m. On the east, the plateau sinks to the plains of Bornu (q.v.), which extend to Lake Chad. Tributaries of the Niger traverse the western portion of the country, the most noteworthy being the Gulbin Kebbi or Sokoto river and the Kaduna, which flows through a valley not more than 500 ft. above the sea. The north-eastern part of the country drains to Lake Chad by the Waube or Yo, an intermittent stream, which in its lower course forms the Anglo-French boundary. The western portion of Lake Chad (q.v.) belongs to the protectorate, which contains no other large lake. The water parting between the Chad and Niger systems runs N.W. and S.E. from about Katsina in 13° N. to the Bauchi hills. Of the tributaries of the Benue the most important is the Gongola. During the dry season most of the small rivers cease running and the water in the larger streams is low. The great rise of the Niger within the protectorate takes place in August and September and there is a second rise about the beginning of the year.

Geology.—The fundamental formation consists of crystalline rocks. From the edge of the coast belt to near the confluence of the Benue and Niger they are overlain by unfossiliferous sandstones, lying undisturbed and possibly of the age of the sandstones of the Congo basin. Limestones, with fossils indicating a Tertiary age, have been found near Sokoto. Superficial deposits occur on the coast belt. Recent alluvium and a thick deposit of black earth border the upper reaches of the Benue and cover wide areas around Lake Chad.

Climate.—The country lies wholly within the tropics. The climate of the coast-lands is moist and hot, and extremely unhealthy, malarial fever being prevalent and deadly. The annual rainfall in the delta regions varies between 100 and 140 or more inches; the mean temperature is over 80° F. The heat does not vary greatly, rarely
sinking below 70°, and not often exceeding 100° in the shade. The direction of the prevailing wind is S.W. Though unfavourable for the permanent residence of white men, the interior is much less deadly than the coast-lands. The northern part is a land of tornadoes. At the beginning of the rainy season, the desert winds often drive clouds of red dust. At this period the nights are cold, and in the northern January and February are cold even in the day-time, while frosts are experienced in the neighbourhood of Lake Chad. The temperature in the southern parts, though subject to the same changes as along the coast, but the range is far greater, varying from a shade minimum of 99° to a shade maximum of 107°. The rainfall is much scantier on the shores of Lake Chad, averaging only 9 inches a year. In Nigeria about 50 in. a year. There is evidence of the increasing desiccation of the whole country north of the forest belt. This desiccation is partly attributable to the unrestricted felling of wood practised for many years. Along the northern border of the protectorate this has resulted in the encroachment of the Saharan desert over once fertile districts.

The natives of the northern regions do not suffer to any extent from fever unless they move to a part of the country some distance from their home. Leprosy is common, especially in the inland towns; while ophthalmitis is prevalent in the north, especially among the poor and negroes. At times the natives expose themselves to the blinding dust from the deserts and the excessive glare of the sun reflected from the burning sand.

Fauna and Flora.—The animals of Nigeria include the hyæna, antelope of the West-African species, masai, all living in the forest, gazelle and smaller game. Monkeys are numerous in the forests, and snakes are common. The camel is found in the northern parts of the country. The common animals of the savannah are the hippopotamus and crocodile. The manatus is also found. The birds include the ostrich, marabout, vultures, kites, hawks, ground horn-bill, great bustard, guinea fowl, partridge, lesser bustard, quail, snipe, duck, widgeon, teal, geese of various kinds, partridges, doves, blue, bronze and green pigeons, and many others. Domestic animals include the horse and donkey in the plateaux, but baggage animals are rare in the coast-lands, where the tecta fly is found. Mosquitoes are also abundant throughout the country. Herds of cattle and flocks of sheep and goats are numerous throughout the country.

The mangrove is the characteristic tree of the swamps. North of the swamps the oil palm (Elaeist guineensis) florishes abundantly. It is common as far as about 7° N. Rubber vines, mahogany, ebony and many valuable timber trees are found in the forest zone. Other trees, found chiefly on the plateaux, are the baobab, the shea-butter tree, clove, jatropha, palm, including the date and dum palm (Hyphaene), the tamarind, and, in the arid regions, the acacia and mimosa.

Inhabitants.—The population of Nigeria is estimated at 15,000,000. The Europeans (mostly British) number about a thousand, and are civil servants, soldiers, traders or missionaries. In the delta district and the forest zone the inhabitants are typical negroes. Besides the people of Benin, the coast tribes include the Jekri, living on the lower part of the Benin river and akin to the Yoruba, the Ijos, living in the delta east of the main mouth of the Niger, and the Iboos, occupying a wide tract of country just above the delta and extending for 100 m. east from the Niger to the Cross river. South of the Iboos live the Aros, a tribe of relatively great intelligence, who dominated many of the surrounding tribes and possessed an oracle or ju-ju of reputed great power. On the middle Cross river live the Akuna-kunas, an agricultural race, and in the Calabar region are the Efiks, Ibibios and Kwas. All these tribes are fetish worshippers, though Christian and Moslem missionaries have made numerous converts. The Efiks, a coast tribe which has come much into contact with white men, have adopted several European customs, and educated Efiks are employed in government service. The great secret society called Egbo (q.v.) is an Efik institution. Each tribe has a different ju-ju, and each speaks a separate language or dialect, the most widely diffused tongues being the Ibo and Efik, which have been reduced to writing. In general little clothing is worn, but none of the tribes go absolutely nude. In colour the majority are dark chocolate, others are coal-black (a tint much admired by the natives themselves) or dark yellow-brown. Cannibalism, human sacrifices and other revolting practices common to the tribes, are being gradually stamped out under British control.

Trial by ordeal and domestic slavery are still among the recognized institutions.

In the northern parts of Nigeria the inhabitants are of more mixed blood, the negro substratum having been to a great extent driven out by the northern races of the continent. The most important race in Northern Nigeria is that of the Hausa (q.v.), among whom the superior classes adopted Mahommedanism in the 14th and 15th centuries. While the lower classes remained pagan, a fairly civilized system of administration, with an efficient judicial and fiscal organization, was established in the Hausa territories. The Hausa are keen traders and make excellent soldiers.

At the beginning of the 19th century the Hausa territories were conquered by another dominant Mahomedan race, the Fulas (q.v.), who founded the province of Bauchi as many as sixty native languages are spoken.

In Bornu (q.v.) the population consists of (1) Berberi or Kanuri, the ruling race, containing a mixture of Berber and negro blood, with many less indigenous tribes; (2) so-called Arabs, and (3) Fula. The country to the back of Lagos is largely inhabited by Yorubas (q.v.), and the people of Borgu according to some native traditions claim to have had a Coptic origin.

Towns.—A large proportion of the population dwells in towns. The towns are capitals of the district, with a population of about 50,000; Calabar (q.v.), pop. about 15,000, known as Old Calabar and Duke Town, on the Calabar river; Opobo, on the Opobo river; and Brass Town, in the vicinity of the same river; Brass Town contains a fine church, the gift of a native chief. The places are east of the Nun or main mouth of the Niger, where, on the western bank, is Akassa. Here are important engineering works and a slip for repairing ships. Further west at the Forcados mouth of the Niger is a town of the same name, which is the principal port for entry of the river. Benin (q.v.), about 60 m. inland from the mouth of the Benin river, and Benin, about 50 m. N.W. of Calabar, were noted ju-ju towns and have large populations. Warri and Sapele are towns in the Benin district. Owo, some 50 m. N. of Benin city, is an important trade centre for the Yoruba country, in which are the large cities of Aseokuta, Ibadan and Ilorin, all separately noticed. On the Niger at the head of the delta are Asaba (west bank) and Onitsha (east bank); Iddah (Ida), in the palm-oil zone; Lokoja on the west bank opposite the confluence with the Benue, and the headquarters of the protectorate's military force; Baro, on the east bank, 70 m. above Lokoja, the river terminus of the Northern Nigeria railway; Egba, Mureji (at the Kaduna confluence), Jebba and Bussa (q.v.). The administrative headquarters of Northern Nigeria are at Zungeru, on the Kaduna river, in 6° N. 40° E., 9° 48' 32" N.

Apart from the sea and river ports and the towns in Yorubaland, there are two chief centres of trade in the interior of the Niger. They are the capitals of various states founded by the Hausa. Of these cities the most important is Kano (q.v.), the great emporium of trade for the central Sudan, where Taurag and Arab from the south and the Niger merchant meet from the Niger. Lake Chad and the far southern regions. It is situated in 12° N. and 8° 32' E. Some 220 m. W.N.W. of Kano is Sokoto, on a tributary of the Niger of the same name. On a hill near the religious and political centre of the Fulas, some importance among the Hausa towns are Bauchi (or Yakoba), pop. over 50,000, 140 m. S.E. of Kano; Zaria (q.v.), pop.
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about 60,000, 82 m. S.S.W. of Kano; Katsena (g.g.), 84 m. N.W. of Kano; Hadeija, near the N. end of the Kano-N. track, 25 m. N.W. of Egga on the Niger; and Yola (g.g.) on the Benue near the German frontier. Jegga, 85 m. S.W. of Sokoto, is an important entrepôt for trade from the hinterland of the country. In the various parts of the country, the most important rivers are the Benue and the Niger. The chief towns on the Benue are Kuka (g.g.) on Lake Chad, and Maidugari, some 70 m. S.W. of that lake. Most of these towns are capitals of provinces and residences of native princes subordinate to the British administration. There is no more picturesque sight than the Benue steamer passing by the town.

In addition to the towns mentioned there are many others containing populations of from 10,000 to 20,000, the bulk of the inhabitants of the Hausa countries being town dwellers.

Steamers and small launches on the Benue and the Niger are the chief means of communication, but, in consequence of the lowness of the water between October and May, navigation is then only possible for shallow draught stern-wheel steamers and launches. From the Forcados mouth of the Niger steamers ascend the main stream as far as Jebba, a distance of 530 m. and, at some risk, to Fort Goldie, 30 m. farther up at the foot of the Busa rapids. Steamers can also ascend the Benue to Barijuko, 380 m., above the confluenče of that river, and the Niger at Lokokja. It is also possible by this route to proceed by small boat via the Shari system to Lake Chad. The Kaduna from its confluence with the Niger can be ascended by steamer 50 m. to Baro, 30 m. to Zaria, 60, 000, and 120 m. to Baroqoto. Steamers can also be worked up the Benue and the Niger so as to reach Lokoja, 20,000, on the river by river steamers. The Niger is navigable up to Baro- Jega and Zaria to Kano—a distance of about 400 m.

Good roads connect some of the great Hausa cities, and Kano and Kuka are starting points for caravans across the Sahara to the Mediterranean. There are also old established caravan routes from Kano to Ashanti and neighbouring countries.

Regular communication is maintained with Europe by steamers running between Liverpool and Forcados, Bonny and Calabar, the steamers calling at other West African ports en route. The time occupied between Liverpool and Forcados is about seventeen days.

Other steamers ply between the ports named (and others in the protectorate) by telegraph. A good line of communication between Brass and Bonny and Europe by submarine cable, and land lines from Calabar to Lagos and from Lagos to Koko, Lokoja, and Kano are being also effected with the telegraph system of French West Africa.

Agriculture.—The natives of the coast region cultivate yams and other food plants, but in that district agriculture properly scarcely exists, the fruit of the oil-palm being an easy means of obtaining almost everything that the natives require. In the plains of the north, inhabited by Hausa and by agricultural pegan tribes, and in the fertile river valleys, agriculture is regularly carried on. Rice and wheat are cultivated in many parts, though the staple food is guineagum. Sweet potatoes, ground nuts, yams, onions and other vegetables are largely grown. Of fruits, dates, pomegranates, citrons and bananas abound in certain areas. The shea-butter tree supplies an excellent oil for lamps, and also for cooking, though it is only used by the poorer classes. The most important vegetable products are cotton and indigo, which are universally grown. Tobacco and kola nuts are also cultivated in many districts.

Mineral Products.—Tim ore of excellent quality is found in the province of Bauchi, alkali salts are abundant in Kano province; iron pyrites and yellow ocheres are found in Kontogara and other provinces, kaolin is found in the south-central regions. Silver and lead have been found in the Benue area.

Trade.—Throughout Nigeria local trade is active and has shown rapid development. The growth of the trade has been fostered by the improvement of communications which is taking place. Export trade in the delta and forest regions is almost entirely confined to the jungle produce, the most important articles being palm kernels and palm oil. The introduction of rice and gum copal, come next in importance. Cotton is also grown for export. The quantity of palm oil exported annually exceeds 12, 000 tons, valued at £60,000; cotton about 60,000, valued at £60,000. Of palm kernels 50,000 to 70,000 tons are shipped yearly, with an average value of £1,000,000. The value of the rice export is £100,000. The gold trade (import and exports) of Southern Nigeria (exclusive of Lagos) increased from £1,656,000 in 1894-1895 to £3,454,000 in 1905. In 1906 the total trade, inclusive of Lagos, was valued at £6,299,000—imports £2,985,000 and exports £3,314,000.

In Northern Nigeria up to the moment of the British occupation, the foreign trade was chiefly in the hands of Tripoli Arabs whose chief article of export is turmeric, and who sold this raw drug to the markets of Kuka and Kano tea, sugar and other European goods, taking away the skins and feathers which constituted the principal articles of export to the Mediterranean coast. There was one important trade in the south—indigo, whose value in 1898 was £4,000, and a large trade in the great indusius Hausa population carried for great distances through the western and central states of the Sudan. The principal articles of this trade are salt, kola nuts, ivory, leather, sodium carbonates and spices. The centre of the cloth manufacture is Kano. The cloth is made of the cotton grown in the country, woven on small hand-looms and dyed either with indigo or with a magenta dye obtained from the bark of a tree. If the Hausa history, which exists in written form, be correct, the manufacture of this cloth has been carried on in Kano since the 9th century. Kano and the district around it clothes half the population of the Sudan. The kola nut, chewed by the natives, is exchanged for medicinal drugs, and the Cotonou, Niger traders from Ashanti, Accra and Yorubaland frequenting the markets of Jegga. Salt and "potation" are imported from Absen and Kano, and ivory, ostrich feathers and leather goods are exported to Tripoli in exchange for the cotton and rice on which the white world is almost entirely dependent. The commerce of Kano comes hither from the forest regions, and are of the same class as the forest products of the south. Rubber constitutes at present the most important export. The cultivation of cotton is however indigenous to the country. Inquiries made under the auspices of the British Cotton Growing Association have led to the conclusion that Northern Nigeria offers the most promising field contained within the empire for the growth of cotton required to render Lancashire looms independent of foreign supplies. Steps have been taken to stimulate the native industry, and it is hoped that cotton may take the place in Northern Nigeria which palm oil and kernels occupy in the coast zone. Any great expansion in the cotton trade is however dependent on the development of cheap and efficient means of transport—hence the importance, commercially, of the Baro-Kano railway, with its base on the navigable Niger. With the increase of transport facilities it is probable that the trade with the Mediterranean coasts will also be diverted to the south, and profitable minor branches of trade would be formed in leather, ostrich feathers, gums, fibres, &c. The importia from Great Britain, which come via Forcados, are mostly cotton goods, provisions and hardware. The importation of spirits is prohibited north of 7° N.

History.

Of the early history of the races inhabiting the coast lands little is known. The Beni appear to have been the most powerful race at the time of the discovery of the coast by the Portuguese in the 15th century, and the kings of Benin in the 17th century ruled a large part of the south-western portion of the existing British protectorate (see BENIN). The Benin influence does appear to have extended much further than the boundaries of Nigeria. In the greater part of the delta region each town owned a different chief and there was no one dominant tribe. Among these people, who occupied a low position even among the degenerate coast negroes, and who were constantly raided by the more virile tribes of the interior, trading stations were established by the Portuguese, and later on by other Europeans, British traders appearing as early as the 17th century. There was no assertion of political rights by the white men, who were largely at the mercy of the natives, and who rarely ventured far from Lokoja or the "factories" established on the various rivers and estuaries.

By the end of the 18th century British enterprise had almost entirely displaced that of other nations on the Niger coast. But the principal trade of all Europeans was still in slaves.
After the abolition of the slave-trade in the 19th century palm oil formed the staple article of commerce, and the various streams which drain the Niger coast near the mouth of the great river became known as the "Oll Rivers." The opening up of the interior was in the meantime promoted, chiefly by the efforts of British travellers and merchants. Mungo Park traced the Niger from Segu to Bussa, where he lost his life in 1805. From Bussa to the sea the course of the river was first made known in 1830 by the brothers Richard and John Lander. Major Dixon Denham and Captain Hugh Clapperton entered the country now known as Northern Nigeria from the north in 1823, crossing the desert from Tripoli. Clapperton in 1826-1827 made a second journey, approaching the same territory from the Guinea coast. Dr. Barth, travelling under the auspices of the British government, entered the country from the north and made the journeys, lasting over two years between 1832 and 1855, of which he has left the record that still remains the principal standard work for the interior. Macgregor Laird first organized in 1832 the navigation of the river Niger from its mouth to a point above the Benue confluence. During the next twenty-five years expeditions were despatched into the interior, and a British consul was posted at Lokoja. Possession was also taken, in 1861, of Lagos island, with the object of checking the slave trade still being carried on in that region. But the deadly climate discouraged the first efforts of the British government, and, after the parliamentary committee of 1865 had recommended a policy which would render possible the ultimate establishment of British influence from the coast, the consulate of Lokoja was abandoned.

It was re-established a few years later to meet the still steadily growing requirements of British trade upon the river. In 1880 the influence of the international "scramble for Africa" made itself felt by the establishment under the recognized protection of the French government of two French firms which opened upwards of thirty trading stations on the Lower Niger. The establishment of these firms was admittedly a political move which coincided with the extension of French influence from Senegal into the interior. Nearly at the same time a young Englishman, George Goldie-Taupman, afterwards better known as Sir George Goldie (g.v.), having some private interests on the Niger, conceived the idea of amalgamating all local British interests and creating a British province on the Niger. To effect this end the United African Company was formed in 1879, and trade was pushed upon the river with an energy which convinced the French firms of the futility of their less united efforts. They yielded the field and allowed themselves to be bought out by the United African Company in 1884. At the Bedina Conference held in 1884-1885 the British government was able to state that Great Britain alone possessed trading interests on the Lower Niger, and in June 1885 a British protectorate was notified over the coast lands known as the Oll Rivers. Germany had in the meantime established itself in Cameroon, and the new British protectorate extended along the Gulf of Guinea from the British colony of Lagos on the west to the new German colony on the east, where the Rio del Rey marked the frontier. In the following year, 1886, the United African Company received a royal charter under the title of the Royal Niger Company. The territories which were placed by the charter under the control of the company were those immediately bordering the Lower Niger in its course from the confluence at Lokoja to the sea. On the coast they extended from the Forcados to the Nun mouth of the river. Beyond the confluence European trade had not at that time penetrated to the interior.

The interior was held by powerful Mahommedan rulers who had imposed a military domination upon the indigenous races and were not prepared to open their territories to European intercourse. To secure British political influence and to preserve a possible field for future development, the Niger Company had negotiated treaties with some of the most important of these rulers, and the nominal extension of the company's territories was carried over the whole sphere of influence thus secured. The movements of Germany from the south-east, and of France from the west and north, were thus held in check, and by securing international agreements the mutual limits of the three European powers concerned were definitely fixed. The principal treaties relating to the German frontiers were negotiated in 1886 and 1893; the Anglo-French treaties were more numerous, those of 1890 and 1898, which laid down the main lines of carved border between French and British possessions on the northern and western frontiers of Nigeria, having been supplemented by many lesser rectifications of frontier. (See AFRICA, § 5.) It was not until 1900 that the whole of the frontier between Nigeria and the French and German possessions had been definitely demarcated. Thus, mainly by the action of the Royal Niger Company, a territory of vast extent, into which the chartered company itself was not able to carry either administrative or trading operations, was secured for Great Britain. In 1897, at a time when disputes with France upon the western frontier had reached a very active stage, the company entered upon a campaign against the Mahommedan sovereign of Nupe. This campaign would, no doubt, have led to important results had the company retained its administrative powers. In the expedition a force of 500 Hausa, drilled and trained by the company, and led by thirty white officers—of whom some were lent for the occasion by the War Office—decisively defeated a force of some thousands of native troops, led by the emir of Nupe himself. The capital town of Bida was taken and the emir deposed. From Bida the expedition marched to Illorin, where again the whole district submitted to the authority of the company. In Illorin the campaign had some lasting effect. In Nupe, on the northern side of the river, the company was unable to occupy the territory conquered, things shortly reverted to their previous condition. When the company's troops were withdrawn the deposed emir returned and reoccupied the throne, leaving the situation to be dealt with after the territories of the company had been transferred to the crown.

The complications to which the pressure of foreign nations, and especially of France, on the frontiers of the territories gave rise, became at this period so acute that the resources of a private company were manifestly inadequate to meet the possible necessities of the position. Relations with France on the western border became so strained that in 1897 Mr Chamberlain, who was then secretary of state for the colonies, thought it necessary to raise a local force, afterwards known as the West African Frontier Force, for the special defence of the frontiers of the West African dependencies. In these circumstances it was judged advisable to place the territories of the Royal Niger Company, where, from Bida this expedition marched to Lokoja, where was proclaimed a protectorate under the name of Northern Nigeria.

The company, during its tenure of administrative power under the charter, had organized its territories south of the confluence into trading districts, over each of which there was placed a European agent. The executive powers in Africa were entrusted to an agent general with three provincial district superintendents. There was a small judicial staff directed by a resident judge, and there was a native constabulary of about 1000 men, trained and drilled by white officers. The company kept also upon the river a fleet of about
thirty steamers. The entire direction of the proceedings of the company was, however, in the hands of the council in London, and the administrative control of the territories was practically from first to last vested in the person of Sir George Goldie. The local work of the representatives of the company was mainly commercial. When, on the surrender of the charter, Sir George Goldie withdrew from the company, the administrative element disappeared. No administrative records were handed over, and very little machinery remained. Two enactments, however, bore testimony to the legislation of the company. One, which by force of circumstances remained inoperative, was the abolition of the legal status of slavery, proclaimed in the year of Queen Victoria's jubilee (1897). The other, more practical, which has remained in operation to the present day, confirmed and enforced by the succeeding administration, was the absolute prohibition of the trade in spirits beyond the parallel of 7° N.

While the development of the Royal Niger Company's territories was proceeding in the manner described, the regions under direct British control were also being opened up and new and order introduced. In 1893, when the Niger Oil Rivers Protectorate was changed to that of Niger Coast Protectorate, a regular administration was established (subject to the Foreign Office in London) under Sir Claude Macdonald, who was succeeded as commissioner and consul-general in 1896 by Sir Ralph Moor (1860-1900). Under these official peace was gradually established between various tribes, trade routes opened and progress made in civilization. The work was one of extreme difficulty, largely because there was no central native authority with which to deal. Small local factions had constantly to be employed to break up slave-raiding gangs and reduce to order tribes which blocked trade routes or made war on other tribes living peaceably under British protection. The most serious military operations were against the Beni, a peaceful mission to the king of Benin having been massacred in the bush in January 1897. The operations were completely successful and the Benin country was added to the protectorate (see BENIN). In 1900, as stated, the southern portion of the Niger Company's territories was added to the protectorate, the change in administration being effected without difficulty of any kind. Sir Ralph Moor continued in office to govern the country under the style of high commissioner. The efforts of the administration to better the condition of the natives without undue interference with customary law met with encouraging results, and the submission of the Aros to the government in 1902 brought to an end the system of tribal warfare for the purpose of making slaves, while the enforcement of a proclamation of 1901 prohibiting the buying, pawning or selling of slaves had a salutary effect. Trade steadily developed, and owing to the large sums paid as duty on imported spirits, the revenue of the protectorate was sufficient to cover the expenditure.

In Northern Nigeria in 1900 the establishment of British authority remained still to be effected. The man selected for the post of first high commissioner was Colonel—afterwards better known as Sir Frederick—Lugard, who had conducted one of the Royal Niger company's most successful expeditions into the western portion of the interior and had already been employed by the British government to raise and organize the West African Frontier Force. The transfer of influence from the company to the government was officially effected on the 1st of January 1900, on which day the Union Jack was hoisted at Lokoja, and the formation of a local administration was entered upon. The number of civilians in the employ of the government was very small, and the administrative machinery had to be evolved under the pressure of a somewhat acute military situation. The headquarters of the West African Frontier Force had been at Jebba, not far from the point at which Mungo Park had lost his life upon the river. Neither Jebba nor Lokoja was considered suitable for the permanent capital of the protectorate, and survey parties were sent out, with strict orders to avoid conflict with the nominally friendly natives, to find a more suitable site. This was selected on a bend of the Kaduna river in the south-western corner of the province of Zaria, at a place of which the native name of Zungeru was retained. The ruler of Zaria, while professing friendliness, was, however, unable or unwilling to restrain the rulers of Kontagora and Nupe from aggression. These two potentates raided for slaves to the borders of the rivers and openly threatened the British position on the Niger. The Ashanti War of 1900 claimed the dispatch of a strong detachment of the West African Frontier Force, and it was not until the return of the troops in 1901 that Nupe and Kontagora could be effectively dealt with. In that year both provinces were subdued, their emirs deposed, and letters of appointment given to new emirs, who undertook to rule in accordance with the requirements of humanity, to abolish slave-raiding and slave dealing, and to acknowledge the sovereignty of Great Britain. Illorin and Borgu with a portion of Kabba were already under British rule. The rulers of other neighbouring provinces offered their allegiance, and by the end of the year 1901 nine provinces, Illorin, Kabba, Ashanti, Lower Benue, Upper Benue, Nupe, Katsina, Borgu and Zaria had accepted the British occupation. These territories, with the exception of Zaria, were all in the more or less immediate neighbourhood of the valleys of the Niger and the Benue, and Zaria bordered upon the Kaduna. For all these territories an initial system of administration was organized, and British residents were appointed to each province. Seventeen legislative proclamations were enacted in the first year dealing with the immediate necessities of the position, and providing for the establishment of a supreme and provincial court, the administration of justice, the legalisation of all contracts of justice, and dealing with questions of slavery, importation of liquor and firearms, land titles, &c. In the autumn of 1901 the emir of Yola, the extreme eastern corner of the territories bordering upon the Benue, was, in consequence of the aggressions upon a trading station established by the Niger Company, dealt with in the same manner as the emirs of Nupe and Kontagora, and a new emir was appointed under British rule. In 1902 Bauchi and Bornu were brought under British rule. In Bauchi the emir was deposed and a new emir was appointed. In Bornu the extension of British authority was very willingly accepted as a guarantee of good treatment of the natives. The emir of Bornu was restored to the throne under British protection. Military stations were established in Bornu and in Bauchi, and both provinces were included in the system of British administration. Later in the same year an act of treachery culminating in the murder of a British resident, Captain Moloney, in the province of Nassarawa, led to the military subjugation of that province. The murderer fled northwards through Zaria to Kano, which was still an independent Mahommedan state. The emir of Zaria was found to be in treasonable correspondence with the emir of Kano. It was thought desirable to arrest and despatch him, and his prime minister was temporarily appointed to administer the province under British protection. To all these provinces British residents were appointed, and British legislative enactments became applicable to them all. By the end of the year 1902 British administration had been extended to the whole of the provinces in the south, east and west of the protectorate. The important Mahommedan states of Sokoto, Gando, Kano and Katsena remained independent. These states were regarded as the stronghold of Fulani supremacy. The emir of Sokoto held the position of religious as well as political head of all the lesser states of Northern Nigeria, and in response to friendly overtures on the part of the British administration had declared that between Sokoto and Great Britain there could be nothing but war. Katsena was the centre of local learning, while Kano was at once the commercial and the military centre of power. By the end of 1902 it had become evident that a trial of strength between the Mahommedan powers and the new British administration was inevitable. The Mahommedan rulers were themselves of comparatively recent date. In fighting them there was no question of fighting the whole country. On the contrary it was presumed with justice that their overthrow would be hailed
with satisfaction by many of the subject peoples. Every attempt was made to settle the question at issue by conciliatory methods, but these having failed, a campaign against Kano and Sokoto was entered upon in January 1903. It was entirely successful. The capital of Kano, a walled and fortified town of great extent and formidable strength, fell to a British expedition in February of 1903. Sokoto submitted after a battle which took place on the 17th of May. The sultan fled, and on the 21st of May a new sultan, chosen by the council of elders, was installed by the British high commissioner, after he had publicly accepted the conditions imposed by the British government. These conditions were that all rights of conquest acquired by the Fulani throughout Northern Nigeria passed to Great Britain, that for the future every sultan and emir and principal officer of state should be appointed by Great Britain, that the emirs and chiefs so appointed should obey the laws of the British government, that they should no longer buy and sell slaves, nor enslave people, that they should import no firearms, except flint-locks, that they should enforce no sentences in their courts of law which were contrary to humanity, and that the British government should in future hold rights in land and taxation. When these conditions were accepted by the Fulani chiefs the supremacy of Great Britain was established over the entire country. Katsena and Gando followed the example set to them by Kano and Sokoto. Sokoto, the capital of the emirates of Katsena and Pagan, now hold their appointments under the British crown and take the oath of allegiance to the British sovereign.

It remained to organize the territories for British rule, to institute a reformed system of taxation, to establish courts of justice, and to open the country to civilized occupation. The following account of the legislation carried into force up to 1907 shows in effect what was done in that direction. After the conquest of the Hausa States in 1900-1903 the king's writ ran—with the exception of a few districts inhabited by primitive savages—through the whole area known as Northern Nigeria. The lands of the inhabitants of the country were ceded by laws based upon a more accurate knowledge of local conditions and rendered possible by the effective administration which had been set up throughout the country.

Courts of Law and Administration of Justice.—A superior court was set up with jurisdiction over all non-natives and government employed. Its jurisdiction over natives was limited to the two centres of administration named "cannons," and to such neighbouring territories as might be included by regulation within a feasible distance of those centres. It could, however, try any case in any province by special warrant of the high commissioner. The whole country was divided into seventeen provinces, in each of which there was a provincial court presided over by the resident in charge, whose assistants were commissioners of the court. They submitted all cases coming before them of importance to the court for decision. The attorney-general, as a court of appeal, and no sentence exceeding six months could take effect without his confirmation. Cases decided by the commissioner were subject to the review of the court of king's bench, if he so decided. A criminal code was drawn up, together with a criminal procedure proclamation. Native courts were established by warrant at all the chief native towns with varying powers. They were of two classes, the "Alkalis' Court," presided over by trained Mahomedan jurists, and "Judicial Councils," under the leading chiefs and natives presided over by the emir or other native ruler. In these courts native law and customs (principally the Moslem law of feud and inheritance) were largely allowed. The laws of the country might declare a penalty to be enforceable which was contrary to the laws of humanity or opposed to any specific proclamation of the protectorate. With the exception of two or three of the most enlightened chiefs, the criminal powers of these courts were restricted, but in civil actions they had full scope. No native court could carry a sentence of death into execution without the concurrence of the resident. The criminal code also sanctioned the establishment of government courts (Zungeru and Lokoja), chiefly for the purpose of enforcing sanitary and municipal regulations. These were affiliated to the superior court.

Lands and Minerals.—These constitute the main asset of the government. In the first instance, as following upon conquest or potential conquest, the Fulani emirs who were appointed by government and were accorded great trust and power by letter of appointment in which (in addition to rights of legislation, taxation and other powers inherent in suzerainty) the ultimate title to all land was transferred from the Fulani dynasty and vested in the British. Private ownership was not interfered with, but all waste lands became the property of the crown, and no non-native could acquire title except as from government. Similarly the right of the crown to minerals (subject to the sharing of proceeds assigned to the Niger Company by the deed of transfer) was vested in the government, and the terms upon which licences to prospect or mine could be given were fixed by legislation. Land titles were also registered by law. The right of natives to smelt iron and the question of compensation for any other existing mining industry or for surface disturbance was left to the discretion of government.

In practice the maintenance of the legal status of slavery, in so far as all British courts were concerned. This decree had been promulgated before the transfer of the administration, but had existed merely on paper. Every slave could claim his freedom if his master had lived since April 1864; the descendants of slaves were made free by proclamation, and the institution of domestic slavery remained justiciable by the native courts; which in this matter were very carefully supervised by the British administration.

In the earlier years of the administration the tolls upon trade in transit, which had existed from time immemorial and had become the means of much extortion, were made a monopoly of the government, and were reorganized on an equitable and popular basis. To these were added certain licences (e.g. on canoes, &c.). In 1902 a complete reorganization of the direct taxation of the country was introduced. The innumerable taxes upon agriculture and industry of the most various kinds produced more or less directly the land and general tax—in its nature an income tax—and the jangali or cattle tax upon nomad herdsmen. The imposition of this tax involved a rough and ready assessment of every village in the country, and it was only when the system of local government practised under native rule gave place to a carefully regulated method of assessment. At its initiation the proceeds were divided into two parts: one absolutely exempt for the benefit of the native administration, and a means was thus found of creating a legitimate revenue for the native chiefs to supersede the proceeds of slave-raiding and slave-dealing, and of oppression and extortion, by which they had hitherto supplied their needs. As in India, the village with its lands and cultivation was constituted the unit of assessment, and the provinces were divided into districts under native headsmen responsible for the collection of the tax, and its transmission to the provincial government. They were advised by the attorney-general, as a court of appeal, and no sentence exceeding six months could take effect without his confirmation. Cases decided by the commissioner were subject to the review of the court of king's bench, if he so decided. A criminal code was drawn up, together with a criminal procedure proclamation. Native courts were established by warrant at all the chief native towns with varying powers. They were of two classes, the "Alkalis' Court," presided over by trained Mahomedan jurists, and "Judicial Councils," under the leading chiefs and natives presided over by the emir or other native ruler. In these courts native law and customs (principally the Moslem law of feud and inheritance) were largely allowed. The laws of the country might declare a penalty to be enforceable which was contrary to the laws of humanity or opposed to any specific proclamation of the protectorate. With the exception of two or three of the most enlightened chiefs, the criminal powers of these courts were restricted, but in civil actions they had full scope. No native court could carry a sentence of death into execution without the concurrence of the resident. The criminal code also sanctioned the establishment of government courts (Zungeru and Lokoja), chiefly for the purpose of enforcing sanitary and municipal regulations. These were affiliated to the superior court.

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Military and Police.—The defensive force—the Northern Nigeria Regiment of the West African Frontier Force—is constituted by law, and the proclamation contains a military code based on the Army Act with modifications necessary in local circumstances. The code provides also for the division of the state into military districts, each under the command of a major, the appointment of which is in the discretion of the high commissioner. The police, on the other hand, are more or less equally divided between the provinces (including the establishment at each cannon), and while their interior economy is under the control of the resident of the province, the police are supervised by the superintendent of police, appointed by the high commissioner. In 1907 there were 136 native constables, 125 European officers, 258 European constables, and 1,521 native constables. They are paid by the government and are subject to the control of the resident of the province. A district superintendent is appointed to each province.

Miscellaneous Enactments.—A variety of other enactments deals with matters of lesser importance of administration. Commodities of inquiry may be appointed by the high commissioner to investigate the conduct
of an individual or department and take evidence on oath. Discipline on board of steamers is prescribed by the Marine Discipline Act.

The preservation of wild animals and birds in accordance with international agreement is enforced by law. The importation of arms of precision is forbidden, except by permits in conformity with the Brussels Act, and in further application of that act certain weapons of war are prohibited or restricted, and the possession of arms remaining generally prohibited.

The cantonments are regulated by a municipal ordinance, establishing rates and laying down various regulations for order and sanitation. In order to prevent hydrophobia dogs may only be kept under certain restrictions. Patents, marriages (of non-natives), &c., &c., form the subject of other laws.

Administrative Divisions.—For administrative purposes the territories were at first divided into seventeen provinces: Sokoto, Lagos, Kano, Bornu, Eastern Nigeria, Western Nigeria, Borgu, Kontagora, Nasserawa, Muri, Yola, Bassa, Kabbia, Illorin, Nupe. Of these Sokoto and Gando, Kano and Katsena, Bornu East and Bornu West have been carried a step further in organization and now form three double provinces, each under the charge of a first-class resident. Illorin, Nupe and Kabbia have been formed into one province called the Niger province, and also placed under the charge of a first-class resident, and it is intended to continue this process so as to make finally eight first-class provinces of the whole territory. The first-class residents of the double provinces are assisted by about twelve residents and assistant residents of sub-province rank. In the amalgamated states of the Niger Province of administration remains intact, and is carried on under British supervision by native emirs and officials. In the pagan states there is no organized system of native administration, and the British residents are responsible for good government.

Amalgamation of Lagos and Southern Nigeria.—The political reasons which had resulted in the Nigerian territories being divided into three distinct administrations no longer existing, it was decided to unite them under one government, and as a first step in that direction Sir Walter (then Mr) Egerton was in 1904 appointed both governor of Lagos and high commissioner of Southern Nigeria. This was followed in February 1906 by the elevation of the four provinces under the banner of "the Colony and Protectorate of Southern Nigeria," with headquarters at Lagos town. The former colony and protectorate of Lagos (q.v.) became the western or Lagos province of the new administration.

In the year the amalgamation was effected the revenue reached a record figure, the amount collected being £1,088,000, to which Lagos province contributed £424,000. Over 80% of the revenue was derived from customs. In the same year the expenditure from revenue was £1,036,000.

Northern Nigeria Railway.—In Northern Nigeria, which continued for the time being an independent part of the lands of the Protectorate, Sir Percy Girouard ascended, at the beginning of 1907, succeeded as high commissioner by Sir Percy Girouard. In August of that year the British government, on administrative, strategic and commercial grounds, came to a decision to build a railway which should place the important cities of Zaria and Kano in direct communication with the perennially navigable waters of the Lower Niger. In view of the approaching unification of Southern and Northern Nigeria, the money needed, about £1,250,000, was raised as a loan by Southern Nigeria. The route chosen for the line was that advocated by Sir Frederick Lugard. This important work, essential for the welfare of the northern territories, was begun under the superintendence of Sir Percy Girouard,1 the builder of the Wadi Halfa-Khartum railway. At the same time the decision was taken to continue the Lagos railway till it effected a junction with the Kano line near Zungeru, the Niger being bridged at Jebba.

Land Tenure.—Sir Percy Girouard devoted much attention to land tenure, probably the most important of the questions concerning imperial policy in West Africa. He adopted the land policy of Sir F. D. Lugard, and recommended "a declaration in favour of the enforcement of the Primitive Right..." This was in accordance with native laws—that the land is the property of the people, held in trust for them by their chiefs, who have not the power of alienation. Thereafter the secretaries for the colonies appointed a strong committee, which, after hearing much evidence, issued a report in April 1910 in substantial agreement with the governor's recommendations. This policy was adopted by the Colonial Office. By this means the natives of Nigeria were secured in the possession of their land—the government imposing land taxes, which are the equivalent of rent. This exclusion of the European land speculator and denial of the right to buy and sell land and of freehold tenure was held by all the authorities to be essential for the moral and material welfare of the inhabitants of a land where the duty of the white man is mainly that of administration and his material advantages lie in trade. (See an article on "Land Tenure in West Africa" in The Times, May 24, 1910.)


Night, that part of the natural day of twenty-four hours during which the sun is below the horizon, the dark part of the day from sunset to sunrise (see DAY). The word in O. Eng. takes two forms, night and night, the latter form apparently being early Indo-European in origin, and the word night existing in various forms to Indo-European languages. The root is usually taken to be nakt-, to perish, the word meaning the time when the light fails (cf. Gr. νυκτ-, Lat. nux, death, noxere, to hurt). It was customary to reckon periods of time by nights, and we still use "fortnight" (O. Eng. fouertynyn niht, fourteen nights), but "se'n-night" (seven nights) has been displaced by "week" (q.v.).

NIGHTINGALE, FLORENCE (1820-1910), younger daughter of William Edward Nightingale of Embly Park, Hampshire, and Lea Hurst, Derbyshire, was born at Florence on the 13th of May 1820, and named after that city, but her childhood was spent in England, chiefly in Derbyshire. From her earliest years her strong love of nature and animals manifested itself. Her games, too, were characteristic, for her great delight was to nurse and bandage her dolls. Her first living patient was a shepherd's dog. From tending animals she passed to human beings, and wherever there was sorrow or suffering was she sure to be found. Her most ardent desire was to use her talents for the benefit of humanity. She had a natural shrinking from society; and though her social position necessitated her presentation at Court, her first care in town was spent in examining hospitals, reformatories and other charitable institutions. This was followed by a tour of inspection of foreign hospitals. At that time England was sadly behind-hand in matters of nursing and sanitation, and Miss Nightingale, who desired to obtain the best possible teaching for herself, went through a course of training in the Institute of Protestant Deaconesses at Kaiserswerth. She remained there six months, learning every detail of hospital management with a thoroughness rarely equalled. Miss Nightingale neglected nothing that could make her proficient in her self-chosen task. From Kaiserswerth she went to Paris, where she studied the system of nursing reform and management in the hospitals under the charge of the sisters of St. Vincent de Paul. After her return to England she devoted herself to reorganizing the Goernesses' Sanitarium in Harley Street (now the Home for Gentlewomen during Temporary Illness), which was at that time badly managed and in great need of funds. Miss Nightingale grudged neither time nor money to this work, and she had the satisfaction of placing it on a thoroughly satisfactory basis.

In the year 1854 England was stirred to its depths by the report of the sufferings of the sick and wounded in the Crimea. There was an utter absence of the commonest preparations to carry out the first and simplest demands in a place set apart
to receive the sick and wounded of a large army. - The condition of the large barracks-hospital at Scutari was deplorable. A royal commission of inquiry was appointed, a patriotic fund opened, and money flowed in fast. To Miss Nightingale this proved the trumpet-call of duty. She wrote to Sidney Herbert, secretary at war, and offered her services. Her letter crossed with one from him inviting her to proceed to the Crimea. She set out on the 24th October with a staff of thirty-seven nurses, partly volunteers, partly professionals trained in hospitals. They reached Scutari in the midst of November, in time to receive the Balaklava wounded. A death-rate of 10.5 per 10,000 was recorded. A story of 600 from Inkerman. The story of Miss Nightingale's labours at Scutari is one of the brightest pages in English annals. She gave herself, body and soul, to the work. She would stand for twenty hours at a stretch to see the wounded accommodated. She regularly took her place in the operation-room, to hearten the sufferers by her presence and sympathy, and at night she would make her solitary round of the wards, lamp in hand, stepping here and there to speak a kindly word to some patient. Soon she had 10,000 men under her charge, and the general superintendence of all the hospitals on the Bosphorus. Daily the effects of the measures adopted were seen in a lowered death-rate. In February 1855 it was as high as 45%, before many months it had sunk to 2. For a time Miss Nightingale was herself prostrated with fever, but she refused to leave her post, and remained at Scutari till Turkey was evacuated by the British in July 1856. The enthusiasm aroused in England by Miss Nightingale's labours was indescribable. A man-of-war was ordered to bring her home, and London prepared to give her a triumphal reception; but she returned quietly in a French ship, crossed to England, and escaped to her country home before the news of her return could leak out. The experiences of those terrible months permanently affected Miss Nightingale's health, but the quiet life she afterwards led was full of usefulness. With the £50,000 raised in recognition of her services she founded the Nightingale Home for training nurses at St Thomas's and King's College Hospitals. She also turned her attention to the question of army sanitary reform and army hospitals, and to the work of the Army Medical College at Chatham. In 1858 she published her Notes on Nursing, which gave an enormous stimulus to the study of this subject in England. According to Miss Nightingale murder was the least of the rigours of Army life. Insanitary and ill-planned the effects of trivially the effects of the measures adopted were seen in a lowered death-rate. In February 1855 it was as high as 45%, before many months it had sunk to 2. For a time Miss Nightingale was herself prostrated with fever, but she refused to leave her post, and remained at Scutari till Turkey was evacuated by the British in July 1856. The enthusiasm aroused in England by Miss Nightingale's labours was indescribable. A man-of-war was ordered to bring her home, and London prepared to give her a triumphal reception; but she returned quietly in a French ship, crossed to England, and escaped to her country home before the news of her return could leak out. The experiences of those terrible months permanently affected Miss Nightingale's health, but the quiet life she afterwards led was full of usefulness. With the £50,000 raised in recognition of her services she founded the Nightingale Home for training nurses at St Thomas's and King's College Hospitals. She also turned her attention to the question of army sanitary reform and army hospitals, and to the work of the Army Medical College at Chatham. In 1858 she published her Notes on Nursing, which gave an enormous stimulus to the study of this subject in England. According to Miss Nightingale murder was the least of the rigours of Army life. Insanitary and ill-planned the effects of trivially

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The range of the European nightingale, *Daulus lucetitia*, is peculiar. In Great Britain it is abundant in suitable localities to the south-east of a line stretching from the valley of the Exe, through Kent, to the Isle of Wight, and thence to the north of Ireland. Its presence in Wales is doubtful or intermittent, and it is extremely improbable that it has ever reached Scotland. On the continent of Europe it does not occur north of a line stretching irregularly from Copenhagen to the northern Urals, and it is absent in Brittany; over south Europe otherwise it is abundant. It reaches Persia, and is a winter visitor to Arabia, Nubia, Abyssinia, Algeria and as far south as the Gold Coast. The larger eastern *D. philomela*, sometimes called the threshold nightingale or Sprosser of German bird-catchers, is russet-brown in both sexes, and is a summer visitor to northern Europe. The tree nightingale, a true nightingale, is probably the Perse-Arabic bullfinch of poets.

The nightingale reaches its English home about the middle of April, the males (as is usual among migratory birds) arriving some days before the females. On the coasts being joined by their partners, the work for which the long and hazardous journey of both has been undertaken is speedily begun, and before long the nest is completed. This is of a rather uncommon kind, being placed on or near the ground, the outworks consisting chiefly of a great number of dead leaves ingeniously applied together so that the plane of each is mostly vertical. In the midst of the mass is wrought a deep cup-like hollow, neatly lined with fibrous roots, but the whole is so loosely constructed, and depends for lateral support so much on the stems of the plants, among which it is generally built, that a very slight touch disturbs its beautiful arrangement. Herein from four to six eggs of a deep olive colour are duly laid, and the young hatched. The nestling plumage of the nightingale differs much from that of the adult, the feathers above being tipped with a buff spot, just as in the young of the redbreast, hedge-sparrow and redstart, thereby showing the natural affinity of all these forms. Towards the end of summer the nestlings disperse, and take to the air, with a tinkling song.

The name nightingale has been vaguely applied to several other birds. The so-called "Virginian nightingale," is a species of grose-beak (g.v.); the "Pekin nightingale" or "Japanese nightingale" (Liothrix rufous) inhabiting the Himalayas and China, not Japan at all.

The nightingale holds a place in classical mythology. Proene and Philomela were the daughters of Pandion, king of Attica, who in a quarrel for war which she rendered him by Tereus, her hus-

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much smaller. The flower clusters spring from the stems at the side of, or opposite to, the insertion of a leaf. The corolla is rotate, of a lilac-blue colour with a green spot at the base of each segment, or sometimes white, and bears the yellow sessile anthers united at their margins so as to form a cone in the centre of the flower. The flowers are succeeded by ovate scarlet berries, ½ in. long, which in large doses appear to be poisonous or, to say the least, dangerous to children, cases of poisoning by them having occurred. Solanum dulcamara is subject to the same parasitic fungus (Phytophthora infestans) as the potato, and may serve as a medium for communicating the spores to the potato if not removed from the hedges of the fields where potatoes are grown. The plant derives its names of "bittersweet" and Dulcamara from the fact that its taste is at first bitter and then sweet. It is a native of Europe, North Africa and temperate Asia, and has been introduced into North America. The dried young branches are known in pharmacy under the name dulcamara.

Dulcamara contains a bitter principle yielding by decomposition a sugar dextrose and the alkaloid solanine. It also contains another glucoside dulcamarin, which when boiled with dilute acid splits up into sugar and dulcamaretin. Solanine appears to exert a depressant action on the vagus nerve and an excitant action on the medulla oblongata.

Solanum nigrum differs from S. Dulcamara in having white flowers in small umbels and globose black berries. It is a common weed in gardens and waste places, growing about 12 or 18 in. high, and has ovate, entire or subulate or toothed leaves. Two varieties of the plant, one with red and the other with yellow berries, are sometimes met with, but are comparatively rare. The berries have been known to produce poisonous effects when eaten by children, and owe their properties to the presence of solanine. In Réunion and Mauritius the leaves are eaten like spinach.

Deadly nightshade, dwale or belladonna (Atropa belladonna) is a tall bushy herb of the same natural order (fig. 2). It grows to a height of 4 or 5 ft., having leaves of a dull green colour, with a black shining berry fruit about the size of a cherry, and a large tapering root. The plant is a native of central and south Europe, extending into Asia, and is found in Spain, Italy, and England, chiefly on chalk and limestone, from Westmorland and southwards. The entire plant is highly poisonous, and accidents not infrequently occur through children and unwary persons eating the attractive-looking fruit. Its leaves and roots are largely used in medicine, on which account the plant is cultivated, chiefly in south Germany, Switzerland and France (see Belladonna).

The name nightshade is applied to plants of different genera in other countries. American nightshade is Physolacca decandra (pokeweed, &c.). The three-leaved nightshade is an American species of Trillium. The Malabar nightshade is Basella, which is widely used as a pot-herb in India. Enchanter's nightshade is Circaea lutetiana, a small, glandular, softly-haired plant, common in damp woods, with slender, erect or ascending stems, paired ovate leaves with long stalks, and small white flowers in terminal racemes, succeeded by a brown or black fruit, as with white nightshade, a natural order Ongraceae, and is not known to possess any poisonous property; the name seems to have been given to it in the first place in mistake for a species of Mandragora (see Mandragora).

NIGRA—NIHILISM

Fig. 1.—Bittersweet (Solanum Dulcamara). § nat. size. 1, Flower; 2, fruits, § nat. size; 3, berry, cut across, enlarged; 4, seed, much enlarged.

Fig. 2.—Deadly Nightshade (Atropa belladonna). Flowering branch, § nat. size. 1, Flower, after removal of the corolla, § nat. size; 2, corolla, with stamens, cut open and flattened, § nat. size; 3, cross section of ovary, much enlarged.

NIHILISM, the name commonly given to the Russian form of revolutionary Socialism, which had at first an academic character, and rapidly developed into an anarchist revolutionary movement. It originated in the early years of the reign of Alexander II., and the term was first used by Turgueniev in his celebrated novel, Fathers and Children, published in 1862. Among the students of the universities and the higher technical schools Turgueniev had noticed a new and strikingly original type—young men and women in slovenly attire, who called in question and ridiculed the generally received convictions and respectable conventionalities of social life, and who talked of reorganizing society on strictly scientific principles. They reversed the traditional order of things even in trivial matters of external appearance, the males allowing the hair to grow long and the female adeptes cutting it short, and adding sometimes the
NIHILISM

additional badge of blue spectacles. Their appearance, manners and conversation were apt to shock ordinary people, but to this they were profoundly indifferent, for they had raised themselves above the level of so-called public opinion, despised Philistine respectability, and rather liked to scandalize people still under the influence of what they considered antiquated prejudices. For aesthetic culture, sentimentalism and refinement of every kind they had a profound and undisguised contempt. Professing extreme utilitarianism and delighting in paradox, they were ready to declare that a shoemaker who distinguished himself in his craft was a greater man than a Shakespeare or a Goethe, because humanity had more need of shoes than of poetry.

Thanks to Turguiev, these young people came to be known in common parlance as "Nihilists," though they never ceased to protest against the term as a calumniuous nickname. According to their own account, they were simply earnest students who desired reasonable reforms, and the peculiarities in their appearance and manner arose simply from an excusable neglect of trifles in view of graver interests. In reality, for the name we may apply to them, they were the extreme representatives of a curious moral awakening and an important intellectual movement among the Russian educated classes (see ALEXANDER II., of Russia).

In material and moral progress Russia had remained behind the other European nations, and the educated classes felt, after the humiliations of the Crimean War, that the reactionary regime of the emperor Nicholas must be replaced by a series of drastic reforms. With the impulsiveness of youth and the recklessness of infancy, they went headlong in their revolutionary movement, their elders, and their reforming zeal naturally took an academic, pseudo-scientific form. Having learned the rudiments of positivism, they conceived the idea that Russia had outruled the religious and metaphysical stages of human development, and was ready to enter on the positivist stage. She ought, therefore, to throw aside all religious and metaphysical conceptions, and to regulate her intellectual, social and political life by the pure light of natural science. Among the antiquated institutions which had to be abolished as obstructions to real progress, were religion, family life, private property and centralized administration.

Religion was to be replaced by the exact sciences, family life by free love, private property by collectivism, and centralized administration by a federation of independent communes.

Such doctrines could not, of course, be preached openly under a paternal, despotic government, but the press censure had become so permeated with the prevailing spirit of enthusiastic liberalism, that they could be artfully disseminated under the disguise of literary criticism and fiction, and the public very soon learned the art of reading between the lines. The work which had perhaps the greatest influence in popularizing the doctrines was a novel entitled STIGMATA, and the author himself, Tchernishevi, was sentenced to imprisonment in Tchernishevi, one of the academic leaders of the movement, and published with the sanction of the authorities!

Since the time of Peter the Great, Russia had been subjected to a wonderful series of administrative and social transformations, and it seemed to many people quite natural that another great transformation might be effected with the consent and cooperation of the autocratic power. The doctrines spread, therefore, with marvellous rapidity. In the winter of 1861-1862 a high official wrote to a friend who had been absent from Russia for a few months: "If you returned now you would be astonished at the progress which the opposition—one might say, the revolutionary party—has made. . . . The revolutionary ideas have taken possession of all classes, all ages, all professions, and they are publicly expressed in the streets, in the barracks, and in the government offices. I believe the police itself is carried away by them." Certainly the government was under the influence of the prevailing enthusiasm for reform, for it liberated all the serfs, endowed them liberally with arable land, and made their democratic communal institutions independent of the landed proprietors; and it was preparing other important reforms in a similar spirit, including the extension of self-government in the rural districts and the towns, and the reorganization of the antiquated judicial system and procedure according to the modern principles adopted in western Europe.

The programme of the government was extensive enough and liberal enough to satisfy, for the moment at least, all reasonable reformers, but the well-intentioned, self-confident young people to whom the term Nihilists was applied were not reasonable. They wanted an immediate, thorough-going transformation of the existing order of things according to the most advanced socialistic principles, and in their youthful, reckless impatience they determined to undertake the work themselves, independently of and in opposition to the government. As they had no means of seizing the central power, they adopted the method of endeavouring to bring about the desired political, social and economic changes by converting the masses to their views.

They began, therefore, a propaganda among the working population of the towns and the rural population in the villages. The propagandists were recruited chiefly from the faculty of physical science in the universities, from the Technological Institute, and from the medical schools, and a female contingent was supplied by the midwifery classes of the Medico-Surgical Academy. Those of each locality were personally known to each other, but there was no attempt to establish among them hierarchical distinctions or discipline. Each individual had entire freedom as to the kind and means of propaganda to be employed. Some disguised themselves as artisans or ordinary labourers, and sought to convert their uneducated fellow-workmen in the industrial centres, whilst others settled in the country towns and villages, where there was less danger of detection among the recently emancipated peasantry by telling them that the tsar intended they should have all the land, and that his benevolent intentions had been frustrated by the selfish landed proprietors and the dishonest officials. Landlords and officials, it was suggested, should be got rid of, and then the peasants would have arable, pastoral and forest land in abundance, and would not require to pay any taxes. To persons of a certain education the agitators sought to prove that the general economic situation was desperate, that it was the duty of every conscientious citizen to help the people in such a dilemma, and that the first step towards the attainment of this devoutly to be wished consummation was the limitation or destruction of the uncontrolled supreme power. On the whole the agitators had very little success, and not a few of them fell into the hands of the police, several of them being denounced to the authorities by the persons in whose interest they professed to be acting; but the great majority were so obstinate and so ready to make any personal sacrifices, that the arrest and punishment of some of their number did not deter others from continuing the work. Between 1861 and 1864 there were less than twenty native Nihilists, and all the rest that most of the accused were condemned to imprisonment, or to compulsory residence in small provincial towns under police supervision.

The activity of the police naturally produced an ever-increasing hostility to the government, and in 1866 this feeling took a practical form in an attempt on the part of an obscure individual called Karakozov to assassinate the emperor. The attempt failed, and the judicial inquiry proved that it was the work of merely a few individuals, but it showed the dangerous character of the movement, and it induced the authorities to take more energetic measures. For the next four years there was an apparent lull, during which only one political trial took place, but it was subsequently proved that the Nihilists during this time were by no means inactive. An energetic agitator called Netchaiev organized in 1869 a secret association under the title of the Society for the Liberation of the People, and when he suspected of treachery one of the members he caused him to be assassinated. This crime led to the arrest of some members of the society, but their punishment had very little deterrent effect on the Nihilists in general, for during the next few years there was a recrudescence of the propaganda among the labouring classes. Secret circles were created and provided with secret printing-presses in many of the leading provincial towns, notably in Moscow,
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Nijni-Novgorod, Penza, Samara, Saratov, Kharkof, Kiev, Odessa, Rostov on the Don and Taganrog; and closer relations were established with the revolutionary Socialists in western Europe, especially with the followers of Bakunin, who considered that a great popular rising should be brought about in Russia as soon as possible. Bakunin's views did not, it is true, obtain unanimous acceptance. Some of the Nihilists maintained that things were not yet ripe for a rising of the masses, that the pacific propaganda must be continued for a considerable time, and that before attempting to overthrow the existing social organization some idea should be formed as to the order of things which should take its place. The majority, however, were too importunate and missed the last drop of blood and to the last breath. "In accordance with the fashionable doctrine of evolution, the reconstruction of society on the tabula rasa might be left, it was thought, to the spontaneous action of natural forces; or, to use a Baconian phrase, to natura naturans."

To this and similar declarations of irreconcilable hostility the government replied by numerous arrests, and in the winter of 1877-1878 no less than 197 agitators, selected from 2000 arrested on suspicion, were tried publicly in St Petersburg by a tribunal specially constituted for the purpose. Nearly all of them were condemned to imprisonment or exile, and the revolutionary organization in the north was paralysed, but a few energetic leaders who had escaped arrest reorganized their scattered forces and began the work anew. They constituted themselves into a secret executive committee, which endeavoured to keep in touch with, and partially direct, the independent groups in the provincial towns. Though they never succeeded in creating an efficient centralized administration, they contrived to give to the movement the appearance of united action by assuming the responsibility for terrorist crimes committed by persons who were in reality not acting under their influence. During these years, 1878, 1879, and 1880, these terrorist crimes were of frequent occurrence. General Trepopov, prefect of St Petersburg, was shot by Vera Zasulitch under pretence of presenting a petition to him; General Mezentsov, chief of the political police, was assassinated in broad daylight in one of the principal streets of St Petersburg, and an attempt was afterwards made on the life of his successor, General Drenten; Prince Krapotkin, governor of the province of Kharkof, was assassinated for having introduced stricter prison discipline with regard to political prisoners; a murderous attack was made on the emperor in front of the Winter Palace by an ex-student called Sokolov; repeated attacks were made by blowing up the train conveying the Imperial family from the Crimea to St Petersburg; and a dynamite explosion, by which ten people were killed and thirty-four wounded, took place in the Winter Palace, the Imperial family owing their escape to the accident of not sitting down to dinner punctually at the usual hour. Assassination was used also by the agitators against confederates suspected of giving information to the police, and a number of gendarmes were murdered when effecting arrests. Above all, the fear of these crimes a proclamation was issued by the executive committee, explaining the motives and accepting the responsibility.

When repressive measures and the efforts of the police were found insufficient to cope with the evil, Alexander II. determined to try a new system. Count Loris Melikof was entrusted with semi-dictatorial powers, relaxed the severity of the police régime, and endeavoured to obtain the support of all loyal Liberals by holding out the prospect of a series of reforms in a liberal sense. His conciliatory methods failed signaly, and were repaid by an attack on his life. A semblance of parliamentary institutions was not what the Anarchists wanted. They simply redoubled their activity, and hatched a plot for the assassination of the emperor. In March 1881 the plot was successful. Alexander II., when driving in St Petersburg, was mortally wounded by the explosion of small bombs, and died almost as soon as he had reached the Winter Palace. On the following day the executive committee issued a bombastic proclamation, in which it declared triumphantly that the tsar had been condemned to death by a secret tribunal on 26th August 1879, and that two years of effort and painful losses had at last been crowned with success. Though this put an end to the policy of killing Anarchists by kindness, and one of the first acts of the new reign was a manifesto in which Alexander III. announced very plainly that he had no intention of limiting the autocratic power, or making concessions of any kind to the revolutionary party. The subsequent history of the movement presents little that is interesting or original, merely a continual but gradually subsiding effort to provoke local disturbances with a view to bringing about sooner or later a general rising of the masses and the overthrow not only of the government, but also of the existing social and economic régime. A sort of revolution was under way; the young men, by the late years of the reign of Alexander II. had been largely shattered and dispossessed by experience. The revolutionary propaganda temporarily led to a serious situation in the early years of the reign of Tsar Nicholas II., but a new era opened for Russia with the inauguration of parliamentary government.

The following criminal statistics of the movement during six and a half years of its greatest activity (from 1st July 1881 to 30th June 1888) are taken from unpublished official records:

Number of affairs examined in the police department 1500
Number of persons punished 3046

These 3046 punishments may be divided into the following categories:

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>20</td>
</tr>
<tr>
<td>Penal servitude</td>
<td>128</td>
</tr>
<tr>
<td>Exile in Siberia</td>
<td>681</td>
</tr>
<tr>
<td>Exile under police supervision in European Russia</td>
<td>1500</td>
</tr>
<tr>
<td>Lesser punishments</td>
<td>717</td>
</tr>
</tbody>
</table>

From the beginning of the movement up to 1902 the number of Anarchists condemned to death and executed was forty-eight, and the number of persons assassinated by the Anarchists was thirty-nine. There is no reason to suspect the accuracy of these statistics, for they were not intended for publication. They are taken from a confidential memorandum presented to the Emperor.

(D. M. W.)

NIIGATA, the chief town of the province of Echigo, Japan, Pop. (1903) 58,821. It lies on the west coast of the island of Nippon, on a narrow strip of sandy ground between the left bank of the Shinano and the sea, which though close at hand is shut out from view by a low range of sandhills. It occupies an area of rather more than 1 sq. m., and consists of five long parallel streets intersected by cross-streets, which in most cases have canals running down the middle and communicating with the river, so that the internal traffic of the city is mainly carried on by water. The houses are usually built with gables to the street, and roofs and verandas project so as to keep the windows and footpaths from being blocked up by the heavy winter snows. Niigata was originally chosen as one of the five open ports—Nagasaki, Kobe, Yokohama, Niigata and Hakodate—but it failed, chiefly owing to a bar which prevents the entry of vessels
of any size. The town has been brought within the railway circuit, and the production of petroleum has been developed in the district. Ehisa, on the island of Sado, was opened as a supplementary harbour of refuge, but not as a trading port. There is a large manufacture of lacquer-ware in the town. The foreign trade is entirely in the hands of Japanese merchants. During winter Niigata suffers from a terribly severe climate; the summers, moreover, are excessively hot.

Nijar, a town of south-eastern Spain, in the province of Almeria; on the southern slope of the Sierra Alhamilla, and on the river Aratil, which flows into the Mediterranean Sea 60 m. S.W. Po! (1892). 94, 342. Dispite its isolated location and lack of communication, Nijar is a place of some commercial importance. Lead, iron and manganese are mined in the neighbouring mountains; the fertile plain watered by the Aratil yields an abundance of wheat, fruit, olives and esparto grass; and fine porcelain and woollen and cotton goods are manufactured in the town.

Nijmegen, Nimjogen, Nyjegen or Nimwegen, a town in the province of Gelderland, Holland, on the left bank of the Waal, 243 m. by rail E. by S. of Tiel. It has regular steamboat communication with 15 different harbours, and steamers connect it with the North Sea. Pop. (1904) 49,342. Nijmegen is very prettily situated on the slopes of five low hills rising from the river-side. It stands up with a boldness quite unusual in a Dutch town, and steps are even necessary to lead to the higher portions of the town. In 1877–1884 the old town walls were demolished, a promenade and gardens taking their place, and since then a new quarter has grown up on the south side with a fine open space called the Emperor Charles’s Plain. On the east of the town is the beautiful park called the Valkhof, which marks the site of the old palace of the Carolingian emperors. The palace was still inhabitable in 1787, but was ruined by the French bombardment of 1794, and only two portions of it remain. These are a part of the choir of the 12th-century palace-church, and a sixteen-sided baptistry originally consecrated by Pope Leo III. in 759 and rebuilt in the 12th or 13th century. Close by is the lofty tower of the Belvedere, dating from 1460. The Groote Kerk of St Stephen forms with its tall square tower one of the most striking features in the general views of the town. Originally built about 1273, it dates in its present condition mainly from the 16th and 17th centuries. In the choir is the fine monument of Catherine of Bourbon (d. 1499), wife of Adolphus of Egmont, duke of Gelderland, with a brass of the duchess, and the heraldic achievements of the house of Bourbon. There is also a fine organ. The interesting Renaissance town-hall was built in 1534 (restored in 1879). It is adorned with the effigies of kings and emperors who were once benefactors of Nijmegen. Inside are to be found some fine wood-carving, tapestries, pictures and a curious safe in which the town charters were so jealously preserved that the garrison used to be called out and the city gates closed whenever they were consulted. There is also an interesting museum of antiquities. Other buildings of note are the theatre (1830), the Protestant hospital, the Roman Catholic or Canisius hospital (1866), and the old weigh-house and Flesher’s Hall, probably built in 1612 and restored in 1885. Between 1656 and 1678 Nijmegen was the seat of a university. Beer, Prussian blue, leather, tin, pottery, cigars, and gold and silver work are the chief industrial products, and there is a considerable trade by rail and river.

Nikāya ("collection"), the name of a division of the Buddhist canonical books. There are four principal Nikāyās, making together the Sutta Pātakā ("Basket of Discourses"), the second of the three baskets into which the canon is divided. The fifth or miscellaneous Nikāya is by some authorities added to this Pātakā, by others to the next. The first two Nikāyās, called respectively Dīgha and Majjhima (Longer and Shorter), form one book, a collection of the dialogues of the Buddha, the longer ones being included in the former, the shorter ones in the latter. The third, called the Anguttara (Progressive Addition), rearranges the doctrinal matter contained in the Dialogues in groups of ethical concepts, beginning with the units, then giving the pairs, then the groups of three, four, five, etc., up to ten. In the Dialogues the arrangement in such numbered groups is frequent. In an age when books, in our modern sense, were unknown, it was a practical necessity to invent and use aids to memory. Such were the repetition of memorial tags, of cues (as now used for a precisely similar purpose on the stage), to suggest what is to come. Such were also these numbered lists of technical ethical terms. Religious teachers in the West had similar groups—the seven deadly sins, the ten commandments, the four cardinal virtues, the seven Sacraments, and many others. These are only now, since the gradual increase of books, falling out of use. In the Buddhist canon it was found convenient by the early Buddhists to classify almost the whole of their psychology and ethics in this manner. And the Anguttara Nikāya is based on that classification. In the last Nikāya, the Samyutta (The Clusters), the same doctrines are arranged in a different set of groups, according to subject. All the Logia (usually of the master himself, but also of his principal disciples) on any one point, or in a few cases as addressed to one set of people, are here brought together. That was, of course, a very convenient arrangement then. It saved a teacher or scholar who wanted to familiarize himself with one subject from the trouble of repeating over, or getting some one else to repeat over for him, the whole of the Dialogues or the Anguttara. To us, now, the Samyutta seems full of repetitions; and we are apt to forget that they are there for a very good reason.

During the time when the canon was being completed there was great activity in learning, repeating to oneself, rehearsing in company and discussing these three collections. But there was also considerable activity in a more literary direction. Hymns were sung; lyrics were composed, tales were told, the results of some exciting and interesting talk were preserved in summaries of exegetical exposition. A number of these have been fortunately preserved for us in twenty-two collections, mostly of very short pieces, in the fifth or miscellaneous Nikāya, the Khuddaka Nikāya.

The text of the Dialogues fills about 2000 pages 8vo in the edition prepared for the Pali Text Society, of which five volumes out of six had been published in 1909, and the first had been translated into English. The Samyutta, of about the same size, and the Anguttara, which is a little smaller, have both been edited. Of the twenty-two miscellaneous books twenty have been edited (see Rhys Davids, American Lectures (1896), pp. 66-70); five have been translated into English, and two more into German.


NIKE, in Greek mythology, the goddess of victory (G. victor). She does not appear personified in Homer; in Hesiod (Theog. 384) she is the daughter of the giant Pallas and Styx, and is sent to fight on the side of Zeus against the Titans. Nike does not appear to have been the object of a separate cult at Athens. She was at first inseparably connected and confounded with Pallas Athena, the dispenser of victory, but gradually separated from her. As an attribute of both Athena and Zeus she is represented as a small figure carried by those divinities in their hand. Athena Nike was always wingless, Nike as a separate goddess winged. In works of art she appears carrying a palm branch or a wreath (sometimes a Hermes staff as the messenger of victory); erecting a trophy or recording a victory on a shield; hovering with outspread wings over the victor in a competition, since her functions referred not only to success in war, but to all other human undertakings. In fact, Nike gradually came to be recognized as a sort of mediator of success between gods and men.

At Rome the goddess of victory (Victoria) was worshipped from the earliest times. Evander was said to have erected a temple in her honour on the Palatine before the foundation of Rome itself (Dion. Halic. i. 32, 33). With the introduction of the Greek gods, Victoria became merged in Nike. She always had a
firm hold over the Roman mind, and her popularity lasted till the end of paganism. Special games were held in her honour in the circus, and generals erected statues of her after a successful campaign. She came to be regarded as the protecting goddess of the senate, and her statue (originally brought from Tarentum and set up by Augustus in memory of the battle of Actium) in the Curia Julia (Dio Cassius II, 22; Suetonius, Aug. 100) was the cause of the final combat between Christianity and paganism towards the end of the 4th century. Victoria had altars in camp, a special set of worshippers and colleges, a festival on the 1st of November, temples at Rome and throughout the empire. The Sabine goddess Vicuna and Vica Pota, one of the divi indigetes (see divi indigetes), were in time merged with various figures on the victoria (Livy xxxix. 14). Representations of Nike—Victoria in Greek and Graeco-Roman art are very numerous. The statue of Nike at Olympia by Paeonius has been in great part recovered.

See A. Baudrillard, Les Divinités de la victoire en Grèce et en Italie (1894), whose view that in the 5th century Nike became detached from Athena, although Athena Nike still continued to exist, is supported by Miss J. E. Harrison (Classical Review, April 1895) and L. R. Farnell (Cults of the Greek States I, 1896), but opposed by E. Sikes (C.R., June 1895), who holds that "while Nike was a late copy of Athena, there is no evidence that the victory cannot have originated, either at Athens or elsewhere, from an aspect of Athena"; F. Studzicka, Die Siegestoyl (Leipzig, 1890); and the Fränkische Museum zu Nürnberg (Bilder über das Cultusbild der Athena Nike (Vieja, 1879); G. Boissier, La fin du paganisme (1891); Gibbon, Decline and Fall, ch. 28.

In the article Greek Art, fig. 32 represents Nike pouring water over a sacrificial ox; fig. 36 the floating Nike of Paeonius; figs. 61, 62 (Pl. iii.), the winged Nike of Samothrace; the running or flying figure (fig. 19) is also possibly a Nike.

NIKISCH, ARTHUR (1855—), Hungarian conductor, became known as a musical prodigy at an early age, making a public performance as a pianist at eight years old. He studied at the Vienna Conservatoire from 1866 to 1873, and while there he composed a symphony and other works. For a while engaged as a violinst, but in 1877 he began as assistant conductor at the Leipzig opera and two years later became chief conductor. His success there, and his reputation as the producer of the more modern types of music as well as of classical masterpieces led to his being appointed conductor of the symphony orchestra at Boston, U.S.A., from 1880 to 1893; and subsequently, after having been director at the Budapest opera, he was made conductor at the Leipzig Gewandhaus. His fame was now widespread, and he made successful visits to London, Paris and other capitals, his ability as a pianoforte accompanist being recognized no less marked than his brilliance as director of an orchestra.

NIKITIN, ATHANASIUS, of Tver (fl. 1468-1474), Russian merchant, traveller and writer, the earliest known Russian visitor to India. He started in 1468 on his "wanderings beyond the Three Seas" (Caspian, Euxine and Indian Ocean), and descended the Volga, passing by Uglich, Kostroma, Nizhny Novgorod, Kazan, Sarai and Astrakhan. Near the latter he was attacked and robbed by Tartars; but he succeeded in reaching Derbent, where he joined Vasili Tapin, the envoy of Ivan III. of Moscow to the shah of Shirvan; from Nizhny Novgorod he had travelled with Hasan Bey, the Shirvan shah's ambassador, returning to his master with a present of falcons from Ivan. At Derbent Nikitin vainly endeavoured to get means of returning to Russia; failing in this, he went on to Batu, where he notices the "eternal fires," and thence over the Caspian to Bokhara. Here he stayed six months, after which he made his way southward, with several prolonged stoppages, to the Persian Gulf, through Mazanderan province and the towns of Amul, Demavend, Ray (near Tehran), Kazan, Nain, Yazd, Sirjan, Tarun, Lar and Bandar, opposite New (equator) to Persia. From here he travelled by sea to Gujarat, Cambay and Chaul in western India. Landing at Chaul, he seems to have travelled to Ummr in Aurangabad province, south-east of Surat, and thence to Beder, the modern Ahmedabad. Here, and in adjacent regions, Nikitin spent nearly four years; from the little he tells us, he appears to have made his living by horse-dealing. From Beder he visited the Hindu sanctuary ("their Jerusalem") of Perwattam. He returned to Russia by way of Calicut, Dabul, Muscat, Hormuz, Lar, Shiraz, Yazd, Isfahan, Kashan, Sultanabad, Tabriz, Trebizond and Kaffa (Theodosia), in the autumn. He has left us descriptions of western Indian manners, customs, religion, court-ceremonies, festivals, warfare and trade, of some value; but the text is corrupt, and the narrative at its best is confused and meagre. His remarks on the trade of Hormuz, Cambay, Dabul, Ceylon, Pegu and China; on royal progresses and other functions, both ecclesiastical and civil, at Beder; and on the wonders of the great fair at Perwattam—as well as his comparisons of things Russian and Indian—deserve special notice.

Two MSS. are known: (1) in the library of the cathedral of St. Cyril at Moscow; (2) in the library of the Tent of the Tendai Monastery (Treato-Sergievskaya Lavra) near Moscow. See also the edition by Pavel Mikhailovich Stroev in Sofiiskii Vremennik (A. 862-1534), pt. ii. pp. 145-154 (Moscow, 1820-1821); and the English version in India in the 15th Century, pp. xxxiv.-lxxv.: 1-32 (separately paginated). Nikitin's being the third narrative in the volume, translated and edited by Count Wielhorski; London, Hakluyt Society, 1857.

NIKKO, one of the chief religious centres of Japan. The name belongs properly to the district, but is as commonly applied to the principal village, Hachi-ishi, which is 91 m. N.E. of Tokyo by rail. The district is high-lying, mountainous and beautiful, and is in favour for summer residence. The chief objects of interest are the temple of Futarasan (Mount of Brightness), a Shinto temple seems to have existed at Nikko from time immemorial, and in 767 its first Buddhist temple was founded by Shodo Sho-nin (the subject of many strange legendary adventures); but the main celebrity of the place is due to the sepulchres and sanctuaries of Ieyasu and Iemitsu, the first and third shoguns of the Tokugawa dynasty. Ieyasu was buried with amazing pomp in 1617, and Iemitsu, his grandson, was slain in 1650 while visiting his tomb. From 1644 to 1668 the "birds" of Nikko were always princes of the imperial house; and the "sixth road" of Nikko was always kept in its original form, with a censer, a censer and an enclosure. Though the magnificent abbots' residence was destroyed by fire in 1871, and the temples have lost most of their ritual and much of their material splendour, enough remains to astonish by elegance and bewilder by variety of decorative detail. Of the numerous structures which cluster round the shrine of Ieyasu, it is sufficient to mention the cylindrical copper column (1643), a guardian against evil influences, 42 ft. high, adorned at the top with a series of lotus flowers, from the petals of which hang small bells; a five-storied pagoda (1639), 104 ft. high, with the signs of the zodiac carved round the base; the gate of the Two Dragons, which has as figures of unicorns, lions, tigers, elephants, mythical animals and tree-peonies; the vermilion-coloured timber enclosure to which this gate gives entrance, with three great storehouses, a sumptuous stable for the sacred horses, and a finely fashioned granite cistern (1618) for holy water; and the Yo-mei-mon gate, which with the contiguous cloister is covered with the most elaborate carving, and gives access by way of another gate (Kara-Mon) to the court in the midst of which stands the last and most sacred enclosure. This, known as the Tamagoh; is a quadrangle of girt trellis-work 50 yds. square; within it stands the "chapel" or oratory (or rather a series of chambers), in the decoration of which gilding and black lacquer have been lavishly employed. The tomb of Ieyasu lies apart about two hundred steps higher up the hills, in the shadow of tall cryptomerias—a single light-coloured bronze urn or casket standing on a circular base of three steps with a stone table in front on which rests a censer, a lotus-cluster and a stork with a candlestick in its mouth, the whole enclosed by a high stone wall. Somewhat similar are the tomb of Iemitsu and its surroundings; and though the art displayed is of an inferior character, the profusion of buildings and embellishments is very great. From Ieyasu's tomb to a spot on the hill on which the tomb stands, is completely covered to the summit with trees of various tints. There are numerous temples and shrines of minor interest in the locality.

NIKOLAYEV, a town, seaport and chief naval station of Russia on the Black Sea, in the government of Kherson, 40 m. N.W. of the city of Kherson. Pop. (1881) 35,000; (1897) 77,210; (1897) 92,060. Nikolayev stands a little above the
confluence of the Ingul with the Bug, at the head of the liman, or estuary, of the Bug, and is the natural outlet for the basin of that river. The estuary, which is 25 m. long, enters that of the Dnieper. The entrance to the double estuary is protected by the fortress of Ochakov and by the fort of Kinburn, erected on a narrow headland opposite, while several forts surround Nikolayev on both sides of the Bug and protect it from an attack by land. Over the bar at Ochakov the water has been deepened to 25 ft., and over the bar of the Dnieper to 20 ft. by dredging. The town, which occupies two flat peninsulas between the Bug and the Ingul, extends up the banks of the latter, while its suburbs reach still farther up the estuaries of its tributaries. The town is divided into one another at right angles. The bank of the Ingul is taken up with shipbuilding yards, docks, slips and various workshops of the admiralty for the construction of armour-plates, guns, boilers, etc. On the river there is a floating dock for armoured ships. Before the Crimean War the activity of the dockyards was very great; the suburbs—which belong to the admiralty—were bound to supply the necessary hands to the number of 3000 every day, and all the inhabitants had to perform compulsory service. Since 1870 the construction of armoured ships and torpedoes has been carried on at Nikolayev. Nikolayev was the chief port for the Russian volunteer fleet, which sailed to and fro between this port and Vladivostok until the Russo-Japanese War of 1904-05. Nikolayev has steam flour-mills, iron and machinery works, saw-mills, soap, tobacco, vinegar, carriage and agricultural machinery works. The foreign exports consist almost entirely of cereals, especially wheat and rye, with a little sugar, iron and manganese ore and oilcake. The total value reaches £7,000,000 to £9,000,000 annually. Navigation is maintained during the whole winter by the aid of a powerful ice-breaker. Nikolayev is the chief market for the governments of Kherson, Poltava, Kharkov, Esterhazy and parts of Kiev, Kursk and Podolia. In addition to the naval harbour, there are the harbour of the Russian Steamship Company and the coating harbour, made in 1893; while large storehouses stand close to the commercial port, 2 m. from the town, at Popovaya-Balka on the Bug. The educational institutions include an artillery school, a school of navigation, two technical schools, an astronomical and meteorological observatory, museums and libraries, and a hydrographical institute. Amongst the public buildings, the cathedral, which contains some good Italian pictures, the theatre, the artillery arsenal, the admiralty and other state buildings are worthy of mention.

The remains of the Greek colony Olbia have been discovered close to the confluence of the Ingul with the Bug, 10 m. S. of Nikolayev. In medieval times the country was under the Lithuanians, and subsequently under the Zaporozian Cossacks. Russian colonists settled in the locality about the end of the 18th century, and after the fall of Ochakov, Prince Potemkin established (1789) a wharf on the Ingul which received the name of Nikolayev. (P. A. K.; J. T. B.)

NIKOLAYEVSK, a town of East Siberia, in the Maritime province, on the left bank of the Amur, 20 m. above its outflow into the Gulf of Amur, in 53° 8' N. Pop. (1897) 8200. It is defended by a fort and batteries. Founded in 1851, Nikolayevsk was formerly the capital of the Maritime province.

NIKOLAYEVSK, a town of Russia, in the government of Samara, on the right bank of the Iriz, 40 m. from the Volga and 100 m. S.W. of the town of Samara. Pop. (1897) 32,524. Its inhabitants are mostly Raskolniks (i.e. Nonconformists), who have numerous monasteries along the river, and members of the United Greek Church, with about 2000 Tatars. The chief occupations are agriculture and Eve stock breeding.

Under the name of Metchetnoff, Nikolayevsk was founded in 1762 by Raskolniks who had fled to Poland and returned when Catherine II. undertook to grant them religious freedom. In 1828 serious persecutions began, with the result that the monasteries were closed with the exception of three, which were handed over in 1829 and 1836 to the United Greek Church. In 1835 the name of the town was changed to Nikolayevsk.

NIKOLAYEVS KAYA, SLOBODA, a town of Russia in the government of Astrakhan, 3 m. from the left bank of the Volga, opposite Kamyshin, and 110 m. N. of Tsarsitsyn. Pop. (1897) 20,000. It dates from the end of the 18th century, when a number of Little Russians settled there for the transport of salt from Lake Elton. It is one of the chief centres on the lower Volga for the trade in corn and salt.

NIKOLSBURG (Czech, Mikulov), a town of Austria, in Moravia, 53 m. S. of Brünn by rail. Pop. (1900) 8091. It is situated at the foot of the Polau Mountains and near the border of Lower Austria. It possesses a château of Prince Dietrichstein-Menlowitz, a considerable arsenal and a large arsenal of rubber. The town was formerly inhabited by Lituans, a tribe of Lithuanian origin, which possessed a notable asylum for Waldenses. The modern inhabitants, who are mainly Germans, are mostly of Magyarian stock. The place was called Mikowiez in the 13th century, and is first mentioned in 1383. In 1828 the place was destroyed by fire. The town is famous for its fine cathedral, with a very elaborate and highly carved Gothic façade. The church contains a number of fine pictures, including a copy of the Madonna of an unknown artist of the 13th century. The town is noted for its wine and its famous porcelain, which is still produced in the town.

NIKON [NIEZT MININ] (1605-1682), 6th patriarch of Moscow, Russian, was a son of a peasant farmer named Min, born on the 7th of May 1605 in the village of Valmanovo, 90 versts from Nizhny Novgorod. Missery pursued the child from his cradle, and prematurely hardened a character not naturally soft; he ran away from home to save his life from an inhuman stepmother. But he gave promise betimes of the energy and thoroughness which were to distinguish him throughout his life, and contrived to teach himself reading and writing. When he was but twenty his learning and talents obtained for him a cure of souls. His eloquence attracted attention, and, through the efforts of some Moscow merchants, he was transferred to a patrician parish in the capital. Shortly afterwards, seeing in the loss of his three little children a providential warning to seek the higher life, he first persuaded his wife to take the veil and then withdrew himself first to a desolate hermitage on the isle of Anzersky on the White Sea, and finally to the Kozhuzersky monastery, in the diocese of Novgorod, of which he became abbot in 1643. On becoming a monk he took the name of Nikon. In his official capacity he had frequently to visit Moscow, and in 1640 made the acquaintance of the pious and impressionable Tsar Alexius, who fell entirely under his influence. Alexius appointed Nikon archimandrite, and later patriarch, of the wealthy Novosospassky monastery at Moscow, and in 1648 metropolitan of Great Novgorod. Finally (1st of August 1652) he was elected patriarch of Moscow. It was only with the utmost difficulty that Nikon could be persuaded to become the arch-pastor of the Russian Church, and he only yielded after imposing upon the whole assembly a solemn oath of obedience to him in everything concerning the dogmas, canons and observances of the Orthodox Church.

Nikon's attitude on this occasion was not affectionate, but the wise determination of a would-be reformer to secure a free hand. Ecclesiastical reform was already in the air. A number of ecclesiastical dignitaries, known as the party of the protopopes (deans), had accepted the responsibility for the revision of the church service-books inaugurated by the late Patriarch Joasaph, and a few other very trivial rectifications of certain ancient observances. But they were far too timid to attempt anything really effective. Nikon was much bolder and also much more liberal. He consulted the most learned of the Greek prelates abroad; invited them to a consultation at Moscow; and finally the scholars of Constantinople and Kiev opened the eyes of Nikon to the fact that the Moscow service-books were heterodox, and that the icons actually in use had very widely departed from the ancient Constantinopolitan models, being for the most part imitations of later Polish and Frankish (West European) models. He at once (1654) summoned a properly qualified synod of experts to re-examine the service-books revised by the Patriarch Joasaph, and the majority of the synod decided that "the Greeks should be followed rather than our own ancients." A second council, held at Moscow in 1656, sanctioned the revision of the
service-books as suggested by the first council, and anathematized the dissident minority, which included the party of the protopopes and Paul, bishop of Kolomna. Heavy weight came with the fullest ecumenical authority, Nikon's patriarchal staff descended with crushing force upon the heterodox. His scheme of reform included not only service-books and ceremonials but the use of the "new-fangled" ikons, for which he ordered a house-to-house search to be made. His soldiers and servants were charged first to gouge out the eyes of these "heretical counterfeits" and then carry them through the town in derision. He also issued a ukaz threatening with the severest penalties all who dared to make or use such ikons in future. This ruthless measure goes far to explain the trouble that entered in with the "Old Ritualists" and the "Old Believers," as they now began to be called, ever afterwards regarded Nikon and all his works.

From 1652 to 1658, Nikon was not so much the minister as the colleague of the tsar. Both in public documents and in private letters he was permitted to use the sovereign title. Such a free use did he make of his vast power, that some Russian historians have suspected him of the design of establishing a particular national papacy; and he himself certainly maintained that the spiritual was superior to the temporal power. He enriched the numerous and splendid monasteries which he built with valuable liberalties. His empires were subject to the predominant power, and the Orient for precious Greek and Slavonic MSS., both sacred and profane. But his severity raised up a whole host of enemies against him, and by the summer of 1658 they had convinced Alexius that the sovereign patriarch was eclipsing the sovereign tsar. Alexius suddenly grew cold towards his "own familiar friend." Nikon thereupon publicly divested himself of the patriarchal vestments and shut himself up in the Voskresensky monastery (19th of July 1658). In February 1660 a synod was held at Moscow to terminate the "wickedness" of the Muscovite Church. Nikon, who had now been put out a pastor for nearly two years. The synod decided not only that the new patriarch should be appointed, but that Nikon had forfeited both his archiepiscopal rank and his priest's orders. Against the second part of this decision, however, the great ecclesiastical expert Epiphani Slavenitsky protested energetically, and ultimately the whole inquiry collapsed, the scrupulous tsar shrinking from the enforcement of the decrees of the synod for fear of committing mortal sin. For six years longer the Church of Muscovy remained without a patriarch. Every year the question of Nikon's deposition became more complicated and confusing. Almost every month a new petty controversy was excited. His empires were subject, and no two authorities agreed. At last the matter was submitted to an ecumenical council, or the nearest approach to it attainable in the circumstances, which opened its sessions on the 18th of November 1666 in the presence of the tsar. On the 12th of December the council pronounced Nikon guilty of reviling the tsar and the whole Muscovite Church, of deposing Paul, bishop of Kolomna, contrary to the canons, and of beating and torturing his dependants. His sentence was deprivation of all his sacerdotal functions; henceforth he was to be known simply as the monk Nikon. The same day he was put into a sledge and sent as a prisoner to the Therapontov Belyezovskaya monastery. Yet the very council which had deposed him confirmed all his reforms and anathematized all who should refuse to accept them. Nikon survived the tsar (with whom something of the old intimacy was resumed in 1671) five years, expiring on the 17th of August 1681.

See N. K. Bain, The First Romanovs (London, 1905); S. M. Solovev, History of Russia (Russ.), vol. x. (St Petersburg, 1905); &c. A. K. Borodzin, The Protopope Avvakum (Russ.) (St Petersburg, 1899); V. S. Ikonnikov, New Materials concerning the Patriarch Nikon (Russ.) (St Petersburg, 1899); William Palmer, The Patriarch and the Tsar (London, 1871-1876).

NIKOPOL, a town of Russia, in the government of Ekaterinoslav, on the right bank of the Dniester, 70 m. S.S.W. of the town of Ekaterinoslav. It was formerly called Nikitin Rog, and occupies an elongated peninsula between two arms of the Dniester at a point where its banks are low and marshy, and has been for centuries one of the places where the middle Dniester can most conveniently be crossed. Its inhabitants, 21,892 in 1900, are Little Russians, Jews and Mennonites, who carry on agriculture and shipbuilding. The old seokas, or fortified camp, of the Zaporogian Cossacks, brilliantly described in N. V. Gogol’s novel Taras Bulba (1834), was situated a little higher up the river. Numbers of graves in the vicinity recall the battles which were fought for the possession of this important strategic point. One of them, close to the town, contained, along with other Scythian antiquities, the well-known precious vase representing the capture of wild horses. Even now Nikopol, which is situated on the highway from Ekaterinoslav to Kherson, is the point where the "salt-highway" of the Chemaks (Little Russian salt-carts) crosses the Dniester. Nikopol is, further, one of the chief places on the lower Dniester for the export of corn, linseed, hemp and wool.

NIKOPOLI, or NICOPOLIS (Turkish, Nhigebolu or Nebul), the chief town of a sub-prefecture in the district of Plevna (Plevon), Bulgaria. Pop. (1908) 5,236, including 3,339 Turks and 1,615 Bulgarians. Nikopoli is picturesquely situated on the south bank of the Danube, where it receives the Osem. Until the creation of a new port at Somovit, in the neighbourhood, Nikopoli served as an outlet for the trade of Plevna, Lovtcha and other towns in the interior, the principal export being cereals. The following are the chief points in the modern history of the place:—capture of the fortress by Sigismund of Hungary in 1392 and 1395; defeat of Sigismund and his hosts in 1396 by Bayezid I.; siege of the town by King Ladislaus I. of Hungary in 1444; defeat of the Turks by Balbo in 1571 and by the Howitzers in 1598; capture of the town by Pasvan-oglu in 1777; occupation of the fortress by the Russians under Kamensky in 1810; destruction of the Turkish flotilla and storming of the Turkish camp by Govarov in 1829; capture and burning of the town by the Russians under Krudener on the 15th of June 1877.

NIKSHICH (also written Nikshitch and Nikshiti; Croatian, Nikšić), a town of Montenegro, lying in a flat plain enclosed by lofty mountains on the north-west, and watered by the river Zeta. Pop. (1900) about 3,500. Owing to the prevalence of floods, a good vineyard, a gift from Russia, was raised on the river, and the mountain road which leads to Podgorica, 60 m. S.E. Nikshich consists of a mass of white houses, dominated by the belfry and the pale yellow cupola of its cathedral, another gift from Russia. This building is chiefly Byzantine in style, and, though hardly beautiful, is the most impressive and by far the largest of Montenegrin churches. Close by stands a barrack-like royal palace; and a little beyond the town are the ruins of an old castle. As Nikshich possesses a brewery and a clothmill, besides the chief mart of Western Montenegro for timber, hides, farm-produce and livestock, it ranks second in commercial importance to Podgorica. About 7 m. S.E. is the celebrated shrine of Ostrog (see MONTEGRO). Nikshich was included in the Turkish province of Herzegovina until 1876, in which year it was stormed by the Montenegrins, led by Prince Nicholas in person. In 1878 the Montenegrin possession was ratified by the treaty of Berlin.

NILE, the longest river of Africa, and second in length of all the rivers of the globe, draining a vast area in north-east Africa, from the East African lake plateau to the shores of the Mediterranean. Although falling short of the length of the Mississippi-Missouri (2,454 m. according to the estimate of General Tillo1), the Nile is at the head of all rivers as regards the length of its basin, which extends through 35° of latitude or 2,450 m. in a direct line, with a waterway of about 4,000 m. The Nile proper, i.e. from the outlet at Victoria Nyanza to the sea, is 4,247 m. long.

1 General Alexi A. Tillo (1839-1900), Russian scientist and geographer, author of works on geodesy, meteorology, &c.
The Name.—The early Egyptians called this river by a name which was probably pronounced Hap. It seems to be connected with a root meaning “concealed,” “mysterious.” This survived as a religious designation down to the fall of paganism. The “great river” was also a frequent name for the main stream, and this became the usual name of the Nile in late times as Jer-o and continued in use amongst the Copts. In the Bible the Nile is regularly named Yco (the, “he”), from the contemporary Egyptian Yor, “river.” The origin of the Greek and Roman name Νέιος, Νίλος, is quite unknown. Μυστήριος in the Odyssey is the name of the Nile (masc.) as well as of the country (fem.). The Arabs preserved the classical name of the Nile in the proper name En-Nil (النيل), or Nil-Misr (نيل مصر), the Nile of Misr (Egypt).

The same word signifies indigo.

The modern Egyptians commonly call the river El-Bahr, “the sea,” a term also applied to the largest rivers, and the inundation “the Nile,” En-Nil; and the modern Arabs call the river Bahr-en-Nil, “the river Nile.”

Basin of the River.—The Nile system is a simple one with three principal divisions: (1) the main stream running south to north, and fed by the great lakes of East Central Africa; (2) the equatorial tributary rivers draining the country north-east of the Congo basin; (3) the Abyssinian affluents. The extent of the basin of the Nile is clearly indicated on the map. Its area is estimated at 1,107,227 sq. m., which compares with the 1,425,000 sq. m. area of the Congo basin. The smaller basin of the longer river is due to its narrowing through the Sahara. Southward the basin includes the northern part of the plateau between the two “Rift” valleys which traverse that part of Africa, and also that portion of the Albertine (or western) “Rift” valley which lies north of the Mfumbiro mountains. That part of the plateau within the Nile basin is occupied by the Victoria Nyanza and its affluents. These affluents drain a comparatively small part of this plateau, which stretches south to Lake Nyasa. The most remote feeder of the Nile in this direction does not extend farther than 3° 20’ S. West and W.S.W. of Victoria Nyanza, however, the Nile basin reaches 3° 50’ S. (264 m. south of the equator) and 20° 15’ E., following the crest of the hills which dominate the north-eastern shores of Lake Tanganyika and the eastern shores of Lake Kivu. Turning north-westward from this point the Nile basin crosses the mountainous region of Mfumbiro and includes that of Ruwenzori. Its limit is marked by the western wall of the

1"En-Nil is the river (lit. the inundation) of Egypt: Es-Sagharn sayes—‘But as to the nil [indigo] with which one dyes, it is an Indian word Arabicized ‘ (“The Mishb of El-Fayymi)."
Albertine Rift valley, in which lie the Albert Edward and Albert Nyanzas. For a considerable distance the water-parting between the Congo and the Nile is close to the Albert Nyanza and to the Nile as it flows from that lake, but not far north of Wadelai (2° 46' E.), the Nile and the Nile basin spread westward over the wide area drained by the Bahir-Ghazal and its tributaries. In this region there is no well-marked watershed between the Congo and Nile systems, which interlace. Further north the limit of the valley is marked by the hills of Darfur. Below that point the valley of the Nile extends but a mile or two into the desert.

The south-eastern limits of the Nile basin extend nearly to the western escarpment of the eastern Rift valley—the dividing plateau being a narrow one. North of the equator a bend is made westward to Mt. Elgon which raises the northern limit of its water towards Lake Rudolf. From Mt. Elgon the Nile watershed is some distance to the west of that lake, while to its north a turn is made again, the watershed including a great part of the Abyssinian highlands. Beyond 15° N. it follows a line generally parallel to the west shore of the Red Sea, except where diverted to the west by the basin of the Khor Baraka.

Sources of the Nile.—The question of the sources of the Nile opens up a number of very famous problems. The Unsinkable Nile of Du Faur, the Victoria Nyanza (q.e.), is the great reservoir whence issues the Nile on its long journey to the Mediterranean. But if the source of a river be considered to be the most remote headstream (measured by the length of course) then the sources of the Nile are the upper branches of the Kagera. Among the feeders of Victoria Nyanza the Kagera is by far the most important, both for length of course and for the volume of water contributed. The name of Lake Victoria, then, is not merely a title of convenience, but the name of a region. The Kagera and its tributaries, the more important of which are the Nyabarongo, the Ruvuvu, and the Raphia, are the chief branches uniting to form the Kagera, and of these the most important for the volume of water carried is said to be the Nyabarongo. The Nyabarongo is formed by the union of various mountain streams, the Ruvuvu, and the Raphia, being the chief. The Rukarara rises in about 2° 20' S., 29° 20' E., at an elevation of some 7000 ft., in a picturesque and bracing region immediately east of the Albertine Rift valley. The Nyabarongo first flows southeasterly through the plateau of Elgon, and then southward, which is its main course, and finally, on reaching 2° 20' S. unites with the Akanyaru just west of 30° E. The Akanyaru, which comes from the south-west, has been sometimes considered to be the larger stream, but according to Dr. Richard Kandt it carries decidedly less water, while its course is shorter than that of the Nyabarongo. The combined stream takes an easterly and southerly direction, flowing in a swampy valley and joining a little west of 31° E. the third branch of the Kagera, the Ruvuvu, coming from the south. The source of the Ruvuvu is in about 2° 55' S., 29° 56' E., but its most southern tributary, and the most distant, is the Nyabarongo. The Nyabarongo rises in about 3° 45' S., 29° 50' E., and flows north-east, joining the Ruvuvu, which has hitherto had an easterly direction, in about 30° 25' E., 3° 10' S. From this point the Ruvuvu flows north-west to join the Raphia. From this confluence the combined stream of the Kagera flows north and north-west in a valley stream with small lakes until almost 1° S., when it turns east, and finally empties itself into Victoria Nyanza just north of 1° S., the mouth forming a small projecting delta. Its lower course is navigable by shallow draught steamers. The total length of the Kagera, reckoning from the source of the Nyabarongo, is some 430 m. Its volume is stated to vary between 21,000 and 54,000 cub. ft. per second. All the other feeders of Victoria Nyanza are small and often intermittent rivers, the largest being probably the Nzoia, which enters on the north-east from the plateaus south of Mount Elgon. (The rivers which enter Albert Edward and Albert Nyanzas and, with those lakes, form the western sources of the Nile, are dealt with under Albert Edward and Albert Nyanzas.)

The Victoria or Somerset Nile.—The ridge of high land which forms the northern shore of Victoria Nyanza is broken at its narrowest part, where the pent-up waters of the lake—through which a drift from the Kagera jet into the Nile outlet is just perceptible—have forced a passage at the northern end of a beautiful bay named Napoleon Gulf. At this spot, 30 m. north of the equator, at an altitude of 3704 ft., the Nile issues from the lake between cliffs 200 m. and more in height, and forms a narrow gorges. From this point on the river becomes a much greater. The escaping water precipitates itself over a rocky ledge with a clear fall of 161 ft. The falls, some 400 yds. across, and 130 yds. high, are deeply cut into the soft shales by which they are named the Ripon Falls, after Earl de Grey and Ripon (afterwards 1st marques of Ripon), president of the Royal Geographical Society in 1859. The Victoria or Somerset Nile, as this section is called, has at one time a depth of nearly 30 ft. and at another only about 1 ft. From this point to the upper end, the river is one of much grandeur. The escaping water precipitates itself over a rocky ledge with a clear fall of 161 ft. The falls, some 400 yds. across, and 130 yds. high, are deeply cut into the soft shales by which they are named the Ripon Falls, after Earl de Grey and Ripon (afterwards 1st marques of Ripon), president of the Royal Geographical Society in 1859. The Victoria or Somerset Nile, as this section is called, has at one time a depth of nearly 30 ft. and at another only about 1 ft. From this point to the upper end, the river is one of much grandeur. The escaping water precipitates itself over a rocky ledge with a clear fall of 161 ft. The falls, some 400 yds. across, and 130 yds. high, are deeply cut into the soft shales by which they are named the Ripon Falls, after Earl de Grey and Ripon (afterwards 1st marques of Ripon), president of the Royal Geographical Society in 1859. The Victoria or Somerset Nile, as this section is called, has at one time a depth of nearly 30 ft. and at another only about 1 ft. From this point to the upper end, the river is one of much grandeur. The escaping water precipitates itself over a rocky ledge with a clear fall of 161 ft. The falls, some 400 yds. across, and 130 yds. high, are deeply cut into the soft shales by which they are named the Ripon Falls, after Earl de Grey and Ripon (afterwards 1st marques of Ripon), president of the Royal Geographical Society in 1859. The Victoria or Somerset Nile, as this section is called, has at one time a depth of nearly 30 ft. and at another only about 1 ft. From this point to the upper end, the river is one of much grandeur. The escaping water precipitates itself over a rocky ledge with a clear fall of 161 ft. The falls, some 400 yds. across, and 130 yds. high, are deeply cut into the soft shales by which they are named the Ripon Falls, after Earl de Grey and Ripon (afterwards 1st marques of Ripon), president of the Royal Geographical Society in 1859. The Victoria or Somerset Nile, as this section is called, has at one time a depth of nearly 30 ft. and at another only about 1 ft. From this point to the upper end, the river is one of much grandeur. The escaping water precipitates itself over a rocky ledge with a clear fall of 161 ft.
of the Abai the majority join it on its left bank. The Bashiko, Jamma and Muger, which reach the Abai in the order named, drain the country east of the main stream between the basins of the Takaze and the Abai, their waters being conducted in the mountains which form the watershed between the Nile and the Lake Rudolf basin. Next comes the Disdessa, a large stream rising near the head-waters of the Baro (the main upper branch of the Goang or Bahr el-Aswad) and forming the boundary between the Abyssinian hills. All these affluents are perennial, as is the Balossa or Yebis, a right-hand tributary which reaches the Abai below the junction with the Tana. Four miles below Famaika the river is joined on its left bank by the Teresero. This affluent receives on its right bank two considerable tributaries from the Abyssinian heights, the Dinder, a very long but not perennial stream, and the Rakel, waterless in the dry season, copiously richly charged with sediment during the rains from June to September. At this period the discharge of the Blue Nile rises from less than 200 to over 10,000 cub. metres per second, thus greatly enlarging that of the White Nile, itself, which is only about 800 cub. metres during the floods above the confluence. The length of the Blue Nile is about 850 m. The country, El Geizia, enclosed in the triangle formed by the junction of the White and Blue Niles forms the Nile portion of the Anglo-Egyptian Sudan. The flood season preserves, however, the name of Abai, and at its confluence with the Nile has a breadth in flood time of over 900 yds. The Abai and its tributaries, like many of those which empty into the Nile, rise after a time of uninterrupted rainfall. In its lower course the Abai runs completely dry, but higher up water may be found in deep pools, hollowed out of the sand bed of the stream by the river when in flood. These pools are full of jawbone and crocodile remains which remain imprisoned until the return of the flood. The country comprised between the Nile proper, the Abai and the Blue Nile is identified with the island of Meröe of ancient history.

The Cataracts.—Downstream the Abai junction the Nile continues its course to the Mediterranean, traversing a distance of over 1600 m. without receiving a single tributary on either bank. The river here is wide and slow, and its waters, laden with the remains of the vast floodplains of the Nubian desert, are of a deep brownish colour. Below Khartoum, in lat. 18° 27' E., the river, flowing in a slightly sinuous course, becomes narrower and deeper, and its latitude is given as 19° 0'. At Abu Zeid (about 13° 5' N.) for a distance of nearly 4 m. the river is extremely broad and shallow, being fordable at low water. Fifteen miles lower down, at Goa Aba Goma—which is the northern limit of the suck vegetation—the river is divided into two channels by Abba Island, wooded, narrow and 28 m. long. On Abba Island lived, for some years before 1861, Mohammed Ahmed, the Mahdi.

The Blue Nile.—Five hundred and twenty miles below the Sobat mouth and 1652 m. from Ripon Falls, in 15° 37' N., the White Nile is joined by its greatest eastern affluent the Bahr-el-Azrak or Blue Nile. This river, which runs northwards, is the Anglo-Egyptian Sudan, while on the western bank of the Nile is Omdurman, the former Mahdist capital. The Blue Nile, or Abai as it is called in Abyssinia, joins the White Nile in 11° N. and 37° E., and flowing northwards 70 m. enters Lake Tana (q.v.) near its south-west corner, to issue again at the south-east end. The Abai and its tributaries drain a great part of the Abyssinian plateau, and its waters sink below the line of the northern foothills of the Banat, and end in Lake Tana, through the dam of the Aswak Dam. The Abai itself on leaving Lake Tana makes a great semicircular sweep S.E. to N.W., from the highlands of Ethiopia to the plains of Sennar. In this section of its course its swirling waters reach a height of 140 ft. above sea-level, and at the point of its confluence with the Blue Nile at Khartoum, 1300 ft. above sea-level. Of the tributaries

1 At Khartoum the water of the one river is of a greenish-grey colour, that of the other is clear and blue, except when in flood, if when it flows a chocolate brown from its alluvial burden.

2 The fall in the river-bed, as given in these pages, is an approximation derived from barometric readings only.
In a length of 3 m, the river fell 161 ft. Since the completion of the great Aswan dam the Nile has been practically constant. The greatest rise (Dec.) is only 40’ higher than the lowest level reached at the middle of June, after which the rise is slow. In July and August the river is fully 80’, and in September the beginning of October. By using the water stored by the Asuan dam in the months following high Nile, the river lower down has been, since 1902, replenished at times of low water to meet the needs of cultivation. The great Aswan dam, which is exceeding the height of the cataract. Upstream from the dam a lake some 100 m. in length has been formed. The Aswan Dam was opened on the 20th of December, 1898, by King Edward VII on the right bank, with a ceremony that above Aswan. The valley is comparatively narrow, being an almost level depression in a limestone plateau—the area of fertility ends where the land ceases to be irrigated by the river. At Edfu, 68 ft. from its source, the river is 5000 ft. wide, carrying, according to some, the flow of the water, and at Assiut, 274 m. below Edfu, is another barrage fulfilling the same purpose. Cairo, the capital of Egypt, is built on the eastern bank of the Nile 12 m. north of the apex of the delta.

At the beginning of the delta the Nile separates into two channels, the Rosetta and the Dumiatta, which join the Mediterranean at its south-east angle. At the bifurcation is a double barrage, by means of which the water can be dammed to the height required for forcing the river into the canals which irrigate the delta. Of the two branches the Dumiatta is the more important. Both are separated by a small sandbank. Beyond the coast-line, which is low and sandy, are a number of salt marshes or lagoons. Whilst the Dumiatta branch is gradually silt ing up, the Rosetta branch is scouring out a way towards the sea. Along the bed of full flood the depth of the water in either branch is about 23 ft.

**Hydrography.**—The fertility and prosperity of Egypt and the northern part of the Sudan being entirely dependent on the irrigation of the flood, the variation in the height of the Nile affects the water-supply of the delta in a very important manner. The river varies in height at different seasons of the year is of vital importance. (In Egypt) the height of the flood has been recorded annually, as the chief event of the year since at least 3600 B.C. Above the Rosetta the Nile traverses a region of heavy rainfall and the water-supply is super abundant. It is from Victoria, Albert and Albert Edward Nyanzas and their feeders, and in a lesser degree from the Baher-el-Ghazal, that this river obtains its constant supply of water throughout the year. The great lakes and the region of swamps, containing a large proportion of the water they receive, act as natural reservoirs and prevent the lower Nile from ever running dry in summer. The Abyssinian branches are the chief cause of the Nile flood. In the equatorial regions rainfall varies from 30 to 80 in. during the year with a mean of about 50. It is heaviest in the months of January, February, March and April, and again in October and November. The most rainy periods of the lake plateau (where alone occurs a rainfall of 60 in. and over) lie along the eastern edge of the Albertine Rift valley, and west and north of Victoria Nyanza. These rains feed Albert Edward Nyanza, which, by means of the Chaguru river, supply a great part of the water of Victoria Nyanza. The water in the Victoria Nyanza begins to rise in January, the rise becomes marked, is at its height in July, at the beginning of the fall, and begins to subside in September. The Baher-el-Jebel is at its lowest in March and April and at its highest in September. The seasonal supply of the Baher-el-Ghazal does not vary very greatly, the maximum rises which occur in November and December, however, has but a slight discharge. The Obat, from December to March, is at its lowest, and is in flood from June to October, during which period the water (milky colored) which it pours into the Nile equals in volume that of the main stream. It is the colour of the Obat water which gives its name to the White Nile. The Blue Nile, at its confluence at Khartoum, begins to rise in June and is in flood from July to October; the Obat is also in flood during the same months. The great difference in the supply of water from the equatorial regions and from Abyssinia arises from the fact that the first-named district is one of heavy rain practically all the year round; whereas in the other the rainfall is concentrated in the months of June to September. Reduced to its simplest expression, the Nile system may be said to consist of a great steady flowing river fed by the rains of the tropics, controlled by the existence of a vast sea of swamps and reservoirs of fresh water. (IRRIGATION: Egyt.)

At Assuan the average depth of the river is 30 ft. only. At Khartoum it is 245 ft. At Assuan the Nile is lowest in April and May and highest in August and September. Its minimum depth is 18 ft. and its maximum depth 29 ft.

1 In ancient times the delta was watered by seven branches; five of these branches are now canals not always navigable. The ancient branches were, beginning at the west, the Canopic, Bobitine, Sebenitic, Pharaonic, Mendesian, Tanitic and Pelusiac, of which the modern Rosetta and Dumiatta branches represent the Bobitine and Patnithic.

2 By Sir Hanbury Brown, inspector-general of irrigation, Lower Egypt, 1892–1903.

3 Egyptian Irrigation (p. 29), by Sir W. Willcocks (London, 1899).

4 Between Assuan (Shelli) and Wadi Halfa the river is, however, the main highway, there being no railway between the places named.
the chief channel of trade and commerce. Steamers first ascended the Nile above the cataracts (to Korosko) in 1820. It was not till 1846 that a steamboat was placed on the White Nile.

(W. E. G.; F. R. C.)

**Story of Discovery.**—Few problems in geographical research exercised for so long a period so potent an influence over the imaginations of man as that of the origin of the Nile. The ancient Egyptians, as is apparent from the records on their monuments, were acquainted with the main stream as far south as the junction of the White and Blue Niles. They appear also to have known the Blue Nile up to its source and the White Nile as far south as Lake Tana, influenced by the knowledge acquired by Ptolemy. But, throughout the centuries, the White Nile and the Niger issue from a great lake, the Niger flowing west, the Nile north. Hence arose much confusion, the Senegal estuary being regarded by its discoverers (1445) as the mouth of a western branch of the Nile. Even until the early years of the 19th century the belief persisted in a connexion between the Nile and the Niger (see further Niger). Portuguese explorers and missionaries, who in the 15th and 16th centuries visited the east coast of Africa and Abyssinia, gained some information about the equatorial lake region and the Nile, the extent of the knowledge that they possessed being brought together by Pigafetta, Italian traveller and historian (1533–1603) published in 1580. It was not, however, till the 17th century that the sources of the Blue Nile were visited by Europeans. In 1615 Pedro Paez, a Portuguese priest, was shown them by the Abyssinians. Ten years later another Portuguese priest, Jeronimo Lobo, also visited the sources and left a vivid description of the rise of the river and its passage through Lake Tana. An English version of the accounts of Paez and Lobo—written by Sir Peter Wyche—was published in 1650 by order of the Royal Society, of which Sir Peter was an original Fellow. Between 1625 (the date of Lobo’s visit) and 1770, some attempts were made by French and other travellers to explore the Blue Nile, but they ended in failure. In the last-named year James Bruce (q.v.) reached Abyssinia, and in November 1772 he arrived in Egypt, having visited the source of the Blue Nile and followed it, in the main, to its confluence with the White Nile. On returning to Europe Bruce was mortified to find that whilst he was still in Egypt the French geographer D’Anville had (1772) issued a new edition of his map of Africa in which by a careful study of the writings of Paez and Lobo he had anticipated Bruce’s discoveries, D’Anville’s map is singularly accurate, if we remember the scanty information at his disposal. To Bruce, nevertheless, belongs the honour of being the first white man to trace the Blue Nile to its confluence with the White Nile. He himself, considering that the Blue Nile was the main branch of the river, claimed to be the discoverer of the long-sought caput Nile.3

From the time of Bruce, interest in the Nile problem grew rapidly. The Englishman W. G. Browne (q.v.) when in Darfur (1794–1796) heard that the Abiad rose far south in the Mountains of the Moon, but he makes no mention of the great lakes, and in Major Rennell’s map of 1809 there is no hint of equatorial lakes at the Abiad sources. During the French occupation of Egypt the river from the sea to Assuan was accurately surveyed, the results being embodied in Jacotin’s *Atlas de l’Egypte* (1807). In 1812–1814 J. L. Burckhardt, the Orientalist, went up the Nile to Korosko, travelled thence across the desert to Berger and Shendi, and crossing the Athara made his way to the Red Sea. It was, however, due to the initiative of Mehemet Ali, Pasha of Egypt, that the White Nile was explored. In 1820–22 a military expedition under Ismail Pasha, a son of Mehemet Ali, which was joined by the French scientist Frédéric Caillaud (who had visited Meroë in 1819) ascended the river to the

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1 The two lakes afterwards received the names Lake of Crocodiles and Lake of Cataracts.

2 Francisco Alvarez, a priest, who was in Abyssinia 1520–1526, afterwards wrote (about 1550) an account of Abyssinia in which he reproduced the Athara and a part of the main Nile.

3 Bruce, however, acknowledged in his *Travels* that the Abiad (White Nile) at its confluence with the Blue Nile was the larger river. The Abiad, he writes, "preserves its stream always undiminished, because rising in latitudes where there are continual rains, it therefore suffers not the decrease the Nile does by the six months’ dry weather."
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confluence of the White and Blue Niles, founded the city of Khartum, and ascended the Blue Nile to Fazokli. In 1847 Adolphe Ignant, a Belgian in the service of the British African Association, ascended the White Nile 132 m. above Khartum, being the first white man to do so since the 1st century A.D. Then followed three Egyptian expeditions sent in 1839-41 and 1842 by Mehemet Ali up the White Nile. The first expedition reached, on the 28th of January 1840, a point 6° 30' N., the second and third pressed further south, reaching 4° 42' N.—or the foot of the rapids above Gondokoro. A Turkish officer, Selim Bimbaashi, commanded the expeditions, and among the members were the Frenchmen Thibaut (a convert to Islam and for nearly forty years French consular agent at Khartum), D'Arnaud and Sabatier, and a German, Ferdinand Werne. The last-named wrote a scientific account of the second expedition and drew a map of the Nile between Khartum and Gondokoro. An Austrian Roman Catholic mission was established in the Sudan, and in 1850 one of its members, Dr Ignatz Knobloch, sent to Europe reports, gleaned from the natives, of the existence of great lakes to the south. About the same time two Protestant missionaries, Ludwig Krapf and John Rebmann, stationed on the Zanzibar coast, sent home reports of a vast inland sea in the direction where the Nile sources were believed to be. This sea was supposed to extend from 6° 30' to 13° 30' S. These reports revived interest in Palaeontological Geography. The exploration of the Bahr-el-Ghazal by John Petherick, Miss Tinne and her companions, and others followed the opening up of the White Nile (see Bahr-el-Ghazal). The general result of the work carried on from the north was that by 1858 the Nile system was known as far south as the rapids at Bedden.

On the 3rd of August 1858 the English explorer J. H. Speke (q.v.) discovered the large nyansa (lake), which he rightly conceived to be the head reservoir of the White Nile, and which in honour of the queen of England he named Victoria Nyanza. Colonel Grant (q.v.) continued his exploration of the river. He made an ascent of the Zanzibar coast in search of these sources of the Nile, which Rebmann and Krapf had called the Sea of Unyamwezi. These reports proved to be exaggerated accounts of three distinct lakes—Nyasa, Tanganyika and Victoria Nyanza. In 1860 Speke returned to Zanzibar accompanied by J. A. Grant (q.v.), bent on solving the problem of the Nile. In spite of great difficulties he made his way to Uganda, on the north-west of Victoria Nyanza, and (without exploring the lake) succeeded in reaching its outlet. On the 28th of July 1862 Speke stood by the Ripon Falls—the birthplace of the Nile. Here Speke and Grant paddled down the Nile a short distance, but before reaching Lake Kioga they were stopped by hostile natives and compelled to go westward to Unyoro. There they heard of another great lake further west, but the king of Unyoro refused them permission to visit it. In the end they ascended the Kafu river to its confluence with the Nile and then down the main stream to the Karuma Rapids. Here Speke and Grant left the river, and travelled overland east of the stream, which they did not strike again until just above the Ausa confluence. Then they travelled down the Nile to Gondokoro, reached on the 15th of February 1863.

This remarkable journey virtually solved the Nile problem so far as the source of the main stream was concerned, but there remained much to be done before the hydrography of the whole Nile basin was made known. At Gondokoro Speke and Grant met Mr (afterwards Sir Samuel) Baker 1 and his wife—a Hungarian lady—who had journeyed thither to afford the explorers help. To Baker Speke communicated the news he had heard concerning the western lake, and this lake Baker determined to find. On the 26th of March 1863 Baker and his wife left Gondokoro, and despite much opposition, especially from slave-dealers, followed, in the reverse direction, the route of Speke and Grant as far as Unyoro, whence they journeyed west. On the 14th of March 1864 they struck the lake (Albert Nyanza) on its S.E. side. They paddled up the lake to the point where a large river coming from the east poured its waters into that lake. This stream, which they rightly conjectured to be the Speke's Nile, made its course up to the Murchison Falls. Thence they went overland to the Karuma Rapids, and so back to Gondokoro by their old tracks. It fell to the lot of General C. G. Gordon (when that officer administered the Egyptian Equatorial provinces) and his assistants to fill up the gap left by Speke and Baker in the course of the main stream. In 1874-75 two English engineer officers—Lieut. (afterwards Colonel Sir Charles M.) Watson and Lieut. H. Chippendale—followed the river between Gondokoro and Albert Nyanza; in 1876 an Italian, Romolo Gregor Pasha, circumnavigated that lake, proving Baker's estimate of its extent to be vastly exaggerated; Gordon in the same year traced the river between Murchison Falls and Karuma Rapids, and an American, Colonel C. Chaillé-Long followed (1874) the Nile from the Ripon Falls to the Karuma Rapids, discovering in his journey Lake Kioga (which he named Ibrahim). In this manner the identity of the Victoria Nile with the river which issued from the Albert Nyanza was definitely established.

In 1874 H. M. Stanley (q.v.) went to Africa with the object of completing the work left unfinished by David Livingstone, with a view, if possible, of discovering the ultimate sources of the Nile. He first ascended the Blue Nile to Khartum, and after sailing up the river to an estimated distance of 600 miles (a.d. 1875) he turned back to the head of Lake Tana, and followed the River Choa (q.v.) to Lake Victoria before turning to the north, and reaching Lake Albert by way of Lake George. Here he was joined by Leopold M. Stanley (q.v.), who had reached Lake Albert by way of the Gambia. On the 2nd of October 1877 Leopold was killed by the Bahr-el-Jebel Arabs, and his brother Henry M. Stanley followed his route so far as Lake Albert. Stanley had already ascended the Nile to the source of the Blue Nile, and during his travels had discovered (1) Albert Edward Nyanza, and traced the river (Semiliki) which connects it with Albert Nyanza. The Semiliki had been discovered, and its lower course followed in 1884 by Emin Pasha. Thus at length the riddle of the Nile was read, though much was still to do in the matter of scientific survey, and in the exploration of the valley of the Sobat (q.v.). The Kagera had been partly explored by Stanley (1875), by whom it was called the Alexandra Nile, and between 1891-98 its various branches were traced by the German travellers Oscar Baumann, Richard Kandt and Ferdinand Kühne. In 1890-91 H. G. Thompson navigated the same river in the wake of a Frenchman.

A British officer, Colonel C. Delmé-Radcliffe, made a detailed survey of the Kagera from 30° E. to its mouth. The Kioga system was surveyed in 1907-1908 by Lieut. C. E. Fishbourne. A trigonometrical survey of the upper river was begun by Colonel M. G. Talbot, director of Sudan surveys, in 1906, and other surveys were made by Captains H. G. Lyons, director-general of the Egyptian survey department. A fish-survey of the waters of the Nile was also undertaken.

The Removal of Sudd.—As already stated, the sudd above the Sobat confluence seems to have stopped the Roman centurions sent by the emperor Nero to explore the Nile. When the river above the Sobat was again reached by white men (1840) the stream was clear of sudd, and so continued until 1863-64, when both the Bahr-el-Jebel and the Bahr-el-Zeral became blocked by floating masses of vegetation. When Baker proceeded to Gondokoro in 1870 he thus described the increase that neglect had caused in the obstruction: "The immense number of floating islands that were constantly passing down the stream of the White Nile had no exit; thus they were sucked under the original obstruction by the force of the stream, which passed through some mysterious channel, until the subterranean passage became choked with a wondrous accumulation of vegetable matter. The entire river became a marsh, through which, by the great pressure of water, the stream was sent through immeasurable small channels. In fact, the White Nile had disappeared." Baker, who had to cut through 50 m. of sudd in his passage to Gondokoro, urged to Khedive

1 Baker and his wife had in 1861-62 explored the Atbara (its upper waters) and other eastern tributaries of the Nile.

2 In the map issued in 1875 to illustrate Schenewerk's "The Heart of Africa, Victoria Nyanza is shown as five small lakes.
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Ismaïl to reopen the Nile. This work was efficiently done by Ismaïl Ayoub Pasha, and the White Nile was clear for large vessels when Gordon reached Khartum in 1874. The river did not long remain free. The capture of Assuan by the French in 1879 gave them access from the south on account of sud. It was cleared in 1879-1880 by officials in the Egyptian service, but had again accumulated in 1884. In consequence of the Mahdist movement nothing could then be done on the river, and work on the canal was in hand again until 1899, when, by direction of Sir William Garstin, the Egyptian inspector-general of irrigation, an expedition under Major Malcolm Peake reached the site of the dam on which the Naharain from the Bahr-el-Ghazal confluence almost to Gondokoro. During 1900 a channel was cut through the northern and heaviest portion of the sud. It was one of much difficulty, some of the blocks being 11 feet thick and floated out on barges. To remove the obstruction the surface was first burnt; then trenches were cut dividing the sud into blocks 10 ft. square, and these were floated out on barges and towed by gunboats working from below. For a distance of 17½ m. of Shambe (i.e. about midway between the Ghazal confluence and Gondokoro) the true bed of the river could not, in many places, be found, but Major Peake forced a passage to Gondokoro through a spill channel or series of shallow lakes lying west of the main stream. In 1901 Lieut. Drury, a British naval officer, removed many of the remaining blocks of sud, opening a navigation a further 147 m. of the river. Thereafter, the Sudan waterway was cleared of weeds and silt, so that the channel was continually open, and the removal of the sud "undoubtedly checked the fall in the river levels which would otherwise have taken place."

Political Relations.—Explored in part by Egyptian government expeditions, the upper Nile as far south as Albert Nyanza became subject, between 1840 and 1882, to Egypt. Possession of the greater part of the river above Wadi Halfa then fell to the followers of the Mahdi. In 1890-98 an Anglo-Egyptian army reconquered the country, and from Victoria Nyanza to the Mediterranean the main river came under British or Egyptian administration. The west bank of the Bahr-el-Jebel, as far north as 9° 30′ N., was in 1894 taken on by the British. In reply to the Egyptian attack at the mouth of the Nile by the French, Sir William Garstin was despatched by the government of Egypt to clear the removal of the sud. The effect of the sud-cutting operations on the supply of water available for irrigation purposes in the lower river was apparently very slight. Sir William Garstin, in his report, speaks of the removal of the sud "undoubtedly checked the fall in the river levels which would otherwise have taken place."

Authoritative.—For the story of exploration see the works of Bruce, Speke, Grant, Baker and other travellers (whose books are mentioned in the bibliographical notices). Their achievements, and those of ancient and medieval explorers, are ably summarized in The Story of Africa, vols. ii. and iii., by Dr Robert Brown (London, 1833-1891), and The Nile Quest, by Sir Harry Johnston (London, 1903). See also J. Partsch, Das Arabists Buch: "Uber das Studium des Ostens" (1915); the works of Capitn Nili, by Richard Kandl (Berlin, 1904). Latest additions to geographical knowledge are recorded in the Geographical Journal (London, 1895-1910). The results of the great Egyptian explorations and the Nile fauna and geology and climate see: The Physiography of the River Nile and its Basin, by Captain H. G. Lyons, director-general, survey department, Egypt (Cairo, 1906), an authoritative work, and numerous other publications of the Survey and Public Works Departments. "Notes on the History of the Nile and its Valley," by W. F. Hume, in Geog. Jnl. (Jan. 1906); Egyptian Irrigation (2nd ed., London, 1899) and the Nile Reservoir Dam at Assuan and After (London, 1901), both by Sir William Wulfscocks; the Annual Reports (1899 and after) of the Egyptian Public Works Department, by Sir William Garstin and others, and those on Egypt and the Sudan by Lord Cromer and Sir Eldon Gorst (London; official publications); the Blue Book Egypt No. 2, 1904, which is a report by Sir William Garstin on the basin of the upper Nile, dealing at length with the lake area, the Nile affluents and the main river as far south as Khartum, from which the Nile basin was divided both topographically and climatically. W. Garstin and Captain Lyons give full bibliographical notices. The study of the zoology of the Nile valley was the special object of a Swedish scientific expedition in 1901, under the direction of Professor Nordenfalk, published as The Zoology of the Nile, pt. iii., appearing in 1909. For the botanical and other aspects of the Nile valley, see the works of Petherick, Hegelius, Schweinfurth, Junginger, and Heim. The Nile basin as studied by the Survey Department, Cairo, in 1898. It is in six sheets on a scale of 1:2,500,000, with inset maps showing political divisions, distribution of rainfall and of vegetation. (F. R. C.)

NILE, BATTLE OF THE.

This was fought between the British and French fleets on the 1st of August 1795 in the headwaters of the Nile. The peace of Campo Formio, signed on the 17th of October 1797, had left France without an opponent in arms on the continent. War with Great Britain still continued, and for a time the Directory appeared to be intent on its schemes for an invasion of Ireland. Napoleon, fresh from his Italian victories, was appointed to command, and he made a round of inspection of Brest and the Channel ports. But all this show of activity was designed to cover the preparations for an attack on Great Britain "from behind"—in India and by way of Egypt. The French naval forces at Toulon were got ready slowly in spite of Napoleon's urging and with the defects inevitable in the impoverished state of the arsenal. Thirty-six thousand soldiers, including the best of the army of Italy, were to be embarked from the southern French ports and from the9

From the British point of view it appeared quite certain that a great offensive movement was about to be made by the French reached both Earl St Vincent, the commander-in-chief of the Mediterranean fleet, and the British government. Since Spain had entered into alliances with France in 1796, the British fleet had not cruised in the Mediterranean but had been occupied in blocking the Spanish ships at Cadiz. On the 2nd of May 1798 St Vincent detached Nelson, then the junior rear-admiral, with his flag into the Mediterranean, with three sail of the line and frigates to make a reconnaissance at Toulon. On the 17th of May a small French corvette was captured near Cape St. Vincent, and from the crew Nelson learnt that the French were still in the harbour. He could gain no information as to the aim of the armament. Napoleon enforced strict secrecy by not letting even the most important officers of the dockyard know whither he was bound. On the 2nd of May the British government had written to St Vincent stating their wish that a part of his fleet should be sent into the Mediterranean. The first lord of the admiralty, Lord Spencer, told him that he might either go himself or send a subordinate. If the latter course was followed Nelson was indicated as the officer to be chosen. Reinforcements were sent to him to enable him to provide both for the rendezvous in the Mediterranean and for the blockade of Cadiz. St Vincent had already selected Nelson, and when the reinforcements arrived he despatched Captain Troubridge with the inshore squadron engaged in watching Cadiz—"the choice fellows," as he described them, of his fleet—to join Nelson at Toulon. The ships were replaced by others similarly painted, so that the Spaniards might see no difference and therefore be unable to send news to their ally. Troubridge left on the 24th of May with as many vessels as would bring Nelson's whole command up to thirteen 7's and a frigate ship.

While these measures were being taken to intercept him, Nelson had put to sea on the 9th of May with fifteen sail of the line, twelve frigates and some two hundred transports. He sailed down the eastern side of Corsica and Sardinia to pick up the detachments which were to join him from the first-named island and from Civita Vecchia. On the evening of the 20th a gale from the N.W. brought some confusion on his flock of ships, but as he continued his course at S.W. His flagship the "Vanguard" (74) was dismasted and compelled to anchor at San Pietro to reft. His frigates were separated from him by the weather, and the captains made for Gibraltar, concluding that the admiral would go there to reft. The departure of his frigates left Nelson without vessels for scouting and had a material influence on the campaign. The "Vanguard" was made ready by the 27th of May, and resumed her station off Toulon. On the 7th of June Nelson was joined by Troubridge. Calms hampered his pursuit of the French, whom he now knew to be at sea, but on the 14th he was off Civita Vecchia; on the 17th he was at Naples, where he heard that the French had been seen going south, and made arrangements to obtain water and stores without going on shore. On the 20th he was at Messina, where he first got definite information of the movements of the enemy. The French had appeared off Malta on the 9th and had occupied the island, which was surrendered to them on the 17th by the treachery of the French and Italian members of the order. Pushing on in the hope of finding them on the coast of the island, Nelson was off Cape Passaro on the 22nd, and learnt that the French had sailed from the island. His instructions directed him to guard against possible French attacks on Sicily, or even an attempt to pass the Straits of Gibraltar and sail for Ireland.
NILE, BATTLE OF THE

But Nelson knew that the Neapolitan government had no fears for Sicily and that the westerly winds would prevent the French from going to Gibraltar. On a view of all the circumstances, and after consultation with those of his captains in whose judgment he had the most confidence, he came to the just conclusion that they were bound for Egypt. He therefore sailed for Alexandria on the most direct route eastward along the coast of Africa. The information given him at Cape Passaro was that the French had left Malta on the 16th; the actual date was the 19th. Napoleon, whose frigates had sighted the British squadron, and who knew that he might be pursued, did not take the direct route, but steered toward the north-east along the shore of Crete. Thus it happened that on the night of the 22nd of June the fleet crossed another’s tracks. Want of look-out vessels prevented Nelson from detecting the neighbourhood of his enemy. The French with their convoy going more slowly on the longer route to the north, and the active British squadron on the direct route to the south, both headed for Egypt, with barely 60 m. of sea between them, but neither aware of the position of the other.

On the 28th of June Nelson reached Alexandria to find the port occupied by a few Turkish ships. It was from Nelson that the Turkish authorities gained their first knowledge of the impending invasion. Nelson, misled by the false date given him at Cape Passaro, and being unable to reconnoitre the position of the enemy, came to the erroneous conclusion that he was mistaken in supposing that the French were on the way to Egypt, and that they must be bound for some other part of the eastern Mediterranean. On the 29th of June he sailed from Alexandria, standing to the north-east. His topsails were still in sight to the north-east when the French appeared coming from the north-west. They sighted the coast on the 29th to the west of Alexandria, and on the 1st of July they occupied the anchorage and town. While Nelson was ranging along the coast of Asia Minor, seeking for news of them and finding none, on his way back to Sicily, the French were landing their army. The British squadron reached Syracuse on the 19th of July. Here Nelson was able to obtain water and stores and clear indications that the French had gone to Egypt. On the 24th he sailed, and on the 1st of August was again off Alexandria. The battle of the Pyramids had been fought on the 21st, and Napoleon was master of Egypt. The news of the British admiral was that the French fleet had left the coast in the interval of his absence. Brueys, the French admiral, had had a choice of three courses open to him—to enter the old harbour of Alexandria, to sail for Corfu then occupied by the French or to take a strong anchorage on the coast and prepare to repel attack. To enter the harbour was difficult for large ships, and to leave it by its one narrow entrance in the presence of even an inferior force would have been impossible. Brueys therefore decided against that course. He did not sail for Corfu, partly because some of the army stores were still in his ships and partly because his squadron, ill fitted from the first, was short of provisions, and no more could as yet be obtained from the shore. He therefore stationed himself with thirteen of his ships of the line in the roadstead of Aboukir, some 15 m. north-east of Alexandria, between the island of Aboukir and the Rosetta mouth of the Nile. Here he was found on the evening of the 1st of August when the British fleet came in sight. The French line of thirteen ships was anchored to the east of Aboukir, now called Nelson’s Island, in a curve stretching to the south-east. It consisted of the “Guerrier” (74), the “Conquérant” (74), the “Spartiate” (74), the “Aquilon” (74), “Souverain Peuple” (74), “Franklin” (80), “Ombre” (80), Admiral Brueys’s flagship “Tonnant” (80), “Heureux” (74), “Timoléon” (74), “Guillaume Tell” (80), “Mercure” (74) and “Généreux” (74), counting from the west end. The French ships had begun the voyage short-handed and many men were absent on shore filling the water-casks. They fought with a half to two-thirds of their complements, which suffered from the bad training and inexperience of the French republican navy. A council of flag officers and captains was being held in the “Orient” when the British squadron appeared.

When the enemy was sighted Nelson at once gave the order to attack. All the possibilities of battle had been fully discussed between him and his captains. Much controversy of a rather idle character has taken place as to assigning the credit for the actual course adopted; it was almost dictated to men so experienced and capable as the British captains and their admiral by the position of the enemy. If the French had been anchored so near the shore that it was not possible to pass between them and it, the British ships, coming from the west with a westerly wind, would have passed outside of them, endeavouring to anchor one on the bow and the next on the quarter of each French ship. Thus they might have been crushed before the ships in the rear and to leeward were driven ashore. As it was, the French were so placed that there was room for the British ships to pass between them and the land. Therefore it was possible for the first comers of the British squadron to pass inside the French ships, to anchor there, and to allow the next comers to anchor outside so as to put the enemy’s van between two fires. This dispositions was not without its drawbacks, for it entailed the risk that the British ships might fire into one another while directing their guns on an object between them. The result was, the nearer the French the battle began sundown and was continued in the dark. Yet it had the advantage that it produced an intense concentration of fire. In the circumstances it had the peculiar advantage, of which, however, the British captains may not have been aware, that as the French were very short-handed they were unable to work both broadsides to the full. It is to this fact that we must attribute the comparatively small loss suffered by the British ships in an attack which, if made against a well-appointed enemy, must have been extremely costly. Whether by previous arrangement with Nelson, or because he acted on the facts before him, the first British captain to come into action, Captain Foley of the “Goliath” (74), had passed inside the French, and anchored abreast of the second of them, the “Conquérant.” The “Zealous” (74), under Captain Hood, anchored on the bow of the first Frenchman, the “Guerrier.” The “Audacious” (74), under Captain Davidge Gould, anchored between the “Zealous” and “Goliath.” The “Theseus” (74), under Captain Miller, anchored inside of the third French ship, the “Spartiate.” The “Orion” (74), under Captain Saumarez, anchored abreast of the fifth French vessel, the “Souverain Peuple.” Then Nelson, in his flagship the “Vanguard” (74), the sixth British ship to come into action, anchored on the outside of the French line abreast of the “Spartiate” already engaged with the “Theseus.” The “Minotaur” (74), under Captain Thomas Louis, and the “Defence” (74), under Captain Peyton, anchored next to the “Vanguard” and opposite the fourth French ship, the “Aquilon,” and the “Souverain Peuple,” already engaged with the “Orion.” Thus eight British 74’s which had only to fight one broadside at a time were thrown on five undermanned French 74’s, which had to fight both and were speedily crushed. One British vessel, the “Culloden” (74), under Captain Troubridge, grounded on the shoal at Aboukir, and could not get into action. She served as a beacon to the vessels coming behind her. As the French van was silenced, and the fresh vessels came up from the British rear, the attack was carried down the French line. About 9.30 P.M. the “Orient” was seen to be in flames, and at 10 P.M. she blew up. The explosion imposed a brief suspension of battle, but the fire was soon renewed. By midnight the battle was over. In the course of the next day the “Guillaume Tell,” the “Généreux” and two frigates succeeded in escaping, but they were the only survivors of the fleet attacked in the roadstead of Aboukir.

The destruction of the French fleet, which isolated Napoleon in Egypt, had profound political influence in Europe. The total loss of the British squadron was 218 killed and 678 wounded. The loss of the French was never exactly ascertained, but it was certainly very much greater. Admiral Brueys was killed on the quarter-deck of his flagship, and Nelson received a wound in the head from a landridge shot which disabled him.

NILES—NIMES

NILES, a city of Trumbull county, Ohio, U.S.A., on the Mahoning river, at the mouth of the Meander and Mosquito creeks, about 55 m. E.S.E. of Cleveland. Pop. (1890) 4289; (1900) 7488 (2104 foreign-born); (1910) 8361. It is served by the Baltimore & Ohio, the Erie and the Pennsylvania railways, and by an interurban electric system. Coal and iron-ore are abundant in the vicinity, and the city's principal manufactures are sheet steel, sheet iron, tin, metal lath, boilers and railway cars.

The municipality owns and operates its waterworks and electric-lighting plant. It is situated in the meandering valley of the south-east Wyan, and again, in 1895, it was named (1834) in honour of Hezekiah Niles (1777-1839), the founder and editor of the weekly Niles's Register (1811-1849).

NIGLAI, or NVLYGHAU ("blue bull"), the largest antelope (Boselaphus tragocamelus) found in India, where it represents the kudu and eland group of Agrica. Only the bulls have horns, and these are short and insignificant. The general colour of the old bulls is bluish grey, but younger bulls and cows are browner. The nilgai is about the size of a mule (see Antelope).

NIGLIRIS, THE, or NEILGHERRYS (Blue Mountains), a range of hills in southern India, which gives its name to a district of the Madras Presidency. The Nilgiris are really a plateau rather than a range, rising abruptly from the plains on most sides, with a general elevation of about 6500 ft. above the sea.

The District of the Nilgiris is the smallest administrative district in Madras. It formerly consisted exclusively of a mountain plateau lying at an average elevation of 6500 ft., with an area of about 725 sq. m. In 1873 this was increased by the addition of the Chittar valley in the Satpura range, and again, in 1877, by other portions of the Wynaad, making a total area of 985 sq. m.

The administrative headquarters is at Ootacamund, which is also the summer capital of the government of Madras. The summit of the Nilgiri hills is an undulating plateau, frequently breaking into lofty ridges and steep rocky eminences. The descent to the plains is sudden and abrupt, the average fall from the crest to the general level below being about 6000 ft., save on the north, where the base of the mountains rests upon the elevated land of Wynaad and Mysore, standing between 2000 and 3000 ft. above sea-level. The Ochterlony valley and Wynaad country consist of a series of broken valleys, once forest-clad throughout, but now studded with tea and coffee-gardens.

The highest mountain peaks are—Dodabetta, 8760 ft.; Kudialkad, 8502; Bebovillatteen, 8488; Makurti, 8402; Davarsolobetta, 8380; Kunda, 8353; Kundamogg, 7816; Ootacamund, 7361; Tambrabetta, 7292; Hokabetta, 7267. There are six well-known passes or ghats by which the district communicates with the neighbouring plains, three of which are practicable to wheeled traffic. The chief rivers are the Moyar, Paikara and Calicut, none of which are navigable. The forests consist of fine timber trees, such as dsf (Shorea robusta), kina (Pterocarpus Marsupium), jack (Artocarpus integrifolia), blackwood (Dalbergia latifolia) and teak. Eucalyptus and Australian wattle have been extensively planted in the higher grounds of the Wynaad. The hills were first explored by British officers in 1814, and in 1821 the first English house was built on the plateau. The hill tribes include the Todas, the Badagas, the Kotas, the Kurumbas and the Irulas (q.v.). The total population of the district in 1901 was 1111,437, showing an increase of 11.7% in the decade. The commercially important products are coffee, tea and chincha. Coffee cultivation was introduced about 1841. One of its chief seats is the Ochterlony valley. The Madras government commenced the experimental cultivation of Chincha on the Nilgiris in 1860, and several private chincha gardens were laid out, owing to the success of the government experiment. The climate of the Nilgiri hills is almost unrivalled for equability of temperature. The average is 58° F. The approach from the plains is by the branch of the Madras railway from Podanur to Mettapollem, whence a metre-gauge line on the rack principle has been constructed to Coonoor, with an extension to Ootacamund. The chief educational institution is the Lawrence Asylum at Ootacamund maintained by government. The military quarters are at Wellington.

See Nilgiris District Gazetteer (Madras,1908).

NILSSON, CHRISTINE (1843- ), Swedish singer, was born at Wedelsbro, near Wexiö, Sweden, on the 20th of August 1843. Her father was a poor working man, and she used as a girl to sing and perform on the violin at popular gatherings. In 1857 a wealthy man, M. Tornérhjelm, perceiving the unusual beauty of her voice while she was performing at a fair in Ljungby, gave her a home and gave her a proper musical education, and in 1860 she was heard in the concert halls in Stockholm and Upsala, and then went to Paris, where, after four years' study, she made her début in the rôle of Violetta at the Théâtre Lyrique on the 27th of October 1864. Between that date and 1872, when she married M. Auguste Rouzaud, she was the leading prima donna. Her first appearance in London was in 1867. A year later, on the 9th of March, she made her first appearance in the Paris Opera House as Ophélie in Hamlet; and she visited the United States in 1870. She sang in St Petersburg in 1872; to Amsterdam in 1873-1874 and in 1882; in Germany and Austria between 1870 and 1877; and in the next few years in Spain and Scandinavia; but after her marriage her appearances in public were rare. M. Rouzaud died in 1882, and five years afterwards Madame Nilsson married Count A. de Casa Miranda, and finally retired from the stage.

NIMAR, a district of British India, in the Nerbudda division of the Central Provinces. The administrative headquarters are at Khandwa; but the capital in Mahomedian times was Burhanpur. Area, 4273 sq. m. Pop. (1901) 329,615, showing an increase of 14.7% in the decade. The district consists of two portions of the Nerbudda and Tapti valleys, separated by a section of the Satpura range, about 15 m. in breadth. On the highest peak, about 850 ft. above the plain and 1800 above sea-level, stands the fortress of Asirgarh, commanding a pass which has for centuries been the chief highway between Upper India and the Deccan. The district contains extensive forests, but the only tract reserved by government is the Punsar forest, which extends for about 120 m. along the south bank of the Nerbudda, and contains young teak, besides sđj (Terminalia tomentosa) and anjan (Hardwickia binata). The staple crops are cotton and indi; gajah or Indian hemp, is also allowed to be grown under government supervision. The Great Indian Peninsula railway runs through the district, and a branch of the Rajputana line from Indore joins it at Khandwa. There are factories for ginning and pressing cotton at Khandwa, and manufacture of gold-embroidered cloth at Burhanpur.

The name Nimar, derived from that of the ancient province, is also applied to a district in the state of Indore, lying W. of the British district on both banks of the Nerbudda. Area, 3871 sq. m.; pop. (1901) 257,110. From 1823 onwards this tract, then belonging to Sindia, was under British management; in 1861 it was ceded in full sovereignty to the British, but in 1867 it passed to Holkar as the result of an exchange of territory.

See Nimar District Gazetteer (Allahabad, 1908).

NIMES, a city of southern France, capital of the department of Gard, 174 m. S. by W. of Lyons on the Paris-Lyon railway, between Avignon and Montpellier. Pop. (1906) 70,708. Nimes, important alike for its industries and for its archaeological treasures, lies at the foot of the Garrigues, a range of stony and barren hills which limit it on the north and west. The most prominent of these is the Mont Cavalier, the summit of which is crowned by the Tour Magne, a ruined Roman tower commanding a fine view of the town and its surroundings. To the south and east the town overlooks the monotonous plain traversed by the Viste, and for the most part given over to the cultivation of the vine. Nimes covers a large area, owing to the fact that its population is housed in low buildings, not in the lofty tenements which are found in most of the industrial towns of France. The central and oldest part is circled by shady boulevards, which occupy the site of the old fortifications. Here are to be found the majority of the Roman remains for which Nimes is remarkable. The most celebrated is the amphitheatre, the best preserved...
though not the largest in France. It dates from the 1st or 2nd century A.D., and was used as a fortress for some time during succeeding centuries. Occupied during the middle ages by a special quarter, with even a church of its own, it was cleared in 1800, and since then has been well kept in repair. It is built of large stones fitted together without mortar. In form it is elliptical, measuring approximately 440 by 336 ft. externally; the arena is 227 by 126 ft. The elevation (70 ft. in all) consists of a ground story of 60 arches, an upper story of 60 arches and an attic with arcades pierced with holes for supporting the telarium or awning. The building, which was capable of holding nearly 24,000 spectators, Nimes must have been one of the finest of its kind. Of the arches 96 are at each of the cardinal points; and 124 doorways gave exit from the 35 tiers of the amphitheatre to the inner galleries. Originally designed for gladiatorial shows, naval spectacles, chariot races, wolf or boar hunts, the arena has in recent times been used for bull-fights. The celebrated Maison Carrée, a temple in the style of the Parthenon, but on a smaller scale, 82 ft. long by 40 wide, is one of the finest monuments of the Roman period, and according to an inscription is dedicated to Gaulus and Lucius Caesar, adopted sons of Augustus, and dates from the beginning of the 1st century A.D. It contains a collection of antique sculptures and coins. The so-called temple of Diana, which adjoins the Fountain Gardens, was probably a building connected with the neighbouring haths of which remains are visible. Two Roman gates, the Porte d'Auguste, consisting of two large archways flanked by two smaller ones and dating from A.D. 16, and the Porte de France are still preserved. The Tour Magne (Turris Magna) is still 92 ft. in height, and was formerly a third higher. Admittedly the oldest monument of Nimes, it has been variously regarded as an old signal tower, a treasure house or a mausoleum. Attached to the ramparts erected by Augustus, and turned into a fortress in the middle ages by the counts of Toulouse, the Tour Magne was restored about 1840. Near the Tour Magne has been discovered the reservoir from which the water conveyed by the Pont du Gard (see AQUEDUCT) was distributed throughout the city.

When it still possessed its capital, the temple of Augustus, the basilica of Plotina erected under Hadrian, the temple of Apollo, the baths, the theatre, the circus, constructed in the reign of Nero, the Campus Martius and the fortifications built by Augustus, Nimes must have been one of the handsomest of the Roman cities of Gaul. The cathedral (St Castor), occupying, it is believed, the site of the temple of Augustus, is partly Romanesque and partly Gothic in style. The church of St Paul, a modern Romanesque building, is adorned with frescoes by Hippolyte and Paul Flandrin; St Baudile (modern Gothic) is of note for the two stone spires which adorn its façade; and the court-house has a fine Corinthian colonnade and a pediment. Other buildings of note are the old citadel (dating from 1687, and now used as a central prison), and the former lycée, which contains the public library and the museums of epigraphy, of archaeological models of the Roman and Romanesque periods, and of natural history. The town also has a collection of paintings. The esplanade in front of the court-house has in the centre a handsome fountain with five marble statues by James Pradier. The Fountain Gardens, in the north-west of the town, owe their peculiar character as well as their name to a spring of water which after heavy rains is copious enough not only to fill the ornamental basins (constructed in the 18th century with balustrades and statues on ancient foundations) but also to form a considerable stream. Neither the spring, however, nor the Vistre into which it discharges, is sufficient for the wants of the city, and water has consequently been brought from the Rhone, a distance of 17 m. A beautiful avenue, the Boulevard de la République, runs south for nearly 1 m. from the middle walk of the garden. Nimes has erected monuments to the "Children of Garden" (by A. Mercié), to Alphonse Daudet and to the Provençal poet Jean Reboul, natives of the town.

The city is the seat of a bishop, a prefect, a court of appeal and a court of assizes, and has tribunals of first instance and of commerce, a board of trade-arbitrators, an exchange, a chamber of commerce and a branch of the Bank of France. Its educational establishments include lycées and training colleges for both sexes, and schools of music and art. At the close of the middle ages the industries of Nimes were raised to a state of great prosperity by a colony from Lombardy and Tuscany; and, though the plague, the Wars of Religion and the revocation of the edict of Nantes were all sufficiently disastrous in their effects, before the Revolution about half of the whole community, or from 10,000 to 12,000 persons, had come to be engaged in manufactures, chiefly that of silk. Upholstery materials, shawls, carpets, handkerchiefs, tapes and brocades, brandies and armagnacs, leather, hand-woven materials, machine and boots are now manufactured, and there are a number of foundries. Nimes is, besides, one of the great southern markets for wine and brandy, and there is a good trade in grain, groceries and colonial wares. Quarries of hard limestone, used as the material for the amphitheatre and other buildings by the Romans, are still worked in the vicinity.

Nîmes, the ancient Nemausus, derived its name from the sacred wood in which the Volcae Arecomici (who of their own accord surrendered to the Romans in 121 B.C.) were wont to hold their assemblies. Strabo states that it was the metropolis of a district containing twenty-four dependent towns, and that it was independent of the proconsuls of Gallia Narbonensis. Constituted a colony of veterans by Augustus, and endowed with numerous privileges, it built a temple and struck a medal in honour of its founder. The medal, which afterwards furnished the type for the coat of arms granted to the town by Francis I., bears on one side the heads of Caesar Augustus and Vipsanius Agrippa (the former crowned with laurel), while on the other there is a crocodile chained to a palm-tree, with the legend Col. Nemausus. The statue of Agrippa who built the public baths at Nîmes, the temple of Diana and the aqueduct of the Pont du Gard. The city-walls, erected by Augustus, were nearly 4 m. in circuit, 30 ft. high and 10 ft. broad, flanked by ninety towers and pierced by ten gates. Hadrian on his way back from Britain erected at Nîmes two memorial trophies of his benefactress Plotina. In the very height of its prosperity the city was ravaged by the Vandals; the Visigoths followed, and turned the amphitheatre into a stronghold, which at a later date was set on fire along with the gates of the city when Charles Martel drove out the Saracens. Nîmes was again pillaged by the Franks under the protection of Pippin the Short; and in 1185 it passed to the counts of Toulouse, who restored its prosperity and enclosed it with ramparts whose enceinte, less extensive than that of Augustus, may still be traced in the boulevards of the present day. The city took part in the crusade against the Albigenses in 1207. Under Louis VIII. it received a royal garrison into its amphitheatre; under Louis XI. it was captured by the duke of Burgundy, and in 1420 was recovered by the dauphin (Charles VII.). On a visit to Nîmes Francis I. enriched it with a university and a school of arts. By 1538 about three-fourths of the inhabitants had become Protestants; and in 1567 a massacre of Catholics took place on St Michael's day. From the accession of Henry IV. till the revocation of the edict of Nantes (1685) the Protestant community devoted itself to active industry; but after that disastrous event great numbers went into exile or joined the Camisards. Louis XIV. built a fortress (1687) to keep in check the disturbances caused by the rival religious parties. Nîmes passed unharmed through the storms of the Revolution; but in 1815 Trestaillon and his bandit followers pillaged and burned and plundered and massacred the Bonapartists and Protestants. Since then the city has remained divided into two strongly marked factions—Catholics and Protestants—though with no repetition of such scenes.

See H. Bazin, Nîmes Gallo-Romain (Nîmes, 1801); L. Menard, Histoire civile, ecclesiasitique et littéraire de la ville de Nîmes; R. Peyre, Nîmes, Arles et Orange (Nîmes, 1903).

Nîmes, Councils of (Concilium Nemenense). Of the four councils held at Nîmes those of 886 and 1284 are relatively unimportant. The synod of 394 adopted seven canons on discipline, which were first printed in 1743 and have not as yet
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made their way into the great collections. At the council of July 1066 Pope Urban II. presided, and sixteen disciplinary canons were adopted, which have many points of contact with the canons of the council of Clermont.

See, for the first council of Nimes, Lauchert, pp. 183-185; for the others, Hardouin vi. 1. 397, vii. 2. 1744 ff., vii. 903 ff.; full titles under Council. (W. W. R. *)

NIMROD (*nimrod, *nimré; Septuagint, Νιμρόδ; various reading in Gen. x. 8, Νιμρόδ; Vulg. Nimrod). Nimrod is only mentioned in the two consecutive paragraphs of Gen. x. 8-12, and the words מָרָד "the land of Nimrod," and 1 Chron. i. 10 quotes a portion of the third, the most important reference, Gen. x. 8-12. The last-named is ascribed to one of the oldest writers of the Pentateuch, the Yahwist; but not perhaps to the oldest stratum of his work (Ball, Sacred Books of the Old Testament). In Gen. x. 8, as Jabal was the inventor of music, so Nimrod was the first warrior, gibbor, the first hunter, "he became a mighty hunter, gibbor qayidh, before Yahweh, so that it is said, A mighty hunter before Yahweh like Nimrod," the first builder of cities and ruler of a widespread domain, "the beginning of his kingdom was Babel, Erec, Accad and Calneh in the land of Shinar. Out of that land he went forth into Assyria," and built Nineveh, Rehoboth-ir, Calah and Resen between Nineveh and Calah (the same is the great city)." The general statement that Assyria was originally an offshoot and dependence of Babylon is substantially in accordance with Assyrian and Babylonian authorities. As the chapter stands, Nimrod is a descendant of Ham, cf. verses 6 and 8; but as Babylon and Assyria were Semitic, cf. verses 21, 22, and as verses 6, 7, on the one hand, and verses 8-12, on the other, come from different documents, we must distinguish at least two consecutive paragraphs, and regard the "Cush" of verse 8 as the Babylonian Cush or Cassites, a people quite distinct from the Cush of verse 6, which is Ethiopia; the text and interpretation of portions of Gen. x. 8-12 are doubtful. The "mighty hunter before Yahweh" has been variously explained as "a divinely great hunter" (Surrell); "a hunter in defiance of Yahweh" (Holzinger); "a hunter with the help of Yahweh" or "of some deity whose name has been replaced by Yahweh," (Gunkel, Genesis, p. 82).

The name Nimrod has not been found in any ancient (say older than 2000 B.C.) non-Israelite document or inscription; and there is not convincing evidence for identifying Nimrod with any of the names found in such documents. In the absence of evidence, the theories are naturally endless, especially as both the legendary and the historical heroes of the ancient East were often "mighty hunters." Nimrod would suggest a Jew or Syrian the idea of "rebels," "mr=rebels;" but this is not likely to be the etymology. By regarding the "N" as performative, Nimrod has been identified with Merodach, the god of Babylon (Pinches, Hastings's Bible Dict). He has also been identified with Gilgamesh, the hero of the epic which contains the Babylonian Deluge story (Jergas, Das A.T., im Licht des alten Orients), with various historical kings of Babylon, with Orion, &c., &c. As the name Nmrd (Petrie, Nemarti) frequently occurs in Egyptian documents of the XXIInd Dynasty, c. 2037-2000 (Petrie, Hist. of Egypt, ii. 242, &c.), the story of Nimrod is sometimes (E. Meyer ap. Holzinger, Genesis) conjectured to be of Egyptian origin. Some support might be obtained for this view by supposing Cush in verse 8 to be Ethiopia as in verse 6; but it seems impossible to reconcile it with the statements in Genesis and Micah which connect Nimrod with Babylon and Assyria. It is possible that the Nebrod of the Septuagint (similarly Philo and Josephus) is the more ancient form of the name (Cheyne, Encyl. Bibl.).


It is possible that Enoch (Ency. Bibl. article "Nimrod") is generally regarded as far too sweeping. Ball, Sacred Books of the Old Testament, marks verse 9, which describes Nimrod as "a mighty hunter," as a later addition, giving a mistaken explanation of the gibbor of verse 8.

Many later legends gathered round Nimrod; Philo, De gigantibus, § 15, alleges more suo. Nimrod stands for treachery or desertion, according to the derivation from mrd mentioned above. According to Josephus, Ant. l iv. 2, Nimrod built the city of Babel. According to the Rabbis (Tzemah u Reenah, Hershon's tr., p. 59), Nimrod cast Abraham into the fire because he refused to worship idolatry; God, however, delivered him. Nimrod, in the form Nimrod=Nimroud, is an element in many modern place-names in western Asia. (W. H. BE.)

NINE MEN'S MORRIS, known also as Morelles and Merelles, an ancient English game played with 9 counters a side on a board marked with four squares, one within the other. The middle points of the three inside squares are connected by straight lines, and, in a variation of the game, the corners also. The players, whose counters are of different colours, place these alternately one by one upon the intersections of the lines, the object of each being to get three of his own men in line, in which case he may have the power of knocking or, if remaining from the board, any one of his opponent's men, although he may not take one of a row of three, unless there are no others. When all 18 counters have been placed on the board they are moved to adjacent unoccupied intersections. When all but three of a player's men have been captured he is allowed to jump or hop to any vacant point he chooses. As soon as a player is reduced to two men he loses.

In the time of Shakespeare (Midsummer Night's Dream, Act 11, Scene 1) the game was commonly played out of doors.

NINEVEH (Heb. נינֵה; in classical authors Nínus, Ninus; I.XX. Nínus, Nínue: Assyrian Nin or Ninda), the best known and most famous of the renowned cities of the Assyrian empire. There was a quarter or suburb of the old Babylonian city of Lagash whose name was written in the same way; this may possibly have been the home of those settlers from Babylonia who gave its name to the Assyrian city. The name was carried elsewhere, probably by Assyrian settlers, and we meet with Ninec in Asia Minor (Th. Ndrdeke, Hermes, v. 464, n. 2). Philiostorus calls a Hierapolis, ἑρατίας Nínus but it must not be confounded with the Egyptian Nī-γ, Assur-bani-pal Nī, the frontier city to the east of Egypt's greatest extension, where Tethmosis (Thothmes) III. hunted elephants, probably situated on the Euphrates. This, or an adjacent town, may be the origin of Ctesias's statement (απ. Diol. ii. 3) that Nineved stood on the Euphrates, the Arabic geographer Yaqut places a Nineved on the lower Euphrates near Babylon, and this may be a colony from the great Nineved, or possibly the Ninā of Lagash.

The derivation of the name is uncertain. The name Ninā was borne also by the goddess Ishtar, whose worship was the special cult of Nineved, and Ninā may well be a hypocoristicon of Ninā. The ideogram for Nineved, as also for the Lagash city, 𒈦𒈦, is a fish enclosed in the sign for house, possibly indicating a fish pond, sacred to Ishtar. As the Semitic.nim means a fish, a play upon nānā and Nīnā is suggested, but the name is not Semitic. A derivation from the root "u with a meaning like "lowland" is doubtful, unless we are sure that the name is Semitic, and that the Lagash city also lay low.

Nineved was situated at the N.W. angle of an irregular trapezoid of land which lay between the rivers Husur (Khausar, Choser) on the N.W., Gomāl on the N.E. and E., Upper Zāb on the S.E. and S. and Tigris on the S. and W. In extent this plain is 25 m. by 15 m., and contains the ruins of Nineved at Kuyunjik and Nehi Yānūs, of Dur Sargon at Khorsabad to the N.E. of Calah at Nimrood to the S. as well as of other towns not yet identified. The whole plain has a gradual slope from the low range of Jebel Maqtab and the hill of Ain-es-safra on the N.E. to the Tigris on the S.W. This plain was, for those days, amply protected on three sides by the two rapid broad streams of the Tigris and its tributary Zāb, by the hills on the N.E. and the river Gomāl at their base. The weak N.W. side was partly covered by the Husur, an impassable flood in winter but easily fordable in summer. The floods caused by the Husur were frequent and destructive, on one occasion sweeping away the palace terrace at Nineved and exposing the tombs of the kings, on another isolating Khorsabad. A great series of dams was therefore constructed (mapped and described in Topography).
of Nineveh, "J.R.A.S. xiv. 318 ff.) which flooded the cliffs and filled the ditches and moats of Nineveh. One of these ditches can be traced over 2 m. with a breadth of 200 ft., and was lined with a rampart on the city side.

The city on the river side of the Tigris extended about 2½ m., its north wall measured 7000 ft., the eastern wall was nearly 3 m. long and the southern about 1000 ft. The city thus formed a long narrow strip along the Tigris, pierced at right angles by the Husur, the waters of which, by closing the great dam in the eastern wall, could be sent round the moats to the N. and S. The Tigris may have swept the western wall, though now a wide belt of sand has accumulated beyond the wall in the ruins and its plain, with channels partially shifting. The actual extent of the city may be reckoned at about 1800 acres, or about two-thirds the size of Rome within Aurelian's Wall. At the rate of 50 sq. yds. to a person, it would have held a population of 175,000; but the extent of the palaces, gardens, &c., forbid us to imagine any such multitude except as refugees during a siege. Outside this city proper lay wide outskirts (kāblu) which were divided into quarters each with a separate governor (šaknu). Further afield lay the Rēhit-Ninūa, in which some have recognized the Rebo-both-Ir of Gen. x. 11 (Ninūa is often replaced by Nābū, and Ninūa by Nābūkudur), a city of considerable extent to which extended and included the site of Khorsabad, before Sargon II built his city of Dūr-Sargon there. Across the Tigris, connected by a bridge, lay an extensive district, probably now replaced by Mōsul. As Esarhaddon entered Nineveh, on his triumphal return from Sidon, through Rēhit-Ninūa, it is probable that this name covered the western suburbs. The walled city formed a sort of Arcopolis, and it is difficult to say exactly how far the name of Nineveh should be extended. Few traces of private houses have been found within the walls, but as deeds of sale speak of houses in Nineveh, which were bound on three sides by other houses, there must have been continuous streets within the area denoted by that name. Great emphasis has been laid on the agreement of a tetrapolis, formed by Nineveh, Khorsabad, Calah and Keramis, with the dimensions given by Diodorus and with the phrase "an exceeding great city of three days' journey" (Jonah iii. 3). Admitting that this whole area was thickly inhabited and might be regarded by those at a distance as one city, and that the district may well have had a common name, which could hardly be Assur, there is yet no native evidence that Nineveh extended so far. Assyrians have just spoken of "returning the walls of each city as was strongly fortified towards the interior as on the outside. Each had its own šaknu, and the governor of Nineveh stands below the governors of Assur and Calah in official lists. In deeds of sale "the road to Calah" is as often named as the "king's highway" to Arbela or Assur.

The history of Nineveh is, of course, bound up with that of Assyria in general. Later Assyrian writers professed to carry back its foundation to the creation of the world, but we lack any historical evidence of its age or early history. We may conjecture that it was founded by settlers from Babylon in Ninī, and the statement that Ninid built it from Babylonias, along with Calah, Reboboth-Ir and Resen, shows that this opinion was early held. We are, however, still without evidence that this was its first occupation. The mention of Gudea's building a temple for Ishtar in Ninī (2800 B.C.) may refer to the Lagash city and an inscription of Dungi, king of Ur (2700 B.C.), said to have been found at Nineveh, might have been carried there by some antiquary king. We reach firm ground with the statement of Khammurabi (2375 B.C.) that he "made the waters of Ishtar to become nineveh in E-mes-līs-mās," the temple of Ishtar there (Code IV, 60-62). We have just spoken of "returning the gracious protecting god to Assur," and spells the name Nu-um-a, there can be no doubt that Nineveh is meant. Shalmaneser I., in his zikkīt inscriptions (L. W. King, Records of the Reign of Tukulti-Ninib II. p. 131), c. 1300 B.C., records his restoration of the temple of Ishtar of Nineveh, which had been built by Samsi-Addad (Shamsi-Addad) and restored once before by Assur-uballit. Which Samsi-Addad (out of six at least) this was, and which Assur-uballit we are not told; the first of the former name known to us was a contemporary of Khammurabi and, if he built the temple first, Khammurabi may have plundered it and then restored it again; but an even earlier Samsi-Addad may be meant. Dushratta, king of Mitanni, about 1400 B.C., in the Tell el-Amarna letters offers to send to the king of Egypt an image of Ishtar of Nineveh; from which it has been inferred that Nineveh was then under foreign rule. The same letters mention Shaushash as goddess of Nineveh. A statue of a female nude figure found at Nineveh bears an inscription showing it to have been in the palace of Assur-bēl-kala (1300 B.C.), who is therefore supposed to have resided in Nineveh. Assur-resh-ishi, son of Assur-resh-ishi, built the temple of Ishtar, probably in Nineveh. Assur-sunsin-apli (885 B.C.) restored the temple E-mas-mas of Ishtar at Nineveh, but removed his residence to Calah. Shalmaneser II. set out on several of his expeditions from Nineveh, but in the latter part of his reign resided at Calah, and when rebellion broke out under his son Assur-danin-apli Nineveh sided with the rebel prince. Sennacherib records that several of his royal ancestors had been buried in Nineveh and they presumably had resided there. At the commencement of his reign Sennacherib found Nineveh a poor place. A store-house for vessels and a renowned temple, an armoury or storehouse, were the chief buildings, containing all the art objects which the front had served as foundations of the palaces hitherto built, but the platforms had been wrecked and the palaces were in decay. Sennacherib restored and enlarged the northern platform now covered by the Kuyunjik mound and built his palace on the south-western portion of it. It has been only partially excavated, though seventy-one rooms were opened, and it is the grandest architectural effort of Assyria. The bas-reliefs with which the walls are adorned are unrivalled in antiquity, for variety of subject, breadth of composition, truth of presentation and artistic literary merit. The accuracy with which building operations are portrayed, and a sense of landscape, are great advances even on the superb work of Sargon's palace at Khorsabad. On the adjoining platform to the south, now Nebi-Yunus, Sennacherib erected an arsenal for military supplies. Nineveh was badly supplied with water for drinking; the inhabitants had to "turn their eyes to heaven for the rain," but Sennacherib conducted water by eighteen canals from the hills into the Husur and distributed its waters round the moats and into store tanks, or ponds, within the city. He laid out a fine park or Paradise, for pleasure and for recreation. The chase on the stags, the magnificent "triumphant way" sixty-two cubits broad and forbade any householder to encroach upon the street. Sennacherib made Nineveh his court residence and, after his destruction of Babylon and the influx of the enormous booty brought back from his conquests, it must have been the most magnificent and wealthiest city of the East.

Esarhaddon began to rebuild Babylon and so departed from his father's purpose to make Nineveh the metropolis of the empire, but he did not altogether neglect the city. He rebuilt the temple of Assur at Nineveh, and a palace for himself now covered by the Nebi-Yunus mound and so insufficiently explored. Thither Assur-hani-pal brought the rebel Egyptian vassals Necho and Sharru-Ludari, the Elamite kings, the booty and captives of his continual conquests. He rebuilt the temples and a palace for himself north of Sennacherib's on the site of the latter's harem; which was adorned with extraordinary variety and richness. His sculptures are at the highest range of original and effective delineation in antiquity. Especially is his palace famous for the celebrated library, of which Sennacherib had made a commencement. Tens of thousands of clay tablets, systematically arranged on shelves, contained the classics of the Babylonian literature for which his scribes ransacked and copied the treasures of all then known centres of literary life.

Very little trace is left of the fortunites of Nineveh during the reigns of the sons of Assur-hani-pal. Nineveh, according to Herodotus, was besieged by Cyaxares and the Medes but saved by Medes and the Scythians some twenty or more years before the Medes in alliance with Nabopolassar, king of Babylon,
finally took it, c. 606 B.C. Much conjecture has been lavished upon the varying accounts which have reached us of the capture, but it seems probable that a heavy flood or the besiegers burst the great dam and while thus emptying the moats launched a fleet against the west wall on the inside and thus breached the defences.

It may be of interest to record the names of the governors of Nineveh: Nergal-mudadnik, 835 B.C.; Ninib-mukin-ahha, 790–761 B.C.; Sennacherib, 722–705 B.C.; Nabû-dîn-erpuš, 704 B.C.; Ahi-ilai, 649 B.C., officiated as Eponymos for the year.

If, as generally admitted, the ruins of Mespila and Larissa "described" by Xenophon, Anab. iii. 4, 7 sq. were those of Kuyunjik and Nimrud, we may conclude that there was no inhabited city on the spot at the time of the march of the Greeks with Cyrus (cf. Strabo xvi. p. 243). The name of Nineveh (Syriac Ninveh; Arabic Ninawā, Nīnawā) continued, even in the middle ages, to be applied to a site opposite Mosul on the east bank of the Tigris, where huge mounds and the traces of an ancient city wall bore witness of former greatness. Copious references to these mentions are collected in Tuch, *De Nino Urbe* (Leipzig, 1845). Ibn Jubiur, p. 237 sq., followed by Ibn Batuta, ii. 137, gives a good description of the ruins and the great shrine of Jonah as existing in the 12th century. The name of Ninawā applied, not to the ruins, but to the Rustak (fields and hamlets) on the site (Baladhuri, p. 331; Ibn Haukal, p. 145; Yaqut, ii. 694).

A very complete summary of the traditions will be found in Lincke, "Ninveh," in Geschichte und Sage der Mutterreichen nach 606–607.

The explorations of Sir A. H. Layard at Kuyunjik (1845–1847 and 1849–1851) definitely located the city, in confirmation of ancient tradition and the identifications of Rich and others. Excavations were carried on by Rawlinson, 1853–1855; H. Rassam, 1854; G. Smith, 1873–1874 and 1876; Rassam again, 1877–1883; E. A. Wallis Budge, 1888–1890; and King, 1903.

The enormous mound of Kuyunjik now separated from that of Nebi-Yunus by the deep and rapid Khausar, marks the site of the palace of Sennacherib and Assur-bani-pal. The mound of Nebi-Yunus is crowned by the "Tomb of Jonah," a sacred shrine to the modern inhabitants, and could not be explored; but by sinking a shaft within the walls of a private house, some sculptured slabs were recovered, and the Turkish government later opened out part of a palace of Esarhaddon. Excavations at two of the great city gates showed them to have been erected by Shalmaneser.

BIBLIOGRAPHY.—The architecture of these palaces is exhaustively treated in Ferguson's *Palaces of Nineveh and Persepolis Restored,* and in Perrot and Chipiez, *Art in Chaldea and Assyria.* Each palace was in its day a city, and the external walls are still standing in high places. The many topographical details furnished by exploration when compared with the building inscriptions and the indications given by deeds of sale will doubtless enable us ultimately to map out the principal features of the ancient city, but much more systematic exploration is needed, as well as further publication of existing documents.

(C. H. W. J.)

NING-PO—NING-PO-FU, i.e. City of the Peaceful Waves), a great city of China, the principal emporium of trade in the province of Chekiang, standing in a fine plain bounded by mountains towards the west, on the left bank of the Ning-po river, about 16 m. from its mouth, in 29° 40' N., 121° 4' E. It was visited by Portuguese traders as early as 1522, and is one of the five seaports which were thrown open to foreign trade in 1842 by the treaty of Nanking. The population of the city and suburbs is estimated from 400,000 to 500,000. Ning-po is surrounded by a fine old wall, 25 ft. high and 16 ft. broad, pierced by six gates and two passages for ships in its circuit of 4 to 5 m. Just within the walls there is a considerable belt of open ground, and in many places the ramparts are thickly covered with jasmine and holly-suckle. In ascending the river a stranger's eye is first caught by the numerous huge ice-houses with high thatched roofs and by the tall white crows of the T'ien-feng-t' a or Ning-po pagoda or obelisk—which rises to a height of 160 ft., and has fourteen stories and seven tiers of windows, and unfortunately has been stripped of its galleries and otherwise damaged. Another striking structure in the heart of the city is the Drum Tower, dating from before the 15th century. As is natural in a place long celebrated for its religious and educational pre-eminence, there is no lack of temples, monasteries and colleges, but few of these are of any architectural significance. Brick is the ordinary building material, and the buildings themselves are mostly of one storey. Silks, cottons, carpets, furniture, white-wood carvings and straw hats are the chief products of the local industry. Large salt-works are carried on in the vicinity, and thousands of fishermen are engaged, mainly between April and July, in catching cuttle-fish. In spite of the powerful competition of Shanghai, Ning-po has a valuable foreign trade. It is regularly visited by the vessels of the China Navigation Company and the Chinese Merchants' Steam Navigation Company. From 216,192 tons in 1873 the tonnage of the port has increased to 220,000 tons in 1904. The chief exports are 1,519,763 tons, as compared with 2,143,560 in 1900 and 1,657,400 in 1904. Straw or grass hats, straw mats, samshu (from the Shao-sing district), Chinese drugs, vegetable tallow and fish are among the chief exports; in 1904 the hats numbered 2,125,566, though in 1863 they had only amounted to 40,000, and the mats, mainly despatched to south China, average from 1,000,000 to 2,000,000. Missions are maintained in Ning-po by the Roman Catholic church, by the Church Missionary Society (1848), the American Presbyterian, the Reformed Westleys, and the Chinese Inland Mission (1837). A hospital was instituted in 1843. After the storming of Chenaik—the fortified town at the mouth of the river—on the 10th of October 1841, the British forces quietly took possession of Ning-po on the 12th. In 1864 the Taipings held the town for six months.

NINIAN, ST., a Briton, probably from Strathclyde, who was trained at Rome and founded a church at Whithorn on the west side of Wigtown Bay. Whithorn has been identified with the Leukopibia of Ptolemy, but this is uncertain. Bede, writing three centuries after Ninian, ascribes the name Ad Caelidinum Casbon to the fact that he lived at the church of Ninian, which was built of stone.

We are told by Bede that St Ninian dedicated his church to St Martin of Tours, who died between 337 and 400, but Alired of Rievaulx is our only authority for the statement that St Martin supplied him with masons. The population of the north shore of the Solway Firth at the beginning of the 5th century were probably either Picts or Goildes or a blend of both, and naturally hostile to the Romanized Britons. Bede records that Ninian preached among the Picts within the Mounth, which indicates that he was acquainted with the Pictish language. The legends of the Irish and the Britons, according to the Irish of Ireland and the Britons of Scotland, which are generally paralleled in that country by the church of Whithorn. The date of Ninian's death is given by Archbishop Ussher as 432, but there is no authority for this statement.


NINIB, the ideographic designation of a solar deity of Babylonia. The phonetic designation is uncertain—perhaps Annisht. The cult of Ninib can be traced back to the earliest period of Sumerian history. According to a text from Nippur at Shurpula (Shirgulla, also known as Lagash), he appears as Nin-girsu, that is, "the lord of Girsu," which appears to have been a quarter of Shirgulla. He is closely associated with Bel (g.), or En-lil of Nippur, as whose son he is commonly designated. The combination points to the amalgamation of the district in which Ninib was worshipped with the one in which Bel was the chief deity. This district may have been Shirgulla and surrounding places, which, as we know, fell at one time under the control of the rulers of Nippur.

Ninib appears in a double capacity on the epithets bestowed on him, and in the hymns and inscriptions addressed to him. On the one hand he is the healing god who releases from sickness and the ban of the demons in general, and on the other he is the god of war and of the chase, armed with terrible weapons. It is not easy to reconcile these two phases, except on the assumption
that he has absorbed in his person various minor deities, representing different phases of the sun, just as subsequently Shamash absorbed the attributes of practically all the minor sun-deities.

In the systematized pantheon, Ninib survives the tendency towards centralizing all sun cults in Shamash by being made the symbol of a certain phase of the sun. Whether this phase is that of the summer solstice or of the springtime with which beneficent qualities are associated, or that of the noonday sun or of the summer solstice, bringing suffering and destruction in its wake, is still a matter of dispute, with the evidence on the whole in favour of the former proposition. At the same time, the possibility of a confusion between Ninib and Nergal (q.v.) must be admitted, and perhaps we are to see the solution of the problem in the recognition of two diverse schools of theological speculation, the one assigning to Ninib the rôle of the spring-tide solar deity, the other identifying him with the sun of the summer solstice. In the astral-theological system Ninib becomes the planet Saturn. The swine seems to have been the animal sacred to him, or to have been one of the symbols under which he is represented. The consort of Ninib was Gula (q.v.).

**Ninus**, in Greek mythology, the eponymous founder of Nineveh (q.v.), and thus the city itself personified. He was said to have been the son of Belos or Bel, to have conquered in seventeen years the whole of western Asia with the help of Aráeus, king of Arabia, and to have founded the first empire. During the siege of Bactra he met Semiramis, the wife of one of his officers, Onnes, whom he took from her husband and married. The fruit of the marriage was Ninias, i.e. "The Ninivite." After the death of Ninus, Semiramis, who was accused of causing it, erected to him a temple-tomb, nine stades high and ten stades broad, near Babylon. According to Castor (ap. Synell. p. 167) his reign lasted fifty-two years, its commencement falling 2189 B.C. according to Ctesias. Another Ninus is described by some authorities as the last king of Nineveh, successor of Sardanapalus.


**Nioe**, in Greek mythology, daughter of Tantalus and Dione, wife of Amphion, king of Thebes. Proud of her numerous family, six daughters and six sons, she boasted of her superiority to her friend Leto, the mother of the Olympian gods, Apollo and Artemis. As a punishment Apollo slew his son Niobe and Artemis her daughters. Their bodies lay for nine days unburied, for Zeus had changed the people to stone; on the tenth day they were buried by the gods. Out of pity for her grief, the gods changed Niobe herself into a rock on Mount Sipylos in Phrygia, in which form she continued to weep (Hom. Iliad, xxiv. 602-617; Apollodorus iii. 5; Ovid, *Metam.* vi. 430-432). The names and number of her children, and the time and place of their death, are variously given. This "Niobe," described by Pausanias (i. 21) and Quintus Smyrnaeus (i. 203-306), both natives of the district, was the appearance of a cliff on Sipylos when seen from a distance and from the proper point of view (see Jebb on Sophocles, *Antigone*, 831). It is to be distinguished from an archaic figure still visible, carved in the northern side of the mountain near Magnesia, to which tradition has given the name of Niobe, but which is really intended for Cybele.

According to some, Niobe is the goddess of snow and winter, whose children, slain by Apollo and Artemis, symbolize the ice and snow melted by the sun in spring; according to others, she is an earth-goddess, whose progeny—vegetation and the fruits of the soil—is dried up and slain every summer by the shafts of the sun-god. Burmeister regards the legend as an incident in the struggle between the followers of Dionysus and Apollo in Thebes, in which the former were defeated and driven back to Lydia. Heffter builds up the story around the dripping rock in Lydia, really representing an Asiatic goddess, but taken by the Greeks for an ordinary woman. Emmann, who interprets the name as "she who prevents increase," in contrast to Leto, who made women prolific, considers the main point of the myth to be Niobe's loss of her children. He compares her story with that of Lamia, who, after her children had been slain by Zeus, retired to a lonely cave and carried off and killed the children of others. The appearance of the rock on Sipylos gave rise to the story of Niobe having been turned to stone. The tragedians used her story to point the moral of the instability of human happiness; Niobe became the representative of human nature, liable to lapse in prosperity and forgetfulness of the respect and submission due to the gods.

The tragic story of Niobe was a favourite subject in literature and art. Aeschylus and Sophocles wrote tragedies upon it; Ovid has described it at length in his *Metamorphoses*. In art, the most famous representation was a marble group of Niobe and her children, taken by Susius to Rome and set up in the temple of Apollo Sosianus (Pliny, *Nat. Hist.* xxxvi. 4). What is probably a Roman imitation of this work was found in 1583 near the Lateran, and is now in the Ufizzi gallery at Florence. In ancient times it was disputed whether the original was the work of Praxiteles or Scopas, and modern authorities are not agreed as to its identity with the group mentioned by Pliny.

On the whole subject see C.E. Burmeister, *De fabula quae de Niobe ejusque libris agit* (Wismar, 1836); L. Curtze, *Fabulae Niobae Thebaeae* (Corbach, 1836); W. Heßler in *Zeitschrift für Gymnasial- und Volkslehrer* (1865); E. Heydreich, *Die Amphion* (1884); H. Heydreich, *Klassische Antiquitäten* (1885); E. Thramer, *Fergusons* (1888); C. Friederichs, *Praxiteles und die Niobegruppe* (1884); A. Mayerhöfer and H. Oldenbourg, *Die Fluren- und Vasenbilder des Niobengruppen* (1888); A. Ohlrich, *Niobegruppe* (1885); H. Stark and D. Stark, *Nach dem griechischen Oriens* (1874); G. Weber, *Le Sipylos et ses monuments* (1880); W. Ramsay, *Sipylos and Cybele," in *Journal of Hellenic Studies*, iii. 1882; A. Frazer's *Passamonti*, iii. 555; for vase-paintings, see F. Prisse's *Vasenbildern* (1875). For further literature on the subject, see A. Feurer's mythological bibliography in C. Burckhardt's *Jahresbericht über die Forschritte der klassischen Alterthums- und vorhistorischen Wissenschaften*, vol. xxv. (1861); the various derivations of the name and interpretations of the legend are given in Emmann's article in Roscher's *Lexikon der Mythologie*.

The ancient Ast. *fig. 29* (from an Orvieto vase) represents the slaying of the children of Niobe by Apollo and Artemis; *fig. 78* (Pl. VI.), Niobe shielding her youngest daughter.

**Niort**, a city of western France, chief town of the department of Deux-Sèvres, 42 m. E.N.E. of La Rochelle on the railway to Saumur. Pop. (1906) 20,538. Niort is situated on the left bank of the Sèvre Niortaise, partly in the valley and partly on the slopes of the enclosing hills. The tower of the church of Notre-Dame (15th and 16th centuries) has a spire 246 ft. high, with bell-turrets adorned with statues of the evangelists, and at the base a richly decorated façade in the Renaissance style; and the north doorway shows a balustrade, of which the balusters form the inscription *O Mater Dei, memento mei*. St André, with a fine window in the apse, and St Hilaire, which contains some beautiful frescoes, both date from the 15th century. Of the old castle, whose site is partly occupied by the prefecture, there remains the donjon—two large square towers united by a central building, flanked by turrets, built when Henry II. of England or Richard Coeur de Lion. The platform on the top affords a fine view of the public garden (one of the most picturesque in France) and the valley of the Sèvre. The old town-hall, Renaissance in style, is wrongly known as the Alénoir palace, after Eleanor of Guînes; it contains a collection of antiquities. The house is still shown in which Madame de Maintenon is erroneously stated to have been born. Near Niort are the fine feudal ruins of the fortress of Courdroy-Salbart.

Niort is the seat of a prefect and a court of assizes, and has tribunals of first instance and of commerce, a popular assembly, a middle arbitration, lycées, a gymnasium, a college, a seminary, a Jesuit establishment, and a branch of the Bank of France. Tanning, currying, shammy-dressing, glove-making and the manufacture of brushes and boots and shoes are the staple industries.

Up to the 7th century the Niort plain formed part of the Gulf of Poitou; and the mouth of the Sèvre lay at the foot of the hills now occupied by the town which grew up round the castle erected by Henry Plantagenet in 1155. The place was captured by Louis VIII. in 1224. By the peace of Brétigny it was ceded to the English; but its inhabitants revolted against the Black Prince, and most of them were massacred when his troops recovered the town by assault. In 1573 Duguesclin regained
possession of the town for the French. Protestantism made numerous proselytes at Nior, and Gaspard de Coligny made himself master of the town, which successfully resisted the Catholic forces after the Battle of Jarnac, but surrendered without striking a blow after that of Moncontour. Henry IV. rescued it from the League. It suffered severely by the revocation of the edict of Nantes.

NIPIGON [NEEPEIGN, or NIPIGON], a lake and river of Thunder Bay district, Ontario, Canada. The lake is 30 m. N. of the bay of the same name on Lake Superior, at an altitude of 832 ft. above the sea. It is 70 m. long and 50 m. wide; contains over 1000 islands, is very deep, and has a much-indented shore-line meandering for 550 m. The river, which drains the lake, descends several hundred feet in the 40 m. of its course and is the largest stream flowing into Lake Superior. It is widely known for the excellence of its trout fishing.

NIPISSING, a lake of the district of the same name in Ontario, Canada, situated nearly midway between Lake Huron and the Ottawa river, at an altitude of 644 ft. above the sea. It is of irregular shape, with bold shores, and contains many islands; from the north it receives the waters of Sturgeon river. It is 50 m. in length and 20 in breadth; discharges its waters by a very broad confluence on the Ottawa river, forming the Ottawa river, a tributary of the Ottawa. It has been proposed as the summit level of the projected Ottawa and Georgian Bay canal, an important project rendered difficult by the numerous rapids both on French river and on the Ottawa. With the Ottawa, Mattawa and French, it formed the old voyageur route from Montreal to the Great Lakes.

NIPUR, one of the most ancient of all the Babylonian cities of which we have any knowledge, the special seat of the worship of the Sumerian god, En-lil, lord of the storm demons. It was situated on both sides of the Shatt-en-Nil canal, one of the earliest courses of the Euphrates, between the present bed of that river and the Tigris, almost 100 m. S.E. of Bagdad, in 32° 7' N. 45° 10' E. It is represented by the great complex of ruin mounds known to the Arabs as Nuffar, written by the earlier explorers Niffer, divided into two main parts by the dry bed of the old Shatt-en-Nil (Arakhat). The highest point of these ruins, a conical hill rising about 100 ft. above the level of the surrounding plain, N.E. of the canal bed, is called by the Arabs Bint el-Amir or "prince's daughter." Here very brief and unsatisfactory excavations were conducted by Sir A. H. Layard in 1851, which seemed, however, beyond means of the inscribed bricks discovered, to identify the site. The university of Pennsylvania began systematic excavations in 1889 under the direction of Dr John P. Peters. With some intermissions these excavations were continued until 1900 under the original director and his successors, Dr John Henry Haynes and Dr H. V. Hilprecht. The result of their work is a fairly continuous history of Nippur, and especially of its great temple, E-kur, from the earliest period.

Originally a village of reed huts in the marshes, similar to many of those which can be seen in that region to-day, Nippur underwent the usual vicissitudes of such villages—floods and conflagrations. For some reason habitation persisted at the same spot, and gradually the site rose above the marshes, partly as a result of the mere accumulation of débris, consequent on continuous habitation, partly through the efforts of the inhabitants. As these began to develop in civilization, they substituted, at least so far as their shrine was concerned, buildings of mud-brick for reed huts. The earliest age of civilization, which we may designate as the clay age, is marked by rude, hand-made pottery and thumb-marked bricks, flat on one side, concave on the other, gradually becoming through several fairly brief stages. The exact form of the sanctuary at that period cannot be determined, but it seems to have been in some way connected with the burning of the dead, and extensive remains of such cremation are found in all the earlier, pre-Sargonic strata. There is evidence of the succession on this site of different peoples, varying somewhat in their degrees of civilization. One stratum is marked by painted pottery of good make, similar to that found in a corresponding stratum in Susa, and resembling the early pottery of the Aegean region more closely than any later pottery found in Babylonia. This people gave way in time to another, markedly inferior in the manufacture of pottery, but superior, apparently, as builders. In one of these earlier strata, of very great antiquity, there was discovered, in connexion with the shrine, a conduit built of bricks, in the form of an arch. Somewhere, apparently, in the 4th millennium B.C., we begin to find inscriptions written on clay, in an almost linear script, in the Sumerian tongue. The shrine at this time stood on a raised platform and apparently contained, as a characteristic feature, an artificial mountain or peak, a so-called zigurat, the precise shape and size of which we are, however, unable to determine. So far as we can judge from the inscriptions, the peak was of stone, and we cannot say what period for that matter, political hegemony, but was distinctively a sacred city, important from the possession of the famous shrine of En-lil. Inscriptions of Lugal-zaggisi and Lugal-kigub-nidudu, kings of Erech and Ur respectively, and of other early pre-Semitic rulers, on door-sockets and stone vases, show the veneration in which the ancient shrine was then held and the importance attached to its possession, as giving a certain stamp of legitimacy. So on their votive offerings some of these rulers designate themselves as patres, or over-priests, of En-lil. Early in the 3rd millennium B.C. the Semitic rulers of Akkad, or Agade, and numerous votive objects of Alu-usharissi (Urumush or Rimush), Sargon and Naram-Sin testify to the veneration in which they also held this sanctuary. En-lil was in fact adopted as the Bel or great god of the Semitic pantheon. The last monarch of this dynasty, Naram-Sin, rebuilt both the temple and the city walls, and in the accumulation of débris now marking the ancient site his remains are found about half way from the top to the bottom. To this Akkadian occupation succeeded an occupation by the first Semitic dynasty of Ur, and the constructions of Ur-Gur or Ur-Engur, the great builder of Babylonian temples, are superimposed immediately upon the constructions of Naram-Sin. Ur-Gur gave to the temple its final characteristic form. Partly razing the constructions of his predecessors, he erected a terrace of unplastered bricks, some 40 ft. high, covering a space of about 8 acres, near the northwestern edge of which, towards the western corner, he built a zigurat, or stage-tower, of three stages of unburned brick, faced with kiln-burned bricks laid in bitumen. On the summit of this artificial mountain stood, apparently, as at Ur and Eridu, a small chamber, the special shrine or abode of the god. Access to the stages of the zigurat from the court beneath, was had by an inclined plane on the southeast side. To the north-east of the zigurat stood, apparently, the House of Bel, and in the courts below the zigurat stood various other buildings, shrines, treasure chambers and the like. The whole structure was roughly orientated, with the corners towards the cardinal points of the compass. Ur-Gur also rebuilt the walls of the city in general on the line of Naram-Sin's walls.

The restoration of the general features of the temple of this and the immediately succeeding periods has been greatly facilitated by the discovery of a sketch map on a fragment of a clay tablet. This sketch map represents a quarter of the city to the eastward of the Shatt-en-Nil canal, which was enclosed within its own walls, a city within a city, forming an irregular square, with sides roughly 2700 ft. long, separated from the other quarters of the city, as from the surrounding country to the north and east, by canals on all sides, with broad quays along the walls. A smaller canal divided this quarter of the city itself into two parts, in the south-eastern part of which, in the middle of its S.E. side, stood the temple, while in the N.W. part, along the stage of the zigurat, from the court beneath, was built by a proper plan, consisting of an outer and inner court (each covering approximately 8 acres), surrounded by double walls, with zigurat on the north-western edge of the latter.

The temple continued to be built upon or rebuilt by kings of various succeeding dynasties, as shown by bricks and votive objects bearing the inscriptions of the kings of various dynasties of Ur and Isin. It seems to have suffered severely in some
Nippur

manner at or about the time of the Elamite invasions, as shown by broken fragments of statutory, votive vases and the like, from that period, but at the same time to have won recognition from the Elamite conquerors, so that Eríku (Sem. Rim-Sin, biblical Arioch), the Elamite king of Larsa, styles himself "shepherd of the land of Nippur." With the establishment of the Babylonian empire, under Khammurabi, early in the 2nd pre-Christian millennium, the religious as well as the political centre of influence was transferred to Babylon, Mariakú became the Bel or lord of the pantheon, many of En-lil's attributes and myths were transferred to him, and finally that Nippur was to some extent a sub-centre in the extending Cossaean dynasty, however, shortly after the middle of the 2nd millennium, E-kur was restored once more to its former splendour, several monarchs of that dynasty built upon and adorned it, and thousands of inscriptions, dating from the time of those rulers, have been discovered in its archives. After the middle of the 12th century follows another long period of comparative neglect, but with the conquest of Babylonia by the Assyrian Sargon, at the close of the 8th century B.C., we meet again with building inscriptions, and under Assur-bani-pal, about the middle of the 7th century, we find the temple of E-kur restored to its former splendour, and finally, toward the end of the 5th century, the ziggurat of that period being 190 ft. by 128 ft. After that E-kur appears to have gradually fallen into decay, until finally, in the Seleucid period, the ancient temple was turned into a fortress. Huge walls were erected at the edges of the ancient terrace, the courts of the temple were filled with houses and streets, and the ziggurat itself was curiously built over in a cruciform shape, and converted into an acropolis for the fortress. This fortress was occupied and further built upon until the close of the Parthian period, about A.D. 250; but under the succeeding rule of the Sassanids its turn fell into decay, and the ancient sanctuary became, to a considerable extent, a mere place of sepulture, only a little village of mud huts huddled about the ancient ziggurat continuing to be inhabited. The store-house quarter of the temple town had not been explored as late as 1900.

As at Tello, so at Nippur, the clay archives of the temple were found not in the temple proper, but on an outlying mound. South-eastward of the temple quarter, without the walls above described, and separated from it by a large basin connected with the Shatt-en-Nil, lay a triangular mound, about 25 ft. in average height and 130 ft. in diameter. In this were found large numbers of inscribed clay tablets (it is estimated that upwards of 40,000 tablets and fragments have been excavated in this mound alone), dating from the middle of the 3rd millennium B.C. onward into the Persian period, partly temple archives, partly school exercises and text-books, partly mathematical tables, with a considerable number of documents of a more distinctly literary character. For an account of one of the most interesting fragments of a literary or religious character, found at Nippur, see below.

The great complex of ruin mounds lying S.W. of the Shatt-en-Nil canal, larger in extent and mass than the N.E. complex, had not up to 1900 been so fully explored as the mounds in the N.E. Almost directly opposite the temple, however, a large palace was excavated, apparently of the Cossaean period, and in this neighbourhood and further southward on these mounds large numbers of inscribed tablets of various periods, including temple archives of the Cossaean and commercial archives of the Persian period, were excavated. The latter, the "books and papers" of the house of Murashu, commercial agents of the government, throw light on the condition of the city and the administration of the country in the Persian period, the 5th century B.C. The former gives us a very good idea of the organisation of an ancient temple. The whole city of Nippur appears to have been at that time merely an appanage of the temple. The temple itself was a great landowner, possessed of both farms and pasture land. Its tenants were obliged to render careful accounts of their administration of the property entrusted to their care, which were preserved in the archives of the temple. We have also from these archives lists of goods contained in the temple treasuries and salary lists of temple officials, on tablet forms specially prepared and marked off for periods of a year or less.

On the upper surface of these mounds was found a considerable Jewish town, dating from about the beginning of the Arabic period onward to the 10th century A.D., in the houses of which were large numbers of incantation bowls. Jewish names, appearing in the Persian documents discovered at Nippur, show, however, that Jewish settlement at that city dates in fact from a much earlier period, and the discovery on some of the tablets found there of the name of the canal Kabari suggests that the Jewish settlement of the exile, on the canal Chebar, to which Ezkiel belonged, may have been somewhere in this neighbour- ing region. H. Hilbrecht believes that the Kabari was the Shatt-en-Nil. Of the history and conditions of Nippur in the Arabic period we learn little from the excavations, but from outside sources it appears that the city was the seat of a Christian bishopric as late as the 12th century A.D.

The excavations at Nippur were the first to reveal to us the extreme antiquity of Babylonian civilization, and, as already stated, they give us the best consecutive record of the development of that civilization, with a continuous occupancy from a period of unknown antiquity, long ante-dating 5000 B.C., onward to the middle ages. But while Nippur has been more fully explored in this respect than the Babylonian site at the Tigris, in the valley of Lagash, still only a small part of the great ruins of the ancient site had been examined in 1900. These ruins have been particularly fruitful in inscribed material, especially clay tablets, many of them from the very earliest periods; but little of artistic or architectural importance has been discovered. Excavation at Nippur is particularly difficult and costly by reason of the in-accessibility of the site, and the dangerous and unsettled condition of the surrounding country, and still more by reason of the immense mass of later débris under which the earlier and more important Babylonian remains are buried.

See A. H. Layard, Nineveh and Babylon (1853); John P. Peters, Nippur (1897); H. V. Hilprecht, Excavations in Assyria and Babylonia (1904); Clarence S. Fisher, Excavations at Nippur (1st pt. published 1901); E. F. Peters, Excavation of the Temple of E-kur (1905); H. Hilbrecht, "Nippur," in The Pennsylvania Academy of Sciences, a monumental edition of the cuneiform texts found at Nippur, with brief introductions and notes of a more general character (1883, 1885, 1889, 1891 fol.). For a plan of the Parthian palace see Architecture, vol. ii, p. 291.

The Nippur Deluge Fragment.—From among the many tablets and fragments of tablets discovered at Nippur one of more than ordinary interest was published in 1910. Though mutilated portions of only a few of its lines have been preserved, and the text contains no proper name, it is clear that the tablet represents part of a Babylonian version of the Deluge Legend.1 The portion of the story covered by the text relates to the warning given by Ea to Ut-napishtim, the Babylonian equivalent of the Hebrew Noah. The god here states that he is about to send a deluge, which will cause destruction to all mankind, and he gives directions for the building of a great ship in which "the beasts of the field and the birds of heaven" may be saved, along with Ut-napishtim and his family; he fixes the size of the ship and directs that it should be covered with a strong roof or deck. The text bears a general resemblance to the two well-known Assyrian versions on tablets in the British Museum, but it has been claimed that its phraseology presents a closer parallel to the biblical version of the Deluge story in the "Priestly Code."2 For several years the existence of Babylonian versions of the legend had been detected among collections of tablets dating from the earlier Persian periods, and the argument of one such version belongs to the period of the First Dynasty of Babylon,3 and part of a still earlier Semitic version of another portion of the Gilgamesh Epic has also been recovered.4 The new fragment from Nippur has given rise to considerable discussion, in view of the light it provides on the prehistory of Sumerian literature; cf. Scheil, Recueil de travaux, xx. 55 ff. For another fragment of the Atar-akhis-legend of the same period, see Cuneiform Texts in the British Museum, pt. vi, and cf. Zimmern, Zeits. für Assyriol., xiv. 275 ff.

4. For other Semitic legendaries of this early period, see Cuneiform Texts in the British Museum, pt. xv. (1902), pls. i.-vi., and cf. King, The Seven Tables of Creation, p. xxixvii. i.
The town of Niriz is situated in a plain 7 m. from the southeastern point of the lake, and about 150 m. from Shiraz, and has a population of about 9000. The people of Niriz were stanch followers of the Báb (see Bábí-Násí), and rose against the government in 1850 and in 1852, with disastrous results. Niriz was formerly known for its manufacture of steel from iron ore brought from Parpa, 40 m. E.

NIRVANA, the term in Buddhist theology, meaning literally "blowing out" or "dying out," Skt. nírvāṇa, to blow, for a calm or sinless state or condition of the mind reached by a dying out or extinction of sin (see Buddhānitya).

NISARD, JEAN MARIE BECQUELON DÉSIRÉ (1806-1888), French archeologist and critic, was born at Châtillon-sur-Seine on the 20th of March 1806. In 1826 he joined the staff of the Journal des Débats, but subsequently transferred his pen to the National. Under the empire he was inspector-general of education (1852) and director of the École normale (1857-1867). His literary reputation was actually established by his Histoire de la littérature française (1844-1861), which secured his election to the Academy (1850). His other works include Études d'histoire et de littérature (1859-1864), and Les Quatre grands historiens latins (1875). In all his books he vigorously supported the department of Sumerian romanticism. He died at San Remo on the 27th of March 1888.

NISBETT, LOUISA CRANSTOUN (1812-1838), English actress, was the daughter of Frederick Hayes Macnamara, an actor, whose stage name was Morduant. As Miss Morduant she had considerable experience, especially in Shakespearean leading parts, before her first London appearance in 1829 at Drury Lane as Widow Cleerly in Andrew Cherry's (1762-1812) Soldier's Daughter. Her beauty and high spirits made her at once a popular favourite in a large number of comedy parts, until in 1831 she was married to Captain John Alexander Nisbet and retired. Her husband, however, was killed the same year by a fall from his horse, and she was compelled to reappear on the stage in 1832. She was the original Lady Gay Spunker of London Assurance (1841). In 1844 she withdrew again from the stage to marry Sir William Boothby, Bart., but on his death (1846), returned to play Lady Teaze, Portia, Constantia in the Love Chase, Helen and Julia in the Hunchback. It was in the first of these parts that she made her final appearance in 1851. She died on the 15th of January 1858.

NISH (also written as Nîsh), the capital of the Nineveh district, of Servia, lying in a plain among the southern mountains, on the left shore of the Nishava, a tributary of the Morava. Pop. (1900) 24,451. Among Servian cities, Nish is only surpassed by Belgrade in commercial and strategic importance; for it lies at the point where several of the chief Balkan highroads converge, and where the branch railway to Salonica leaves the main line between Belgrade and Constantinople. The administration of the Servian railways has its factory for repairing engines and principal store of materials in the city, which also possesses an iron foundry. The king and the government reside for at least three months in the year in Nish, where also the national assembly, before the constitution of 1901, was regularly held. It is the see of a bishop, the seat of the district prefecture and a tribunal, and the headquarters of the territorial militia corps, having besides a large number of regular troops in garrison. There is a small obsolete fortress on the right bank of the Nishava, believed to have been erected on the site of the Roman Naisus. The surrounding hills (Vinik, Goritsa, Kamenitsa) were, after 1886, fortified by modern earthworks.

After the Turks were driven from the city in 1875, it was in many respects modernized; but something of its former character is preserved in the ancient Turkish palace, mosque and fountain, the maze of winding alleys and picturesque houses in the older quarters, and, on market days, by the medley of peasant costumes—Bulgarian, Albanian and Rumanian, as well as Servian. The ancient Roman city Naisus was mentioned as an important place by Ptolemy of Alexandria. Under its walls was fought in A.D. 260 the great battle in which Emperor Claudius destroyed the army of the Goths. It was at Naisus that

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is said to have thrown up a disputed problem of biblical criticism. According to its discoverer it represents the oldest account of the Babylonian Deluge story extant; and he considers it of fundamental importance for determining the age of Israel's earliest traditions, since he would regard it as having been written "before Abraham had left his Babylonian home in Ur of the Chaldees."

Beyond the fact that it was found at Nippur during the fourth of the American expeditions, there does not appear to be any exact record of its provenance; and, in order to determine its date, it is necessary to rely on the external and internal evidence furnished by the tablet itself. A number of hymns and prayers addressed to the chief Babylonian gods, and written throughout in the Sumerian language, have been found at Nippur, and these may be dated in the era of the kings of Ur and Isin, since some of them are mentioned by name in the petitions. To the latter part of this period Professor Hilprecht would assign the new Deluge fragment. It is natural that under the Sumerian revival, which characterized the united kingdom of Sumer and Akkad, the ancient ritual should have been revived and the Sumerian service-books adapted for the use of the reigning monarch. Sumerian, in fact, predominated, not only on the historical monuments, but also on the literary deluge; and the tendency was against assigning the newly discovered Semitic legend to the period of these early Sumerian texts. It has already been noted that the earliest deluge-fragment previously recovered dates from the latter half of the First Dynasty of Babylon, when the Western Semites had succeeded in establishing their authority throughout the greater part of the country. But, to judge from the photographic reproduction of the Nippur tablet, the characters upon it do not appear to resemble those in use at the time of the First Dynasty, nor those of the period of the Dynasties of Ur and Isin. On purely epigraphic grounds the suggestion has indeed been advanced that it should be assigned to the Kassite period (not earlier than 1700 B.C.), during which a very large number of the tablets found at Nippur were inscribed. 1

But, even so, the fragment is one of the most interesting that has been recovered on the site of Nippur. For it strikingly illustrates the fact that the temple of En-lil, like that of the Sun-god at Sippar and the other great temples in Babylonia, possessed a body of mythological and religious texts, which formed subjects for study and comment among the priests.

It was by the collection and reproduction of such documents that the ancient scribes attempted to connect the local mythology with the Semitic legend. Such a connection allows of a number of interpretations for the name En-lil, and furnishes a key to the understanding of the tablet itself.

The text of this Deluge fragment also furnishes one more proof of the existence of parallel versions of the same legend. In some instances, as in the great Creation Series of Babylon, the later scribes subjected the different versions to processes of editing, with the result that the earlier forms gave place to the redactions of a militant priesthood. But where no theological or local prejudices were involved, the tendency to a faithful reproduction of the earlier texts prevailed. Thus the resemblances which have been claimed between the Nippur Deluge fragment and the version of the Priestly Code in Genesis, in this case furnishing no significant evidence as to the latter's date. The possibility that Hebrew traditions were subject to Babylonian influence from the period of the Canaanite conquest has long been recognized, and to the Exilic and post-Exilic Jew the mythology of Babylon may well have presented many familiar features.

NIRIZ, or NARIRZ, a district and town in the province of Fars, Persia. The district has 24 villages and extends from near Istahbamat, south of the Bakhtegan lake, to about 50 m. E. Water is scarce and the plain is not much cultivated in consequence. The produce consists of some grain, cotton, tobacco, &c., but fruit is more abundant. Here, as in the neighbouring Dibaj district, villages situated in the hills are called madan (mine), and some travellers have their itineraries indicated a mine in localities where there is none.

1 It has also been pointed out that the employment of the sign PI for wa and the use of s for s, cited in support of the earlier date, survived in the Kassite period.
Constantine the Great was born in a.D. 274. Though the emperor Julian improved its defences, the town was destroyed by the Huns under Attila, in the 5th century, but Justinian did his best to restore it. In the 9th century the Bulgarians became masters of Nisibis, but had to cede it to the Hungarians in the 11th century, from whom the Byzantine emperor Manuel I. reconquered it in 1173. Towards the end of the 12th century the town was in the hands of the Servian prince Stephen Nemanya, who received it from the Byzantine emperor Frederic Barbarossa in 1189, as a Crusader. In 1357 the Turks captured Nisibis for the first time from the Servians. In 1445 the allied armies of the Hungarians under Hunyady and the Servians under George Brankovich, retook it from the Turks, but in 1456 it again came under Turkish dominion, and remained for more than 300 years the most important Turkish military station on the road between Hungary and Constantinople. In the frequent wars between Austria and Turkey during the 17th and 18th centuries the Austrians captured Nisibis twice (in 1689 and 1739), but were not able to retain it for long. The Servians having, in the beginning of the 19th century, successfully cleared Servia of Turks, were emboldened to attack Nisib in 1809, but were repulsed with great loss. The Turks raised as a monument of their victory a high tower composed entirely of the heads of the Servians slain in the battle of Nish. The remains of this monument are still kept up. It stands half a mile to the east from Nish, and is called to this day by the Turkish name “Tyele-Koula,” “the Tower of Skulls.” In the Russo-Turkish War the Servian army, under the personal command of King Milan, besieged Nish, and forced it to capitulate on the 20th January 1878. The Berlin congress decided that it should remain with Servia.

**NISHĀPŪR,** a province of Persia, situated between Meshed and Sabzevar, in northern Khorasan. The older name of the district was Abarshehr. It has a population of from 130,000 to 140,000, is divided into twelve districts, and pays a yearly revenue of about £1,200. It produces much grain and cotton, and is considered one of the most fertile districts of Persia. One of its subdivisions is that of Bār-i-Mādan, with chief place Mādan (situated 32 m. N.W. of the city of Nishāpur, at an elevation of 3100 ft., in 36° 28′ N., 58° 20′ E.), where the famous mines are which have supplied the world, in the beginning of the last 2000 years. The province used to be one of the administrative divisions of Khorasan, but is now a separate province, with a governor appointed by the shah.

**NISHĀPŪR** (Old Pers. Nīn-shāpūr-nīr, New Pers. nīr, nīl = good; Arab. Nisīsābūr), the capital of the province of Nishāpur, Persia, situated at an elevation of 3920 ft., in 36° 12′ N., and 58° 40′ E., about 40 m. west of Meshed. The second element of the name is that of the traditional founder Shāhīpur, or Sapor of the Western historians. Some accounts name the first (241-272), others the second Shāhīpur (309-370). It was known to the four great cities of Khorasan, rivalling Rhage (Khages), “the mother of cities,” in importance and population, but is now a small and comparatively unimportant place with a population of barely 15,000. It has post and telegraph offices and a lively trade in wool, cotton and dry fruits (almonds, pistachios).

Eastward of the present city, amongst the mounds and ruins of the old town, in a dilapidated chamber adjoining a blue-domed building over the grave of an imamzadeh, is the tomb of the astronomer-poet Omar Khayyam, an uninsight heap of plaster without inscription, and probably fictitious. Near it is the grave of the celebrated poet and mystic Farīd ud-dīn Attār, who was killed by the Mongols when they captured the city c. 1220.

Nishāpur was an important place during the 5th century, for Yazdegird II. (438-457) mostly resided there. During the latter Sassanids it is seldom mentioned, and when the Arabs came to Khorasan (641-642) it was of little importance that, as Tabari relates, it did not even have a garrison. Under the Tabibriz (820-872) it became a flourishing town and rose to great importance during the Samanids (874-990). Toghrul, the first ruler of the Seljuk dynasty, made Nishapur his residence in 1037. In 1153 the Ghuzz Turkomans overran the country and partly destroyed town and suburbs. In 1208 most of the town was destroyed by an earthquake. The town was hardly rebuilt when it was again destroyed, this time by the Mongols (April 1221) and so effectually that, completely levelled to the ground, it was turned into a vast barley field. The city was again rebuilt, suffered again at the hands of the Mongols (1269) and from another great earthquake (1286), and never again rose to its former greatness.

**Nisibis** in the Assyrian inscriptions as Nisib, a strongly fortified city and fortress in the north of Mesopotamia, near the point where the Mygdonius (mod. Jaghjagha) leaves the mountains by a narrow defile. The modern Nisib or Nasibin consists of some 4000 inhabitants, largely Jews, who pay tribute to the Shammar Bedouins. The neighbourhood, we are informed by Arab writers, was at one time richly wooded, but is now somewhat marshy and unhealthy. According to the Arabic geographer, Yaqut, Persian scorpions were thrown into the place when it was besieged by Anushirwan, his nephew, in the 13th century. The church of St. James, belonging to a small community of Jacobite Christians, and a few pillars and blocks of masonry are the only remains of the former greatness of the town.

The site of Nisibis, on the great road between the Tigris and the Mediterranean, and commanding like the mountain country to the north and the fertile plain to the south, gave it an importance which continued during the period of its existence. The Parthian and the Seleucid empires. From 149 B.C. to A.D. 14 Nisibis was the residence of the kings of Armenia, and there Tigranes had his treasure-houses. The place figured frequently as a frontier fortress in the wars of the Romans with Parthia and the Parthians, and with the Persian king Artaxerxes II. and his citadel very strongly. Ceded to the Parthians by Hadrian, it became a Roman colony (Septimia Colonia Nisibis) under Septimius Severus. It was heroically defended against Shapur (Sapor) II., who unsuccessfully besieged it twice. In the peace made by Jovian, however, it passed into the hands of the Persians, who established a strong colony there (A.D. 364). Nisibis early became the seat of a Jacobite bishop and of a Nestorian metropolitan, and under the Arabs (when it continued to flourish and became the centre of the district of Diyār Rib`ā) the population of the town and neighbourhood was still mostly Christian, and included numerous monasteries. Arab geographers and travellers of the middle ages speak in high terms of the gardens of Nisibis, and the magnificent returns obtained by the agriculturists. According to Mokaddasi (ob. 1024), acorns, preserved fruits and manufactured articles such as carriages and inkstands were exported. The town was so heavily taxed by the Hamdanid princes at Mosul that the Arab tribe of the Banu Habib, although blood relations of the Hamdanids, migrated into media. It is a terrible sight to see the town, which was once a place where, when the Persians or the Parthians attacked it, the Christians, attracted other emigrants from Nisibis, and at last began to avenge themselves by yearly raids upon their old home. Ibn Haukal goes on to say that finally the Hamdanids took possession of the town and sold it to the Turks. The original inhabitants were compelled those who remained to substitute corn for their profitable fruit crops. This destroyed the prosperity of Nisibis, and the district which extended about 20 miles north and south of Nisibis (Nasib) appeared for the last time in history in 1839, when the Egyptians under Ibrahim Pasha defeated the Turkish army under Haziz Pasha on the 24th of June in a battle at which von Moltke was present.

**Nisi Prius,** in English law, a term used to denote generally all actions tried before judges of the king's bench division. For the history and meaning of this term see Assize. As a rule actions only are tried at nisi prius, and a judge is said to sit at nisi prius when he sits, usually in the king's bench division, for the trial of actions. By a resolution passed by the judges of the king's bench division in 1894 it was declared that the utmost importance that there should be at least three courts of nisi prius sitting together, in order to avoid possible legal y causes, one for common jury causes, and one for causes without juries (see the Annual Practice).

**Nisi Prius Record** was before the Judicature Acts the name of the formal copy of proceedings showing the history of the case up to the decision of the court. After the Judicature Acts the name was retained for the result of the trial, and delivered by the officer of the court to the successful party, whose possession of the postea was his right to judgment. Since the Judicature Acts there is no nisi prius record in England, but the name is retained to denote the deposit of copies of the pleadings for the use of the judge, and there is no postea, the certificate of the associate or master as to the result of the trial superseding it.

**Nissus,** in Greek mythology, king of Megara, brother of Aegeus, king of Athens. When Minos, king of Crete, was on his way to
attack Athens to avenge the murder of his son Androgeus, for which Aegeus was directly or indirectly responsible, he laid siege to Megara. He finally gained possession of the city through the treachery of the king’s daughter Scylla, who, enamoured of Minos, pulled out the golden (or purple) lock from her father’s head, on which his life and the safety of his subjects depended. See Frazer, Golden Bough, iii. 1900, p. 358.

Megara was captured, and Nisus, who died fighting (or slew himself), was changed into a sea-eagle. Minos, disgusted at Scylla’s treachery, tied her to the rudder of his ship, and afterwards cast her body ashore on the promontory called after her Scyllaueum; or she threw herself into the sea and swam after Minos, constantly pursued by her father, until at last she was changed into a ciris (a bird or a fish). In Virgil, Scylla, the daughter of Nisus, is confused with the sea-monster, the daughter of Phorcys. Nisus was the eponymous hero of the harbour of Nisaea, and local tradition makes no mention of his betrayal by his daughter. According to Roscher (in his Lexikon der Mythologie), who identifies the ciris with the heron, the story of Nisus and Scylla (like those of Aëdon, Procne, Philomela and Tereus) was invented to give an aetiological explanation of the characteristics of certain birds. The birds were regarded as originally human beings, whose acts and characters were supposed to account for certain habits of the birds into which they had been changed.

E. Siecke, De Niso et Scylla in aves mutatis (progr. Berlin, 1884), holds that the purple or golden hair of Nisus is the sun, which reflected the sun’s heat and thereby kept the citadel warm. Although rough in style, partisan in character and sometimes incorrect in detail, the book is the work of a man who had an intimate knowledge of the events which he relates, who possessed a clear and virile mind, and who above all was not a recluse but a man of action. They are dedicated to Charles the Bald, at whose request they were written.

The Historiae has been printed several times. Perhaps the best edition is in Band ii. of the Monumenta Germaniae historicà. Scriptoribus edita (Berlin, 1868—9). This edition has been translated into German by J. von Jasmund (Berlin, 1851—4; new edition by W. Wattenbach. Leipzig, 1888); and into French in Tome iii. of Guizot’s Les Monumens (Paris, 1824).

See O. Kunzelmüller, Nithard und sein Geschichtswerk (Jena, 1873); G. Meyer von Knobau, Über Nithards vier Bücher Geschichten (Leipzig, 1866); and W. Wattenbach, Deutschlands Geschichtsquellen, Band i. (Berlin, 1904).

NITHARD—NITRIC ACID

NITHARD (d. 844), Frankish historian, was the illegitimate son of Angilbert, the friend of Charlemagne, by Bertha, a daughter of the great emperor. He was educated at the imperial court and became abbot of St Riquier in commendam, never taking the vows. Little else is known about his life, but he appears to have served his cousin, Charles the Bald, on peaceful errands and also on the field of battle. He fought for Charles at Fontenoy in June 841, and died as the result of wounds received whilst fighting for him against the Northmen near Angoulême. The date of his death was probably the 14th of June 844. In the 11th century his body, with the fatal wound still visible, was found in the grave of his father, Angilbert. Nithard’s historical work consists of four books on the history of the Carolingian empire under the turbulent sons of the emperor Louis I., especially during the troubled period between 840 and 843. This Historiae or De dissensionibus filiorum Ludovici pii is valuable for the light which it throws upon the causes which led to the disintegration of the Carolingian empire. Although rough in style, partisan in character and sometimes incorrect in detail, the books are the work of a man who had an intimate knowledge of the events which he relates, who possessed a clear and virile mind, and who above all was not a recluse but a man of action. They are dedicated to Charles the Bald, at whose request they were written.

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NITHSDALE, WILLIAM MAXWELL, 5TH EARL (1676—1744), Jacobite leader, was a member of the family of Maxwell (q.v.), being a son of Robert, 4th earl (d. 1696) and a collateral relative of James, 3rd earl of Cowan, who was created 5th earl of Nithsdale in 1620. He became famous by his loyalty to the royalist tradition of his family, and by the heroism of his wife Winifred, daughter of William Herbert, 1st marquess of Powis. After becoming earl in 1698 he served the exiled house of Stuart in secret, was suspected as a Jacobite conspirator, and was much molested on that account. In 1712 he resigned his estate to his son William (d. 1776), reserving a life rent to himself. When the Jacobite rising took place in 1715 he joined his friends in the north of England and was taken prisoner at Preston, being sent to London for trial. The countess of Nithsdale, who was at Terrigal when she heard of the capture of her husband, followed him to London, making part of the journey on horseback in bitter winter weather. The earl and the other Jacobites were brought to trial in Westminster Hall on the 19th of January 1716, and condemned to death on the 9th of February. The execution was fixed for the 24th. The countess presented a petition to George I., which he refused to receive, and when she knelt before him and took hold of the skirts of his coat he dragged her half across the room before he could break away. Finding that no pardon could be obtained the countess laid a plain request to be permitted to live at the Tower of London. With the help of her two Jacobite ladies, Mrs Morgan and Mrs Mills, she very cleverly extricated her husband from his cell on the night before the day fixed for the execution by disguising him as a woman. The earl escaped from England and was followed by the countess, but not till she had gone back to Scotland to rescue important legal papers which proved the transfer of the estate to their son. The earl and countess went to Rome after a short stay in France. In Rome they were attached to the court of the Pretender and lived in poverty and obscurity. The earl died on the 20th of March 1744, and the countess in 1749. Their son, William Maxwell, who succeeded to the earldom, spent the last years of his life in the French capital, where he died in 1778. He was succeeded by Charles, 6th earl, his son.

See Sir A. Fraser, The Book of Carlaverock (Edinburgh, 1873).

NITRE, the name given to naturally occurring potassium nitrate; "cubic nitre" is sodium nitrate. The word is adapted from Lat. nitrum, which is itself adapted from Gr. νιτρος. These words were originally applied to the naturally occurring sodium carbonate; the connexion with potassium nitrate (sal petrae or sal petraus) may be traced to Raimon Lull’s name sal nitri, which substance, however, he distinguished from nitrum. In the 16th century the ancient nitrum became altered to natron, a term still used for native sodium carbonate, while nitrum, and its adaptation nitre, were retained for potassium nitrate or salt-petre (q.v.).

NITRIC ACID (aqua fortis), HNO₃, an important mineral acid. It is mentioned in the De inventione veritatis ascribed to Geber, wherein it is obtained by calcining a mixture of nitre, alum and blue vitriol. It was again described by Albert le Grand in the 13th century (see U. of Paris, 1276), who prepared it by heating niter and clay and called it "cauca." Glabur described the process in common use to-day, viz. by heating nitre with strong sulphuric acid. Its true nature was not determined until the 18th century, when A. L. Lavoisier (1776) showed that it contained oxygen, whilst in 1785 H. Cavendish determined its constitution and showed that it could be synthesized by passing a stream of electric sparks through moist air. The acid is found to exist to a slight extent in the free condition in some waters, but chiefly occurs in combination with various metals, as nitrates, obtained in particular nitre or salt-petre, KNO₃, and Chile salpetre, NaNO₃. It is formed when a stream of electric sparks is passed through moist air, and in the oxidation of nitrogenous matter in the presence of water.

For experimental purposes it is usually obtained by distilling potassium or sodium nitrate with concentrated sulphuric acid. The acid so obtained usually contains more or less water and some dissolved nitrogen peroxide which gives it a yellowish red colour. It may be purified by redistillation over barium and silver nitrates, followed by treatment of the distillate with a stream of oxygenized air. The product so obtained is then redistilled under diminished pressure, and finally distilled again in a strongly heated and evacuated apparatus (V. Vley and Manley, Phil. Trans., 1828, A. 291, p. 365). On the large scale it is obtained by distilling Chile salpetre with concentrated sulphuric acid in horizontal cast iron stills, the vapours being condensed in a series of much

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NITROBENZENE, \( \text{C}_6\text{H}_5\text{NO}_3 \), the simplest aromatic nitro compound. It was first isolated in 1834 by E. Mitscherlich (Pogg. Ann., 1834, 31, p. 625), and is prepared commercially by the gradual addition of benzene to a well-cooled mixture of concentrated nitric and sulphuric acids, the oily product being separated, washed with alkali, and then distilled. It also results in the oxidation of aniline by monopersulphuric acid (H. Caro, Bull. Soc. Chim., 1856, p. 845) or by potassium peroxymagnesium (E. Bamberger, Ber., 1893, 30, p. 469); by the oxidation of nitrobenzene (below) with atmospheric oxygen; or by the decomposition of benzene diazonium nitrate mercury nitrite, \( \text{Hg(NO}_2\text{)}_2\text{C}_6\text{H}_5\text{N}_2\text{O}_7 \), with copper powder (A. Hantsch, Ber., 1900, 33, p. 2551). It is a yellowish liquid possessing a strong smell of oil of bitter almonds. It boils at 206°C, and melts at 3-6°C (C.E. Linebarger, Amer. Chem. Jour., 1896, 18, p. 437). The products of its electrolytic reduction vary with the conditions: in sulphuric acid solution it yields para-anisole (L. Gattermann, Ber., 1893, 26, p. 1844); in alcoholic alkaline solution it yields aniline, and with potassium hydroxide and benzidine; in ammoniacal alcoholic solution, phenylhydrzone. With chlorine, in the presence of iodine or antimony chloride, it yields meta-chloronitrobenzene. Hydrobromic acid at 185-190°C. converts it into di- and tri-bromonitrobenzene. It occasionally acts as an oxidizing agent, as in the preparation of quinoline and fuchsine. It is used commercially for the preparation of aniline and benzidine; and in perfumery (oil of mirbane).

**Dinitrobenzenes, \( \text{CH}_2\text{(NO}_2\text{)}_2 \).**—Ortho-dinitrobenzene is formed in small quantity in the rapid action of nitric acid on metal. Para-dinitrobenzene results from the action of nitro-sulphuric acid on bismuth triphenyl (A. Gilleimier, Ber., 1897, 30, p. 2844). It forms colourless crystals which melt at 116-6°C and boil at 319°C (773 mm.). On boiling with an alcoholic caustic solution, it yields a meta-chloronitrobenzene which, by the direct nitration of nitrobenzene with fuming nitric acid, the product being poured into water and redistilled (Small, J. Soc. Chem. Ind., 1878, 37, 275), it yields aniline and meta-chloronitrobenzene which melt at 276°C. It is used for the preparation of meta-phenylene diamine. Para-dinitrobenzene results from the action of nitric peroxide on an ethereal solution of quinone dioxime (R. Oliveri-Tortorici, Gazz., 1900, 30, i. p. 515). It crystallizes in colourless needles, which melt at 171-172°C. It is only slightly soluble in cold water and cold alcohol.

**Trinitrobenzenes, \( \text{CH}_3\text{(NO}_2\text{)}_3 \)—Asymmetric.** (a.) trinitrobenzenes result from the reaction of nitric and sulphuric acids on para-dinitrobenzene. It forms yellow crystals, which melt at 57-5°C. When boiled with dilute aqueous caustic soda it yields Zeil's nitrophenol. Symmetrical (1.3.5) trinitrobenzene is formed by the further nitration of meta-dinitrobenzene with fuming sulphuric and nitric acids; by the action of hydrochloric acid on sodium malonyl aldehyde (H. B. Hill and J. Torray, Ber., 1895, 28, p. 2958), or by the action of water on 2.4.6-trinitrobenzoic acid (German patent 77244). It crystallizes in prisms which melt at 121°C. It yields addition compounds, with aniline and naphthalene, and combines directly with potassium methyldithiono and potassium cyanogen ester. All these potassium ferricyanide oxidizes it to picric acid.

**Nitrobenzene, \( \text{C}_6\text{H}_5\text{NO} \), was first obtained by the action of nitrosyl bromide on diphenyl (Small, Jour., 1854, 3, p. 1638). It results, with other products, in the oxidation of phenyl diazonium chloride with alkaline potassium ferricyanide; of \( \beta \)-phenylhydroxylamine with chronic acid mixture (E. Bamberger, Ber., 1893, 26, pp. 473, 483, 1894, 27, p. 1340), or of aniline by monopersulphuric acid (German patent 1010755). It exists in two crystalline forms. Nitric acid passed into its chloriform solution...
Nitro Compounds

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Nitro Compounds

Concentrated caustic potash decomposes into carbon monoxide and hydroxylamine. It combines with aromatic aldehydes in the presence of alcoholic potash to form addition products which are converted by acids into styryl derivatives (J. Thiele, Ber., 1890, 23, p. 1833). Nitrotoluene, C6H5NO2, is a colourless liquid which boils at 114° C. Nitroform (trinitromethane), CH₃(NO₂)₃, is obtained in the form of its ammonium salt by the decomposition of trinitroacetone with water (L. Schischkoff, Ann., 1857, 193, p. 364). It is a colourless crystalline solid which melts at 55° C. and has the properties of a strong acid. The potassium salt is formed by the action of potassium ethylate on tetrinitromethane (A. Hantzsch, Ber., 1899, 32, p. 631). It is a deep yellow coloured solid, which is readily soluble in water. It explodes when heated. The silver salt, obtained by shaking an ether solution of nitroform with freshly prepared, slightly moist silver oxide, reacts with methyl iodide to form methyl nitroformate, (CH₃O)₂C(NO₂)I. Tetranitromethane, CH₃(NO₂)₄, obtained by adding nitroform to a hot mixture of nitric and sulphuric acids, is a crystalline solid, which melts at 127° C. Chloropicrin, C₈H₇NO₂, is a liquid of suffocating odour obtained by the action of nitric acid and chloride of lime on many organic compounds. It boils at 234° C.

Aromatic Nitro Compounds

The aromatic nitro compounds are generally obtained by the direct action of nitric acid. Substitution takes place usually in the nucleus and only rarely in the side chain, and according to the conditions of the experiment and the nature of the compound acted upon, one or more nitro groups enter the molecule. The reaction is generally carried out in the presence of sulphuric acid, which is used to absorb the water formed during the process of nitration. Nitro compounds have also been prepared by the action of cuprous oxide on diazonium salts (T. Sandmeyer, Ber., 1887, 20, p. 1494); by the action of copper powder on the double salt formed by the addition of potassium metanitroic acid to diazonium nitrates; and by the oxidation of primary aromatic amines (E. Bamberger, Ber., 1893, 26, p. 496). The mono-nitro compounds are stable and distill without decomposition; they have a pale yellow colour and possess an agreeable odour. Most of the poly-nitro compounds are not volatile, but undergo decomposition on heating. The nitro group in the aromatic series is bound very firmly in the molecule and is not readily exchanged for other groups. Several different products may be obtained by the reduction of the aromatic nitro compounds, the substances formed in any particular case depending on the conditions of experiment. In acid solution, amines are obtained, in alkaline solution, azoxy, azo and hydrazo compounds, and in neutral solution hydroxylamino compounds. The electrolytic reduction of the aromatic nitro compounds gives rise to substituted hydroxylamines which are immediately transformed into aminophenols or amines.

For the nitrobenzenes see Nitrobenzene, C₆H₅(CH₃)NO₂. Three isomers exist, the ortho- and para- compounds being the chief products of the direct nitration of toluene. They may be separated by fractional distillation. The ortho-compound melts at 10-5° C. and boils at 218° C., the para-compound melts at 35° C. and boils at 260° C., and the meta-nitro-derivative (melting at 16° C.) is obtained by nitrating acetophenone and then replacing the amino group by hydrogen.

Phenylnitromethane, C₆H₅CH₂NO₂, isomeric with the nitrobenzene, is prepared by the action of concentrated nitric acid on allyl nitrite. It is a colourless oily liquid which boils at 225°-227° C., is somewhat soluble in water, and does not give a coloration with ferric chloride. It readily forms a sodium salt, from the aqueous solution of which on the addition of a mineral acid an isomeric solid form of the nitro compound (melting at 84° C.) is precipitated. This solid form gradually passes, on standing, into the oily variety. It is probably a hydroxy-compound, since it gives a red-brown colour with ferric chloride, reacts with phenyl isocyanate and with phosgene to chlorophenylchloride, and with benzoyl chloride yields dibenzhydroxyazomethane, C₇H₅CO-NH-OCOCH₃. Thus the solid form is probably to be represented as CH₃:CH:NO:OH or CH₃:CH:N=O (see further, A. Hantzsch on Pseudo-acids, Ber., 1899, 32, p. 575, 1902, 35, pp. 210, 226, 1001, 1906, 39, pp. 139, 1073 et seq.).

The nitric acids, R-C(NO₂)NO₂, may be prepared by the action of nitric acid on the primary nitroparaffins; by the action of hydroxylamine on the dibromonitroparaffins; and by the action of nitrogen peroxide on the α-sinositro fatty acids (Ber., 1905, 38, p. 519). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518). They are colourless liquids (1° C. p. 518).
Nitrogen

A. Hantzsch and O. Graul (Ber. 1898, 31, p. 2854) described several series of salts of the nitrolucic acids, with particular reference to ethynitrolucic acid. They discriminate between the red or erythro-salts, which are well crystallized, very explosive and unstable compounds, and which regenerate the colourless nitric acid on the addition of dilute mineral acids, and the leuco-salts, which are colourless salts obtained by warming the erythro-salts and exposing them to the air. These salts cannot be converted either into the red salts or into the free acid. An intensely yellow acid salt is described, as is also a very unstable colourless salt which could not be examined further owing to its very labile nature. The following structural formulae are assigned to these compounds:

\[
\text{R-C}^\equiv \text{NO} \quad \text{R-C}^\equiv \text{NO}^\circ \quad \text{R-C}^\equiv \text{NO}_2 \quad \text{R-C}^\equiv \text{NO}_3
\]

nitric acid; erythro-salt; leuco-salt; basic nitroso-octane.

The acid salts are obtained by the addition of one molecule of alkali to two molecules of the acid in concentrated alcoholic solution at a low temperature. They are unstable compounds which readily split into the red salt and the free acid on standing.

The pseudo-nitrolucic acid, RR':C(NO)(NO)_, may be obtained by the action of nitrous acid on the secondary nitroparaffins; by the action of silver nitrate on such bromo-nitrosoparaffins as contain the bromine and the nitroso group united to the same carbon atom (O. Piloty, Ber., 1902, 35, p. 3093); and by the action of nitric oxide on ethereal solutions of ketoximes (R. Scholl, Ber., 1888, 21, p. 308; G. Born, Ber. 1896, 29, p. 93). They exhibit an intense blue colour when in the liquid condition or dissolved in alkali and exposing them to the air.

They are unstable with chromic acid; they yield dinitrohydrocarbons, and on reduction with hydroxylamine (in alkaline solution) or with potassium sulphide give ketoximes, RR':C: NOH (R. Scholl and K. Landsteiner, Ber., 1896, 29, p. 87).

RR':C(NO)_2.OH \rightarrow RR':C(NH.OH) \rightarrow RR':C: NOH + HO.NH.

Nitrosobenzenecarbons have been prepared in the aliphatic series by the oxidation of the corresponding hydroxylamino compounds. Nitroso-tertiary butane, (CH_3)C=NO, is formed when the corre- sponding hydroxylamine is oxidised by sulphuric monoper acid (E. Bamberger, Ber., 1903, 36, p. 686). A nitrosocetane (CH_3)C(NO)(CH_3)CH_3, has been obtained by O. Piloty and Ruff (Ber., 1898, 31, p. 459) from nitro-isobutylxyl by reducing it to the corresponding hydroxylamino compound with aluminium amalgam and oxidising this with chromic acid mixture. It is a colourless solid which melts at 54° C, to a deep blue liquid. Numerous nitroso compounds are met with in the aromatic series.

Nitrogen [symbol N, atomic weight 14.01, O]=16. A non-metallic chemical element, first isolated in 1772 by D. Rutherford, who showed that on removing oxygen from air a gas remained, which was incapable of supporting combustion or respiration. Nitrogen forms approximately 79% by volume (or 77% by weight) of the atmosphere; actual values are: % by volume—79.97 (Regnault), 79.20 (Dumas); % by weight—76.87 (Regnault), 77.00 (Dumas), 77.02 (Lévy), 76.90 (Stas), 77.01 (Marignac). No absolutely accurate determinations appear to have been made recently. Free nitrogen is also found in some natural waters and has been recognized in certain nebulae. In the combined state nitrogen is fairly widely distributed, being found in nitrile, Chile salt-petreum, ammonium salts and in various animal and vegetable tissues and liquids. It is invariably present in soils, where compounds are formed by nitrifying bacteria.

Nitrogen may be obtained from the atmosphere by the removal of the oxygen with which it is there mixed. This may be effected by burning phosphorus in a confined volume of air, by the action of an alkaline solution of pyrogalol on air, by passing air over heated copper, or by the action of copper on air in the presence of ammoniacal solutions.

It is also prepared by heating ammonium nitrite (or a mixture of sodium nitrite and ammonium chloride); NH.NO_2 = 2H_2O + N_2; by heating a mixture of ammonium nitrate and chloride (the chlorine which is simultaneously produced being absorbed by milk of lime or by a solution of sodium hydroxide); 4NH.NO_2 + 2NH.CI = 5N_2 + CO_2 + 12H_2O; by heating ammonium dichromate (or a mixture of sodium dichromate and chromic oxide); 2NH.Cr_2O_7 = CrO_3 - 2H_2O + N_2; or by passing chlorine into a concentrated solution of ammonia (which should be present in considerable excess): 8NH_3 + 3Cl_2 = 6NH_4Cl + N_2; by the action of hypochlorites or hypo- bromites on ammonia: 3NaOBr-2NH_3 = 3NaBr+3H_2O+N_2; and by the action of manganese dioxide on ammonium nitrate at 180-200° C. It is also formed by the reduction of nitric and nitrous acids by hydrogen in the presence of platinitized asbestos at a red heat (G. v. Knorre and Electrick. Ber. 1872, 32, p. 66) by the oxidation of hydroxylamine (ibid., 1900, 33, p. 30); and by the electrolysis of hydrazine and its salts (E. Ch. Szarvasy, Jour. Chem. Soc., 1900, 77, p. 603).

The chief importance of nitrogenous compounds depends upon their assimilation by living plants, which, in their development, absorb these compounds from the soil, wherein they are formed mainly by the action of nitrifying bacteria. Since these compounds are essential to plant life, it becomes necessary to replace the amount abstracted from the soil, and hence a demand for nitrogenous manures was created. This was met in a very large measure by deposits of natural nitre and the products of artificial nitrifies, whilst additional supplies are available in the ammonical liquors of the gas-manufacturer, &c. The possible failure of the nitre deposits led to attempts to convert atmospheric nitrogen into manures by processes permitting economic success. Combination can be made in five directions, viz. to form (1) oxides and nitric acids, (2) ammonia, (3) readily reducible nitrates, (4) cyanides, (5) cyanamides. The first three will be treated here; for the others see PERSIC Acid and CYANAMIDE.

The combination of nitrogen with oxygen was first effected by Cavendish in 1785, who employed a spark discharge. The process was developed by Madame Lefebre in 1859; by Meissner in 1863, who found that moist gases gave a better result; and by Prim in 1882, who sparked the gases under pressure; it was also used by Lord Rayleigh in his isolation of argon (q.v.). It was not, however, a commercial success, and the same result attended Siemens and Halbe's application of the silent discharge. More effective was the electric arc. In 1892 Sir W. Crookes showed that the arc brought about combination; and in 1897 Lord Rayleigh went into the process more fully. But the first careful working-out of the conditions was made in 1900 by A. McDougall and F. Howles, who, employing a high tension alternating arc, showed that the effectiveness depended upon the temperature. The commercial manufacture of nitric acid was attempted by C. S. Bradley and D. R. Lovejoy at Niagara Falls, who passed atmospheric air, or air enriched with oxygen, about a high tension arc made as long as possible; but the company (the Atmospheric Products Company) was a failure. Better results have attended the process of K. Birkeland and S. Eyde, which is being worked on a large scale at Notodden, Norway. The arc is produced by leading a current of about 5000 volts equatorially between the poles of an electromagnet; this produces what is practically a disk of flame, 6 ft. in diameter and having a temperature of about 3000°. The disk really consists of a series of successive arcs which increase in size until they burst. The first product of the reaction is nitric oxide, which on cooling with the residual gases produces nitrogen peroxide. The cooled gases are then passed through water to form nitric acid, the gases being sent in the contrary direction. Nitric acid (up to 50%) is formed in the first tower, and weaker acids in the successive ones; the last tower contains milk of lime which combines with the gases to form calcium nitrate and nitrate (this product, being unsuitable as a manure, is decomposed with the acid, and the evolved gases sent back). It was found advantageous not to work for acid but for a basic calcium nitrate (normal calcium nitrate being very deliquescent); for this purpose the acid is treated with the requisite amount of milk of lime. In the process of the Badische Oel- und Soda-Fabrik, the arc, which is said to be 30 to 50 ft. long, is formed in a long tube, and the gases are sent round the arc by obliquely injecting them. A 30% acid is said to be formed. I. Moscicki and J. von Kowalski have patented a process wherein the arc is formed at two vertical
NITROGEN

concentric copper electrodes and rotated by an electromagnet; it is worked at Vevey, Switzerland. The Rankin process, of which very little is known, produces the arc with much lower current.

The conversion of nitrogen into ammonia by electricity has received much attention, but the commercial aspect appears to have been first worked out by de Hemptinne in 1900, who used both the spark and the silent discharge on mixtures of hydrogen and nitrogen, and found that the pressure and temperature must be kept low and the spark gap narrow. J. Schütz in 1903 employed Dowson gas as a source of hydrogen, and induced combination by means of platinum and the silent discharge. Several non-electrical processes have been devised. In 1862 Fleck passed a mixture of steam, nitrogen and carbon monoxide over red-hot lime, whilst in 1904 Wolterek induced combination by passing steam and air over red-hot iron oxide (peat is used in practice). In de Lambilly's process air and steam is led over white-hot coke, and carbon dioxide or monoxide removed from the escaping gases according as ammonium formate or carbonate is wanted.

The residual gas is then passed through a tube containing porous materials, such as wood- or bone-charcoal, powdered pumice or spongy platinum, then mixed with steam and again forced through the previously heated tube. (1) \( \text{N}_2 + 3\text{H}_2 + 2\text{CO} + 2\text{H}_2\text{O} = 2\text{H}_2\text{CO}_3\text{NH}_2 \) (Ammonium formate). (2) \( \text{N}_2 + 3\text{H}_2 + 2\text{CO} + 2\text{H}_2\text{O} = 2\text{H}_2\text{CO}_2\text{NH}_2 \) (Ammonium carbonate).

The best temperature for the first reaction is between 80°C and 130°C, and for the second between 40°C and 66°C. In another process, which originated with C. Kaiser (Abst. J.C.S., 1907, ii. p. 862), calcium is heated in a current of hydrogen, and nitrogen passed over the hydride so formed; this gives ammonia and calcium nitride, the latter of which gives up its nitrogen as ammonia and reforms the hydride when heated in a current of hydrogen.

The fixation of nitrogen as a nitride has not been attended with commercial success. H. Mehner patented heating the oxides of silicon, boron or magnesium with coal or coke in an electric furnace, and then passing in nitrogen, which forms, with the metal liberated by the action of the carbon, a readily decomposable nitride.


Nitrogen is a colourless, tasteless and odourless gas, which is only very slightly soluble in water. It is slightly lighter than air. Lord Rayleigh in 1894 found that the density of atmospheric nitrogen was about 1% higher than that of chemically prepared nitrogen, a discovery which led to the isolation of the rare gases of the atmosphere (see Arcron). The values obtained are shown below:

<table>
<thead>
<tr>
<th>Atmospheric</th>
<th>Chemical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>Nitrogen</td>
</tr>
<tr>
<td>0-9709</td>
<td>0-9672</td>
</tr>
<tr>
<td>0-9720</td>
<td>0-9671</td>
</tr>
</tbody>
</table>

Nitrates are a very inert gas: it will neither burn nor support the combustion of ordinary combustibles. It combines directly with lithium, calcium and magnesium when heated, whilst nitrates of the rare earth metals are also produced when their oxides are mixed with magnesium and heated in a current of nitrogen (C. Malignon, Comptes rendus, 1900, 131, p. 837).

Nitrogen has been liquefied, the critical temperature being \(-149^\circ\text{C}\) and the critical pressure \(27.54\text{ atm}\). The liquefied gas boils at \(-195.5^\circ\text{C}\), and its specific gravity at its boiling point is \(0-8103\) (E. C. C. Baly and G. F. Donnan, Jour. Chem. Soc., 1902, 81, p. 912).

**Compounds.**

Nitrogen combines with hydrogen to form ammonia, \(\text{NH}_3\), hydrazine, \(\text{N}_2\text{H}_4\), and azomelone, \(\text{N}_2\text{H}\) (gaseous); the other known hydrides, \(\text{NH}_{2}\text{H}_3\), \(\text{NH}_{2}\text{H}_4\), \(\text{NH}_{2}\text{H}_5\), etc., are all unstable.

Nitrogen trihydride, \(\text{N}_3\text{H}_3\), discovered by P. L. Dulong in 1811 (Schweigg. Journ., 1811, 8, p. 302), and obtained by the action of chlorine or hydrochloric acid on ammonium chloride, or by the electrolysis of ammonium chloride solution, is a very yellowish yellow oil. It possesses an extremely pungent smell, and its vapour is extremely irritating to the eyes. It is a most dangerous explosive (see D. L. Chapman and L. Vodden, Jour. Chem. Soc., 1909, 95, p. 158).

Chlorine oxide, \(\text{Cl}_2\text{N}=\text{N}_2\), was discovered by F. Raschig in 1906 (see Azomelone); the corresponding iodine compound had been obtained in 1906 by A. Hantzsch (Ber., 1907, p. 522). For the so-called nitrogen oxide see Azomelone.

Nitrogen forms five oxides, viz. nitrous oxide, \(\text{N}_2\text{O}\), nitric oxide, \(\text{NO}\), nitrogen trioxide, \(\text{NO}_3\), nitrogen dioxide, \(\text{NO}_2\), and nitrogen pentoxide, \(\text{N}_2\text{O}_5\). They may be represented by the formulas: \(\text{NO}_2\), \(\text{NO}_3\), hyponitrous acid, \(\text{H}_2\text{NO}_2\text{N}=\text{N}_2\), nitrous acid, \(\text{H}_2\text{NO}_2\), and nitric acid, \(\text{HNO}_3\) (gaseous). The first four oxides are gases, the fifth is a solid.

Nitrous oxide, \(\text{N}_2\text{O}\), isolated in 1776 by J. Priestley, who obtained it by heating nitrogen oxide with iron, may be prepared by heating ammonia nitrate at 170-260°C, or by reducing a mixture of nitric and sulphuric acid with zinc. It is a colourless gas, which is practically odourless, but possesses a sweetish taste. It is some-
NITROGLYCERIN

Nitroglycerin, $\text{C}_3\text{H}_5\text{N}_3\text{O}_9\text{,}$ was first obtained in 1846 by A. Sobrero (Mem. Acad. Torino, 1847) by acting with a mixture of strong nitric and sulphuric acids on glycerin. The reaction proceeds in several stages, mono- and finally tri-nitrate being produced, the final stage requiring sulphuric acid as a dehydrator. When pure it is a very pale yellow oil of sp. gr. 1.614 at 4°C and 1.00 at 15°C. One gram of the nitroglycerin does not dissolve in 100 cc. of water but yields about 8 parts of an oil, the rest being a residue of about 1-5%. The mixture of absolute alcohol or 18 c.c. of wood spirit, and it is scarcely at all soluble in glycerin itself, but mixes in all proportions with ether, acetone, ethyl acetate and benzene.

In the manufacture of glycerin is dropped in a very thin stream into a mixture of 3 parts of nitric (sp. gr. 1-5) and 5 parts of sulphuric acid (sp. gr. 1-84), the containing vessel being cooled by a water jacket and the acid mixture agitated by a stream of cooled air, the temperature being kept at about 15°C. A considerable excess of acids is used for the completion of the reaction, and finally the reaction mixture is agitated with about 8 parts of the oil to the mixture to 1 of glycerin. The higher the strength of the acids the higher the yield of nitroglycerin and the smaller the loss by solution in the waste acids. In recent practice by the use of phosphorus pentachloride the mixture of acids contain less than 1% of water. The action is very rapid, and the product, which rises to the top of the acids, is separated and washed successively with cold and then tepid water, and finally with water made slightly alkaline with sodium carbonate or hydroxide, to remove all adhering or dissolved acids which otherwise render the product very unstable. Nitroglycerin dissolves a little water and then appears thick or milky. Generally it is ether...
NITZSCH, G. W.—NITZSCH, K. I.

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dried, after being separated from the wash water, by means of common salt, upon a layer of which the nitroglycerin is run a millimetre pressure or it is filtered through, or it is filtered through a mass of dry or similar dry and porous material.

Under ordinary pressure it boils at above 200° C. (L. de Bruyn). If gradually heated it begins to vaporize and decompose at about 130°, and as a rule it detonates when heated slightly above this temperature, previously giving off some red fumes.

A little vapour is given off at ordinary temperatures and pressures, and when under a few millimetres pressure it rapidly vaporizes below 100° C. The freezing-point is uncertain, owing perhaps to the existence of two modifications, as suggested by Kast (Zeits. f. ges. Schiess- u. Sprengstoff, 1827; also S. Nauckhoff, Zeits. f. ang. Chem., 1898, Heft 1 and 2). It is frequently given as 43° to 46° F. (about 6° to 8° C.), and it is stated to be more sensitive to percussion when frozen (Belstein). It crystallizes in (long needles) more easily when gently agitated during the cooling, or when mixed with such substances as kieselguhr. At one time it was transported all over America in a frozen condition without serious accidents, and according to Sir F. Nathan (Jour. Soc. Chem. Ind., 1908, 27, p. 5) it is safer to export in the frozen state. To prevent the freezing of nitroglycerin in dynamite it has been proposed to add various substances, such as chlorodinitroglycerin, nitrated diglycerin or tetranitrodiglycerol, and also mono- and di-nitroglycerin. The latter two have been studied by C. W. Will (Ber., 1908, 7, p. 497), who obtained two isomeric di-nitroglycerins, one of which is eminently crystallizable and the other fluid. Both are sensitive to percussion, but a little less so than nitroglycerin. The crystals exist in two forms, neither of which is strictly explosive. It appears that an addition of di-nitroglycerin to nitroglycerin would materially retard its freezing or lessen its sensitivity (see also C. Claassen, Ger. Pat. 210990 (1908)).

<table>
<thead>
<tr>
<th>Mono.</th>
<th>Di.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity</td>
<td>1.40</td>
</tr>
<tr>
<td>Melting-point</td>
<td>45°</td>
</tr>
<tr>
<td>Boiling-point 18 mm.</td>
<td>155°-160°</td>
</tr>
<tr>
<td>Solubility</td>
<td>70%</td>
</tr>
</tbody>
</table>

The liquid when soaked into a porous combustible substance like blotting-paper burns rapidly and quietly, and when struck with a hammer on a hard surface violently detonates; when a little of the liquid is spread on an anvil and struck, the portion immediately under the hammer only will, as a rule, detonate, the remainder being scattered. Some solutions of nitroglycerin (in ether, acetone, &c.) burn quietly, and the same is the case when it is held in solution or suspension in a colloidal substance, as gelatinized guncotton, &c.

Strong sulphuric acid dissolves nitroglycerin, and this solution on being poured into water yields dinitroglycerin (see Will, loc. cit.) and also some mononitroglycerin. When the solution in the strong acid is allowed to stand, some nitric acid is first evolved, and as the temperature rises this is followed by a general decomposition of the substance, though not necessarily an explosive one. Shaken with methylated alcohol its nitroglycerin content dissolves in the alcohol; the measurement of the volume of this gas is a convenient mode of estimating nitroglycerin. Ammonium hydroxide has no appreciable action at ordinary temperatures, but strong solutions of sodium or potassium hydroxides tend to a decomposition, with rise of temperature, in which some nitrate and always some nitrate is produced. Some glycerin may be re-formed, but with very strong alkaline solutions little of the glycerin molecule escapes destruction, oxalic acid and several other products resulting. Alcoholic solutions of the alkalis also produce much nitric acid along with some formate and acetate. Calcium or potassium sulphides and potassium hydroxide completely reduce nitroglycerin to glycerin, oxalic acid and sulphur being oxidized and some precipitated. Hydroxide acid reduces it to glycerin and nitric oxide. Aniline and similar bases are oxidized and partially nitrated by nitroglycerin, with the production of a nitroso nitroglycerine.

The first attempts to utilize the explosive power of nitroglycerin were made by Nobel in 1863; they were only partially successful until the plan, first applied by General Picot in 1854, of developing the force of gunpowder in the most rapid manner and to the maximum extent, through initiative detonation, was applied by Nobel to nitroglycerin. Even then, however, the liquid nature of the substance, though advantageous in one or two directions, constituted a serious obstacle to its safe transport and storage and to its efficient employment; it was therefore not until Nobel produced plastic solid preparations containing the liquid substance, which consisted of nitroglycerin, clay, and about 10% of sulphur, and finally kieselguhr in a fine state of division, capable of absorbing and retaining considerable quantities of it, that it could be employed as a blasting agent (see Explosives, Dynamite, Cordeite).

Therapeutics.—Nitroglycerin has a sweet burning taste and is decidedly poisonous. Its vapour produces violent headache, and the same effect is often caused by handling compositions containing it. Prior to its use as an explosive, its alcoholic solution found application in medicine under the name of glicolone. Although its phosphorescent property rendering it the source of nitrates such as amylnitrite, taken internally. The explanation that is in an alkaline medium at body heat nitroglycerin yields a nitrite, probably as a preliminary stage of resolution. Nitroglycerin shaken up with warm very dilute alkaline solutions, as sodium carbonate, for a few minutes only, always yields sufficient nitrite to give the diazoreaction; and, as stated, strong alkaline solutions always produce some nitrite as one of the decomposition products. This gradual conversion in the tissues is a valuable property of nitroglycerin, as its effects take longer to manifest themselves than is the case with amyl nitrite and other nitrates. Nitroglycerin is valuable as a preventive in cases of cardiac pain, such as angina pectoris, and it is also used in other conditions where it is desirable to reduce the arterial tension. The British Pharmacopoeia contains a liquor trinitriti (1%), and tablets made up with chocolate, each containing one-hundredth of a grain.

NITZSCH, GREGOR WILHELM (1790-1861), German classical scholar, brother of Karl Immanuel Nitzsch, was born at Wittenberg on the 22nd of November 1790. In 1827 he was appointed professor of ancient literature at the University of Kiel, but in 1832 was dismissed by the Danish government for his German sympathies. In the same year he accepted a similar post at Leipzig, which he held till his death on the 22nd of July 1861. Nitzsch is chiefly known for his writings on the Homeric epic. In opposition to Wolf and Lachmann, he maintained that the Iliad and Odyssey were not an aggregate of single short poems, but long complete poems, composed by one and the same author according to a uniform plan with a central dramatic idea.

NITZSCH, KARL WILHELM (1818-1880), became professor of history at Königsberg in 1862, and at Berlin in 1872.

The most important of his works were: Erklaernde Anmerkungen zu Homer's Odyssey, I-xiii. (1826-1840); Die Sagepoesie der Griechen (1842); Beiträge zur Geschichte der epischen Poesie der Griechen (pub. 1862, ed. C. W. Nitzsch). See memoir by F. Lüblcr (1864); C. Bursian, Geschichte der klassischen Philologie in Deutschland (1883) and J. E. Sandys, Hist. of Class. Schol. iii. (1908), p. 105.

NITZSCH, KARL IMMANUEL (1787-1868), Lutheran divine, was born at the small Saxon town of Borna near Leipzig in 1787. His father, Karl Ludwig Nitzsch (1751-1831), who at that time was pastor and superintendent in Borna and afterward in Schlochet, became director (1817) of the seminary for preachers, has also left a name of some distinction in the theological world by a number of writings, among which may be mentioned a work entitled De discriminatione revolutionarum imperatoriae et didacticarum prolusiones academicae (2 vols., 1830). Theologically, he represented a combination of supernaturalism and rationalism (supernatural rationalism or a Kantian rational supernaturalism). Karl Immanuel was sent to study at Schulpforta in 1803, whence he proceeded to the university of Wittenberg in 1806. In 1809 he graduated, and in 1810 he became a Privatdozent at the university. Having become diaconus at the Schleswirch in 1811, he showed remarkable energy and zeal during the bombardment and siege of the city in 1813. In 1817 he was appointed one of the preceptors in the preachers' seminary which had been established at Wittenberg after the suppression of the university. From 1820 to 1822 he was superintendent in Kemberg, and in the latter year he was appointed professor ordinarius of systematic and practical theology at Bonn. Here he remained until called to succeed Marheineke at Berlin in 1847; subsequently he became university preacher, rector of the university, provost of St Nicolai (1854) and member of the supreme council of the church, in which last capacity he was one of the ablest and most active promoters of the Evangelical Union. He died on the 21st of August 1868. He represented the Vermittlungsstoeologie of the school of Schleiermacher.
NIU-CHWANG—NIVERNAIS

His son, FRIEDRICH AUGUST NITSCHE (b. 1832), was made professor ordinarius of theology at Giessen in 1868 and at Kiel in 1872. He was the author of Grundris der christl. Dogmengeschichte (1870, incomplete) and Das System des Bodhidrisht (1872—2 vols., other hands).

Carl Nitzsche's principal works are: System der christlichen Lehre (1829; 6th ed., 1851; Eng. trans., 1840), Praktische Theologie (1847—60; 2nd ed., 1863—68), Akademische Verträge über christliche Glaubenslehre (1858) and several series of Predigten. "He took as his starting-point the fundamental thought of Schleiermacher, that religion is not doctrine but life, direct consciousness, feeling. At the same time he sought to bring religious feeling into closer connexion with knowledge and volition than Schleiermacher had done, and he laid the foundation for the recognition of a necessary and radical union of religion with morality, treating both dogmatics and ethics together accordingly in his System der christlichen Lehre" (Otto Pfleiderer, Development of Theology, p. 123). His Protestantische Beantwortung, a reply to the Symbolik of Johann Adam Möhler (1766—1838), which originally appeared in the Studien u. Kritiken, of which he was one of the founders, may also be mentioned.

See Herzog-Hauck, Realencyklopädie, and the Allgemeine deutsche Biographie; F. Lichtenberger, History of German Theology in the Nineteenth Century, pp. 185—196.

NIU-CHWANG, a city of China, in the Manchurian province of Sheng-king (Liao-tung), in 40° 33’ N. and 129° 57’ E., about 35 m. (50 m. by water) from the mouth of the Gulf of Liao-tung, on the coast is now a small branch of the main entrance of the Liao-ho. The population is estimated at 80,000. The city proper is a comparatively unimportant place with broken-down walls, but it is surrounded by a number of large and flourishing suburbs. About the beginning of the Ta-ts’ing dynasty (1644) Niu-chwang was the chief port on the river, but in the reign of K’ien-lung, owing mainly to physical changes, it was supplanted by T’ien-chwang-tai farther down the stream, and towards the close of the 18th century this had in turn to give place to Ying-tsze still nearer the mouth. In ignorance of these facts Niu-chwang (now a small town reached by a flat-bottomed river boat) has been chosen as one of the ports to be opened to foreign trade by the treaty of Tien-tsin; and, though Ying-tsze had of necessity to be adopted as the site of the foreign settlements, Europeans still continue to speak of it as the port of Niu-chwang. Ying-tsze (otherwise known as Ying-k’ou, Niu-k’ou and in Mandarin as Muh-k’ou-ying) lies on the left bank of the Liao-ho on the lowest dry portion of the plain, not much above high-water mark. The British settlement immediately above the town has a river frontage of 1000 yds., opposite the deepest of the reaches, and runs back 300 yds. The Gulf stream, which pierces the mouth of the river there is an extensive bar of hard mud which can only be crossed by certain channels at high tide, when it is covered by from 18 to 20 ft. of water; and the port is altogether closed by ice for four or five months of the year, between November and May. Niu-chwang has shown considerable vigour as a port of trade, sharing in the general prosperity of the provinces of Manchuria, of which it is the outlet. It was opened to foreign trade in 1838. In 1864 the total value of trade was $200,124; in 1878 $3,060,134, in 1898 $4,634,470, while in 1904 the figures reached £4,950,805. The principal exports (20%) are beans, bean-cake, bean-oil and wild silk. The bean-cake is a popular article of food with the natives of Kwang-tung and Fu-chien, and is also largely employed for manuring the rice and sugar fields in the neighbourhood of Shanghai, Amoy, Swatow, &c. Of imports (71%) the principal are cotton yarn and cotton cloth, most of the latter being drawn from the United States in preference to English-made goods. The number of resident foreigners is about 150. Railways connect the port with Tientsin and Peking on the one hand, and with the Russian territories lying to the north on the other. In 1890 Niu-chwang was occupied by Japanese troops, and the town was included in the cession of territory originally granted by the treaty of peace. By a supplementary convention it was retroceded by the Japanese under pressure of France and Russia. Niu-chwang suffered considerably from the disturbances of 1900 and again during the Russo-Japanese war. In 1900 the Russians attacked the town, and took possession of the port, and administered affairs until they in turn were driven out by Japanese. At the conclusion of the war the Japanese restored the port to China.

Nieuw (Shang-hai In and we Nieuw-Fekai, as the natives call it), an island in the South Pacific Ocean, 14 m. long by 10 m. wide, in 15° 10’ S., 160° 47’ W. The entire island is an old coral reef upreared 200 ft., honeycombed with caves and seamed with fissures. The soil, though thin, is, as in other limestone islands, very rich, and coco-nuts, tara, yams and bananas thrive. There is an abundant rainfall, but owing to the porous nature of the soil the water percolates into deep caves which have communication with the sea, and becomes brackish. The natives, a mixed Polynesian and Melanesian people of Samoan speech, are the most industrious in the Pacific, and many of the young men go as labourers to other islands. The consequent minority of males has been destructive of the sexual morality of the women, which formerly stood high. The natives are keen traders, and though uncouth in manners when compared with their nearest neighbours, the Tongans and Samoans, are friendly to Europeans. Their hostility to Captain Cook in 1774, which earned him the name of Savage for the island, was due to their fear of foreign disease, a fear that has since been justified. The population (1901) is slightly decreasing. The natives are all Christians, and the majority have learned to read and write, and to speak a little English. On the top of the town is the Missionary Society. They wear European clothes. The island became a British protectorate on the 20th of April 1900, and was made a dependency of New Zealand in October 1900, the native government, of an elected "king" and a council of headmen, being maintained. In 1900 there were thirteen Europeans on the island. The exports are copra, fungus and straw hats, which the women plait very cleverly.

See T. H. Hood, Notes of a Cruise in H.M.S. "Fawn" (Edinburgh, 1853); J. L. Brenchley, Jottings during the Cruise of the "Curazo" (London, 1873); B. H. Thomson, Savage Island (London, 1902).

NIVELLES (Flem. Nyvel), a town of Belgium in the province of Brabant, situated on the Thines r. m. S. of Brussels. Pop. (1904) 12,109. It is a busy little place with many industries, notably the manufacture of parchment. The town is supposed to owe its origin to the foundation of a convent on the spot by Itta or Iduberge, wife of Pippin of Lippain. The Romanesque church of St Gertrude, named after Itta's daughter, dates from the 11th century, but has been badly restored and is disfigured by a heavy tower. On the top of the tower is the effigy of the townspeople Jean de Nivelles, a celebrated baron of the 15th century whose title eventually became merged in that of the count de Hornes (Horn). The church is supposed to occupy the site of Itta's convent. Close to Nivelles is Seneffe, where Condé defeated William of Orange in 1674, and at Nivelles itself the French under Marceau defeated the Austrians in 1704.

NIVERNAIS, LOUIS CHARLES BARBON MANGINI MAZARIN, Dec de (1716—1708), French diplomatist and writer, was born in Paris on the 16th of December 1716, son of Philippe Jules Francois, duc de Nevers, and Maria Anne Spinola, and great-nephew of Cardinal Mazarin. He was educated at the Collège Louis le Grand, and married at the age of fourteen. He served in the campaigns in Italy (1733) and Bohemia (1740), but had to give up soldiering on account of his weak health. He was subsequently ambassador at Rome (1748—1752), Berlin (1755—1756) and London, where he negotiated the treaty of Paris (10th of February 1763). From 1787 to 1790 he was a member of the Council of State. He did not emigrate during the revolution but lost all his money and was imprisoned in 1793. He recovered his liberty after the fall of Robespierre, and died in Paris on the 25th of February 1798. In 1743 he was elected to the Academy for a poem entitled Délire, and from 1763 he devoted the greater part of his time to the administration of the duchy of Nevers and to belles-lettres. He wrote much and with great facility; but his writings are of little value, his Fables being his best pro-
ductions. His *Oeuvres complètes* were published in Paris in 1796; an edition of his *Oeuvres posthumes* was brought out in Paris by François de Neufchâtel in 1807, and his *Correspondance secrète* was published in Paris by de Lescure in 1866.


**NIXIE**, or **NIXY**, a female water-sprite. The word is adapted from Ger. *Nixe*, the male water-sprite being *Nix*. The general term covering both the male and female is “nicker,” a kelpie. This also appears in Dutch *nijkerk.* The Old Teutonic *nikus* may be connected with the root which appears in Gr. *nixèr* or *nixote* to wash.

**NIXON, JOHN** (1815–1890), English mining engineer and colliery proprietor, was born at Barlow, Durham, on the roth of May 1815, the son of a farmer. He was educated at the village school, and at an academy in Newcastle-on-Tyne, where he distinguished himself in mathematics. Leaving school at fourteen, he worked on his father’s farm for two years, and then apprenticed himself to Mr Joseph Gray, one of the leading mining engineers in the north of England, and agent to the second marquis of Bute; subsequently he obtained employment as “overman” at one of the Bute collieries in Durham. In 1839 an advertisement drew him to the South Wales coalfield, where he was engaged in mine-surveying, and whence he proceeded to France as engineer to a coal and iron company. Returning to England, he noticed while travelling on one of the Thames steamers that the Welsh coal in use gave off no smoke and was preferred to north country coal both on this ground and because of its greater power-producing efficiency. His experience in France now suggested to him that a profitable market for this coal might be established among the French iron-founders and manufacturers generally who had hitherto imported English north country coal. For some time he was unable to procure any of this special Welsh coal. Eventually, however, by expending all his small savings he secured a cargo, freighted a small craft, and sent it across to Nantes, where with some difficulty he persuaded the local manufacturers to try it on the understanding that he bore the expense of the experiments. These tests, carried out under Nixon’s personal directions, proved highly successful, and in due course the French government gave him a contract for Welsh coal for the French navy. Nixon’s visit to Nantes laid the foundations of the Welsh steam-coal trade, English manufacturers and shipowners benefited, and it is a matter of regret that he was not given a proper share in the development of the vast possiblities which his early experiments suggested. He died in London on the 3rd of June 1890.

**NIZAM**, the hereditary title of the reigning prince of Hyderabad (q.v.) in India, derived from an Arabic word meaning order, or administration. The same word is found in *Nasim*, applied to the Nawab of Bengal, and in *Nizamat*, the old term for criminal jurisdiction. *Nizam-ul-Mulk* ( = “administrator of the kingdom”) was the title of Asaf Jah, the founder of the dynasty, a very able soldier and minister of the court of Aurangzeb, who was appointed governor of the Deccan in 1713, and established his independence before his death in 1748.

**NIZAMI** (1141–1203). Nizam-ud-din Abū Mahommaded Ilyâs bin Vicn, Persian poet, was born 535 A.H. (1141 A.D.). His native place, or at any rate the abode of his father, was in the hills of Kum, but as he spent almost all his days in Ganja in Arrâl (the present Elizavetpol) he is generally known as Nizâmi of Ganja or Ganjavâl. The early death of his parents, which illustrated to him in the most forcible manner the unsteadliness of all human existence, threw a gloom over his whole life, and fostered in him that earnest piety and fervent love for solitude and meditation which have left numerous traces in his writings, and are a noteworthy fact that the once so devout a powerful antidote against the enticing favours of princely courts, for which he, unlike most of his contemporaries, never sacrificed a tittle of his self-esteem. The religious atmosphere of Ganja, besides, was most favourable to such a state of mind; the inhabitants, being zealous Sunnites, allowed nobody to dwell among them who did not come up to their standard of orthodoxy, and it is therefore not surprising to find that Nizâmi abandoned himself at an early age to a stern ascetic life, as full of intolerance to others as dry and unprofitable to himself. He was rescued at last from his two misfortunes by his own genius, which, not being able to give free vent to its poetical inspirations under the crushing weight of bigotry, claimed a greater share in the legitimate enjoyments of life and the appreciation of the beauties of nature, as well as a more enlightened faith of tolerance, benevolence, and liberality. The first poetical work in which Nizâmi embodied his thoughts on God and man, and all the experiences he had gained, was necessarily a didactic character, and very appropriately styled *Makhzanul Assir*, or “Storehouse of Mysteries,” as it bears the unmistakable stamp of Sufi speculations. It shows, moreover, a remarkable resemblance to Nizâm Khosrâu’s ethical poems, *Sanât’s Hadîkat-ul-ahâmât*, or “Garden of Truth.” The date of composition, which varies in the different copies from 552 to 582 A.H., must be fixed in 574 or 575 (1178–1179 A.D.). Although the *Makhzan* is mainly devoted to philosophic meditations, the propensity of Nizâmi’s genius to purely epic poetry, which was soon to assert itself in a more independent form, makes itself felt even here, all the twenty chapters being interspersed with short tales illustrative of the maxims set forth in each. His claim to the title of the foremost Persian romanticist he fully established only a year or two after the *Makhzan* by the publication of his first epic masterpiece *Khosrav and Shirin*, composed, according to the oldest copies, in 576 A.H. (1180 A.D.). As in all his following epopees the subject was taken from what pious Moslems call the time of “heathendom”—here, for instance, from the old Sassanian story of Shâh Khosrâv Parviz (Chosroes Parvez), his love affairs with the princess Shirîn of Armenia, his jealousy against the architect Ferhad, for some time his successful rival, of whom he got rid at last by a very ingenious trick, and his final reconciliation and marriage with Shirîn. The work, which runs through no less than 50 books, was written in perfect Persian, and Nizâmi never chose a strictly Mahomedan legend for his works of fiction. Nothing could prove better the complete revolution in his views, not only on religion, but also on art. He felt, no doubt, that the object of epic poetry was not to teach moral lessons or doctrines of faith, but to depict the good and bad tendencies of the human mind, the struggles and passions of men; and indeed in the whole range of Persian literature only Firdusî and Fâhîr-uddîn As‘ad Jârfân, the author of the older epopee *Wis n. Rûmîn* (about the middle of the 11th century), can compete with Nizâmî in the wonderful delineation of human characters, and the perfect mastery of the art of poetry, especially of the joys and sorrows of a loving and beloved heart. *Khosrav and Shirin* was inscribed to the reigning atâbeg of Azerbaijan, Abû Ja‘far Mahommaded Pahlavan, and his brother Kizîl Arslân, who, soon after his accession to the throne in 582 A.H., showed his gratitude to the poet by summoning him to his court, loading him with honours, and bestowing upon him the revenue of two villages, Hamd and Nîjan. Nizâmî accepted the royal gift, but his resolve to keep aloof from a servile court-life was not shaken by it, and he forthwith returned to his quiet retreat. Meanwhile his genius had not been dormant, and two years after his reception at court, in 584 A.H. (1185 A.D.), he completed his *Divân*, or collection of kasîdas and ghazals (mostly of an ethical and parentetic character), which are said to have numbered 20,000 distichs, although the few copies which have come to us contain only a very small number of...
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verses. About the same time he commenced, at the desire of the ruler of the neighbouring Shirván, his second romantic poem, the famous Bedouin love-story of "Laila and Majnun," which has so many points in common with Ariosto's "Orlando Furioso," and finished it in the short space of four months. A more heroic subject, and the only one in which he made a certain attempt to rival Firouz, was selected by his poet for his third epopee, the "Iskandarnáma," or "Book of Alexander," also called "Sharafija" or "Isháináma-í-Ishandari" ("The Fortunes of Alexander"), which is split into two divisions. The first or semi-historical part shows the events of Alexander's operations in the west, while the second, of a more ethical tendency, describes him in the character of a prophet and philosopher, and narrates his second tour through the world and his adventures in the west, south, east and north. There are frequent Súfí allegories, just as in the Mahbín; and quite imbued with pantheistic ideas is, for instance, the final episode of the first part, the mysterious expedition of Alexander to the fountain of life in the land of darkness. As for the date of composition, it is evident, from the conflicting statements in the different MSS., that there must have been an edition of this work in the latter part of the fourteenth century, and dedicated to the prince of Mosul, Zzz.uddin Mas'ud, the latter made for the atábeg Nusrat-uddin Abú Bakr of Azerbaijan after 593 A.D., since we find in it a mention of Nizámí's last romance "Hafí Paíkor," or the "Seven Beauties," which comprises seven tales related by the seven favourite wives of the Sassánían king Bahrâm-gúr. This poem, which was written 593 A.D., at the request of Nür-uddin Arslán of Mosul, the son and successor of the abovementioned "İzz-uddín, Nizámí returned once more from his excursion into the field of heroic deeds to his old favourite domain of romantic fiction, and added a fresh laurel crown of immortal fame with which the unanimous consent of Eastern and Western critics has adorned his venerable head. The most interesting of the seven tales is the fourth, the story of the Russian princess, in which we recognize at once the prototype of Gozzi's well-known "Turandot," which was afterwards adapted by Schiller for the German stage. The five mathnavís, from the Mahbín to the Hafí Paíkor, form Nizámí's so-called "Quintupile" ("Khamsa") or "Five Treasures" ("Panz Gaîg"), and have been taken as pattern by all the later epic poets in the Persian, Turkish, Chagháuti and Hindustání languages. Nizámí's daughter, by an unknown lover, was given to Ahmad Meshref, son of the Fáríndast-čehro of Bákhtíyar Kháyání, 12th to 13th century.

The fullest account of Nizámí is given in Dr W. Bacher's "Nizámí's Leben und Werke" (Leipzig, 1871; English translation by S. Robinson, London, 1873; reprinted in the same author's "Persian Poetry for English Readers," 1883, pp. 103-244). All the details of Bacher's work are corrected and amplified in his "A Catalogue in the British Museum of the Persian MSS. in the British Museum" (1881), I, 563-691. The most valuable of the MSS. is Add. 6961; Khosrau and Shírin (liethographed, Lahore, 1871; German translation by Hümmer and Shírin, ein persisches romantisches Gedicht, Leipzig, 1809; Laila and Majnun (liethographed, Lucknow, 1871; English translation by J. Atkinson, London, 1836); Hafí Paíkor (liethographed, Bombay, 1848; Lucknow, 1873; the fourth tale at Geben and Erdmann, "Hafí Paíkor und andere Geschichten," Fürstentöchter, Kassan, 1844); Iskandarnáma, first part, with commentary (Calcutta, 1812 and 1825; text alone, Calcutta, 1853, lithographed); with the following additional MSS., 1860 to 1875; English translation by H. Wilberforce Clarke, London, 1881; compare also Erdmann, "De expéditione Russorum Berdaom versus, Kassan, 1826, and Charmoy, "Expédition d'Alexandre contre les Russes," Saint-Petersbourg, 1829); Iskandarnáma-í-Bakht, second part, edited by Dr Spranger (Calcutta, 1852 and 1896). (H. E.)

NIZHNE-TAGILSK, popularly known as Tagil, a town and iron-works of Russia, in the government of Perm, stands in a longitudinal valley on the eastern side of the Ural Mountains, within a few miles of the place where the Tagil, cutting through the eastern wall of the valley, escapes to the lowlands to join the Tura, a tributary of the Tobol. The southern part of this valley is occupied by the upper Tagil, and its northern portion by the upper Tura, from which the Tagil is separated by a low watershed. Pop. (1897) 30,000, all Great-Russians and chiefly Nonconformists. The town is connected by railway (the first in Siberia) with Perm and Ekaterinburg, the latter distant 88 m. to the S.S.E. It was founded in 1725 by the Russian mine-owner Demidov, and is still the property of his family. Nizhne-Tagilsk is a central foundry for a number of iron-mines and other works scattered in the valley of the Tagil and its tributary the Salda. Gold, platinum and copper are also mined at Nizhne-Tagilsk. The town carries on a brisk corn trade. The inhabitants make wooden boxes and trays, which are sent to the fairs of Irbit and Nizhny-Novgorod.

NIZHNY-NOVGOROD or NIZHNY-Novgorod, abbreviated into NIZHEGOROD, a government of Central Russia, bounded by the governments of Vladimir on the W., Kostroma and Vyatka on the N. and N.E., Kazan and Simbirsk on the E., and Penza and Tambov on the S., with an area of 19,792 sq. m., two-thirds below on the right and the rest on the left bank of the Volga. The smaller portion, with the exception of the better-drained lands close to the river, is a low, flat, marshy region, covered with thick forests and sandy hills, and thinly peopled. The space between the Oka and the Volga, in the west, is also flat and forest-grown. The best part of the government is that to the east of the Oka; it is hilly, traversed by deep ravines and better drained, and has patches of fertile black earth in the south. The government is drained by the Volga with its tributaries, the Kerzhnetas and the Vetyuga on the left, and the Sura (with the Pyana) and the Oka on the right. These and their numerous tributaries offer great facilities both for navigation and for the transportation of timber. Numerous small lakes dot the government, especially in the north, and close upon two-fifths of its entire surface is still covered with forests, which occupy nearly the whole of the Zavoljy (to the north of the Volga), and extend without a break for 50 and 80 m. to the west and south-west respectively. The climate is severe, especially in the Zavoljy, where the average yearly temperature is 5-6 Fahr. lower than at Nizhniy. Besides the Carboniferous, Permian and Triassic deposits, numerous lacustrine deposits are found in patches, chiefly in the south-east, as also in the south-west and north. They are overlain with Cretaceous black clays and sandstones. Thick strata of Tertiary sands, containing petrified wood, are found in the Ardatov district, and over the whole lie Glacial deposits, sandy gravels and clays.

Black earth, known as the "black earth of the plateau," prevails on the high plains between the river valleys in the south-east; the "valley black earth," even more fertile than the former, covers the gently-sloping portions of the territory, also in the south-east. More or less sandy clays are met with everywhere, and there are large patches of sand. Iron ores (brown and spheronicritic), alabaster, limestone, sand (used for glass), salt and phosphorites are the chief useful minerals. There are also extensive deposits of peat.

The population increased from 1,376,000 in 1880 to 1,502,292 in 1897; of these 847,245 were women and 140,347 lived in towns. The estimated pop. in 1906 was 1,832,000. They consist of Russians, to the extent of 88%; Mordvinians, to the number of 53,100; Cheremisses, 6,700; with Tatars and Chuvashews. Of the total number in 1897, 1,525,735 were Orthodox and Old Believers, 5,548 Russians, and 5,388 Jews. The birth-rate (53 in 1900) and the death-rate (41 in 1900) are high. A little over 53% of the area is available for agriculture, and of this 59% is owned by noblemen and 16% only by the peasantry, the remainder being owned by merchants and others. Of the cultivable land owned by the peasantry 55% is under crops, but of similar land owned by noblemen only 30% is cultivated. The principal crops are wheat, rye, oats, barley, peas and potatoes. In some years the yield is quite insufficient for the population, and every year over 100,000
persons quit their villages in quest of temporary work in neighbouring governments. The semtvo or district council of Nizhniy-Novgorod supports an agricultural school, an experimental farm, and an agency for the purchase of improved seeds and machinery. The live-stock industry is inferior, as many as 41% of the peasant families having no horses, and 24% no cows. The domestic trades, such as the making of cutlery, felts, woollens, leather goods, wooden wares (sledges, spoons, boxes, window-frames, &c.), gloves, wirework, hardware, mats and sacks, are widely practised; 70% of the male working population among the peasants earn their livelihood in this way, as well as by shipping. This last is an industry of considerable magnitude, goods being shipped and unshipped to the annual value of over £5,000,000. Many of the villages and towns have each its own specialty, those in the district of Semenov being famous for wooden spoons, in Gorbatov for cutlery and locks, in Balakhna for spindles, in Makaryev for fancy boxes, in Arzamas, Knyaginin and Sergach for furs and leather goods. The Mordvinians and Cheremisses keep bees. Fruit and vegetables are cultivated along the Oka and the Volga. The factories are steadily developing, iron and machinery works, flour-mills, potteries, tanneries, shipbuilding yards, sawmills and distilleries are the more important. Education, owing to the efforts of the semtvo, is in a better condition than in many of the surrounding counties. Nizhniy-Novgorod, as the capital of the administration, is supplied by the railroad from Moscow (272 m. by rail E. of Moscow). It occupies an advantageous position on the great artery of Russian trade, at a place where the manufactured and agricultural products of the basin of the Oka meet the metal wares from that of the Kama, the corn and salt brought from the south-eastern governments, the produce of the Caspian fisheries, and the various wares imported from Siberia, Central Asia, Caucasus and Persia. It has thus become a seat of the great Makaryevskaya fair (see below), and one of the chief commercial centres of Russia. Its importance was still further increased during the latter part of the 19th century in consequence of the growth of manufacturing industry in the Oka basin, the rapid development of steamboat traffic on the Volga and its tributaries, the extension of the Russian railway system and the opening of Central Asia for trade.

Nizhniy-Novgorod consists of three parts: the upper city, including the Kremlin; the lower town, or Nizhniy Bazaar; and "the Fair," with the suburb of Kunavino. The upper city is ringed by three walls, which rise as steep ramps 40 ft. (12 m.) above sea-level (above the right bank of both the Oka and the Volga. The Kremlin, or old fort, occupies one of these hills facing the Volga. It was begun in the second half of the 14th century, but was erected chiefly in the beginning of the 16th, on the site of the old palisaded fort, and has a wall 2300 yds. long, and 65 to 95 ft. high, with eleven towers; it contains the courts, the governor’s residence, the arsenal, barracks, the military gymnasion of Count Arakcheev (transferred from old Novgorod), a small museum and two cathedrals, Preobrazhenski and Arkhangelski. These last were erected in 1225 and 1222 respectively, and have been rebuilt more than once; the present structures, in somewhat poor taste, date from 1829-1834 and 1732 respectively. The Preobrazhenski cathedral retains several relics of the past, such as holy pictures of the 14th and 17th centuries and a Bible of 1408; Minin, the hero of Nizhniy (see below) lies buried there. The Kremlin is adorned with a square, containing a monument to Minin and Pozharsky erected in 1826, and pretty boulevards have been laid out along its lower wall. The view from the Kremlin of the broad Volga, with its low-lying and far-spreading left bank, is one of its most beautiful. The town is also rich in its museums and libraries. Of the numerous small churches in the city, one of the most curious is the Makaryevskaya fair (1897), which was erected in 1330 and destroyed by a land-slip in 1596—and has several antiquities and a library which formerly contained very valuable MSS., now at St Petersburg. Another monastery, that of Blagoveshchensk (1370, rebuilt 1647), is situated on the right bank of the Oka. Its old churches have been destroyed by fire, but it has a very ancient holy picture—probably the oldest in Russia, dating from 993, which attracts many pilgrims. In 1914 a town-house and a monument to "Tsar" Alexander II. were built in the principal square of the upper town. Besides the Kremlin, the upper town contains the best streets and public buildings. Five descents lead from it to the lower town, planted on the alluvial terrace, 30 to 35 ft. above the banks of the Oka and the Volga, and in the centre of a very lively traffic. Piles of salt line the salt wharves on the Oka; farther down are the extensive storehouses and heaps of grain of the corn wharves; then comes the steamboat quay on the Volga, opposite the Kremlin, and still farther east the timber wharves. The fair is held on the flat sandy tongue of land between the Oka and the Volga, connected with the town by only a bridge of boats 20 yds. long, which is taken to pieces in winter. The shops of the fair, 4000 in number, built of stone in regular rows, are surrounded by a canal, and cover half a square mile. Outside this inner fair are nearly 4000 more shops. Several buildings have been erected, and Institutions established, in connexion with the fair, e.g. the house of the committee (1890), banks, a theatre, a circus, a new semicircular canal and a second floating bridge, underground galleries, a water-supply, an electrical tramway, temperature tea-shops and restaurants kept by the Society of Tradesmen. The Siberian harbour is conspicuous during the fair on account of its accumulations of tea boxes and temporary shelters, in which the different kinds of tea are tried and appraised by tasters. The point of the peninsula is occupied by the storehouses of the steamboat companies, while metal wares and corn are discharged on a long island of the Oka, at the iron harbour and in Grebnowskaya harbour. An island in the Volga is the place where various kinds of rough wares are landed. The railway from Moscow has its terminus close to the fair buildings, to the south of which is the suburb of Kunavino, widely known now as the "Fair," as a place for amusements of the lowest kind during the fair. On the fair side the Alexander Nevski cathedral was erected in 1881, and there too is the older "Fair" cathedral of 1822.

The climate of Nizhniy is harsh and continental, the yearly average temperature being 39° Fahr. (10°-6° in January and 64° in July), and the extreme thermometric readings -40° and 104° Fahr. The town has a settled population of (1897) 90,053 inhabitants, who are nearly all Great-Russians, and many of them Nonconformists. The mortality exceeds the birth-rate. The educational institutions include a military school, a technical school, a theological seminary, and two schools for sons and daughters of the clergy.

The manufactures include steam flour-mills, iron and machinery works, manufactories of ropes and candles, distilleries and potteries. Shipbuilding, especially for the transport of petroleum on the Caspian Sea, and steamboat building, have recently advanced considerably. Nizhniy is the chief station of the Volga steamboat traffic. The first steamer made its appearance on the Volga in 1821, but it was not till 1845 that steam navigation began to assume large proportions. The merchants carry on a brisk trade, valued (apart from that of the fair) at more than £2,000,000 of purchases and £1,800,000 of sales; the principal items are corn (£500,000 to £500,000), salt, iron, tea, fish, groceries and manufactured goods.

The chief importance of the city is due to its fair, which is held from the 29th of July to the 10th of September. From remote antiquity Russian merchants were wont to meet in summer with those from the East at different places on the Volga, between the mouths of the Oka and the Kama—the fair changing its site with the increasing or decreasing power of the nation. Some traces of the ancient fair are still to be seen on the peninsula in the middle Volga, and the old town is still the seat of the fair. From 1641 its seat was at a monastery 55 m. below Nizhniy and close to Makaryev (whence its present name). The situation, however, being in many ways inconvenient, and a conflagration having destroyed the shops at Makaryev, the fair was transferred in 1875 to its present locality at Nizhniy-Novgorod.
The goods mostly dealt in were cotton, woolen, linen and silk stuffs (35 to 38 % of the whole), iron and iron wares, furs and skins, pottery, salt, corn, fish, wine and all kinds of manufactured goods. The Russians, who in the four following years dominated the whole trade, bought from Asia—tea (imported via Kakhia and via Canton and Suez), raw cotton and silk, leather wares, madder and various manufactured wares—do not exceed 10 or 11%. Manufactured wares include both those brought to the trade from inside Russia and those substantially imported from western Europe. The total turnover of goods sold and "ordered" amounts to nearly 361 millions sterling annually. The former category dropped, however, from 26 millions in 1851 to 14 millions in 1856.

In 1860, the Russian manufacturers depending chiefly on the barter-trade in tea at Kakhia, their production was regulated principally by fluctuations of the price of tea. The cost of the cotton takes the lead, and the prospective output for the year of the mills of central Russia is determined at the fair by the price of raw cotton imported from Asia, by the price of tea, and by the results which have become known during the fair. The same holds good with regard to all other stuffs, the prices of wool (provisionally established at the earlier fairs of south-western Russia) being usually settled at Nizhniy, as well as those of raw silk.

The whole of the iron production of the Urals depends also on the same fair. The "caravans" of boats laden with iron-ware, starting from the Urals works in the spring, reach Nizhniy in August, after a stay of 6 months. The fair supplies the lower Volga and the purchases of iron made at Nizhniy for Asia and middle Russia determine the amount of credit that will be granted for the next year's business. The volume of the iron trade is one of the factors which Flooding of the Volga entirely depend. The fair thus influences directly all the leading branches of Russian manufacture. It exercises a yet greater influence on the corn and salt trades throughout Russia, and still more on the trade in furs. The importance of the fair depends entirely on the conditions of the Siberian and Turkestan merchants obtain at the fair.

The Makaryevskaya fair attracts no fewer than 400,000 people from all parts of Russia every year.

Two other fairs of some importance are held at Nizhniy—one for wooden wares on the ice of the Okha, and another, in June, for horses.

**History.**—The confluence of the Oka and the Volga, inhabited in the 9th century by Moroodvan tribes, became in the 11th century a centre of trade and a stopping place for caravans. In 1115, it was built a fort called "Nizhniy" ("lower city"), which supplied the lower Volga and the Urals with iron and iron wares. The town was the centre of the Volga trade with China and the Middle East, and was a stopping place for caravans.

There are two fairs of some importance held at Nizhniy—one for wooden wares on the ice of the Okha, and another, in June, for horses.

Nizhniy-Novgorod had at one time two academies, Greek and Slav, and took part in some of the literary movements of the end of the 18th century; its theatre also was of some importance in the history of the Russian stage.

The name of the tenth patriarch Noah corresponds to the tenth pre-historic Babylonian king, Xushturu in Berossus, Ut-napištim or Atrahasis in the cuneiform tablets, the hero of the Babylonian flood story.

Gen. ix. 12-27 is a distinct episode, and has no necessary connexion with the narrative of the Deluge. Probably, as Gunkel, Dillmann and others suggest, it came originally from a cycle of stories different from that which contained the account of the Flood. There are some apparent inconsistencies. Noah is called "the husbandman." The proper rendering of verse 20 is "and Noah, the husbandman, was the first to plant a vineyard," the English version rendering it "Noah is the husbandman, and he planted a vineyard," is incorrect. It seems, therefore, that in the original context Noah had been described as "the husbandman," a title in no way suggested by Gen. vi. 9-ix. 19. Moreover, even after making allowance for lack of experience as to the effect of the new product, drunkenness and exposure hardly tally with the statement that "Noah was a just man and perfect in his generations, and Noah walked with God," vi. 9. This indeed comes from the late Priestly Code; but we are also told in the earlier story that "Noah found favour in the eyes of the Lord," vi. 8.

The name also occurs in the Bible (92, Noah, Noé) for the daughter of Zelophehad, of the tribe of Manasseh. Zelophehad having only daughters, the case is made the occasion of laying down the law that where there are no sons daughters inherit, but must marry within their own tribe (Num. xxxvi. 33, xxvii. 1, xxxvi. 11; Josh. xvii. 3, all Priestly Code).

**NOAILLES,** the name of a great French family, derived from the castle of Noailles in the territory of Ayen, between Brive and Turenne in the Limousin, and claiming to date back to the 11th century. It did not obtain fame until the 16th century, when its head, Antoine de Noailles (1507–1562), became admiral of France, and was ambassador in England during three important years, 1553–1556, maintaining a gallant but unsuccessful rivalry with the Spanish ambassador, Simon Renard. Henri (1554–1623), son of Antoine, was a commander in the religious wars, and was made comte d'Ayen by Henry IV. in 1593. 

Anne (d. 1678), the grandson of the first count, played an important part in the Fronde and the early years of the reign of Louis XIV., became captain-general of the newly won province of Roussillon, and in 1665 was made duc d'Ayen, and peer of France. 

The sons of the first Duke raised the family to its greatest fame. The eldest son, Anne Jules (1650–1708), was one of the chief generals.
of France towards the end of the reign of Louis XIV., and, after raising the regiment of Noailles in 1689, he commanded in Spain during the war of the Spanish succession, and was made marshal of France in 1693. A younger son, Louise Antoine (1631-1709), was made archbishop of Paris in 1695, holding this high dignity till his death; he was made a grandee of France in 1721. The name of Noailles occurs with almost confusing reiterated throughout the 18th century. Adrien Maurice (1678-1766), the third duke, served in all the most important wars of the reign of Louis XV. in Italy and Germany, and became a marshal in 1734. His last command was in the war of the Austrian succession, when he was beaten by the English at the battle of Dettingen in 1743. He married Françoise d'Aubigné, a niece of Madame de Maintenon and two of his sons also attained the rank of marshal of France. The elder, Louis (1713-1793), who bore the title of duc d'Ayen till his father's death in 1766, when he became Due de Noailles, served in most of the wars of the 18th century without particular distinction, but was nevertheless made a marshal in 1775. He refused to emigrate during the Revolution, but escaped the guillotine by dying in August 1793, before the Terror reached its height. On the 4th Thermidor (July 22) the aged duchesse de Noailles was executed with her daughter-in-law, the duchesse d'Ayen, and her granddaughter, the vicomtesse de Noailles. Jean Paul François (1739-1824), the fifth duke, was in the army, but his tastes were scientific, and for his eminence as a chemist he was elected a member of the Academy of Sciences in 1766, and was made a grandee of France in 1776 in memory of his father's death, and duc de Noailles on his father's in 1793. Having emigrated in 1792, he lived in Switzerland until the Restoration in 1814, when he took his seat as a peer of France. He had no son, and was succeeded as duc de Noailles by his grand-nephew, Paul (1802-1889), who won some reputation as an author, and who became a member of the French Academy in the place of Chateaubriand in 1849. The grandfather of Paul de Noailles, and brother of the fifth duke, Emmanuel Marie Louis (1743-1822), marquis de Noailles, was ambassador at Amsterdam from 1770-1776, at London 1776-1783, and at Vienna from 1783.

One other branch of the family deserves notice. Philippe (1715-1794), comte de Noailles, afterwards duc de Mouchy, was a younger brother of the fourth duke, and a more distinguished soldier than his brother. He served at Minden and in other campaigns, and was made a marshal of France in 1792. He was in great favour at court, and his wife was first lady of honour to Marie Antoinette, and was nicknamed by her Madame Étiquette. This court favour brought down punishment in the days of the Revolution, and the marshal and his wife were guillotined on the 22nd of January 1794. His two sons, the prince de Poix and the vicomte de Noailles, were members of the Constituent Assembly.

Bundled with other Maras and the vicomte of Noailles and prince of Poix (1752-1819), was born on the 21st of November 1752. In 1789 he was elected deputy of the States-General by the nobility of the barilages of Amiens and Ham, but was compelled to resign in consequence of the death of the comte de Noailles, due to the mob of Nantes at Versailles. He left the country for some time, but returned to France and took part in the revolution on the 10th of August 1792. He was, however, forced to quit the country once more to the fate of his father and mother. Returning to France in 1800, he lived quietly at his residence at Mouchy during the empire. At the Restoration he was brought again into favour and became a peer of France in the 172nd edition of 1819.

Louis Marie (1756-1804), vicomte de Noailles, was the second son of the marshal. He served brilliantly under La Fayette in America, and was the officer who concluded the capitulation of Yorktown. He was elected to the States-General in 1789. He began the famous "orgie," as Mirabeau called it, on the 4th of August, when all privileges were abolished, and with d'Alguillon proposed the abolition of titles and liverys in June 1791. He supported the revolution and became a deputy to America, and became a partner in Bingham's bank at Philadelphia. He was very successful, and might have lived happily had he not accepted a command against the Austrians, at Lorraine, under which he conducted a brilliant defence of the mole St Nicholas, and escaped with the garrison to Cuba; but in making for Havana his ship was attacked by an English frigate, and after a long engagement he was severely wounded. He died on the 23rd of January 1792.

NOAKHALI, a town and district of British India, in the Chittagong division of eastern Bengal and Assam. The town, also known as Suddaram, is on a small river channel 10 m. from the sea. Pop. (1901) 6250. The District of Noakhali has an area of 1644 sq. m.; pop. (1901) 1,141,172. The district consists of an alluvial tract of mainland, together with several islands at the mouth of the Meghna. In general, each home-stead is surrounded by a thick grove of betel- and coco-nut palms, and in the north-western tracts dense forests of betel-nut palms extend for miles. Rice is the greatest crop of cultivation. The district is very fertile; and, with the exception of some sandbanks and recent accretions, every part of it is under continuous cultivation. The process of alluvion is gradually but steadily going on, the mainland extending seawards. Noakhali is peculiarly liable to destructive floods from the sea, generally caused by southerly gales or cyclones occurring at the time when the Meghna is swollen by heavy rains, and at flood-tides—the tidal bore being sometimes 20 ft. high, and moving at the rate of 15 m. an hour. The cyclone and storm-wave of the 31st of October 1856 was greatly disastrous, sweeping over the whole delta of the Meghna. The loss of human life was estimated at 100,000. The east of the district is served by the Assam-Bengal railway.

The Mahommmedan population of the islands at the mouth of the Meghna practised piracy up to a comparatively recent date, and at the beginning of the 17th century Portuguese pirates, under Sebastian Gonzales, occupied Sandiwip. They were ultimately reduced to subjection by Shaista Khan, the governor of Bengal, about the middle of the century; and their descendants have sunk to the level of the natives surrounding them, who have lost the customs and language they have, for the most part, adopted. They are Christians, and retain the old Portuguese names. About 1756 the East India Company established factories in Noakhali and Tippera, the ruins of some of which still remain.

NOBEL, ALFRED BERNHARD (1833-1896), Swedish chemist and engineer, was the third son of Emmanuel Nobel (1801-1872), and was born at Stockholm on the 21st of October 1833. At an early age he went with his family to St Petersburg, where his father started torpedo works. In 1839 these were left to the care of the second son, Ludvig Emilianus (1831-1888), by whom they were greatly enlarged, and Nobel, returning to Sweden with his father, devoted himself to the study of explosives, and especially to the manufacture and utilization of nitroglycerin. He found that when that body was incorporated with an absorbent, inert substance like kieselguhr it became safer and more convenient to manipulate, and this mixture he patented in 1867 as dynamite. He next combined nitroglycerin with another high explosive, gun-cotton, and obtained a transparent, jelly-like substance, which was a still more powerful explosive than dynamite. Blasting gelatin, as it was called, was patented in 1867, and was followed by similar combinations, modified by the addition of potassium nitrate, wood-pulp and various other substances. Some thirteen years later Nobel produced ballistite, one of the earliest of the nitroglycerin smokeless powders, containing in its latest forms about equal parts of gun-cotton and nitroglycerin. This powder was a precursor of cordite, and Nobel's claim that his patent covered the latter was the occasion of vigorously contested law-suits between him and the British Government in 1894 and 1895. Cordite also consists of nitroglycerin and gun-cotton, but the form of the latter which he invented wished for mixtures of ether and alcohol, whereas Nobel contemplated using a less nitrated form, which is soluble in such mixtures.

The question was complicated by the fact that it is in practice impossible to prepare either of these two forms without admixture of the other; but eventually the courts decided against Nobel. From the manufacture of dynamite and other explosives, and from the exploitation of the Baku oil-fields, in the development of which he and his brothers, Ludvig and Robert Häjalmar (1859-1906), took a leading part, he amassed an immense fortune. He died at Saint-Cloud on the 10th of December 1896 at San Remo, he left the bulk of it in trust for the establishment of five prizes, each worth several thousand pounds, to be awarded annually without distinction of nationality.
The first three of these prizes are for eminence in physical science, in chemistry and in medical science or physiology; the fourth is for the most remarkable literary work *dans le sens d'idéalisme*; and the fifth is to be given to the person who shall, in some way or another, render the greatest service to the cause of international brotherhood, in the suppression or reduction of standing armies, or in the establishment or furtherance of peace congresses.

*See Les Prix Nobel en 1901* (Stockholm, 1904).

**Nobili, Leopoldo** (1784–1835), Italian physicist, born at Reggio nell’Emilia in 1784, was in youth an officer of artillery, but afterwards became professor of physics in the architectural museum at Florence, the old habitat of the Accademia del Cimento. His most valuable contributions to science consist in the suggestion of the constant combination of two needles for galvanometers, and in the invention of the so-called thermo-multiplier used by him and M. Melloni. In 1826 he described the prismatically-coloured films of metal, known as Nobili’s rings, deposited electrolytically from solutions of lead and other salts when the anode is a polished iron plate and the cathode is a fine wire placed vertically above it. His papers were mostly published in the *Bibliothèque universelle* of Geneva. He died at Florence in August 1835.

**Nobilior, Marcus Fulvius**, Roman general, a member of one of the most important families of the plebeian Fulvian gens. When he reached the age of 103 a.c. he nobility, in some way or another, rendered the greatest service to the cause of international brotherhood, in the suppression or reduction of standing armies, or in the establishment or furtherance of peace congresses.

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order—the *populus*, *patres*, patricians—has all the characteristics which we commonly expect to find in a privileged order. It is a minority, a minority strictly marked out by birth from other members of the commonwealth, a minority which seems further, though this point is less clearly marked, to have had on the whole the advantage in point of wealth. When we are first entitled to speak with any kind of certainty, the non-privileged class possess a certain share in the election of magistrates and the making of laws. But the privileged class alone are eligible to the greatest offices of the state; they have in their hands the exclusive control of the national religion; they have the exclusive enjoyment of the common land of the state—in Teutonic phrase, the *fælæand*. A little research shows that the origin of these privileges was a very simple one. Those who appear in later times as a privileged order among the people had once been the whole people. The patricians, *patres*, housefathers, goodmen—so lowly is the origin of that proud name—were once the whole Roman people, the original inhabitants of the Roman hills. They were the true *populus Romanus*, alongside of whom grew up a secondary Roman people, the *plebs* or commons. As new settlers came, as the people of conquered towns were moved to Rome, as the character of Romans was granted to some allies and forced upon some enemies, this *plebs*, sharing some but not all of the rights of citizens, became a non-privileged order alongside of a privileged order. As the non-privileged order increased in number, the numbers of the privileged order diminished. Since exclusive body must do, lessened, the larger body gradually put on the character of the nation at large, while the smaller body put on the character of a nobility. But their position as a nobility or privileged class arose solely because a class with inferior rights to their own grew up around them. They were not a nobility or a privileged class as long as there was no less privileged class to distinguish them from. Their exclusive possession of power has made the commonwealth in which they bore rule an aristocracy; but they were a democracy among themselves. We see indeed faint traces of distinction among the patricians themselves, which may lead us to guess that the equality of all patricians may have been won by struggles of unrecorded days, not unlike those in which recorded days brought about the equality of patrician and plebeian. But at this we can only guess. The Roman patricians, the true Roman *populus*, appear at our first sight of them as a body democratic in its own constitution, but standing out as an order marked by very substantial privileges indeed from the other body, the *plebs*, also democratic in its own constitution, but in every point of honour and power the marked inferior of the *populus*. The old Roman order thus grew, or rather shrank up, into a nobility by the growth of a new people by their side which they declined to admit to a share in their rights, powers and possessions. A series of struggles raised this new people, the *plebs*, to a level with the old people, the *populus*. The gradual character of the process is not the least instructive part of it. There are two marked stages in the struggle. In the first the plebeians strive to obtain relief from laws and customs which were actually oppressive to them, while they were profitable to the patricians. When this relief has been granted, and while they have never gained a point of wealth, which the plebeians win political equality with the patricians. In this second struggle, too, the ground is won bit by bit. No general law was ever passed to abolish the privileges of the patricians; still less was any law ever passed to abolish the distinction between patrician and plebeian. All that was done was done step by step. First, marriage between the two orders was legalized. Then one law admitted plebeians to one office, another law to another. Admission to military command was won first, then admission to civil jurisdiction; a share in religious functions was won, while other points of advantage followed, chiefly the religious offices which carried no political power with them, always remained the exclusive property of the patricians, because no special law was ever passed to throw them open to plebeians. In this gradual way every practical advantage on the part of the patricians was taken away. But the result did not lead to the abolition of all distinctions between the orders. Patricians and plebeians went on as orders defined by law, till the distinction died out in the confusion of things under the empire, till at last the word "patrician" took quite a new meaning. The distinction, in truth, went on till the advantage turned to the side of the plebeians. Both could not be patricians; a plebeian could not wield the great powers vested in the tribunes of the commons. These were greater advantages than the exclusive patrician possession of the offices of *interrex*, *res sacra* and the higher flamens. And, as the old distinction survived in law and religion after all substantial privileges were abolished, so presently a new distinction arose of which law and religion knew nothing, but which became in practice nearly as marked and quite as important as the older one.

This was the growth of the new nobility of Rome, that body, partly patrician, partly plebeian, to whom the name nobilis strictly belongs in Roman history. This new nobility gradually became as well marked and as exclusive as the old patriciate. But if differed from the old patriciate in this, that, while the privileges of the old patriciate rested on law, or perhaps rather on immemorial custom, the privileges of the new nobility rested wholly on a sentiment of which men could remember the beginning. Or it would be more accurate to say that the new nobility had really no privileges at all. Its members had no legal advantages over other citizens. They were a social caste, a body with its own large and inclusive offices. By the rest of Rome, they were not men, but the new men, and in keeping, all high offices and political power in its own hands the new privileges, even of an honorary kind, as the nobles did enjoy by law belonged to them, not as nobles, but as senators and senators' sons. Yet practically the new nobility was a privileged class; it felt itself to be so, and it was felt to be so by others. This nobility consisted of all those who, as descendants of curule magistrates, had the *jus imaginum*—that is, who could point to forefathers ennobled by office. That is to say, it consisted of the remains of the old patriciate, together with those plebeian families any members of which had been chosen to curule offices. These were naturally those families which had been patrician in some other Italian city, but which were plebeian at Rome. Many of them equalled the patricians in wealth and antiquity of descent, and as soon as inter-marriage was allowed they became in all things their social equals. The practical result of the Licinian reform was that the great plebeian families became, for all practical purposes, patrician. They separated themselves from the mass of the plebeians to form a single body with the surviving patricians. Just as the old patricians had striven to keep plebeians out of high offices, so the new nobility for their part strived to keep the new nobles, men who had not the *jus imaginum*, out of high office. But there was still the difference that in the old state of things the plebeian was shut out by law, while in the new state of things no law shut out the new man. It needed a change in the constitution to give the consulsiphip to Lucius Sextius; it needed only union and energy in the electors to give it to Gaius Marius.

The Roman case is often misunderstood, because the later Roman writers did not fully understand the case themselves. The new nobility, or nobility as they called themselves, that is, the patrician and plebeian, was something like the struggle between the nobility and the people at large in the later days of the commonwealth. In a certain sense he knew better; at any rate, he often repeats the words of those who knew better; but the general impression given by his story is that the plebeians were a low mob and their leaders factious and interested ringleaders of a mob. The case is again often misunderstood because the words "patrician" and "plebeian," like so many other technical Roman and Greek words, have come in modern language to be used in a way quite unlike their original sense. The word "plebeian," in its strict sense, is no more contemptuous than the word *commoner* in England. The *plebs*, like the English commons, contained families differing widely in rank and social position, among them those families which, as soon as an artificial barrier broke down, joined with the patricians to form the new
nobility. The whole lesson is lost if the words “patrician” and “plebeian” are used in any but their strict sense. The Catuli and Metelli, among the proudest nobles of Rome, were plebeians, and as such could not have been chosen to the purely patrician office of praetor, Arigulianus of Jupiter. Yet even in greater antiquity in Roman history the words “patrician” and “plebeian” are often misapplied by being transferred to the later disputes at Rome, in which they are quite out of place.

We may now compare the history of nobility at Rome with its history in some other of the most famous city-commonwealths. Thus at Athens its history is in its main outlines very much the same as its history at Rome up to a certain point, while there is nothing at Athens which at all answers to the later course of things at Rome. We find that the Athenians, at any rate, for a long time, had no division of the older settlement, a nobility which had once been the whole people, was gradually shorn of all exclusive privilege, and driven to share equal rights with a new people which had grown up around it. The reform of Cleisthenes (q.e.) answers in a general way to the reform of Licinius, though the different circumstances of the two cities hinder us from carrying out the parallel into detail. But both at Rome and at Athens we see, at a stage earlier than the final reform, an attempt to set up a standard of wealth, either instead of or alongside of the older standard of birth. This same general idea comes out both in the way in which the Cornelian law of Solon, though the application of the principle is different in the two cases. Servius made voting power depend on income; by Solon the same rule was applied to qualification for office. By this change power is not granted to every citizen, but it is put within the reach of every citizen. No man can change his forefathers, but the poor man may haply become richer. The Athenian eleration, who were thus gradually brought down from their privileged position, seem to have been quite as proud and exclusive as the Roman patricians; but when they lost their privileges they lost them far more thoroughly, and they did not, as at Rome, practically hang on many of them to a new nobility, of which they formed part, though not the whole. While at Rome the distinction of patrician and plebeian was never wiped out, while it remained to the last a legal distinction even when practical privilege had turned the other way, at Athens, the democracy had reached its full growth, the distinction seems to have had no legal existence whatever. At Rome down to the last it made a difference whether the candidate for office was patrician or plebeian, though the difference was in later times commonly to the advantage of the plebeian. At Athens, at the beginning of the democracy, the euperat was neither better nor worse off than another man.

But, what is of far greater importance, there never arose at Athens any body of men which at all answered to the nobilities of Rome. We see at Athens strong signs of social distinctions, even at a late period of the democracy; we see that, though the people might be led by the low-born demagogue—using that word in its strict and not necessarily dishonourable meaning—their votes most commonly fell on men of ancient descent. We see that men of birth and wealth often allowed themselves a strange license, which their lower brothers could never have. But we see no sign of the growth of a body made up of patricians and leading plebeians who continued to keep office to themselves by a social tradition only less strong than positive law. We have at Athens the exact parallel to the state of things when Apollus Claudius shrank from the thought of the consulsiphip of Galus Licinius; we have no exact parallel to the state of things when Quintus Metellus shrank from the thought of the consulsipship of Galus Marius. The cause of the difference seems to be that, while the origin of the patriciate was exactly the same at Rome and at Athens, the origin of the common was different. The four Ionic tribes at Athens seem to have answered very closely to the three patrician tribes at Rome; but the Athenian demos grew up in a different way from the Roman plebs. If we could believe that the Athenian demos arose out of the union of the other Attic towns with Athens, this would be an exact analogy to the origin of the Roman plebs; the eleration would be the Athenians and the demos the Atticans (Arraias). But from such glimpses of early Attic history as we can get the union of the Attic towns would seem to have been completed before the constitutional struggle began. That union would answer rather to the union of the three patrician tribes of Rome. Such hints as we have, while they set before us, just as at Rome, a state of things in which small landed proprietors are burdened with debt, also set before us the Attic demos as, largely at least, a body of various origins which had grown up in the city. Cleisthenes, for instance, enfranchised many slaves and strangers, a course which certainly formed no part of the platform of Licinius, and which reminds us rather of Gnaeus Flavius somewhat later. On the whole it seems most likely that the kernel of the Roman plebs was rural or belonged to the small towns admitted to the Roman franchise, the Attic demos, largely at least, though doubtless not wholly, arose out of the mixed settlers who had come together in the city, answering to the mestox of later times. If so, there would be no place in Athens for those great plebeian houses, once patrician in some other commonwealth, out of which the later Roman nobilities was so largely formed.

Thus the history of nobility at Athens supplies a close analogy to the earlier stages of its history at Rome, but it has nothing answering to its later stages. At Sparta we have a third instance, that of a people whose distinction of classes was due to conquest, the local character of the distinction lived on much longer than it did at Rome. We hardly look on the Spartans as a nobility among the other Lacedaemonians; Sparta rather is a ruling city bearing away over the other Lacedaemonian towns. But this is exactly what the original Roman patricians, the settlers on the three oldest hills, were in the beginning. The so-called cities (polites) of the plebians answered pretty well to the local plebeian tribes; the distinction is that the plebians never became a united corporate body like the Roman plebs. Sparta to the last remained what Rome was at the beginning, a city with a opolus (hopos) but no plebs. And, as at Rome, the early rich distinguished themselves from the plebians, there were demos and ineriores, like the oferiores and minores gentes at Rome. Only at Rome, where there was a plebs to be striven against, these distinctions seem to have had a tendency to die out, while at Sparta they seem to have had a tendency to widen. The Spartan patriciate could afford to disfranchise some of its own members.

The other old Greek cities, as well as those of medieval Italy and Germany, would supply us with endless examples of the various ways in which privileged orders arose. Venice, a city more fully furnished than any others with the economic necessities of the Eastern empire and not of the Western, gives us an example than which none is more instructive. The renowned patriciate of Venice was as far removed as might be from the character either of a nobility of conquest or of a nobility of older settlement. Nor was it strictly a nobility of office, though it had more in common with that than with either of the other two. As Athens supplies us with a parallel to the older nobility of Rome without any parallel to the later, so Venice supplies us with a parallel to the later nobility of Rome without any parallel to the earlier. Athens has Fabii and Claudii, but no Catulli or Metelli; Venice has Catuli and Metelli, but no Fabii or Claudii.

In one point, however, the Venetian nobility differed from either the older or the newer nobility of Rome, and also from the older nobilities of the medieval Italian cities. Nowhere else did nobility so distinctly rise out of wealth, and that wealth gained

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by commerce. In the original island territory of Venice there could be no such thing as landed property. The agricultural plebeian of old Rome and the feudal noble of contemporary Europe were both of them at Venice impossible characters. The Venetian nobility is an example of a nobility which gradually arose out of the mass of the people as certain families step by step drew all political power into their own hands. The *plebes* did not gather round the *pares*, neither were they conquered by the *pares*; the *pares* were developed by natural selection out of the *plebes*, or, more strictly, out of the ancient *populus*. The *commune* was the efficient style of the commonwealth, changed into the *seigniori* of Venice. Political power was gradually confined to those whose forefathers had held political power. This was what the later nobility of Rome was always striving at, and what they did to a great extent practically establish. But, as the exclusive privileges of the nobility were never recognized by any legal or formal act, men like Gaius Marius would ever and anon thrust themselves in. The privileges which the Venetian nobility took to themselves were established by acts which, if not legal, were at least formal. The Roman nobility, resting wholly on sufferance, was overtaken by a mutilation of its original form and was successively left by members of distinguished families, descendants of ancient magistrates, who were already beginning to be looked on as noble. The series of revolutions already spoken of first made descent from former councillors a necessary qualification for election to the council; then election was abolished, and the council consisted of all descendants of its existing members who had reached the age of twenty-five. Thus the *optimates* of Venice strove to do: they established a nobility whose one qualification was descent from those who had held office in past times. This is what the nobility of office, if left unchecked, naturally grows into. But the particular way in which oligarchy was finally established at Venice had some singular results. Some of the great families which were already looked on as noble were not represented in the council at the time of the shutting; of others some branches were represented and others not. These families and branches of families, however noble they might be in descent, were thus shut out from all the political privileges of nobility. When one branch of a family was admitted and one shut out we have an analogy to the patrician and plebeian Claudi, though the distinction had come about in quite another way.

And in the Great Council itself we have the lively image of the aristocratic popular assembly of Rome, the *populus*, that of the *curiae*, where every man of patrician birth had his place. The two institutions are the same, only the way in which they came about is exactly opposite. The assembly of *curiae* at Rome, originally the democratic assembly of the original people, first grew into an aristocratic assembly, and then died out altogether as a new Roman people, with its own assembly, grew up by its side. It was a primitive institution which gradually changed its character and made its way by other and newer powers, when it became altogether unsuited to the times. The Great Council of Venice was anything but a primitive institution; it was the artificial institution of a late age, which grew at the expense of earlier institutions, of the prince on the one side and of the people on the other. But the two different roads led to the same result. The Great Council of Venice, the *curiae* of Rome, were each of them the assembly of a privileged class, an assembly in which every member of that class had a right to a place, an assembly which might be called popular as far as the privileged class was concerned, though rigidly oligarchic as regarded the excluded classes. But, close as the likeness is, it is merely a superficial likeness, because it is the result of opposite causes working in opposite directions. It is like two men who are both for a moment in the same place, though their faces are turned in opposite ways. If the later *nobilitas* of Rome had established an assembly in which every one who had the *jus imaginum* had a vote and none other, that would have been a real parallel to the shutting of the Venetian Great Council; for it would have come about through the working of causes with which essentially the same.

The nobility which was thus formed at Venice is the very model of a civic nobility, a nobility which is also an aristocracy. In a monarchy, despotic or constitutional, there cannot in strictness be an aristocracy, because the whole political power cannot be vested in the noble class. But in the Venetian commonwealth the nobility was a real aristocracy. All political power was vested in the noble class; the prince sank to a magistrate, keeping only some of the outward forms of sovereignty; the mass of the people were shut off altogether from the government. As on earth ever fully carried out the literal meaning of aristocracy as the rule of the best, these civic nobilities come nearer to it than any other form of government. They do really seem to engender a kind of hereditary capacity in their members. Less favourable than either monarchy or democracy to the growth of occasional great men, they are more favourable than either to the constant supply of a succession of able men, qualified to carry on the work of government. Their weak point lies in their necessary conservatism; they cannot advance and adapt themselves to changed circumstances, as either monarchy or democracy can. When, therefore, their goodness is gone, their corruption becomes worse than the corruption of either of the other forms of government.

All this is signally shown in the history both of Venice and of other aristocratic cities. But we are concerned with them now only as instances of one form of nobility. The civic aristocracies did not all arise in the same way. Venice is the best type of one way in which they rose; but it is by no means the only way. In not a few of the Italian cities nobility had an origin and ran a course quite unlike the origin and the course which were its lot at Venice. The nobles of many cities were simply the nobles of the surrounding country changed, sometimes greatly against their will, into citizens. Such a nobility differed far more widely from either the Roman or the Venetian patriciate than they differed from one another. It wanted the element of legality, or at least of formality, which distinguished both these bodies. The privileges of the Roman patriciate, whatever we may call them, were not usurpations; and, if we call the privileges of the Venetian nobility usurpations, they were stealthy and peaceful usurpations, founded on something other than mere violence. But in many Italian cities the position of the noble, if it did not begin in violence, was maintained by violence, and was often overthrown by violence. They remained, in short, as unruly and isolated within the walls of the cities as they had ever been without. A nobility of this kind often gave way to a democracy which either proved as turbulent as itself, or else grew into an oligarchy ruling under democratic forms. Thus at Florence the old nobles became the opposite to a privileged class. The process which at Rome gradually gave the plebeian a political advantage over the patrician was carried at Florence to a far greater length at a single blow. The whole noble order was disfranchised; to be noble was equivalent to being shut out from public office. But something like a new nobility presently grew up among the commons themselves; there were *popoloni grossi* at Florence just as there were noble plebeians at Rome. Only the Roman commons, great and small, never shut out the patricians from office; they were satisfied to share office with them. In short, the shutting out of the old nobility was, if not the formation of a new nobility, at least the formation of a
new privileged class. For a certain class of citizens to be condemned, by virtue of their birth, to political disfranchisement is as flatly against every principle of democracy as for a certain class of citizens to enjoy exclusive rights by reason of birth. The Florentine democracy was, in truth, rather to be called an oligarchy, if we accept the best definition of democracy (see Thucydides vi. 39), namely, that it is the rule of the whole, while oligarchy is the rule of a part only.

It is in these aristocratic cities, of which Venice was the most fully developed model, that we can best see what nobility really is. It is in these cities that the nobility is in its purest form—nobility to which no man can rise and from which no man can come down except by the will of the noble class itself. In a monarchy, where the king can ennoble, this ideal cannot be kept. Nor could it be kept in the later nobility of Rome. The new man had much to strive against, but he could sometimes thrust himself through, and when he did his descendants had their juss imaginum. But at Venice neither prince nor people could open the door of the Great Council; only the Great Council itself could do that. That in the better times of the aristocracy nobility was not uncommonly granted to worthy persons, that in its wretched later days there were complete changes, was the affair of the aristocratic body itself. That body, at all events, could not be degraded save by its own act. But these grants and sales led to distinctions within the ranks of the noble order, like those of which we get faint glimpses among the Roman patricians. The ducal dignity rarely passed out of a circle of specially old and distinguished families. But this has often been the case with the high magistracies of commonwealths whose constitutions were purely democratic.

From this purest type of nobility, as seen in the aristocratic commonwealths, we may pass to nobility as seen in states of greater extent—that is, for the most part in monarchies.

There are two marked differences between the two.

They are differences which seem to be inherent in the difference between a republic and a monarchy, but which it would be truer to say are inherent in the difference between a body of men packed close together within the walls of a city and a body of men—if we can call them a body—scattered over a wide territory. The member of a civic nobility is more than a member of an order; he is a member of a corporation: he has rights, powers, he has hardly any being, apart from the body of which he is a member. He has a vote in making the laws or in choosing those who make them; but when they are made he is, if anything, more strictly bound by them than the citizen of the non-privileged order. To be a fraction of the corporate sovereign, if it had its gains, had also its disadvantages; the Venetian noble was fettered by burthens, restrictions and suspicions from which the Venetian citizen was free. The noble of the large country, on the other hand, the rural noble, as he commonly will be, is a member of an order, but he is hardly a member of a corporation; he is isolated; he acts apart from the rest of the body and wins powers for himself apart from the rest of the body. He shows a tendency—a tendency whose growth will be more or less checked according to the strength of the central power—to grow into something of a lord or even a prince on his own account, a growth which may advance to the scale of a German elector or stop at that of an English lord of a manor. Now many of these tendencies were carried into those Italian cities where the civic nobility was a half-tamed country nobility; but they have no place in the true civic aristocracies. Let us take one typical example. In many parts of western Europe the right of private war long remained the privilege of every noble, as it had once been the privilege of every freeman. And in some Italian cities, the right, or at least the privilege, of private war was continued within the city walls. But no power of imagination can conceive an acknowledged right of private war in Rome, Venice or Bern.

The other point of difference is that, whatever we take for the origin and the definition of nobility, in most countries it became something that could be given from outside, without the need of any consent on the part of the noble class itself.

In other words, the king or other prince can ennoble. We have seen how much this takes away from the true notion of nobility as understood in the aristocratic commonwealths. The nobility is no longer all-powerful; it may be constrained to admit within its own body members for whose presence it has no wish. Where this power exists the nobility is no longer in any strictness an aristocracy; it may have great privileges, great influence, even great legal powers, but it is not the real ruling body, like the true aristocracy of Venice.

In the modern states of western Europe the existing nobility succeeds to a feudal past, and its origin in personal service to the prince. And this nobility by personal service to the prince has often supplanted an older nobility, as already for the origin of which was, in some cases at least, strictly immemorial. In this way the later nobility of the thegnas was in England substituted for the older nobility of the earls. Now the analogy between this change and the change from the Roman patriciate to the later Roman nobilitas is obvious. In both cases the older nobility gives way to a new; and in both cases the newer nobility was a nobility of office. Under a kingly government office bestowed by the sovereignty is what counts; and again office is held, or rather it is kept, by a class of people holds in a popular government. This new nobility of office supplanted, or perhaps rather absorbed, the older nobility, just as the later nobilitas of Rome supplanted or absorbed the old patriciate. In our first glimpse of Teutonic institutions, as given us by Tacitus, this older nobility appears as strictly immemorial (see Waizt, Deutsche Verfassungsgeschichte, i. 185 sq.), and its immemorial character appears also in the well-known legend in the Rigsmal-saga of the separate creation of jarl, karl and thrall. These represent the three classes of mankind according to old Teutonic ideas—the noble, the simple freeman and the bondman. The kingly house, where there is one, is not a distinct class; it is simply the noblest of the noble. For, as almost everywhere else, this Teutonic nobility admits of degrees, though it is yet harder to say in what the degrees of nobility consisted than to say in what nobility consisted itself.

The older nobility is independent of the possession of land; it is independent of office about the sovereign; it is hard to say what were the powers and privileges attached to it; but of its existence there is no doubt. But in no part of Europe can the existing nobility trace itself to this immemorial nobility of primitive days; the nobility of modern days, the nobility which we see to-day, is independent of land, of office about the sovereign, of power received from the people. This latter nobility is to-day generally called by the name nobilitas or nobility of office, which expresses the view that it is of the office which holds the nobility.

But what is the office? The nobleman in modern Europe is that man who is the lord of his estate, a name which expresses the idea that the nobleman’s office is his property. The lord of the estate is the lord of the soil, a name which expresses the idea that the nobleman’s office is the soil.

The old English word for the lord of the soil, the word to which the modern French title seigneur is a backformation, is seigneur, and the word to which the modern title prince is a backformation, is prince.

In England the nobility of the thegnas was to a great extent personally displaced, so to speak, by the results of the Norman Conquest. But the idea of nobility did not greatly change. The English thegn sometimes yielded to, sometimes changed into, the Norman baron, using that word in its widest sense, without any violent alteration in its position. The notion of holding land of the king became more prominent than the notion of personal service done to the king; but, as the land was held by the tenure of personal service, the actual relation hardly changed. But the connexion between nobility and the holding of land comes out in the practice by which the lord so constantly took the name of his lordship. It is in this way that the prefixes de and von, descriptions in themselves essentially local, have become in other lands badges of nobility. This notion has died out in England by the dropping of the
preposition; but it long lived on wherever Latin or French was used. And before long nobility won for itself a distinguishing outward badge. The device of hereditary coat-armour, a growth of the 12th century, did much to define and mark out the noble class throughout Europe. As it could be acquired by grant of the sovereign, and as, when once acquired, it went on from generation to generation, it answers exactly to the *jus imaginum* at Rome, the hereditary badge of nobility conferred by the election of the people. Those who possessed the right of coat-armour by immemorial use, or by grant in regular form, formed the class of nobility or gentry, words which, it must be remembered, are strictly of the same meaning. They held whatever privileges or advantages had attached in different times and places to the rank of nobility or gentry. In England indeed a variety of causes hindered nobility or gentry from ever obtaining the importance which they obtained, for instance, in France. But perhaps no cause was more important than the growth of the peerage. That institution at once set up a new standard of nobility, a new form of the nobility of office. The peer—in strictness, the peer in his own person only, not on his estate—was a hereditary title in the sense that it is, without legal advantage over others and the same by birth and by gentry thus became divorced in a way in which they are not in any other country. Those who would elsewhere have been counted as the nobility, the bearers of coat-armour by right, were hindered from forming a class holding any substantial privilege. In a word, the growth of the peerage hindered the existence in England of any nobility in the continental sense of the word. The esquires, knights, lesser barons, even the remote descendants of peers, that is, the *noblesse* of other countries, in England remained gentlemen, but not noblemen—simple commoners who, is, without legal advantage over others and the same by birth and by gentry who had no *jus imaginum* to boast of. There can be no doubt that the class in England which answers to the *noblesse* of other lands is the class that bears coat-armour, the gentry strictly so called. Had they been able to establish and to maintain any kind of privilege, even that of mere honorary precedence, they would exactly answer to continental nobility. That coat-armour has been lavishly granted and often assumed without right, that the word “gentleman” has acquired various secondary senses, proves nothing; that is the natural result of a state of things in which the *status* of gentry carries with it no legal advantage, is not merely right but right by social grounds. If coat-armour, and thereby the rank of gentry, has been lavishly granted, some may think that the rank of peerage has often been lavishly granted also. In short, there is no real nobility in England; for the class which answers to foreign nobility has so long ceased to have any practical privileges that it has long ceased to be looked on as a nobility, and the word nobility has been transferred to another class which has nothing answering to it out of the three British kingdoms. This last

1 This statement is mainly interesting as expressing the late Professor Freeman's view; it is, however, open to serious criticism. Coat-armour was in itself not necessarily a badge of nobility at all; it could be, and was, worn by people having no pretensions to be "gentlemen," and this is true both of England and the continent. In general it was a very bad mark of distinction, not a primary sense of the word. No "grant" was necessary; it was assumed by all and sundry who had occasion to use it, though a reasonable convention forbade one man to assume the device of another. Later on the coat of arms took on the character of a family personal favour or gratitude. This again was not at the outset an exclusive right of the crown; it was common for a leader in battle to grant to some one not of his family, who had specially distinguished himself, the right to bear the whole or part of his coat of arms, undifferenced. On the other hand, many undoubted "gentlemen" never assumed arms at all. The claim of the heralds to the exclusive right of arms is an instance of the growth of the common notion that the right to this depend on grant or recognition by themselves as officers of the crown, is of comparatively late growth. See further the article **GENTLEMAN**, W. A., *Oxford*.
political view monarchy and nobility are strongly opposed. Even the modified form of absolute monarchy which has existed in some Western countries, while it preserves, perhaps even strengthens, the social position of a nobility, destroys its political power. Under the fully-developed despotsim of the East a real nobility is impossible; the prince raises and thrusts down as he pleases. It is only in a commonwealth that a nobility can really rule; that is, it is only in a commonwealth that the nobility can really be an aristocracy. And even in a democratic commonwealth the sentiment of nobility may exist, though all legal privilege has disappeared, and it is not unlikely that, as the traditional feeling may give the members of certain families a strong preference, to say the least, in election to office. We have seen that this was the case at Athens; it was largely the case in the democratic cantons of Switzerland; indeed the nobility of Rome itself, after the privileges of the patricians were abolished, rested on no other foundation. (E. A. F.)

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NOBLE, SIR ANDREW (1832— ), British physicist and artillerist, was born at Greenock on the 15th of September 1832, and was educated at Edinburgh Academy and at the Royal Military Academy, Woolwich. In 1849 he entered the Royal Artillery, attaining the rank of captain in 1855, and in 1857 he became secretary to the Royal Artillery Institution. About this time the question of the supersession of the old smooth-bore by rifled guns was coming to the fore, and on the appointment of the Select Committee on Rifled Cannon in 1856 to report on the matter, he was chosen its secretary, a capacity in which he devised an ingenious method for comparing the probable accuracy of the shooting attainable with each type of gun. In 1850 he was appointed Assistant-Inspector of Artillery, and in the following year he became a member of the Ordnance Select Committee and of the Committee on Explosives, serving on the latter for twenty years, until its dissolution. About the same time he was prevailed upon by Sir William, afterwards Lord Armstrong, to leave the public service and take up a post at Elswick. Here, in the first instance, he was put in charge of the ordnance department, but it was not long before his organization and administrative ability and scientific attainments enlarged the sphere of his influence, and he eventually became chairman of the company. Immediately on his appointment he began a systematic investigation of the phenomena which occur when a gun is fired, some of his first experiments being designed to discover with accuracy the pressures attained in the largest guns of that time. About 1862 he invented his chronoscope for the measurement of exceedingly small intervals of time, and began to apply it in ballistic experiments for ascertaining the velocity with which the shot moves along the barrel of a gun with different powders and different charges. Then he joined Sir Frederick Abel in a classical research on "Fixed Gunpowder," the experimental work being largely carried on at Elswick, and the conclusions they arrived at had a great effect on the progress of gunnery, for they showed how increased muzzle velocities were to be attained without increased pressures in the gun. These inquiries, in fact, enabled Elswick in 1877 to turn out the 6-in. and 8-in. guns, with velocities of over 2000 ft. per second, that obliged the British government finally to give up the antiquated muzzle-loaders to which it had so obstinately adhered. Later, when the era of nitro or "smokeless" powders had begun, Captain Noble was an early advocate of their advantages, and when the government was led to the necessity of selecting a powder of that character for the naval and military services of Great Britain, Elswick extended its hospitality to the committee that invented cordite, and gave the members facilities, which were not offered by the government, for the necessary experimental work. Even after the powder was invented and the committee dissolved, inquiries—which it was nobody's official business to make, and which therefore were not made officially—were continued at Elswick to ascertain how by suitable modifications in form, composition, &c., cordite might then be performed. In 1883 he became a member of the committee appointed in 1890 by Lord Lansdowne to consider, among other things, the excessive erosion alleged by some of the powder's critics to be produced by it in the barrels of the guns in which it is used. He was made C.B. in 1881, promoted to be K.C.B. in 1893, and was created a baronet among the Coronation honours in 1902; he was also the recipient of many foreign decorations and scientific honours, including a Royal medal from the Royal Society in 1886, and the Albert medal of the Society of Arts in 1909. He published a number of his scientific papers in a collected form as Artillery and Explosives in 1896.

NOBLESVILLE, a city and the county-seat of Hamilton county, Indiana, U.S.A., on the White river, about 20 m. N. by E. of Indianapolis. Pop. (1890) 3054; (1900) 4792 (226 negroes); (1910) 5753. It is served by the Lake Erie & Western, the Central Indiana and the Indiana Union (electric) Tracton railways. It is in the natural gas region of the state, and has various manufactures. It was settled about 1825 and incorporated as a town in 1851.

NOCERA IMPERATORE, formerly NOCERA DEI PAGANI (anc. Nuceria Alfeata, q.b.), a town and episcopal see of Campania, Italy, in the province of Salerno, at the foot of Monte Albino, 23 m. E.S.E. of Naples by rail, 135 m. above sea-level. Pop. (1901) 11,933 (town); 20,064 (commune). Nocera is connected with Codola on the line from Naples to Avellino by a branch railway (3 m.). In the old castle Helena, the widow of Manfred, died after the battle of Benevento, and here Urban VI. imprisoned the cardinals who favoured the antipope Clement VII. Two miles to the E. near the village of Nocera Superiore is the circular church of Sta Maria Maggiore, dating from the 4th century. Its chief feature is its dome, ceiled with stone internally; but covered externally with a false roof. It is supported by 46 ancient columns, and in its construction resembles S Stefano Rotondo in Rome. The walls are covered with frescoes of the 14th century. At an early date the city became an episcopal see, and in the 12th century it sided with Innocent II. against Roger of Sicily, and suffered severely for its choice. A colony of Saracens introduced by Frederick II. probably gave rise to the epithet ("of the pagans") by which it was so long distinguished, as well as to the town of Pagani, which lies about 1 m. to the west. In 1503 Pope Urban VII. was besieged in the castle of Charles of Durazzo. Nocera was the birthplace of Solimena the painter and of Hugo de' Pagani, the founder of the Templars; and in the list of its bishops appears the name of Paulus Jovius.

NOCERA UMBRA (anc. Nuceria Camellaria), a town and episcopal see in the province of Perugia, Italy, 12 m. by rail N. by E. of Foligno, 1706 ft. above sea-level. Pop. (1901) 2685 (town); 7848 (commune). It has some old churches, containing pictures and frescoes; in the cathedral is a large altarpiece by Nicolo Alunno. Three miles to the south-east of the town are mineral springs.
NOCTURN—NOEGGERATH

NOCTURN, or Nocturne (Lat. nocturnus, or belonging to the night, next), in the Roman Church, one of the three divisions of the office of matins, corresponding with the vigils, beginning at 9 p.m. midnight and 3 a.m. respectively. The service consists of psalms, lessons and antiphons (see Breviary). The term "nocturne" is applied to a musical composition, especially one written for the piano, and resembling to the earlier "serenade," of a quiet, dreamy and romantic character. The name and style are said to have originated with John Field (1782–1837). The best-known compositions of this kind are the pianoforte pieces of Chopin. J. McNell Whistler also introduced the term into painting by using the name for some of his night-pieces. A "nocturnal" is an instrument for finding the hour of the night by observation of the relative positions of the pole-star and other stars, generally the pointers of Ursae Major. The British Museum contains a fine nocturnal made about 1560 by Humphry Cole (see Navigation).

NOODY, the name applied, originally by sailors, to a sea-bird, from its showing so little fear of man as to be accounted stupid. It is the Siera stolid a Linnaeus, and the Anous stolidus of modern ornithology, having the figure of a Tern (q.v.), and belonging to the sub-family Sterininae, but is heavier in flight, with shorter wings and the tail less deeply forked. The plumage is of a uniform sooty hue, excepting the crown of the head, which is light grey. The Noddy is very generally distributed throughout the tropical or nearly tropical oceans, but occasionally wanders into colder climates, and has been met with even in the Irish Sea. It breeds, often in association with a musical compositor, and nesting islets, commonly making a shallow nest of sea-weed or small twigs. Howard Saunders (Proc. Zool. Society, 1876, pp. 669-672) admits four other species of the genus: Anous tenuirostris, supposed to be confined to the southern part of the Indian Ocean, from Madagascar to West Australia; A. melanogenys, often confounded with the last, but having nearly as wide a range as the first; and A. leucocephalus, hitherto known only from Torres Strait and the Southern Pacific. These three have much resemblance to A. stolidus, but are smaller in size, and the two latter have the crown white instead of grey. The fourth species, A. caeruleus (with which he includes the A. cinctus of some authors), differs not inconsiderably, being of a dove-colour, lighter on the head and darker on the back, the wings bearing a narrow white bar, with their quill-feathers blackish-brown, while the feet are reddish and the webs yellow. Three more species—A. superciliosus from the Caribbean Sea and Gulf of Mexico, A. plumbeigularis from the Red Sea, and A. galapagensis from the Galapagos—have been added by R. Bowlder Sharpe (Philos. Transactions, cvii. pp. 408, 409), according to whom (Proc. Zool. Society, 1878, p. 272) A. cinctus of the Eastern Pacific is distinct from A. caeruleus of Australia and the Southern Pacific (A. N.).

NODE (Lat. nodus, a loop), in astronomy, one of two opposite points at which a heavenly body passes through the principal co-ordinate plane to which its motion is referred. In the case of the heavenly bodies this plane is commonly that of the ecliptic, but, in special cases, the plane through the origin parallel to the earth's equator or the plane of a planet's orbit is used. The ascending node is that at which the body moves from the south or negative towards the north or positive side of the plane. The moon's nodes are the points in which its path intersects the plane of the ecliptic. In the geometry of curves, a node is the name given to the loop formed by a continuous curve crossing itself, the point of crossing termed a "double point," and at it there are two non-coincident tangents to the curve; the remaining species of double points, termed "acnode," "spinode" or "cusp," admits of two coincident tangents (see CURVE).

NOIDIER, CHARLES (1770–1844), French author, was born on the 20th of April 1780 at Besançon. His father, on the outbreak of the Revolution, was appointed mayor of Besançon and consequently chief police magistrate; he seems to have rather lent himself as an instrument to the tyranny of the Jacobins that they shared their principles; but his son was for a time an ardent citizen, and is said to have been a club member when he could at the most have been twelve years old. In 1793 Charles saved the life of a lady guilty of sending money to an émigré, by declaring to his father that if she were condemned he would take his own life. He was sent to Strassburg, where he lived in the house of Eulogius Schneider, the notorious Jacobin governor of Alsace, but a good Greek scholar. During the Terror his father was guillotined, and Charles, a prisoner in a Paris jail, was visited by the English and German. His love of books began very early, and he combined with it a strong interest in natural science. He became librarian in his native town, but his exertions in the cause of suspected persons brought him under suspicion. An inspection of his papers by the police, however, revealed nothing more dangerous than a dissertation on the antennae of insects. Entomology continued to be a favourite study with him, but he varied it with philology and pure literature and even political writing. For a skit on Napoleon, in 1803, he was imprisoned for some months. He then quitted Paris, whither he had gone after losing his position at Besançon, and for some years lived a very unsettled life at Besançon, Dôle, where he married, and in other places in the Jura. During these wanderings he wrote Le Peintre de Salzbourg, journal des émotions d'un cœur souffrant, suivi des Méditations du cloître (1803). The hero, Charles, who is a variation of the Werther type, desires the restoration of the monasteries, to afford a refuge from the woes of the world. In 1811 Nodier appears at Laibach as editor of a polyglot journal, the Illyrian Telegraph, published in French, German, Italian and Slav. On the evacuation of the Illyrian provinces he returned to Paris, and the restoration found him a royalist, though he retained something of republican sentiment. In 1824 he was appointed to the librarianship of the Bibliothèque de l'Arseanal. He was elected a member of the Academy in 1833, and made a member of the Legion of Honour in 1843, a year before his death on the 27th of January 1844. These twenty years at the arsenal were by far the most important and fruitful of Nodier's life. He had much of the Bohemian in his composition. But he had the advantage of a settled home in which to collect and study rare books; and he was able to supply a centre and encouragement to a kind of literature greater than what he himself was, or seemed to be inclined to imitate, the so-called Romanticists of 1830—and to colour their tastes and work very decidedly with his own predilections. Victor Hugo, Alfred de Musset and Sainte-Beuve all acknowledged their obligations to him. He was a passionate admirer of Goethe and of Shakespeare, and had himself contributed to the personal literature that was one of the leading traits of the Romantic school.

His best and most characteristic work, some of which is exquisite in its kind, consists partly of short tales of a more or less fantastic character, partly of sensational and far-fetched narratives, the nearest analogue to which in English is to be found in some of the papers of De Quincy. The best examples of the latter are to be found in the volume entitled Souvenirs de la vie d'un bibliophile, published in 1829 and afterwards continued. Of his tales the best are Scharra, ou les démons de la nuit (1821); Trilby, ou le lazard d'Argail (1822); L'histoire du roi de Bohême et de ses sept châteaux (1830); La Fée aux miettes (1832); Inés de las Sierras (1838); Légende se Sœur Blatris (1838), together with some fairy stories published in the year of his death, and Francedes Columnas, which appeared after it. The Souvenirs de jeunesse (1832) is interesting but untrustworthy, and the Dictionnaire universel de la langue française (1853), which, in the days before Littre, was one of the most useful of its kind, is said to have been not wholly or mainly Nodier's work. Nodier published also 12 vols. (1832), but at that time much of the author's best work had not appeared, and it included but a part of what was actually published. Nodier found an Indigent Biographer in Prosper Mérimée on the occasion of the younger man's admission to the academy.

An account of his share in the Romantic movement is to be found in Georg Brandes's Main Currents in Nineteenth Century Literature. Têtes de ruminants, collection de livres (1844), which is a catalogue of the books in his library, contains a life by Francis Wey and a complete bibliography of his numerous works. See also Sainte-Beuve, Portraits littéraires, vol. ii; Philippe Fizeau, Lettres de Charles Nodier (1841); and A. Estignard, Correspondance intitulée de Charles Nodier, 1786–1844 (1876), containing his letters to Charles Weiss.

NOEGGERATH, JOHANN JACOB (1788–1877), German mineralogist and geologist, was born at Bonn on the 10th of
October 1788. In 1814–1815 he became commissioner of mines for some of the Rhine Provinces, and in 1818 professor of mineralogy and afterwards professor of geology, director of the Museum of Natural History and chief of the mining department in the university at Bonn. He obtained a very fine collection of minerals for the museum, was eminently successful as a teacher, and achieved a wide reputation among mining engineers. The following are his more important publications: Über aufrecht im Gehirngestein eingeschlossene fossile Baumstämmte und andere Vegetabilien (1810–1821); Das Gebrige in Rheinland-Westphalen, nach mineralogischem und chemischen Bezug (4 vols., 1822–1826); Die Entstehung der Erde (1843); and Der Laacher See und seine vulkanischen Umgebungen (1870). The Carboniferous plant Noggerathia, allied to the Zamias and Cycads, was named after him. He died at Bonn on the 11th of September 1877.

NOEL, RODEN BERKELEY Wriothesley (1834–1894) English poet, son of Noel, Lord Barham, afterwards Earl of Gainsborough, was born on the 27th of August 1834. He was educated at Trinity College, Cambridge, where he graduated M.A. in 1858. He then spent two years travelling in the East. He married in 1863 Alice de Broër, daughter of the director of the Ottoman Bank in Beirut. The third child of this marriage, Eric, who died at the age of five, is commemorated in Roden Noel's best-known book of verse, A Little Child's Monument (1881). His other works are Behind the Veil, and other Poems (1883), The Life of Faust (1884), The Faustian Wives (1884), and Songs of the Heights and Deeps (1885), A Modern Faust, and other Poems (1888), Poor People's Christmas (1890) and My Sea, and other Poems (1896). Roden Noel's versification was unequal and sometimes harsh, but he has a genuine feeling for nature, and the work is permeated by philosophic thought. The latter part of his life was spent at Brighton, but he died at Mainz, on the 26th of May 1894. His other works include a drama in verse, The House of Ravensburg (1897), a Life of Byron (1890, "On the Wings of Night" series), a selection of Thomas Otway's plays (1888) for the "Mermaid" series, and critical papers on literature and philosophy. His Collected Poems were edited (1892) by his sister, Victoria Buxton, with a notice by J. Addington Symonds, which had originally appeared in the Academy (19th of Jan. 1890) as a review of The Modern Faust. The selection (1892) in the series of Canterbury Poets has an introduction by Robert Buchanan.

NOETUS, a presbyter of the church of Asia Minor about a.D. 230, was a native of Smyrna, where (or perhaps in Ephesus) he became a prominent representative of the particular type of Christology now called modalistic monarchianism or patri-passionism. His views, which lead to his excommunication from the Asiatic Church, are known chiefly through the writings of Hippolytus, his contemporary at Rome, where he settled and had a large following. He accepted the fourth Gospel, but regarded its statements about the Logos as allegorical. His disciple Cleomenes held that God is both invisible and visible; as visible He is the Son.

NOGARET, GUILLAUME DE (d. 1313), councillor and keeper of the seal to Philip IV of France, was born between 1260 and 1270. His father was a citizen of Toulouse, and was, so it was claimed, condemned as a heretic during the Albigensian crusade. The family held a small ancestral property of service origin at Nogaret, near Saint Felix de Caramon, from which it took its name. In 1297 Guillaume was professor of jurisprudence at the university of Montpellier, and in 1298 he became a member of the Curia Regis at Paris. His name is mainly connected with the quarrel of Philip IV with Pope Boniface VIII. In 1300 he was sent with an embassy to Boniface, of which he has left a picturesque but highly coloured account. His real ascendancy over the king dates from February 1303, when he persuaded Philip to consent to the plan of seizing Boniface and bringing him forcibly from Italy to a council in France which should depose him. On the 7th of March he received, with three others, a secret commission from the royal chancery to "go to certain places... and make such treaties with such persons as seemed good to them." On the 12th of March a solemn royal assembly was held in the Louvre, at which Guillaume de Nogaret read a long series of accusations against Boniface and demanded the calling of a general council to try him. Soon afterwards he went to Italy. By the aid of a Florentine spy, Nogaret gathered a band of adventurers and of enemies of the Gaetani (Boniface's family) in the Apennines. The great Colonna house, at bitter feud with the Gaetani, was his strongest ally, and Sciarra Colonna accompanied Nogaret to Anagni, Boniface's birthplace. On the 7th of September, with their band of some sixteen hundred men, Nogaret and Colonna surprised the little town. Boniface was taken prisoner. Sciarra wished to kill him, but Nogaret's policy was to take him to France and compel him to summon a general council. The tide soon turned, however. On the 9th a concerted rising of the townspeople in Boniface's favour put Nogaret and his company to flight. He died at Rome on the 11th of October saved Nogaret. The election of the timid Benedict XI. was the beginning of that triumph of France which lasted through the Avignon captivity. Early in 1304 Nogaret went to Languedoc to report to Philip IV., and was rewarded by gifts of land and money. Then he was sent back with an embassy to Benedict XI. to demand absolution for all concerned in the struggle with Boniface VIII.

Benedict refused to meet Nogaret, and excepted him from the general absolution which he granted on the 15th of May 1304, and on the 7th of June issued against him and his associates at Anagni the bull Flagitiosum. Nogaret replied by apologies for his conduct based upon attacks upon the memory of Boniface, and when Benedict died on the 7th of July 1304 he pointed to his death as a witness to the justice of his cause. French influence was successful in getting a Frenchman, Bertrand de Got (Clement V.) elected as Benedict's successor. The threat of proceedings against the memory of Boniface was renewed to force Clement to absolve Nogaret, and Clement had given way on this point when the further question of an inquiry into the condition of the Templars was brought forward by Philip as a preliminary to their arrest and the seizure of their property in October 1307. Nogaret was active in getting the renegade members of the order to give evidence against their fellows, and the whole proceedings against them bear traces of his unscrupulous and merciless pen. Clement's weak and ineffective resistance to this still further delayed the agreement between him and Philip. Nogaret had become keeper of the seal this year in succession to Pierre de Belleperche. His talents as an advocatus diaboli were given still further employment in the trial of Guichard, bishop of Troyes, charged with various crimes, including witchcraft and inconstancy, which was begun in 1308 and lasted till 1313. The trial was successful in bringing before the secular court the strength and success of the French monarchy, for the threat of a trial of Boniface were fulfilled. Absolution was obtained from Clement on the 27th of April 1311. Guillaume de Nogaret was to go on the next crusade and visit certain places of pilgrimage in France and Spain as a penance, but never did so. He died in 1313 "with his tongue horribly thrust out," according to the chronicler Jean Desnouelles. He retained the seals till his death and was occupied with the king's affairs concerning Flanders as late as the end of March 1312.

See E. Renan in Histoire littéraire de la France, xxvii. 233; R. Holzmann, Wilhelm von Nogaret (Freiburg, 1898). For the sources consult Dom Bouquet, Recueil de historiens des Gaules et de la France, vols. xx–xxiii. Annales régis Edwar correlation is based on the understanding that the text is a continuation of the previous one. The beginning of the text is not clear, but it seems to be about the life of a person named Noel. The text mentions the writing of a book on philosophy and the life of a person named Nogaret. The text also mentions the death of Nogaret and the election of a new pope.
Nogent preserves three Gothic churches and the remains of the old priory of St Denis, and there are statues of General St Pol, killed at Sevastopol, and of the poet Rémy Belleau (16th century), a native of the town. The town has a sub-prefecture, a tribunal of first instance, a communal college and institution for deaf mutes.

Nogent-sur-Marne, a town of northern France, in the department of Seine, on a hill on the right bank of the Marne, 6 m. E. of Paris by rail. Pop. (1906) 11,463. The Eastern railway here crosses the Marne valley by a viaduct 875 yds. in length. Nogent has a Gothic church, with a tower of the Romanesque period, in front of which there is a monument to Wattelo, who died here in 1721. Chemical products are manufactured. The fine situation of the town gained it the name of Beauté, and Charles V. built a château here (demolished in the 18th century) which was presented by Charles VII to Agnes Sorel with the title of Dame de Beauté. An island in the Marne to the south of the town is still known as the Île de Beauté.

Nogent-sur-Seine, a town of north-central France, capital of an arrondissement in the department of Aube, on the left bank of the Seine, 35 m. N.W. of Troyes on the Paris-Bellfort line. Pop. (1906) 3791. The river at this point forms an island, which supports a stone bridge of the 17th century. The chief building is the church of St Laurent (1431-1534). A lateral portal in the Flamboyant style and the Renaissance tower at the west end are remarkable remains of the church of the seigneur and has a tribunal of first instance. There is trade in grain, flour, fodder, wood and cattle. Nogent-sur-Seine was in 1814 the scene of fighting between the French and Austrians.

Nogi, Kiten, Count (1849-1900), Japanese general, was born in Choshu. He commanded a brigade at the battle of Kinchow (1894) and the subsequent capture of Port Arthur from the Chinese; but the most memorable events of his career were the siege of Port Arthur by the third army corps of Japan under his command in the Russo-Japanese War (1904-5), and the south flank marching made by the same army in the battle of Mukden.

Noirmoutier, an island of western France, belonging to the department of Vendée, and protecting the Bay of Bourgneuf on the south-west. Pop. (1906) 8388. The area amounts to 22 sq. m., one-sixth dunnes. Between the island and the mainland is a sandbank laid bare at low water, and crossed by an embankment and carriage road some 23 m. long. It was not till about 1766 that it was found possible to walk across to the island, which lies from N.N.W. to S.E.E., and is 12 m. long, its breadth varying from 1 m. in the north part to 3 or 4 m. in the north. It appears to be formed of alluvial deposits gradually accumu-

lated round a rock of no great size situated at the meeting-place of the Gasoncy and Brittany currents. Fishing, agriculture, oyster-breeding and work in the salt marshes also occupy the inhabitants. There are two communies, Noirmoutier and Barbâtre. Noirmoutier, which has a small port, has about 2165 of its 6644 inhabitants gathered together in a little town with narrow and winding streets. Its castle was once the residence of the abbess of Her. In the church (12th, 14th and 19th centuries) there is a crypt of the 11th century. A mile to the north of the town lies a pleasant woods gradually becoming picturesque by the La Chaise woods (evergreen oaks and pines), and a grand confusion of rocks, among which lie charming beaches. A dolmen, several menhirs, and the ruins of a Gallo-Roman villa with its hot baths show that the island must have been occupied at an early date; but the first fact in its recorded history is the foundation of the Benedictine monastery of Her by St Philibert about 680. From this monastery the name Noirmoutier (Heri monasterium, Hormoutier) is derived. It had already attained to great prosperity when it was pillaged by the Normans in 825 and 845. In 1005 the abbey of Notre Dame la Blanche was built at the north extremity of the island to take the place of a Cistercian convent established in the Île du Pilier, at that time attached to Noirmoutier by a dike. This abbey was ruined by the Protestants in 1562. In the 15th, 16th and 17th centuries the island belonged to the family of La Tremoille, and in 1656 the territory was made a duchy. In 1676 the island was captured by the Dutch. Having been seized by Charette during the war of Vendée, it was recovered by the Republican general, Haxo, who caused the Vendean leader, d'Elbée, to be shot.

Noise (a word of doubtful origin, O. Fr. noiz; Lat. nosis, which points to Lat. nausea, sickness, as the origin; others take Lat. noxia, harm, as the source), an excessive, offensive, persistent or startling sound. By the common law of England freedom from noise is essential to the full enjoyment of a dwelling house and acts which affect that enjoyment may be actionable as nuisances. But it has been laid down that a nuisance by noise, supposing malice to be out of the question, is emphatically a question of degree (Gawnt v. Finney, 1872, 8 Ch. Ap. 8). The noise must be exceptional and unreasonable. The ringing of bells, the barking of dogs, or the discharge of firearms, guns, reports, cannon, or rockets, and other similar noises, are nuisances. The O. Fr. anoi, ausi (modern ennui) is an adaptation of Lat. in odio esse, venire or habere, to be sick, tired of anything (odium, disgust, hatred). The word has no connexion with Lat. nocere, to hurt.

Nokes (Norke, Noah, Noakes), James (d. 1692), an English actor, whose laughter-arousing genius is attested by Cibber and other contemporaries. Sir Martin Mar-all, Sir Davy Dunch and Sir Credulous Easy were among his favourite parts. His success as the Nurse in Nevil Payne's Fatal Jealousy was so great that he was known as the Nurse. He was a great favorite of Charles II. The O. Fr. noz, nozzi (modern noun) is an adaptation of Lat. in odio esse, venire or habere, to be sick, tired of anything (odium, disgust, hatred). The word has no connexion with Lat. nocere, to hurt.

Nola, a city and episcopal see of Campania, Italy, in the province of Caserta, pleasantly situated in the plain between Mount Vesuvius and the Apennines, 16½ m. E.N.E. of Naples, 121 ft. above sea-level. Pop. (1901) 11,927 (town); 14,511 (commune). It is served by the local railway from Naples to Baiano, and is 22 m. from Naples by the main line via Cencello. The more conspicuous buildings are the ancient Gothic cathedral (restored in 1866, and again in 1870 after the interior was destroyed by fire), with its lofty tower, the cavalry barracks, the ex-convent of the Capuchins at a little distance from the city, and the convent of the monastery of the Nuns, which contains the famous Oscan inscription known as the Cipuss Abellanus (from Abella, the modern Avella, g.e.) and some Latin inscriptions relating to a treaty with Nola regarding a joint temple of Hercules. Two fairs are held in Nola, on the 14th of June and the 12th of November; and the 26th of July is devoted to a great festival in honour of St Paulinus, one of the early bishops of the city, who invented the church bell (campana, taking its name from Campania). The church erected by him in honour of St Felix in the 4th century is extant in part. There is a monument (1587) to Giordano Bruno, the free-thinker, who was born at Nola in 1548.

Nola (Νόλα) was one of the oldest cities of Campania, variously said to have been founded by the Ausones, the Chalcidians and the Etruscans. The last-named were certainly in Nola about 500 B.C. At the time when it sent assistance to Neapolis against the Roman invasion (326 B.C.) it was probably occupied by Oscans in alliance with the Samnites. The Romans made themselves masters of Nola in 313 B.C., and it was thenceforth faithful to Rome. In the Second Punic War it thrice bade defiance to Hannibal, but in the Social War it was betrayed into the hands of the Samnites, who kept possession till Marius, with whom they had sided, was defeated by Sulla, who in 80 B.C. subjected it with the rest of Samnium. Seven years later it was stormed by Spartacus. Whatever punishment Sulla may have inflicted, Nola, though it lost much of its importance, remained a
municipium with its own institutions and the use of the Ocean language. It became a Roman colony under Augustus, who died at Nola. Sacked by Germanic in 455, and by the Saracens in 806 and 904, captured by Manfred in the 13th century, and damaged by earthquakes in the 15th and 16th, Nola lost much of its importance. The revolution of 1802 under General Pepe began at Nola. The sculptor Giovanni Marliano was a native of the city; and some of his works are preserved in the cathedral.

Nola lay on the Via Popillia from Capua to Nuceria and the south, and a branch road ran from it to Abella and Abellinum. Mommsen (Corpus inscr. Lat. x. 142) further states that roads must have run direct from Nola to Neapolis and Pompeii, but Kiepert's map annexed to the volume does not indicate them. In the days of its independence it issued an important series of coins, and in luxury it vied with Capua.

Its territory was very fertile, and this was the principal source of its wealth. A large number of vases of Greek style were manufactured here and have been found in the neighbourhood. Their material is of pale yellow clay with shining black glaze, and they are decorated with skilfully drawn red figures. Of the ancient city, which occupied the same site as the modern town, hardly anything is now visible, and the discoveries of the ancient street pavement have not been noted with sufficient care to enable us to recover the plan. Numerous ruins, an amphitheatre, still recognizable, a theatre, a temple of Augustus, &c., existed in the 18th century, and have since disappeared.

Kiepert's Geschichte des Korans (1901) and published it additions at Göttinngen. In 1861 he began to lectured at the university of this town, where three years later he was appointed extraordinary professor. In 1868 he became ordinary professor at Kiel, and in 1872 was appointed to the chair of Oriental languages at Strassburg, which he resigned in 1906. Nöldeke's range of studies has been wide and varied, but in the main his work has followed the two lines already indicated by his prize essay, Semitic languages, and the history and civilization of Islam. While a great deal of his work (e.g. his Grammatic der neuassyrischen Sprache (1874), and his translations from the Arabian of Tabari, 1881-1882) is meant for specialists, many of his books are of interest to the general reader. Several of his essays first appeared in the Encyclopædia Britannica, and his article on the Koran, with some others, was republished in a volume called Oriental Sketches. The articles dealing with Persia were republished in a German volume, Ausfuhrung der persischen Geschichte (Leipzig, 1857). Among his best-known works are: Das Leben Mohammeds (1863); Beiträge zur Koranhistorie der alten Araber (1864); Die attischettischir die lateinische Geschichte der Perser (1867); and his Grammatik des klassischen Arabisch (1866); Fünf Mo'alloqa'ali, übersetzt und erklärt (1890-1901); and Beiträge zur semitischen Sprachwissenschaft (1904). He has contributed frequently to the Zeitschrift der deutschen morgenländischen Gesellschaft, the Göttingische gelehrte Anzeigen and the Expositor.

NOLLI, a coast village of Liguria, Italy, in the province of Genoa, from which it is 36 m. S.W. by rail, 13 ft. above sea-level. Pop. (1901) 1885. It is a town of considerable antiquity, now decayed, and has an ancient church of S. Paragorio, once the cathedral, a Romanesque basilica dating from the 11th century, with interesting works of art. The diocese has been united with that of Savona.

See A. d'Andrade, Relazione dell'Ufficio Regionale per la conservazione dei monumenti del Piemonte e della Liguria (Turin, 1890), 100 seq.

NOLLEKENS, JOSEPH (1737-1823) British sculptor, was born on the 11th of August 1737 in Dean Street, Soho, London, where his father, a native of Antwerp, the "old Nollekens" of Horace Walpole, was a painter of some repute. In his thirteenth year he entered the studio of the sculptor Pedler, Schoolkens, and practised drawing and modelling with great assiduity, ultimately gaining various prizes offered by the Society of Arts. In 1760 he went to Rome, and he executed a marble bas-relief, "Timoleea before Alexander," which obtained a prize of fifty guineas from that society in 1762. Garrick and Sterne were among the first English visitors who sat to him for busts; among his larger pieces belonging to this early period perhaps the most important is the "Mercury and Venus chiding Cupid." Having returned to England in 1770, he was admitted an associate of the Royal Academy in 1773 (somewhat shortened, in 1772, the year in which he married Mary, the second daughter of Saunders Welch. By this time he had become known to George III., whose bust he shortly afterwards executed, and henceforward, until about 1816, he was the most fashionable portrait sculptor of his day. He himself thought highly of his early portrait of Sterne. Among many others may be specially named those of Pitt, Fox, the prince of Wales (afterwards George IV.), Canning, Perceval, Benjamin West and Lords Castlereagh, Aberdeen, Erksine, Egremont and Liverpool. He elaborated a number of marble groups and statues, amongst which may be mentioned those in the National Gallery; amongst his most admired workmanship, are deficient in vigour and originality, and the drapery is peculiarly weak. The most prominent personal characteristic of Nollekens seems to have been his frugality, which ultimately developed into absolute miserliness. Mrs Nollekens died in 1817, and the sculptor himself died in London on the 25th of April 1823, leaving a large fortune.

Nollekens is the Latinized form of the Dutch Nolleken, a technical term of English law, the meaning of which varies as it is used with reference to civil or criminal cases. In civil cases it applied only to actions in the king's bench division, and there signified a formal undertaking by the plaintiff that he intended to proceed no further with the action (se ulterioris nolle prosequi). The more modern practice in such cases is to proceed by way of discontinuance. In proceedings either by indictment or by information, a nolle prosequi or stay of proceedings may be entered by the attorney-general. The nolle prosequi is a matter purely for his discretion, and will not be granted except he believes the case to be procedurally good. The object of it generally is to obtain a stay of proceedings against an accomplice in order to procure his evidence. This object is, however, more usually effected by the prosecution offering no evidence and the judge directing an acquittal.

In the United States the term bears the same meaning as in England, with one exception. The attorney-general has not the same discretion with which English law invests him. Although in some states the prosecuting officer may enter a nolle prosequi at his discretion, in others the leave of the court must be obtained.

NOLLET, JEAN ANTOINE (1700-1770), French physicist, of peasant origin, was born near Noyon (Oise) on the 19th of November 1700. He entered holy orders and ultimately attained the rank of abbe; but his tastes all lay in the direction of experimental research, especially on the subject of electricity. In 1734 he was admitted a member of the London Royal Society, four years later he entered the Academy of Sciences at Paris, and in 1753 he was appointed to the newly-instituted chair of experimental physics in the Collège de Navarre. In addition to many memoirs he wrote Essai sur l'électricité des corps (1747), Recherches sur les cousses particulières des phénomènes électriques (1749 and 1754), Recueil de lettres sur l'électricité (1753), L'Art de faire les chapeaux (1764) and L'Art des expériences (1770). He died at Paris on the 24th of April 1770.
NOMAD—NONCONFORMIST

NOMAD (Gr. νομάς, νομάδες, wandering), a wanderer. The word is particularly used of tribes which shift continually from place to place in search of pasture (Gr. réμα). The νομάδες of ancient Greek writers meant particularly the pastoral tribes of North Africa; hence the Latin name of the Numidians (see NUMIDIA).

NOME, a mining town about 12 m. W. of Cape Nome, on the S. shore of Seward Peninsula, Alaska, in 1900 the largest settlement in the District. Nome (1900) 1,248; (1910) 6,000. A gold rush was found near Nome on Anvil Creek in September 1898, and diggings in the ocean beach were first worked in July 1899. The rush to Nome in 1900 was one of the most remarkable stampedes in American mining history; the town soon had hotels, banks, stores, several newspapers and weekly mails from the States, and for part of the year there were, it was estimated, 20,000 inhabitants. This rapidity of growth and the isolation of the settlement raised prices to extraordinary heights, and in other respects created economic conditions remarkable even among Alaskan mining camps. By 1903 the population had greatly decreased, and in subsequent years the winter population averaged about 3,500, the summer population from 7,000 to 8,000.

In 1905 the gold output of the Nome region amounted to about $2,500,000, nearly all from placers, though some quartz mining was done. A municipal government and local police force were early organized after the fashion of American mining communities, and United States soldiers from the St Michael reservation aided in the preservation of order. The greatest drawback to the town's prosperity is the lack of any good harbour nearer than Point Barrow, 1,585 m. N. The town attimes 9 ft. high on the beach, render harbour improvements at Nome almost impossible. There is connexion with Seattle by steamer (since 1904) in about 83 days. In 1901 the town was incorporated under the laws of the United States. It is the north-western terminus of the United States military telegraph. It was first called Anvil City; the name "Nome" is derived from Cape Nome, first so called on a chart dated 1840, and said to have been a draughtsman's mistake for the query "N Name" on the original chart.

NOMENOE, or NOMINEOE (d. 851), duke of Brittany. The date of his birth is not known, and his origin is obscure; all that is known is that he was of Breton race. In the hope of pacifying Brittany, Louis the Debonair named him count of Vannes in 819 and governor or duke of Brittany in 826. Throughout the reign of Louis, Nomenoe's fidelity to the emperor never flagged; he put down several attempted insurrections, and maintained peace in Brittany for fifteen years. But in 841 he resolved to make himself independent of Charles the Bald. In 843 Charles made a vain attempt to subdue Brittany. In 844 Nomenoe invaded Maine, and in 845 the emperor was completely defeated at Ballon near Bain-de-Bretagne. In the following year Charles recognized the independence of Brittany. Having resolved to detach the duchy from the ecclesiastical province of Tours, Nomenoe accused the Frankish bishops of Vannes, Quimper, Dol and Léon of simony at the council of Couteloue in 848, replaced them by Bretons, and erected Dol into a metropolitan see. In 849 Nomenoe attacked the Frankish county of Anjou. Charles retaliated by establishing a garrison at Rennes; but Nomenoe seized Rennes, Nantes and, finally, the whole of Upper Brittany, and ravaged Maine. In 851 he seized Anjou and invaded Beauce; but he died suddenly, leaving as his successor his son Erripod.


NOMENTANA, VIA, an ancient road of Italy, leading N.E. from Rome to Nomentum (q.v.), a distance of 14 m. It originally bore the name Via Ficulensis, from the old Latin village of Ficulea, about 8 m. from Rome. It was subsequently prolonged to Nomentum, but never became an important highroad, and merged in the Via Salaria (see SALARIA, VIA) a few miles beyond Nomentum. It is followed as far as Nomentum by the modern highroad, but some traces of its pavement still exist.

See T. Ashby in Papers of Brit. School at Rome, iii. 38 sqq. (T. As.)

NOMENTUM (mod. Mentana), an ancient town of Italy, 14 m. N.E. of Rome by the Via Nomentana. It was a Latin town, but was by some considered to be Sabine, and, like Ficulina and Ficulea, was excluded from the first region by Augustus, who made the Anio its northern boundary. Nomentum received the civitas sine suffragio after the last war of the Latins against Rome (335 B.C.); in its municipal constitution the chief magistrate even in imperial times bore the title of dictator. Flury and Martial often praise the fertility of its neighbourhood. The site of the town is well protected by ravines except on the east; no ancient remains exist in situ, but inscriptions and other relics have been found.

See T. Ashby in Papers of the British School at Rome, iii. 68 sqq. (T. As.)

NONIMALISM (from Lat. nomen, name), the name of one of the two main tendencies of medieval philosophy, the other being Realism. The controversy between nominalists and realists arose from a passage in Boëthius' translation of Porphyry's Introduction to the Categories of Aristotle, which propounded the problem of genera and species, (1) as to whether they subsist in things or only in the mind; (2) whether, if subsistent, they are corporeal or incorporeal; and (3) whether separated from sensible things or placed in them. The Realists held that universals alone have substantial reality, existing ante rem; the Nominalists that universals are mere names invented to express the qualities of particular things and existing post rem; while the Conceptualists, mediating between the two extremes, held that universals are concepts which exist in our minds and express real similarities in things themselves. Though a strong realist tendency is evident in the System of Eriugena (9th century), the controversy was not definitively settled till the 11th century: it lasted till the middle of the 12th, when the first period of scholastic philosophy ends. Under an appearance of much vain subtlety the controversy about universals involved issues of the greatest speculative and practical importance: realism represented a spiritual, nominalism an anti-spiritual, view of the world; while realism was evidently favourable, and nominalism unfavourable, to the teaching of the Church on the dogmas of the Trinity and the Eucharist. Nominalism was a doctrine of sceptics and suspected heretics, such as Berengar of Tours and Roscellinus. Even Abelard's mediating doctrine of conceptualism (q.v.) was sufficiently near to obvious ideas to involve him in lifelong persecution. The principles of the great orthodox philosophers of the later scholastic period which begins in the 13th century, Albertus Magnus and Thomas Aquinas, were those of moderate realism. When nominalism was revived in the 14th century by the English Franciscan, William of Occam, it gave evidence of a new tendency in thought, a distrust of abstractions and an impulse towards direct observation and inductive research, a tendency which had its fulfilment in the scientific movement of the Renaissance. Occam's dictum "Entia non multiplicanda praeter necessitatem" was inspired by a spirit similar to that of Bacon. Though nominalism is properly a medieval theory, the tendency has passed over into modern philosophy: the term "nominalist" is often applied to thinkers of the empirical, sensationalist school, of whom J. S. Mill may be taken as the chief representative.

(H. S.)

NONCONFORMIST, a term denoting historically (a) those persons who at the beginning of the 17th century refused to conform to certain practices, e.g. the wearing of the surplice, kneeling at the reception of the Sacrament, &c., of the Church of England; (b) those who, after the passing of the Act of Uniformity 1662, to those who refused to conform to the practices of the Church of England, and were excluded from all privileges, and were refused the liberty of being members of the church. In current usage the term "nonconformist" is applied in Great Britain to any member of a church not conforming to the ceremonies, worship and doctrines ("forms") of the Church of England, and is generally used of a member of the so-called Free Churches, or Protestant Dissenters, and is not usually applied to Roman Catholics. The name can also be applied, in other countries, to those who do not belong to the established religion. Strictly a "dissenter" is one who dissents from the church as an "established" body, or who
NONCONFORMITY

NONCONFORMITY, LAW RELATING TO. For the history of the gradual relief of nonconformists in England from their disabilities see ENGLISH HISTORY, BAPTISTS, CONGREGATIONALISM, METHODISM, FRIENDS, SOCIETY OF, etc.; also OATH. It is possible to trace the growth of nonconformity apart from its history, that is, the matters in which the law as to nonconformists still differs from that applicable to members of the Church of England. The differences may be conveniently grouped under six heads.

(1) Judicial Notice.—The courts, both temporal and spiritual, take judicial notice of matters of general knowledge of the past, the crown being head of the law and of the church. Where the tenets and authorities of a nonconformist body come in question, they must be proved by evidence. By Lord Lyndhurst's act, the Marriage Act 1839 of the Oath Act 1839, the Act 1871, the Act 1878 of the Archbishop of Canterbury the act of the archbishop of the archbishopric in York of both of which the same person is judge. Similar matters arising in nonconformist bodies can only be tried by the ordinary secular courts, and generally depend upon whom has been appointed by the church to which is not in accordance with the rules governing the particular body of which he is a minister. A nonconformist body is in law nothing more than a voluntary association of persons members of an established building as the tribunal assented to by them. But the law is subject in the last degree to the courts of the realm. In cases of a church which have entirely under the cognizance of the spiritual courts, but by the Ecclesiastical Courts Jurisdiction Act 1860 any person guilty of breaking in churches or chapels of the Church of England or Ireland, or in any church or chapel of any religious denomination, is liable on conviction to be attainted and to be dealt with under the Clergy Discipline Act 1892.

(2) Status of Ministers.—A nonconformist minister is not in holy orders, and his church is not a religious body. But his position is honored somewhat when it is recognized at a limited extent. By the Toleration Act, 1 Will. & Mar., c. 18, a minister, preacher or teacher of a nonconformist congregation is exempt from certain parliamentary offices, as that of churchwarden. He is also exempt from serving in the reserve forces or on a jury. These privileges only attach where the place of worship of which he is a minister has been duly registered (the Places of Worship Registration Act 1853), unless in the case of bodies subject to special legislation, as in the case of the Unitarians, or not subject to any such legislation as the Established Church.

(3) Burial.—By the Burial Laws Amendment Act 1880, funeral and burial are no longer left to the discretion of the church. But in such a case notice must be given in a specified form, which is unnecessary where the burial service is conducted by a clergyman of the Church of England. (5) Parish Offices.—By 1 Will. & Mar. c. 42, 1832, the clerk of a parish church is the minister's subordinate. His duties consist of conducting the legal acts of the church and he may execute his office by deputy. His acceptance of office is made optional by the act; there is nothing to prevent his discharging his duties if he so wishes to do so. This seems to be still the law, although a declaration was substituted in the case of the Statutory Declarations Act 1835, s. 9.

NONCONFORMITY—NONJURORS

British Colonies.—In crown colonies ecclesiastical jurisdiction may be conferred by the sole authority of the crown. In colonies which have parliaments representing the crown, the metropolitan bishop jurisdiction or coercive legal authority over suffragan bishops or over any other person. In colonies of the former kind the Church of England may still preserve the privileges which it is open to hold as a religious body as long as it can show that it is in the same position as any other religious body, simply a voluntary association. Since the Irish Church Act 1869 the Church of England has been recognized by the law of the Church of England in colonies which have representative government.

NONFEASANCE, MISFEASANCE, MALFEASANCE. The expressions "nonfeasance" and "misfeasance," and occasionally "malfeasance," are used in English law with reference to the discharge of public obligations existing by common law, custom or statute. The rule of law laid down is that no action lies for nonfeasance, i.e. for failure or refusal to perform the obligation, but that an action lies for misfeasance, i.e. for negligently and improperly performing the obligation.

The doctrine was formerly applied to certain callsings carried on publicly (see R. v. Kilderby, 1669, 1 Will. S. 311, 312). At present the terms misfeasance and nonfeasance are often used with reference to the conduct of municipal authorities with reference to the discharge of their statutory obligations; and it is an established rule that an action lies in favour of persons injured by misfeasance, i.e. by negligence in discharge of the duty; but that in the case of nonfeasance the remedy is either action by indictment or mandamus or by the particular procedural method by which the tribunal is last established in the case of failure to repair public highways; but in other cases the courts are astute to find evidence of carelessness in the discharge of public duties and on that basis to award damages to individuals who have suffered thereby. Misfeasance is also used with reference to the conduct of directors and officers of joint-stock companies. The word misfeasance is sometimes used as equivalent to mala praxis by a medical practitioner.

NOMEN MARCELLUS, Latin grammarian and lexicographer, flourished at the end of the 3rd or the beginning of the 4th century A.D. He is often called the "Peripatetic of Thubursicuim" (in Numidia, probably his birth-place). He is the author of a sort of lexicon called De compendiosa doctrina, in 20 sections or chapters, the first twelve of which deal with language and grammar, the remaining eight with special subjects (navigation, costume, food, arms). The work is a compilation from commentaries on the authors quoted (whom Nonius only knows at second hand) and from existing dictionaries and grammars. Nonius is especially indebted to Verrius Flaccus and Aulus Gellius. He adds a number of recent fragments from old dramatists, annalists, satirists and anti-arian writers. It is remarkable that in the quotations from the authors cited Nonius always follows the same order, beginning with Plautus and ending with Varro and Catu. The grammarians Priscian and Fulgentius borrowed largely from his book; and in the 5th century a certain Julius Tryphonianus Sabinus brought out a revised and annotated edition.


NONJURORS. The name given to those benefited clergy of the Church of England who refused to take the oaths of allegiance to William and Mary in 1689. They were about four hundred in number, and included William Sancroft, archbishop of Canterbury, and many others. The "Seven Bishops," Thomas Ken of Peterborough and Francis Turner of Ely, together with three other bishops, Robert Frampton of Gloucester, William Thomas of Worcester and William Lloyd of Norwich (who is sometimes confused with his namesake, the bishop of St Asaph, one of the
NONNUS

"Seven Bishops "). Other distinguished nonjurors among the clergy were: William Sherlock, master of the Temple, Jeremy Collier, the ecclesiastical historian, Charles Leslie, the controversialist, George Hickes, dean of Worcester, Nathanael Spinknes, John Fitwilliam the convectorial and the dean, the devotional writer. The most famous nonjurors among the laymen were Henry Dodwell, Camden professor of history at Oxford, Robert Nelson, Henry Hyde, second earl of Clarendon, and Roger North, the lawyer. Afterwards their number was augmented by the refusal of William Law, author of The Serious Call, Thomas Carte, the historian, Thomas Hearne, the antiquary, and others, to take the oaths of allegiance to George I. Ken, the most eminent of the nonjurors, disapproved of their subsequent proceedings, and Sherlock and Dodwell afterwards took the required oaths, the former becoming dean of St Paul’s.

Believing in the doctrine of non-resistance to established authority, the nonjurors argued that James II. was still the rightful king, and likened the position of William to that of Cromwell. Taking examples from the Old Testament and from the practice of the early church, their antagonists traversed these arguments, and a long and voluminous controversy followed. Many have thought that the position of the nonjurors was inconsistent, and Dr Johnson said, “I never knew a non-juror who could reason,” although he appears to have excepted Leslie from this general condemnation. The nonjurors did not treat the nonjurors harshly. With the approval of William III., Gilbert Burnet, bishop of Salisbury, attempted to reconcile them to the new order; and it was only when the generous terms offered by Burnet had been refused, that, in February 1700, they were deprived of their sees and other benefices. Although they had only a small following among the mass of the people, who were not required to take the oaths of allegiance, Sanchof and his colleagues claimed to represent the true Church of England, and requested James II. in his exile to nominate two new bishops to carry on the episcopal succession. James chose Hicks and Tho. Hawkins, and in 1713 these two bishops were consecrated at Waltham, as bishops of Thetford and Ipswich respectively. A further consecration took place in 1713 when Collier, Spinknes and Samuel Hawes (d. 1729), were consecrated “bishops at large.”

In 1718 the introduction of a new communion office with some “usages” taken partly from primitive liturgies, and partly from the first prayer-book of Edward VI. caused a schism among the nonjurors, dividing them into “Usagers” and “Non-Usagers.” The four “usages” were: The mixed chalice, prayers for the faithful departed, prayer for the desecrant of the Holy Eucharist, and the Prayer, offering the elements to the Father as symbols of His Son’s Body and Blood. Accepting the “usages” the two bodies united in 1731, but other dissensions followed, although the episcopal succession was maintained until the death of a bishop named Charles Booth in 1805. The last nonjuror is supposed to have been James Yeovell, who died in 1875. Public worship was conducted in chapels or “oratories,” and sometimes in private houses.

In Scotland the nonjurors included the greater part of the clergy of the Episcopal Church, which ceased to be the state church of the country. In these three years most of their English colleagues were ardent Jacobites, and were punished for sharing in the risings of 1715 and 1745, and in other Jacobite movements. The Scottish clergy maintained their attitude of resistance to the government until the death of Prince Charles Edward Stuart in 1788, when the bishops met at Aberdeen, and unananimously agreed to submit to the government of King George III. A large number of the Presbyterians in Scotland, principally found among the Cameronians, also refused to take the oaths of allegiance to William and Mary; but as their reasons for this refusal were quite different from those of the episcopal nonjurors, they are not usually referred to by this name (see CAMERONIANS).


NONNUS—NONPAREIL

NONNUS (Egyptian for “saint”), Greek epic poet, a native of Panopolis (Akhmim) in the Egyptian Thebaid, probably lived at the end of the 4th or the beginning of the 5th century A.D. His principal work is the Dionysiaka, an epic in forty-eight books, the main subject of which is the departure of Dionysus to India, and his return. The earlier portions treat of the rape of Europa, the battle of the giants, the mythical history of Thebes, and it is not until the eighth book that the birth of the god is described. Other poets had already treated the subject, and since the time of Alexander it had gained popularity from the favourite comparison of the king with the god and of his enemies with the giants. In its vast and formless luxuriance, its beautiful but artificial versification, its delineation of action and passion to the entire neglect of character, the poem resembles the epics of India. Like his countryman Claudian, Nonnus is a writer of copious learning and still more copious fancy, whose faults are those of the age in which he lived. His chief merit consists in the systematic perfection to which he brought the Homeric hexameter. But the very correctness of the versification renders it monotonous. His influence on the vocabulary of his successors was likewise very considerable.

We also possess under his name a paraphrase (serebola) of the Gospel of St John, which is chiefly interesting as apparently indicating that Nonnus in his later years was a convert to Christianity. The style is not inferior to that of his epic, but is more embellished in imitation of the Iliad and Odyssey, and produces an impression of extreme bombast and want of taste. According to an epigram in the Palatine Anthology (ix. 198), Nonnus was also the author of a Battle of the Giants, and four lines of the Bassarica (on the subject of Dionysus) have been preserved in Stephanus of Byzantium.

Editio princeps (1569); H. Köchly (‘Teubner’ series, with critical introduction and full index of names, 1881); the most generally useful edition is that by the comte de Marcellus (1866), with notes and prolegomena, and a French prose translation. On the metre, see J. G. Herrmann, Orphica (1865), p. 690; A. Ludwig, Beiträge zur Kenntnis des Dionysiaca (1858), c. 71, on the metre. Hutslin, Studien über die Dithyrambaben des Nonnus (1891), p. 125, on the metre; C. Lehrs, Quaestiones episcopica (1897), pp. 255-320, chiefly on metre questions; on the sources, R. Köhler, Über die Dithyrambaben des Nonnus (1853), a short and connected analysis of the poem, with a comparison of the earlier and later myths; see also I. Nigrisoli, Studio critico . . . Nonnus Panopoli, with short bibliography (1903). The paraphrase on St John (editio princeps, c. 1505) is edited by F. Passow (1834) and A. Scheindler (1851), with complete index.

NONPAREIL, the name under which, from its supposed matchless beauty, a little cage-bird, chiefly imported from New Orleans, was known in America. It is said to be a greater number known from the adventurers of the Louisiana Expedition (Jefferson, i. 132). It is the Emberiza ciris of Linnaeus, and the Cyanospiza ciris of most recent ornithologists, belonging to a small group, now included with the buntings and finches, although some authors have regarded it as a tanager (p.t.). The cock has the head, neck and lesser wing-coverts bright blue, the upper part of the back yellow, deepening into green, and the lower parts generally, together with the rump, bright scarlet, tinged on the latter with purple. This gorgeous colouring is not assumed until the bird is at least two years old. The hen is green above and yellow beneath; and the younger cocks present an intermediate plumage between the adults of both sexes. The species, which is often also called the painted bunting, after wintering in Central America or Mexico, arrives in the Southern states of the American Union in April, but does not ordinarily proceed to the northward of South Carolina. In Louisiana, where it is generally known to the French-speaking inhabitants as the Papel—as it was to the Spaniards of Florida as the Mariposa pintada (painted butterfly)—it is said to be very abundant; and on its appearance in spring advantage is, or was, taken of the pugnacious disposition of the males to capture them as great numbers by means of the ladder, a large net placed in connexion with a cage-trap that they instantly fall into the latter on attacking what they conceive to be a rival. Belonging to the same genus as the nonpareil is the indigo-bird, Cyanospiza cyanus, which, as a summer visitor, is widely diffused from the Missouri to the Atlantic, and extends into the provinces of
Ontario and New Brunswick, being everywhere regarded with favour. Though wanting most of the bright hues of its congeners, the indigo-bird has yet much beauty, the adult cock being nearly all over of a deep blue, changing, according to the light, to green. The hen is bred to the westward and pure-white beneath. The "pintailed nonpareil" of aviculture (Erythura prasina) is a somewhat similarly coloured but really very different bird; the male has a long sharp tail, and the species belongs to the Placidæ (see Weaver-Bird).

**NONPAREIL** (Fr. non, and pareil, like, Lat. par), having no equal, unrivalled. Apart from its uses as a descriptive name for particularly fine kinds of fruit, &c., and of certain birds, moths and butterflies, the chief application in English is, in printing, to a size of type between "emerald" and "ruby," in the United States of America between "minion" and "agate" (see Typography).

**NONSUIT** (Fr. non sult, he does not pursue), in law the name given to a judgment whereby an issue is determined against the plaintiff. It was a term peculiar to the English common-law courts before the Judicature Acts, and was simply the expression of the opinion of the court that, apart from the merits, the plaintiff's case was incomplete. It did not in any way act as a bar to his bringing another action for the same cause. It might be entered either at the wish of the plaintiff himself (to save him from the expense of a suit) or by the court for the defendant or by direction of the court against the will of the plaintiff. Although judgment of nonsuit still exists, it has, since the Judicature Acts, the same effect as a judgment on the merits, unless the court otherwise directs. This effect of a nonsuit was specially provided for by the rules of the Supreme Court of 1875.

**NOODT, GERHARD** (1647-1725), Dutch jurist, was born at Nijmegen in 1647. Educated at Leiden, Utrecht and Franeker, he became a professor of law at Leiden. As a writer on jurisprudence he acquired a wide reputation. His Latin style was modelling himself on the best writers, and his numerous works soon rose to the rank of standard authorities. Two of his political treaties were translated into French by Jean Barbeyrac, and appeared at Amsterdam in 1707 and 1714, under the respective titles of **Pouvoir des souverains et Liberté de conscience**.

The first edition of his collected works was published at Leiden in 1724 and the last in 1767. That of 1735 and those subsequent contain a life of the author by Barbeyrac.

**NOON, midday, twelve o'clock.** The O. Eng. noun, Nor. noun, Dutch noen, are all from Lat. nona sc. hora, the ninth hour, i.e. according to the Roman system, three o'clock p.m. (see Day). The early uses of noon till the 13th and 14th centuries are either as translating the Latin, especially with reference to the Crucifixion, or as equivalent to the canonical hour of "nones" (see Breviary). The ordinary word for twelve o'clock was middag; midday, also the equivalent of the canonical hour "sexi." Both the office and the meal taken about that time were shifted to an earlier hour, and by the 14th century the ordinary use of "noon" is that current to-day.

For "nones" (i.e. noone, sc. dies) in the Roman calendar, see Calendar.

**NOTA,** an ancient town of Sardinia, 22 m. by road S.S.W. of Carales. It was founded, according to Paussanias (x. 17, 5), by the Iberians under Norax, son of Hermes, and was the most ancient town in the island. The discoveries made on the site have, however, shown that it was certainly of Phoenician origin. In Roman times too, we find the milestones on the road from Nora to Bilita and even on that from Nora to Carales reckoned from Nora (Corp. inscr. Lat. x. 831; Ephemcris epigraphica, viii. 180), but the authors and the sepulchral inscriptions found here give us no information as to its juridical condition. The town occupied a characteristically Phoenician site, a small peninsula jutting to the mainland by an isthmus half a mile wide and sandy. Excavations have led to the discovery of a few Phoenician buildings, the foundations of a temple of Tanit, of a road, of quay walls at the water's edge and of a watch-tower on the extremity of the peninsula, which rises to some 150 ft. above the sea. Two cemeteries were found, one of the 7th-6th century B.C., consisting of tombs cut in the rock for inhumation, while in the other, going down to the 4th century B.C., cremation is the rule; there are ossuaries placed in holes in the sand, with a stone and a tile over each. A quantity of small objects, gems, ivories, glass, vases, terracottas, &c., were found in some of them Egyptian, in others Greek, influence and importation are apparent. To the Roman period belong an aqueduct, bringing the water from the neighbouring hills—one pier of it rests upon a destroyed nuraghe—scanty remains of an amphitheatre, a theatre, considerable ruins of concrete foundations (perhaps of villas by the sea) and a watch-tower on the promontory close to the Phoenician tower. A full description of the site and the excavations is given by G. Patroni in Monumenti dei Lincei, xiv. (1905), 111. On the Jathmus is the curious small church of S. Evasio, a nave and two aisles divided by heavy square pillars. At the festival of the saint (May 1-4), his body is brought in procession from the cathedral at Cagliari; the festival is much frequented by people from all parts of Sardinia. (T.A.S.)

**NORBA,** an ancient town of Latium (Adiectum), Italy. It is situated 1 m. N.W. of the modern Norma, 1.75 ft. above sea-level, on the west edge of the Velsian Mountains or Monti Lepini, above a precipitous cliff, with a splendid view over the Pomptine Marshes. It was a member of the Latin League of 499 B.C., and captured by the Romans in 492 B.C., as an important fortress guarding the Pomptine Marshes. It was the place of detention for the Carthaginian hostages, and was captured and destroyed by Sulla's troops during the civil wars at the end of 82 B.C. Some revival in prosperity took place later. From excavations begun in 1901 it seems clear that the remains now visible on the site are entirely Roman. The well-preserved walls are in the polygonal style, 1 3 m. in circuit, and are entirely embankment walls, not standing free above the internal ground level. Remains of a massive tower, and of several gateways (notably the Porta Grande, defended by a tower) exist. Within, the remains of several buildings, including the substructions of two temples, one dedicated to Juno Lucina, have been examined. At the foot of the cliff are the picturesque ruins of the medieval town of Nainfa (12th-13th centuries) abandoned owing to the malaria. The remains of a primitive settlement, on the other hand, have been discovered on the mountain-side to the S.E., above the 13th-century abbey of Valvisciolo, where there is a succession of terraces supported by walls of polygonal work, and approached by a road similarly supported. Here a quantity of primitive Latin pottery has been found. The necropolis of this settlement was probably the extensive one found at Candacu (8th-6th century B.C.), near the railway station of Sermoneta, which belongs also to the 8th-6th century B.C., terminating thus at the precise date at which the Roman city of Norba began to exist.

See L. Savigini and R. Mengarelli in Notizie degli scavi (1901), 514; (1903) 299, 289; (1904) 407; and Atti del Congresso storico (Rome, 1903), vol. v. (Archaeologia) 255. (T. As.)

**NORBANUS, GAIO,** surnamed BULBUS (or BALBUS), Roman politician, was a sedulous and turbulent democrat. In 103 B.C., when tribune of the people, he accused Q. Servilius Caepio of having brought about the defeat of his army by the Cimbri through rashness, and also of having plundered the temple of Tolosa. Caepio was condemned and went into exile. About ten years later Norbanus himself was accused of treason on account of the disturbances that had taken place at the trial of Caea, but the eloquence of M. Antonius, grandfather of the triumvir, procured his acquittal. In 89 Norbanus as praetor successfully defended Sicily against the Italian socii. During the civil war between Marius and Sulla he sided with the former, but was defeated by Sulla at mount Tifata near Capua, and again by Metellus at Faventia in Cisalpine Gaul (82). He fled to Rhodes, where he committed suicide, while the Rhodians were debating whether to hand him over to Sulla.

See Mommsen, Hist. of Rome, bk. iv. ch. v.; Greenidge, Hist. of Rome.

**NORCIA** (anc. Nursia), a town and episcopal see of the province of Perugia, Italy, 29 m. E.N.E. of Spoleto by road, and 40 m. W.
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of Ascoli Piceno, 1860 ft. above sea-level, on the south-west foot-slopes of the Monti Sibillini, still surrounded by old walls. Pop. (1901) 4261 (town), 9534 (commune). There are a cathedral, the church of St Benedict and other churches, with Romanesque 14th-century façades; the town-hall; and the prefecture, with Romanesque arcades. Much Injury was done by earth- quakes in 1730 and 1839. The ancient Nursia was a Sabine city, though close to the Umbrian border. Its inhabitants fought in 43 B.C. at Cambrai. The early Christians were mostly fisherfolk and merchants, and were sometimes seen erecting a monument in honour of those who fell. It was governed by octoviri like other Sabine towns and became a municipium under the empire. At Ancarano near Norcia was situated a small pagus; remains of a temple were found there in 1880, which from the character of the objects seems to have been destroyed in the 5th century B.C. The tombs of the district have also produced interesting early bronzes, &c., some of which go back to the 7th century B.C., and a fine funeral couch decorated with sculptured pieces of bone. M. Guardabassi in Notizie degli scavi, 1876, 13 sqq.; 1880, 6 sqq.; A. Pasquini in and dei Lincei, i. (1891) 230. The town was the birthplace of Q. Sertorius (d. 72 B.C.), of Vespasia, mother of the emperor Vespasian of Plotina, wife of the emperor Trajan, and of St. Benedict, founder of the Benedictine order, and of his sister Scholastica. The town is famous for its pork and its cloth (the term norcineria for a pork butcher’s shop is indeed used in Rome) and produces bricks and earthenware.

See F. Patrizi Forti, Memorie storiche di Norcia (Norcia, 1869).

NORD, the most northern of the departments of France, formed chiefly out of Flanders, French Hainault and the district of Artois. A. sq. m. Its population (1,895,861 in 1906), which includes a large proportion of Belgians, ranks next to that of Seine among French departments. Its length from south-east to north-west is 112 m.; its breadth nowhere exceeds 40 m., and contracts to 4 where it is crossed by the Lys. Bounded N.W. and N. for 21 m. by the North Sea, it has Belgian territory on the N.E. and E., the departments of Aisne and Somme on the S. and Pas-de-Calais on the W. The Flanders portion west of the Scheldt is very flat, the isolated hill at Cassel, only 535 ft. high, looking north towards Dunkirk over a stretch of fertile lowlands, the Watervinger and the Moëvres, separated by a line of sand-dunes from the sea, by which about a thousand years ago they were still covered. The reclamation of this district, now covered by a network of canals, was begun as early as the 12th century. South-east of the Scheldt the country resembles the neighbouring Ardennes, is better wooded, and contains the highest point in the department (873 ft.). The greater part of Nord is in the Scheldt basin, but certain portions belong to those of the Sambre (Meuse), the Oise (Seine) and the little coast-streams the Aa and the Yser. The Scheldt, flowing by Cambray, Bouchain, Douai, Valenciennes and St Amand, is divided by the Sambre passes Lille, receiving the Sambre, which touches Douai, Marchiennes and St Amand. The Lys, which does not join the Scheldt till it has entered Belgium, passes Armentières, and receives the Deule, on which Lille, the capital, is situated. The Sambre passes Landrecies and Maubeuge. The Aa falls into the port at Gravelines. The climate of Nord is colder than that of France in general, the mean temperature being 49° or 50° F. The average annual rainfall is about 28 in.

In agricultural and industrial importance Nord is the first of French departments. In the hilly region of the south-east stock-raising flourishes; in the central portion the characteristic crop is wheat, with mixed farming prevails in the north-west. Cereals (especially wheat and oats) and potatoes are grown in abundance. Among minor crops, flax, tobacco, chicory and hops may be mentioned. Market-gardening and horticulture are practised on a considerable scale in some localities. The mineral wealth of the department lies principally in its coal mines forming part of the Valenciennes basin, the most important in France, which extends into Belgium and Pas-de-Calais. The textile industry is particularly active around Lille, Roubaix and Tourcoing which spin and weave cotton and wool, as also around Fourmies which is especially a weaving town. Other important centres are Armentières (cloth-weaving), Dunkirk (flax, jute and hemp-spinning), Cambrai (batiste and other delicate fabrics), Douai, Avesnes, le Cateau and Caudry. Other great industries are brewing, flour-milling, glass, brick, pottery and sugar manufacture, alcohol-distilling, dyeing, iron-founding and steel production and other branches of the metallurgical industry carried on at Denain, Hautmont, Maubeuge, Valenciennes, Douai, Raismes, &c. Dunkirk and Gravelines equip (1907) near Lille, Caudry (10,047), near Cambrai, and Aniche the chief port of the department, which is served by the Northern railway. Its system of inland navigation is highly developed and attains a length of 320 m., comprising a line of waterways from the Scheldt to the North Sea at Dunkirk, with which the coal basin of Valenciennes is linked up by way of the canalized Scheldt and the textile region of Lille by means of the Deûle canal and the canalized Lys. To these must be added the canalized Sambre and other less important waterways.

The department is divided into seven arrondissements (Avesnes, Cambrai, Douai, Dunkirk, Hazebrouck, Lille, Valenciennes) with 67 cantons and 667 communes. It forms the archiepiscopal diocese of Cambrai and part of the region of the L. army corps (headquarters at Lille) and of the educational division of Lille. Its court of appeal is at Douai. The most noteworthy places are Lille, Cambrai, Douai, Dunkirk, Valenciennes and Anzin, Tourcoing, Roubaix, Avesnes, Halluin, Armentières, Maubeuge, Condé-sur-Saucourt, Fourmies, Hazebrouck, Gravelines, St Amand-les-Eaux, Berges, Le Cateau, Comines, Denain, Cassel and Bavaux, which are separately noticed. Other populous industrial towns not mentioned above are Loos (pop. 1934) and Hauvourdin (1897) near Lille, Caudry (10,047), near Cambrai, and Aniche which serve the northern departments of France by rail. Bailleul (pop. in 1906, 72,08), Bavaux and Berges, which have fine bellfries of the 13th century, structures characteristic of the architecture of the department; Hondschoote, scene of a victory of the French over the allies in 1793, which has a church of the 15th and 16th centuries with a fine tower and spire; and Fiamars which preserves a curious ruined stronghold of the Roman occupation.

NORDAU, MAXIMILIAN (1849— ), German author and philosopher, was born of Jewish parents at Budapest on the 29th of July 1849. He studied medicine and travelled widely through Europe until 1878, when he settled down as a practitioner in his native town. In 1880 he removed to Paris, and in addition to his professional work took up the study of art, literature and social questions. His investigations were marked by a critical accuracy which endeavoured to weigh data and deduce results with a fearless disregard of conventional ideas. In his Entartung he applied the theory of physical degeneration to the intellectual side of civilized man, and endeavoured to show that in art, literature and social evolution there is decadence and bysteria; confused aesthetic theory, mysticism in thought, so-called “realism” in art, all alike indicate the vain spasmodic struggle of an effete civilization. In die konventionellen Lagen der Kulturgeschichte (1884), the same destructive method is applied to politics and to social science. Yet Nordau was not a pessimist. In the Paradoxe psychologiques (1885) he expressed his profound and reasoned conviction that the “Degeneration” of the time was only temporary. This optimism was seen in his enthusiastic support of Dr Herzl’s Zionist movement. In connexion with the British government’s offer of land for a Jewish settlement in East Africa, there was a fundamental difference of opinion among the various Jewish societies. Herzl and Nordau were accused of giving up the idea of returning to Palestine, and substituting the African scheme. This idea provoked great hostility, and at a Zionist Ball in Paris (19th of December 1903) a Jew named Louban Chain Selli fired two shots at Nordau unsuccessfully. The outrage drew from Herzl a letter (The Times, 22nd of December) which clearly set forth the view held by himself and Nordau as to the ultimate destiny of the Zionist Movement.

WOKS.—Novels and Stories: Seifenblasen, Federzeichnungen und Geschichten (1879); Die Krankheit des Jahrhunderts (1889);
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Gefühlshomödie (1892); Die Dreihochschlacht (1897); Logomathismus (1904). Drama: Die neuen Journalisten (in collaboration with F. Gross, 1880); Der Krieg der Millionën (1862); Das Recht zu Leben (2nd ed., 1894); Die Kugel (1894); and Doktor Kohn (1895). He published also Von Kremi zur Alhambra (1880), an account of his travels, and three works descriptive of Paris and the Parisians—Pariser Studien aus dem wahren Mülardenlaute (1878); Paris unter der Regierung Napoleon III.; and Fünf Tage vor Napoleon. For two further volumes of criticism, Zeitgenössische Franzosen, literaturgeschichtliche essays (Berlin, 1901); and Von Kunst und Künstlern (Leipzig, 1905).

NORDEN, JOHN (1548–1627), English topographer, was the first Englishman who designed a complete series of county histories and geographies. His earliest known work of importance was the Description of the British Isles (1596). The MS. of this in the British Museum (Harl. 570) has corrections, &c., in Lord Burleigh's handwriting. In 1595 he wrote a Chronographical Description of ... Middlesex, Essex, Surrey, Sussex, Hampshire, S. W. Gowery, and Jersey, dedicated to Queen Elizabeth; the MS. of this is in the British Museum, Addit. MSS. 31, 783. In 1596 he published his Preparatio to ... Speculum Britanniae, dedicated to Burleigh, and in 1598 his Herfordshire (Lambeth Libr. MSS. 521). Before his death he had completed in manuscript five of his county accounts; three of these studies were printed long after his death by Charles Norden Secty. of the British Museum in 1840 by Sir Henry Ellis from a MS. at Hatfield (see also British Museum Addit. MSS. 33, 769); Northampshire, known to have been finished in 1610, but only published in 1720; Cornwall, likewise finished in 1610, published in 1728 (see Harl. MSS. 6252). Of Kent and Surrey even the MSS. are now lost; parts of the latter are perhaps identical with sections of the Chronographical Description of ... of which he was appointed surveyor of the crown woods and forests in Berkshire, Devon, Surrey, &c.; in 1605 he obtained the surveyorship of the duchy of Cornwall; in 1607, after a careful survey, he composed his valuable Description of the Honour of Windsor, with fine maps and plans in colour, dedicated to James I. (see Harl. MSS. 3749). In 1608 he was mainly occupied with the surveying of crown woods, especially in Surrey, Berkshire and Devon, and with the writing of his works on forest culture—Considerations touching ... raising ... of Coppices, and ... Relation ... Procedings upon ... Commission concerning new forests, to which he added in 1613 his Observations concerning Crown Lands and Woods (see Egerton MSS. 806; Ashmole MSS. 1148; and Lansdowne MSS. 165). In 1612 he was appointed surveyor of the royal forests in Kent, Sussex, Hampshire, Berkshire, Dorset, Wiltshire, Somerset, Devon and Cornwall; in 1616 and 1617 he appears surveying the soke of Kirkton in Lindsey, as well as various manors and lands belonging to Prince Charles, afterwards Charles I. (see Cambridge University Library, Fv. iv. 30; London, British Museum Addit. MSS. 6027); his last works were a survey of Sheriff Hutton manor, Yorks, in 1624 (Harl. MSS. 6288), and England, an intended guide for English travellers, a series of tables to accompany Speed's county maps, executed in 1625, shortly before his death.

Norden's maps of London and Westminster (in his Speculum Britanniae of 1593) are the best representations known of the English metropolis under the Tudors; his maps of London (also from the Spec. Brit. of 1593), of Essex (1594, 1840), of Hertfordshire (1598, 1723) and of Cornwall (published in 1728; see above) are also noteworthy; in the last-named the roads are indicated for the first time in English topography. Norden also executed maps of Hampshire, Hertfordshire, Kent, Middlesex, Surrey and Sussex, for the fifth edition (1607) of Camden's Britannia, also maps of Middlesex, Essex, Hants, and Dorset, compiled from the Surveyors' maps and Tracts of 1607, and the accurate important cartographical works of his are lost: e.g. his Map ... of ... Battles fought in England from ... William the Conqueror to ... Charles II., in 16 sheets, formerly in the Bodleian Gallery, Oxford, of which some part is probably preserved in the Impressions of England, an appendix to the Prospect of the most Famous Parts of the World, by J. Speed (1675); and his View of London, in 8 sheets, made c. 1640, was published by John Green in 1699, and also by A. Walkinshaw and Peter Bristow (1887). The important Crace collection at the British Museum contains an earlier View of London by Norden (1600), and an 1804 reprint of the View of London Bridge; a map of Surrey by Norden, said to have been copied by Speed and Kip in Camden's Britannia of 1607, has also disappeared.

Besides the works noticed above, see the accounts of Norden by C. Bateman in Speculum Britanniae, pars Cornwall (1728), and by Sir H. Ellis in Spec. Brit., pars Essex (Camden Society, 1840); also H. H. Wheatley in Harrison's Description of England (New Shakspere Society, 1877), and C. H. Coote's article in the Dict. Nat. Bio 

NORDEN, a town of Germany, in the Prussian province of Hanover, 4 m. from the North Sea and 20 m. by rail N. of Emden. Pop. (1905) 6717. It has a 16th-century town hall and its parish church was built in 1445. Gin, sugar, chocolate, coffee, tobacco and machinery are manufactured. Norddeich, a small port 4 m. N.W., is the shipping place for passengers bound for Norderney. Norden was first mentioned in 842.

NORDENSKJÖLD, NILS ADOLF ERIK, BARON (1832–1901), geographer and Arctic explorer, was born at Helsingfors, 18th November 1832. His ancestors came originally from Sweden, but for some generations had been settled in Finland. His father, Nils Gustav Nordenskjold, was both a mineralogist and a traveller. Nordenskjold entered the university of Helsingfors in 1849, and applied himself specially to chemistry and mineralogy. In 1853 he accompanied his father to the Ural Mountains and the Caspian Sea. He rose to be a mining engineer by 1856. On his return he received minor appointments both at the university and the mining office, but an unguarded speech at a convivial entertainment in 1855 drew the attention of the Russian authorities to his political views, and led to his dismissal. He then visited Berlin, continuing his mineralogical studies, and in 1856 obtained the Alexander travelling stipend at the university of Helsingfors and planned to expend it in geological research in Siberia and Kamchatka. Before starting he took his master's and doctor's degrees (1857), but he again aroused the suspicion of the authorities by his criticism of the government. In 1857 he succeeded in obtaining leave to return to his home country and was deprived of the right of ever holding office in the university. Settling at Stockholm he thenceforward became practically a Swedish citizen. He soon received an offer from Otto Torell, the geologist, to accompany him on an expedition to Spitsbergen. To the observations of Torell on glacial phenomena Nordenskjold added the discovery at Bell Sound of remains of Tertiary plants, and on the return of the expedition he received the appointment of professor and curator of the mineralogical department of the Swedish State Museum. In 1861 he took part in Torell's second Spitsbergen expedition, which yielded some important geological results. He returned to Spitsbergen a third time in 1863, and was unfortunately involved in a collision between the steamers Offa and Seraph, which injured him severely; but he continued the same quarter promoted by the Swedish academy of science in 1864, Nordenskjold was the leader. Three years later, chiefly through the support of the Swedish government and Oscar Dickson, who contributed largely towards the later expeditions of 1872 and 1875, he headed a well-organized expedition in the iron steamer "Sofia," and reached the highest northern latitude (81° 42') then attained in the eastern hemisphere. Arctic exploration had now become his all-absorbing object in life, and in 1870, with three young naturalists, he visited the vast inland ice-sheet of Greenland. His next expedition in 1872 did not answer expectation, for the tenders were caught in the ice, and the crews of the three vessels were forced to winter in Spitsbergen. In 1875-1876, however, a successful voyage eastwards, including the ascent of the Yenisei, led him to attempt the discovery of the long-sought North-East Passage. This he accomplished in the voyage of the "Vega," navigating for the first time the northern coasts of Europe and Asia. Starting from Karlskrona on the 22nd of June 1878, the "Vega" doubled Cape Chelyuskin in the following August, and after being frozen in at the end of September near Birgus Strait, completed the voyage successfully in the following summer. He edited a monumental record of the expedition in five octavo volumes, and himself wrote a more popular summary in two volumes.

On his return to Sweden he received an enthusiastic welcome, and in April 1880 was made a baron and a commander of the Order of the Nordstjerna. In 1883 he again visited the east coast of Greenland, and succeeded in taking his ship through the great ice barrier, a feat attempted in vain during more than three centuries. Baron Nordenskjold also made a notable reputation
in the field of historical geography by his Fascimile Atlas (1839) and Peripitus (1847). The former contains reproductions of the most important geographical charts printed during the 15th and 16th centuries, and the latter, a work of far greater research, deals with the history of early cartography and the sailing charts in use among mariners during the middle ages. He died at Stockholm on the 12th of August 1901.

**NORDERNEY** (i.e. "northern island"), an island of Germany, in the North Sea, the largest of the East Friesland group, belonging to the Prussian province of Hanover. Pop. (1905) 3888. It is 8 m. long and about 1 1/2 m. broad, and supports a seafaring and fishing population. It is reached by steamer from Bremen, Bremen-Hamburg, Blankenese, or Hamburg by road from the mainland. The village at the S.W. end of the island is one of the most popular sea-bathing places in Germany, and is visited annually by some 26,000 visitors. On the S. side rises a lighthouse 175 ft. high, while the E. end of the island is filled with sand dunes ranging in height from 50 to 75 ft. Norderney is immortalized by its association with Heinrich Heine's Nordsuecholder.

See Berenberg, Das Nordsuehbad Norderney (Norden, 1895); C. Rietschel, Geschichte der Insel Norderney 1398-1711 (1896); and the article FRISIAN ISLANDS.

**NORDFJORD**, an inlet of the west coast of Norway, penetrating the land for 50 m. in an easterly direction, its mouth being 115 m. by sea. N. of Bergen (51' 50' N.). No part of Norway affords finer scenery than the inner ramifications of this fjord among the snowy mountains of the northern Jotulsdalsbre. Driving-roads penetrate the mountains from Visnes eastward to the Gudbrandsdal, from Utvik southward to Vadheim on the Sogne Fjord, and from Faleide northward to Hellesylt (Geiranger Fjord) and Ojle (Flurandsfjord). Nordfjordeid is a large village on the outer fjord, at the mouth of Hornindalen. Olden is one of the favourite centres on the inner part of the fjord. A small but powerful breed of horses is peculiar to the Nordfjord district.

**NORDHAUSEN**, a town of Germany, in the province of Prussian Saxony. It is situated on the Zorge at the south base of the Harz Mountains, and at the west end of the Goldene Aue (Golden Plain), a fruitful valley watered by the Helme, 60 m. by rail W. of Halle, on the main line to Frankfurt-on-Main and Cassel, and at the junction of railways to Erfurt and Blankenheim. Pop. (1885) 27,083; (1905) 29,882. It is built partly on the slope of a small hill, partly in the plain, and the lower and lower parts of the town are connected by flights of steps. Among its eight churches the most noteworthy are the Roman Catholic cathedral, late Gothic with a Romanesque crypt, and the Protestant church of St Blasius, containing two pictures by Lucas Cranach. Near the medieval town hall stands a Roland's column, the ancient symbol of free commercial intercourse and civic liberty. The town has a museum of antiquities and various public monuments, notably a fountain by Ernst Rietschel in the corn market, and another to Luther in the market square. There are statues of the emperor Frederick I. and of Prince Bismark. The chief importance of the place arises from its distilleries, which annually yield about 10,000,000 gallons of "Korn Schnapps," a spirit somewhat akin to whisky. The breweries are also important and there are manufactures of leather, tobacco and cigars, cotton, linen goods, carpets, cheney, malt and chemicals. Nordhausen is sometimes called the Cincinnati of Germany on account of its extensive export trade in pork, corned beef, ham and sausages. There is also a large trade in corn.

Nordhausen is one of the oldest towns in North Germany. It possessed a royal palace in 874 and a convent was founded here in 962. It was destroyed by Henry the Lion, duke of Saxony, in 1180, but was soon rebuilt and was made a free imperial town in 1251. In this and the following century several diets and other assemblies were held here. The protector (Vogt) of the town was the elector of Saxony and later for a few years (1702-1715) the elector of Brandenburg. Nordhausen accepted the reformed doctrines in 1522. It was annexed by Prussia in 1803 and again in 1815, having in the meantime belonged to the kingdom of Westphalia.

**NORDSTREM**, Georg Forstmann, Urkundliche Geschichte der Stadt Nordhausen bis 1250 (Nordhausen, 1828-1840) and Kleine Schriften zur Geschichte der Stadt Nordhausen (Nordhausen, 1855); Lesser, Historische Nachrichten von Nordhausen, edited by Forstmann (Nordhausen 1830). See also: A. Renandt, Beschreibung der Stadt Nordhausen (Halle, 1886); T. Eckart, Gedementsblatter aus der Geschichte der ehemaligen freien Reichstadt Nordhausen (Leipzig, 1895); Heine, Nordhausen and Preussen (Nordhausen, 1902); and Girschner, Lokalfiihrer der Nordhäuser Unterwerfung (Nordhausen, 1895).

**NORDICA, LILIAN** (1839- ), American operatic soprano, née Norton, was born at Farmington, Maine, and trained as a singer at Boston, and later at Milan. As Madame Nordica she made her operatic début at Brescia in 1879, and from that time took high rank among the prima donnas, appearing in all the principal capitals in Europe, and also in America.

**NORDIN, CARL GUSTAF** (1749-1812), Swedish statesman, historian and ecclesiastic. In 1774 he was made doceni of Gothic antiquities at Upsala University in consequence of his work on the treatise, Monumenta svedonesium et heldorrtium aevi falsa merique suscita. Summoned to Stockholm in 1782 by Gustavus III. to edit a Swedish Corpus diplomaticum, half an hour's private conversation with the young priest convinced Gustavus that Nordin's proper place was by his side in the political arena. But he employed Nordin quite differently from his episcopal colleague Olaf Wallqvist. While the bishop publicly defended the royal measures, Nordin became the king's private adviser. In politics Nordin was a royalist from pure conviction. To him a parliament seemed little better than a mob. He was one of the king's secret managers during the troublesome and dangerous riksdag of 1789, but advised caution and compared the estate of clergy, which at one time held the balance between the jarring orders, to ice which might be walked upon but could not be driven over. He was appointed a member of an ecclesiastical commission for reforming the church in 1787, in which capacity he was virtually minister of public worship. In 1791-1792 he became a leading member of the financial and general committees of the riksdag. After the king's death Nordin shared in the general disgrace of the Gustavians and lived in retirement at the little town of Hernösand, where he held the post of lector at the gymnasiun. But he reappeared prominently on the political scene during the riksdag of 1800, and in 1805 was consecrated bishop of Hernösand. Though he lacked the brilliant qualities of his rival Wallqvist, Nordin had the same alertness and penetration, and was infinitely more stable and disinterested. One of the most learned men of his day, he devoted his spare time to history, and discovered that many of the oldest and most cherished Scandinavian MSS. were clever forgeries. Like Jean Hardouin he got to believe that a great deal of what is called classical literature was compiled by anonymous authors at a much later date, and he used frequently to startle his colleagues, the Gustavian academicians, by his audacious paradoxes.

He left behind him a colossal collection of MSS., the so-called Nordiska Samlingarna, which were purchased and presented to Upsala university by Charles XIV, and form the groundwork of the well-known Scriptores chronicorum medii aevi. Nordin published during his lifetime Handliger till upplyningen av svenska krigshistorien (Stockholm, 1787-1788). His academical addresses came out at Stockholm in 1818 under the title Minnen och namnkunniga svenska män. His Dagbok did not appear till 1868.


**NÖRDLINGEN**, a town of Germany, in the kingdom of Bavaria, on the Eger, 40 m. N. of Augsburg by rail and at the junction of lines to Buchloe and Dombühl. Pop. (1905) 8512. It was formerly a free imperial town, owning a territory 35 sq. m. in extent, and is still surrounded with walls and towers. The Evangelical church of St George is a Gothic structure erected in the 15th century and restored in 1880. It has paintings by Hans Schäufelein, who was a native of Nördlingen, and a tower 290 ft. high. The Late Gothic town hall has a collection of pictures and antiquities. The chief manufactures of the town
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are linen goods, soap, malt, and agricultural implements, and a brisk trade is carried on in cattle, grain and geese. From 988, when first mentioned, to 1351 Norfolk was subject to the bishops of Regensburg, but about 1215 it became a free city of the Empire. It was annexed to Bavaria in 1803.

Nördlingen was the scene of two great battles in the Thirty Years’ War (q.v.). In the first, which was fought on the 5th and 6th of September 1634, the hitherto invincible Swedish army, commanded by Duke Bernhard of Saxe Welmar and Marshal Horn, was defeated with great loss by a somewhat superior army of Imperialists and Spaniards under General Gallas, Horn and 3000 men being made prisoners and 6000 killed or mortally wounded. The battle was fought on the plain of Alberheim. The French army, similarly arrayed, but with a few battalions attached to the cavalry wings, was more heterogeneous than the German, being composed of French, Hessian, German mercenaries, and Liégeois. After a cannonade in which it suffered more severely than its entrenched enemy, the French centre furiously attacked the village of Allerheim; the fighting here was very heavy, and on the whole in favour of the Germans, although Mercy was killed. The right wing of the French cavalry was swept off the field by Johann von Weert’s charge, but the German troopers, intoxicated with success, dispersed to plunder. On the French left, meanwhile, Turenne saved the day. Fighting cautiously at first with his leading line to gain time for his second to come up, he then charged and broke up the hostile right wing of cavalry, while some battalions of infantry scaled the hill and captured the Bavarian guns. Unlike Weert the marshal kept his troops in hand, and swung round upon the Bavarian infantry behind Allerheim, who were at the same time cannonaded by their lost guns. A prolonged fight now ensued, in which the Bavarians had the worst of it, and Weert, returning at last to the field, dared not attempt to engage afresh. The armies met, and half a mile apart, but in the morning the Bavarians were found to have retreated. Nothing was gained by the victors but the trophies and the field of battle, and the losses of both sides had been enormous. Enghien had only 1500 of his foot in hand next day. Nördlingen, therefore, is a classical instance of the unprotected and costly bataille range of the 17th century.

See Besselsch, Geschichte der Stadt Nördlingen (Nördlingen, 1851), and Mayer, Die Stadt Nördlingen, ihr Leben und ihre Kun: im Lichte der Vorsie (Nördlingen, 1860).

NORE, THE, a sandbank at the mouth of the river Thames, England, marked by various buoys and by a lightship, with revolving light. This ship lies 3 m. from the nearest point on the Kent coast, about the same distance from the Essex coast, and 471 m. below London Bridge. The first light was placed here as an experiment by Mr Hamlin, its patentee, in 1731. In 1797 the neighbouring anchorage was the scene of a mutiny in the British fleet then lying here, well known in history as the Mutiny of the Nore.

NORFOLK, EARLS AND DUKES OF. The 1st earl of Norfolk was THOMAS MOWBRAY, 1st duke of Norfolk (c. 1366–1399), who forfeited the earldom when he revolted against William in 1375; the 2nd was HUGH BISHO (d. 1377), one of Stephen’s supporters, to whom the earldom was granted by this king before 1141. Hugh’s grandson, HUGH (d. 1225), the 3rd earl of this line, married Matilda, daughter of William Marshal, earl of Pembroke, and from the Marshals their son ROGER (d. 1270), the 4th earl, inherited the office of lord of England. This powerful family of Bigod retained the earldom until ROGER, the 5th earl, died childless in December 1346.

The next earl of Norfolk was THOMAS OF BROUGHTON (1300–1338), a younger son of Edward I, to whom the earldom was granted in 1312 by his half-brother, Edward II. In addition to the estates which he had previously belonged to the Bigods Thomas received the office of marshal. He joined Queen Isabella when she landed in England in 1326, and was one of the group of nobles who brought about the deposition of Edward II. He died in August 1338, leaving no son. The survivor of his two daughters, Margaret (c. 1320–1400), who was countess of Norfolk in her own right, married John de Segrave, 3rd lord Segrave (d. 1383), and had issue by him. One of the offspring, Thomas, the wife of John de Mowbray, 4th lord Mowbray (d. 1368), and the mother of two sons John and Thomas. In 1397 the countess Margaret was created duchess of Norfolk, and at the same time her grandson Thomas Mowbray was made duke of Norfolk.

THOMAS MOWBRAY, 1st duke of Norfolk (c. 1366–1399), became Baron Mowbray and Baron Segrave when his elder brother John died in February 1382; about the same time Richard II. created him earl of Nottingham, a title held by his dead brother and 1358 was severe annulment of England for life. For some years he enjoyed the favour and companionship of the king, but differences arose between them, and in 1387 Nottingham began to act with Thomas of Woodstock, duke of Gloucester, his own brother-in-law, Richard Fitzalan, earl of Arundel, and the party of nobles who wished to deprive the king of his power. They routed the royal favourite Robert de Vere, earl of Oxford, at Radcot Bridge, and Richard was at their mercy. Owing partly to Nottingham’s moderate counsels the suggestion to depose him was not carried out, but in the “merciless parliament” of 1388 his favours were “appealed” of treason and were sentenced to death. For nearly two years the chief power was in the hands of the lords appellant, as Nottingham and his friends were called, but in 1389 the king regained his authority. He detached Nottingham from his colleagues and made him warden of the Scotch marches; later he became captain of Calais and the royal lieutenant in the north-east of France. Richard took him to Ireland in 1394 and soon afterwards sent him to arrange a peace with France and his marriage with Isabella, daughter of King Charles VI. But the earl’s supreme service to the king was in 1397 when he defended and in the “appeal” of treason and were sentenced to death. For nearly two years the chief power was in the hands of the lords appellant, as Nottingham and his friends were called, but in 1389 the king regained his authority. He detached Nottingham from his colleagues and made him warden of the Scotch marches; later he became captain of Calais and the royal lieutenant in the north-east of France. Richard took him to Ireland in 1394 and soon afterwards sent him to arrange a peace with France and his marriage with Isabella, daughter of King Charles VI. But the earl’s supreme service to the king was in 1397 when he defended and

earfed for himself to Germany, Hungary and Bohemia. At once he left England for Dordrecht, and after passing some months in wanderings he reached Venice, where he died on the 22nd or 27th of September 1399. The concluding scene of the duke’s life in England forms the staple material of act i. of Shakespeare’s Richard II. Norfolk left estates in nearly all the English counties. His wife was Elizabeth (c. 1372–1425),
daughter of Richard Fitzalan, earl of Arundel, by whom he had two sons, Thomas and John, and two daughters.

His elder son, Thomas Mowbray (1385-1405), became earl of Nottingham and earl marshal on his father's death, but he was not allowed to assume the title of duke of Norfolk. He quarrelled with Richard Beauchamp, earl of Warwick, over the precedence of their respective earldoms, and left the court in anger when Henry IV. decided in favour of Warwick. At this time (1405) Richard le Scrope, archbishop of York, and other northern potentates were preparing to rise against the king. The earl marshal joined them, was taken prisoner at Shipton Moor, and was beheaded at York on the 8th of June 1405.

John Mowbray (1390-1432), 2nd duke, brother of the last-named, now became earl marshal and earl of Nottingham. He sat in judgment upon Richard, earl of Cambridge, and the other rebels in 1415, and went to France with Henry V. He took part in the siege of Harleux, but illness prevented him from fighting at Agincourt. He saw service in France in subsequent years, and after Henry's death he was a member of the English governing council. In 1424 he followed Humphrey, duke of Gloucester, on his campaign in Hainaut, and in 1425 he secured his recognition as duke of Norfolk. He died on the 19th of October 1432 at Epworth, where his father had founded a Cistercian priory. By his wife Catherine, daughter of Ralph Neville, 1st earl of Westmorland, he left an only son, the 3rd duke.

John Mowbray, 3rd duke (1415-1461), became warden of the Scottish marches; he also served as a soldier and an administrator. He was prominent in the fierce rivalry between the houses of York and Lancaster about 1450; he joined Richard, duke of York, to whom he was related; he aided the Yorkist cause in Norfolk and in London, and it was he who in November 1453 demanded an inquiry into the administration of Edmund Beaufort, duke of Somerset. In 1459 he appeared on the Lancastrian side and took the oath of allegiance to Henry VI. and to his son Edward at Coventry, but soon he was again figuring as an active Yorkist. He was a member of the deputation which in March 1461 asked the duke of York (Edward IV.) to take the crown, and he fought at the second battle of St Albans and also at Towton, where one authority says he saved the day for the Yorkists.

John Mowbray, 4th duke (1444-1476), who had already been created earl of Surrey, a title formerly held by his ancestors, the Fitzalans, was the only son of the preceding. The names both of John and of his father appear frequently in the Paston Letters, as both dukes in turn seized Caister castle, which had been left by Sir John Fastolf to John Paston, and the 4th duke held it against the Pastons for some years. On his death in 1476 the dukedom became extinct, but the title was revived for his son, who married Richard, duke of York, the younger son of Edward IV. Richard was created duke of Norfolk and made earl marshal, but when he was murdered in 1483 the dukedom again became extinct, the earldom having reverted to the crown on the death of Anne.

The illustrious family of Howard (q.v.), members of which have been dukes of Norfolk from 1483 to the present day, with the exception of two periods during which the title was forfeited, was connected with the family of Mowbray.

John Howard, 1st duke of Norfolk (c. 1430-1485), was the son of Sir Robert Howard by his wife Margaret, daughter of Thomas Mowbray, the first duke of that family. In 1455 John Howard was sent to parliament as member for Norfolk, although he "had no livery in the shire"; in 1461 he was knighted; and in 1470, although he appears to have been a consistent Yorkist, he was created a baron by Henry VI. He was treasurer of the royal household from 1467 to 1474, and went to France with Edward IV. in 1475. After Edward's death, however, he supported Richard III., who created him duke of Norfolk and made him earl marshal of England. He was killed at Bosworth whilst fighting for this king on the 22nd of August 1485, and the title thus suffered attainer. He is frequently mentioned in the Paston Letters.

His son, Thomas Howard, afterwards 2nd duke (1443-1524), shared his father's fortunes; he fought at Barnet for Edward IV. and was made steward of the royal household and created earl of Surrey in 1483. Taken prisoner at Bosworth he was attainted and remained in captivity until January 1489, when he was released and restored to his earldom but not to the dukedom of Norfolk. He was then associated with the maintenance of order in Yorkshire and with the defence of the Scottish borders; he was made lord treasurer and a privy councillor in 1501, and he helped to arrange the marriage between Margaret, the daughter of Henry VII., and James IV. of Scotland. Henry VIII., too, employed him on public business, but the earl grew jealous of Wolsey, and for a short time he absented himself from court. He commanded the army which defeated the Scots at Flodden in September 1513, and was created duke of Norfolk in February of the following year, with precedence as of the creation of 1483. In the later years Norfolk worked more harmoniously with Wolsey. He was guardian of England during Henry's absence in France in 1520, and he acted as lord high steward at the trial of his friend Edward Stafford, duke of Buckingham, in 1521. Among his sons were William, 1st Lord Howard of Effingham, and Sir Edward Howard (c. 1477-1513), lord high admiral, who defeated the French fleet off Brest in August 1512, and lost his life during another engagement in April 1513.

Thomas Howard, 3rd duke (1473-1554), eldest son of the 2nd duke, married in 1495 Anne (1475-1512), daughter of Edward IV., thus becoming a brother-in-law and one of the few marrying Anne's sister Elizabeth. He became lord high admiral in 1513, and led the van of the English army at Flodden in September, being created earl of Surrey in February 1514. In 1513 he took for his second wife Elizabeth (d. 1539), daughter of Edward Stafford, duke of Buckingham. In 1520 Surrey went to Ireland as lord-deputy, but soon vacated this post to command the troops which sacked Morlaix and ravaged the neighbourhood of Boulogne in 1522; afterwards he raided and devastated the south of Scotland. He succeeded his father in May 1524, and as the most powerful nobleman in England he headed the party hostile to Cardinal Wolsey. He favoured the divorce of Henry VIII. from Catherine of Aragon, and the king's marriage with his niece Anne Boleyn. In 1529 he became president of the council, but in a few years his position was shaken by the fate of Anne Boleyn, at whose trial and execution he presided as lord high steward. But his military abilities rendered him almost indispensable to the king, and in 1536, just after the rising known as the Pilgrimage of Grace had broken out, he was despatched into the north of England; he temporized with the rebels, and brought them to a surrender, and then, as the first president of the council of the north, punished them with great severity. Sharing in the general hatred against Thomas Cromwell, Norfolk arrested the minister in June 1540. He led the English army into Scotland in 1542 and into France in 1544, but the execution of Catherine Howard, another of his nieces who had become the wife of the king, had weakened his position. His son Henry Howard, earl of Surrey (q.v.), was arrested on a charge of treason; Norfolk himself suffered the same fate as accessory to the crime. In January 1547 Surrey was executed; but Henry, in a subsequent investigation, was convicted by a bill of attainder, but owing to the death of the king the sentence was not carried out. Norfolk remained in prison throughout the reign of Edward VI., but in August 1553 he was released and restored to his dukedom. Again taking command of the English army he was sent to suppress the rebellion which had broken out under Sir Thomas Wyatt, but his men fled before the enemy. He acted as lord high steward at the trial of John Dudley, duke of Northumberland; and he died on the 25th of August 1554. Norfolk was a brutal and licentious man, but was a supporter of the Roman church, being, as he himself admits, "quick against the sacramentaries." As a soldier he was serviceable to Henry VIII., but as a diplomatist he was a failure, being far inferior to Wolsey and to Cromwell. He had two sons, Henry, earl of Surrey, and Thomas (c. 1528-1582), who in 1559 was created Viscount Howard of
Bindon, a title which became extinct in 1611. His only daughter Mary (d. 1557) married Henry, duke of Richmond, the natural son of Henry VIII.

Thomas Howard, 4th duke (1536–1572), son of Henry Howard, earl of Surrey, was born on the 10th of March 1536. His tutor was John Foxe, the martyrologist. Soon after Elizabeth became queen in 1558, he sent the young duke to take part in the war against the Scots and their French allies, but the conclusion of the treaty of Edinburgh in July 1560 enabled him to return to the court in London. Having married and lost three wives, all ladies of wealth and position, Norfolk was regarded as a suitable husband for Mary queen of Scots, who had just taken refuge in England. He prevailed over the commission appointed by Elizabeth to inquire into the relations between the Scottish queen and her subjects; and although he appears to have believed in Mary’s guilt he was anxious to marry her. Among the Scots Maitland of Lethington favoured the proposed union; Mary herself consented to it; but Norfolk was unwilling to take up arms, and while he delayed Elizabeth ordered his arrest, and he was taken to prison in October 1560. In August 1570, after the suppression of the rising in the north of England, the duke was released; but he entered into communication with Philip II. of Spain regarding the proposed invasion of England by the Spaniards. After some hesitation Norfolk placed himself at the head of the conspirators; and in return for his services he asked the king of Spain “to approve of my own marriage with the Queen of Scots” (q.v.). But the young earl of Norfolk’s treachery was revealed to Lord Burghley, and in September 1571 he was arrested. He was beheaded on the 2nd of June 1572.

It is noteworthy that he always regarded himself as a Protestant. Norfolk’s first wife, Mary (1540–1557), daughter and heiress of Henry Fitzalan, 12th earl of Arundel, bore him a son, Philip, who in consequence of his father’s attainder was not allowed to succeed to the dukedom of Norfolk, but became 13th earl of Arundel in succession to his maternal grandfather in 1586. Norfolk left two other sons, Thomas Howard, created earl of Suffolk in 1663, and Lord William Howard (q.v.).

In 1660 the dukedom was restored by act of parliament to Thomas Howard, 4th earl of Arundel (1627–1677), a descendant of the 4th duke. The 5th duke was succeeded by his brother Henry (1628–1684), the friend of John Evelyn, who had been already created earl of Norwich; in 1672 he was made earl marshal, and this dignity was entailed on his male heirs.

Charles Howard, 11th duke (1746–1813), was the son of Charles Howard (1720–1780), who succeeded his cousin, Edward Howard (1686–1777), 10th duke of Norfolk in 1777, and who wrote Historical Anecdotes of some of the Howard Family (1769 and 1790). He married on 15 March 1777 the Earl of Suffolk's eldest daughter, Anne, and in 1777 was created Baron Howard of Effingham. On 25 June 1777 he was created Earl of Arundel and the title was suspended from the family, henceforth passing to the line of his eldest son, Henry Howard, 5th earl of Arundel.

The 13th duke’s eldest son, Henry Granville Fitzalan Howard (1815–1860), succeeded to the title. He was a devoted Roman Catholic, left the Liberal party and resigned his seat in parliament rather than support the Ecclesiastical Titles Bill of 1850. He edited the Lives of Philip Howard, earl of Arundel, and of Anne Ducas, his wife (1857 and 1861). He was succeeded by his son Henry Fitzalan Howard, 15th duke (b. 1847), who was postmaster-general from 1893 to 1900, first Lord Mayor of Sheffield in 1893, went out to the South African War in 1900, and whose position as head of the English Roman Catholics and as premier duke and Earl Marshal made him for many years conspicuous in public life. His only son by his first wife, a daughter of Baron Donington, died in early life; but by his second marriage (1894) to the daughter and heiress of Lord Harries he had a son born in 1908.

Norfolk, an eastern county of England, bounded N. and E. by the North Sea, S.E. and S. by Suffolk and W. by Cambridgeshire and Lincolnshire. The area is 2,044 square miles, and the population (1901) was 529,744. The county being the fourth in size in England. The surface falls into two divisions. The eastern and central portions consist of undulating plain with rising ground skirting the river valleys and low chalk downs in the north. For the most part this section is fertile and well wooded, but there are some expanses of heath land. The principal rivers are the Yare and its tributaries the Wensum, Bure and Waveney, the last forming a large part of the boundary with Suffolk. In the west the county includes part of the Fen country (q.v.), where the principal rivers are the Great Ouse and its tributaries the Little Ouse or Brandon river, which also forms part of the Suffolk boundary, the Wissey and the Nar. The flat fens are crossed by innumerable navigable and drainable channels. They are comprised within that portion of the whole district known as the Bedford Level, and extend from Welney and Hilgay Fens near the junction of the Great and Little Ouse northward to the Wash.

The watershed is nearly in the centre of the county. The middle eastern portion is a low-lying flat area lifted slightly towards the coast in such a way that some of the tributary streams of the Bure rise very near the sea but flow to the sea at a point not far from the coast. Here occur the well-known Norfolk Broads, shallow mires, having their low banks covered with luxuriant reeds and other water-plants, and possessing much of the beauty of an individual character. More of them are connected with pike, harea and other coarse fish, and harbour innumerable waterfowl, including the water-hen, heron, bittern, king-fisher, mallard, teal and snipe. They are frequented by sportsmen, but still more by boating parties, and at Yarmouth, Wroxham Bridge, Acle and elsewhere sailing boats with cabins, and other boats, are hired in large numbers. Annual regattas are held on several Broads. The Broads are generally not wide and many of the main watercourses are only navigable by small craft. The most common craft are the flat-bottomed "cabin" or "cabin-barge," "Spirit" and "Skeg." the largest Broads, the river Bure, being navigable for a few miles above the town of Wroxham. The deep water of all the Broads is used for boating.

The Bure joins the Yare at Yarmouth, at the seaward end of Breydon Water, which does not rank among the Broads. Following the Bure upwards, a small stream is found uniting it with Filby, Rollesby and Ormesby Broads to the north, which form one sheet of water of irregular shape. The Thurne stream then enters from the same direction, draining Heigham Sound, Hickling Broad, Horsey Mere and Martham Broad. The second of these is the largest of all, measuring some 3 miles in length by one at its widest part. The next tributary, the Ant, drains Barton and Stalham Broads. Closely adjoining the upper Bure itself, there are Ranworth Broad, Horning Broad, and Salhouse, Hoveton and Wroxton Broads almost adjoining. South of Ranworth, on a tributary, is South Walsham Broad. Adjacent to the Yare towards Norwich is Rockland Broad. Between the Waveney and Lowestoft Oulton Broad is formed (in Suffolk; see Lowestoft). The eastern two-thirds of the boundary of the county is formed by tidal water. There are a few bays or inlets, and on the eastern coast no river mouths. For the most part the coast-line is flat and low, and has been greatly encroached on by the sea, several villages having been engulfed since the Conquest. From the
mouth of the Yare to Happisburgh the shore is skirted by sand-banks. Thence for 20 m. it is formed of cliffs consisting of clay and masses of embedded rocks, the average height being about 50 ft., although in some cases an altitude of 200 ft. is reached. These cliffs are succeeded by a low shingly or sandy coast stretching as far as St. Edmund’s Point. The shores of the Wash are formed of mudbanks, which are left at low water. West of Lynn a considerable extent of land has been reclaimed from the sea in modern times, and farther south an old Roman embankment stretches into Lincolnshire. At various points off the coast there are submarine forests, especially in Brancaster Bay, and there are large sand dunes and extensive areas of beach. The shores of the Yare and the River Yare are divided by the Fens. Fossilized remains of large mammals are sometimes dragged up by the nets of fishermen, and mammotus tusks measuring from 6 to 9 ft. have been found at Knole Sand off Happisburgh. The fine sandy beaches and healthy climate have contributed to the fine growth of such popular watering-places as Cromer, Yarmouth and Hunstanton, while Mundesley and Wells-next-the-Sea are lesser resorts.

Geology.—The prevailing rock formation in Norfolk is the chalk, which is widely exposed and forms the western and southern boundaries of the county and underlies the Tertiary deposits in the eastern part, the general dip of the rocks being towards that direction. Pliocene deposits predominate in the eastern third of the county; while a narrow belt of gravel and sand extends along the coast from the Yarmouth border. Oxford Clay and Corallian beds have been proved by boring at Lynn, but the oldest formation to appear at the surface is the Kimmeridge Clay. The cliffs along the coast of the Wash from Hunstanton to King’s Lynn and south to Downham, where it has been dug for bricks and tiles. The Lower Greensand, which forms the picturesque escarpment overlooking the Fen-land and the Wash, is represented by the Greensand and the bedded sands of the Winchelsea or Carstone (up to 40 ft.), locally known as the “Gingerbread stone,” which is quarried at Snettisham and elsewhere as a building stone. Below the Carstone are the Snettisham Clay beds, dug for brick-making at that village and at Dersingham and Heacham. Hard sandstone, with flints in the upper part and occasional marl beds, is exposed at Docking, Hillington and Methwold. The Upper Chalk (about 800 ft.), lying above the flint beds, is the peculiarly characteristic rock known as “paramoudras”; it has been largely exploited for lime and whiting, and the flints have been worked from prehistoric times. Dressed flints are still used for facing walls in churches and other buildings, and are known under the name of “London flints.” The county is intersected by the Roman roads which are known in England. Eocene strata, Reading Beds (46 ft.) and London Clay (310 ft.) have been proved to lie beneath younger deposits at Yarmouth. Pliocene deposits, sands, gravels and clays are exposed along the coast from Weybourne and Cromer to Happisburgh and in the river valleys over most of the eastern part of the county.

The lower subdivision of the Norwich Clay Series (25-100 ft.), exhibits numerous local peculiarities to which distinctive names have been applied, as the “Fluvio-Marine beds” of Bramerton and Thorpe, the “mammaliferous crag,” the “Weybourne crag” and the “Chillesford Clays,” &c. The upper sub-division, the Cromer Forest Beds, contains the bones of large mammouths, and one of the giant beaver, sabre-toothed tiger and many others, as well as the transported stumps of trees. Next in order come the glacial clays, sands and gravels, which contain much material derived from the strata of the county and hence greatly influence the scenery. There is a lower “ till ” with boulders and an upper chalky boulder clay, sometimes with sands and gravels between; glacial gravels overlie the clays in large sheets as at Norwich, Moulton and Dereham. The drift is thicker in the east than in the west,—very interesting exposures occur on the cliffs about Cromer. Later valley gravels occupy some of the stream courses, and along the coast sits the Fen landscape from the Fenland to the Fens.

Climate and Agriculture.—On account of the exposed position of the coast to east and north-east winds, the climate, especially in winter and early spring, is much colder than in the adjacent counties. The air is, however, generally dry, and unhealthy fogs are not common, except in the marshy districts. The cynd is a characteristic mist which sometimes rolls up like smoke from the sea over the eastern parts. Norfolk contains a greater variety of soil than any other county in England. In the north and west the soil is generally chalky; towards the south-east it is a light sand, assuming occasionally the form of blowing sand, but elsewhere capable of cultivation and of average fertility. In the centre and east the prevailing soil is loam, chiefly light and workable, but sometimes composed of stiff chalky boulder clay. Alluvial clays and loams occur on the borders of Lincolnshire and Cambridgeshire, and stretch along the river valleys. The marsh lands along the coast are subject to inundation, but afford capital pasturage. Farming is in an advanced condition, and, by means of draining, subsoil ploughing, &c, excellent crops are raised. The farms are for the most part large and commodious, and the farms are often surrounded by a belt of field. A large acreage is given to oats, and the crop is generally one of small quantity. A large acreage is given to oats, which is still carried on at Norwich and also shawl weaving, although the staple trade of the town is now boots and shoes. Silk is also manufactured at Yarmouth, Wymondham and North Walsham. Flour-mills are numerous all over the county, and there are agricultural implement works at Norwich, Lynn, Thetford, East Harling, North Walsham, Walsingham, and East Dereham. Lime-burning, brick-making, tanning, malting and brewing are carried on in various districts. There are extensive mustard and starch works at Norwich. One of the chief hindrances to commercial progress is the dangerous nature of the sea-coast, and the lack of harbours. A large trade, however, is carried on at Yarmouth. The other principal port is Lynn, and there is a small trade at Cromer and Wells. The ancient and flourishing ports of Great Yarmouth, Lowestoft and Great Yarmouth are mentioned. Eastern railway, the principal lines of which are those from London and Ipswich to Norwich and Yarmouth, from Ely to Norwich and Yarmouth, Ely to Lynn, Lynn to Swaffham and Dereham, Norwich to Norfolk and Union and Walsingham to Great Yarmouth, and branch lines. The Midland & Great Northern joint line, from Lynn, serves Cromer, Norwich, North Walsham and Yarmouth. The railway lines are connected with the port of Yarmouth and the Great and Little Ouse, with many of the drainage-cuts which are navigable, with Lynn.

Population and Administration.—The area of the ancient county is 1,308,439 acres, with a population in 1891 of 454,516, and in 1901 of 460,120. The area of the administrative county is 1,514,612. The county contains 33 hundreds. The municipal boroughs are—King’s Lynn (pop. 3,288); Norwich, a city and county borough and the county town (111,733); Thetford (4613); and Yarmouth, properly Great Yarmouth, a county borough (51,316). The urban districts are Cromer (3781), Diss (3745), Downham Market (2472), East Dereham (5545), Hunstanton (1983), North Walsham (3081), Thorpe (3250), Swaffham (3371), Walsoken (3250), Wells-next-the-Sea (2494). Among other towns may be mentioned Fakenham (2007), Holt (1844), Wymondham (4733). The county is in the south-eastern circuit, and assizes are held at Norwich. There are two courts of quarter sessions, and 25 petty sessional divisions. Each of the four municipal boroughs has a separate commission of the peace and separate court of quarter sessions. The total number of civil parishes is 700. Norfolk is mainly in the diocese of Norwich, with small parishes in those of Ely and Lincoln; it contains 607 ecclesiastical parishes or districts, wholly or in part. For parliamentary purposes the county is divided into six divisions (North-Western, South-Western, Northern, Eastern, Mid, and Southern), and also includes the parliamentary
of the Norman invasion of Norwich formed part of Earl Ralph's earldom, but it offered no active resistance to the conqueror, who built a castle at Norwich, and bestowed the earldom of East Anglia on Earl Ralph. The forfeited estates of Earl Ralph had passed at the time of the Domesday Survey to Roger Bigod, ancestor of the earls of Norfolk, whose line expired in 1066. The Norfolk fief of Count Alan later formed part of the Norman fief, the latter's office, as the honour of Eye; Hermer de Ferrière's fief became the barony of Wormegay, afterwards held by the Bardsley; Hugh de Montfort's fief, as the honour of Haughley, was afterwards attached to the office of constable of Dover. The Howard family settled in the county from the 15th century, Thomas Howard being created Duke of Norfolk for his services at Flodden. Castle Acre was a seat of the earls of Warenne; Paston of the Pastons; Attleborough of the Mortimers; Caister of the Fastolfs.

The shire-system was not definitely established in East Anglia before the Conquest, but the Domesday boundaries of Norfolk are fairly well defined. Some of these remain unchanged. As early as 290, the whole fief of Norwich was held in the Norman fief, the latter's office, as the honour of Eye; Hermer de Ferrière's fief became the barony of Wormegay, afterwards held by the Bardsley; Hugh de Montfort's fief, as the honour of Haughley, was afterwards attached to the office of constable of Dover. The Howard family settled in the county from the 15th century, Thomas Howard being created Duke of Norfolk for his services at Flodden. Castle Acre was a seat of the earls of Warenne; Paston of the Pastons; Attleborough of the Mortimers; Caister of the Fastolfs.

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NORFOLK—NORFOLK ISLAND

(a seat of King Edward VII), Holkham, Rainham, Costessey, Gunton, Houghton and Shadwell, are of more modern date. The Holkham estate was the scene of the agricultural work of Thomas William Coke, earl of Leicester (d. 1842), who successfully proved that wheat could be profitably grown in this part of the county, and also made great improvements in live stock. Agriculture, beet and various kinds of marketing, and the birthplace of Nelson; Paston and Oxnead, successive seats of the Paston family whose Letters are famous; and Ket’s Oak near Hethersett, W. of Norwich, where Robert Ket took oath as leader of the agrarian rebellion of 1549.

See Victoria County History; Norfolk; F. Blomefield, Essay towards a Topographical History of Norfolk (London, 1793-1805); Sir John Yarborough’s History of Norfolk (London, 1809); the P. H. Emerson, Pictures of East Anglian Life (London, 1888), and other works; Rev. A. Jessopp, Arcady (London, 1887), and other works; Quarterly Review (London, 1897), where other literature is cited; G. C. Davies, Norfolk Broads and Rivers (Edinburgh, 1893).

NORFOLK, a city of Madison county, Nebraska, U.S.A., on the north branch of the Elkhorn river, 2 m. from its mouth, and about 75 m. S.W. of Sioux City. Pop. (1900) 3883 (622 foreign-born); (1910) 6025. It is served by the Union Pacific, the Chicago & North Western (of which it is a division headquarters), and the Chicago, St. Paul, Minneapolis & Omaha railways. The city is the seat of the Northern Nebraska Insane Asylum. Cereals, alfalfa and fruit are raised in the surrounding country.

The site was first permanently settled in 1856. Norfolk was incorporated as a city in 1886; it became a city of the first class in 1909.

NORFOLK, a city and port of entry of Norfolk county, Virginia, U.S.A., on the northern side of the Elizabeth river (an arm of the Chesapeake Bay) and at the mouth of its eastern branch, and on the Albemarle and Chesapeake and the Dismal Swamp canals, about 90 m. S.E. of Richmond. Pop. (1890) 34,371; (1900) 46,624, of whom 1705 were foreign-born and 20,230 were negroes; (1910 census) 67,452. It is served by the Atlantic Coast Line, the Seaboard Air line, the Southern, the New York, Philadelphia & Norfolk, the Chesapeake & Ohio, the Norfolk & Western, the Norfolk & Southern and the Virginia railways, by many steamship lines, by ferry to Portsmouth (immediately opposite), Newport News, Old Point Comfort and Hampton, and by electric lines to several neighbouring towns. The Norfolk and Portsmouth Belt Line encircles the two cities, and connects the various trunk lines. Among the prominent buildings and institutions are the Custom House, the Federal Building, Marine Hospital, St Christopher’s Hospital, St Vincent’s Hospital, Norfolk Protestant Hospital, Sara Leigh Hospital, Norfolk Public Library, Norfolk Academy, Cotton Exchange, City Market, and the various banks. The Navy Yard, the Norfolk Naval Shipyard, the Norfolk Navy Yard, and the Norfolk Naval Base are of immense importance. One of the most important manufacturing industries is grading, roasting, cleaning and shelling peanuts (in 1905 valued at $791,750). In 1900 the value of the factory products was $4,691,779; in 1905 it was $5,900,120, the city ranking third among the cities of the state in value of factory products.

Norfolk was founded in 1682 in pursuance of an act of the Virginia Assembly passed in 1680 to establish towns for the encouragement of trade; it was incorporated as a borough in 1736 by a royal charter, was chartered as a city in 1845, its charter being revised in 1887 and 1884, and received a new charter in 1906 (amended in 1908), under which there are a mayor (elected for four years), a common council, a board of aldermen and a board of control of three members, which has charge of public works, streets, sewers, drains and water supply, the police and fire departments, the work of the board of health, etc. Norfolk is administratively independent of Norfolk county. In 1906 the town of Berkley (incorporated in 1890; pop. in 1900, 4988) was annexed. During the War of Independence Norfolk was bombarded on the 1st of January 1776 by the British under John Mutfay, 4th Earl of Dunmore (1732-1809); much of the town was burned by the American troops to prevent Dunmore from establishing himself here. In 1835 it suffered severely from yellow fever. At the outbreak of the Civil War the city was abandoned, and the navy yard was burned by the Federals in April 1861; Norfolk was then occupied until the 9th of May 1862 by Virginia troops, first under General William Booth Taliaferro (1822-1868) and later under General Benjamin Huger (1806-1877). Five miles from Norfolk and with Norfolk as its headquarters was held from the 26th of April to the 30th of November 1861 the Jamestown Ter-Centennial Exposition, celebrating the first permanent English settlement in America at Jamestown, Virginia.

NORFOLK ISLAND, an island in the Pacific Ocean, about 800 m. E. of the nearest point of New South Wales, in 29° S., 167° 56‘ E. It stands on a submarine tableland extending about 18 m. to the N. and 25 m. to the S., and has itself an area of 8228 acres or 133.3 sq. m. The islets of Nepean and Philip lie near it. Its high cliff-bound coast is difficult of access. With a general elevation of 400 ft. above the sea the island rises in the N.W. to 1950 ft. in the double summit of Mount Pitt. The soil, of decomposed basalt, is wonderfully fertile. The rich undulating pasture-land with clumps of trees and copes resembles a park. Oranges, lemons, grapes, passion fruit, figs, pine-apples, guavas and other fruits grow abundantly; while potatoes, onions, maize and arrowroot can be cultivated. The Norfolk Island pine ( Araucaria excels a) is a magnificent tree, with a height sometimes exceeding 200 ft. and a girth of 30. A small species of palm is known as the Norfolk Island cabbage. Tree-ferns are abundant. The flora is most closely associated with that of New Zealand, and the avifauna indicates the same connexion. Within the island are the islets of Poor Knights, the Whanganui Island, and the Queen Charlotte Island, which belong to Australian genera are apparently immigrants, while those which occur on the island in common with New Zealand would be incapable of such distant migration. The climate is healthy, the thermometer rarely sinking below 65° F. The island is a station of the British Pacific cable. It was discovered in 1774 by Captain Cook, and was taken by Philip King of the “Stirling” and twenty-four convicts from New South Wales. This settlement was abandoned in 1805, but in 1826 the island was made a penal settlement from New South Wales. In 1846, 104 Pacific islanders took the place of the convicts. Forty of them soon returned to Pircarn Island, and the remainder deteriorated owing to intermarriage. The administration of justice by an elected magistrate was unsatisfactory. Crime was rarely punished, and debts were not recoverable. A remedy was attempted in 1896 by an improvement in the government. The island was brought under the immediate administration of New South Wales; a chief magistrate, appointed by the governor of New South Wales, took the place of the elected magistrate, and an elected council of twelve elders superseded the general gathering of the adult population. In 1867 a Melanesian missionary was appointed, and in 1882 a church was erected to the memory of Bishop Patteson, with windows designed by Burne-Jones and executed by William Morris.
NORICUM (Noricus ager), in ancient geography, a district bounded on the N. by the Danube, on the W. by Raetia and Vindelicia, on the E. by Pannonia, on the S. by Pannonia and Italy, corresponding to the greater part of the modern Styria and Carinthia, and part of Austria, Bavaria and Salzburg. The original population appears to have consisted of Illyrians, who after the great emigration of the Gauls became subordinate to various Celtic tribes, chief amongst them being the Taurisci, probably called Norici by the Romans from their capital Noreia (Neumarkt). The country is mountainous and the soil poor, but it was rich in iron, and supplied material for the manufactories of arms in Pannonia, Moesia and northern Italy. The famous Noric steel was largely used for the Roman weapons ("Noricus basii," Horace, Odes, i. 16. 9). The inhabitants were a brave and warlike people, who paid more attention to cattle-breeding than to agriculture, although it is probable that the Romans, by draining the marshes and cutting down timber, increased the fertility of the soil. Gold and salt were also found in considerable quantities; the plant called zuliuca (the wild or Celtic nard) grew in abundance, and was used as a perfume (Pliny, Nat. Hist. xxi. 20. 43). Noricum was the southern outpost of the northern or Celtic peoples and the starting-point of their attacks upon Italy. It is in Noricum that we first hear of almost all these Celtic inventions. Archaeological researches, particularly in recent years, have established the fact that the Romans were no strangers to the inhabitants of Noricum, and have shown that for centuries before recorded history there was a vigorous civilization. The Hallstatt cemeteries contained weapons and ornaments from the Bronze age, through the period of transition, up to the fully-developed Iron age. Professor Ridgeway (Early Age of Greece, i. ch. 5) has made out a strong case for the theory that in Noricum and the neighbouring districts was the cradle of the Homeric Achaeans. For a long time the Noricans enjoyed independence under princes of their own, and carried on commerce with the Romans. In 48 B.C. they took the side of Caesar in the civil war against Pompey. In 16, having joined with the Pannonians in invading Hخاریa, they were defeated by Publius Silius, proconsul of Illyricum. From this time Noricum is called a province, although not organized as such, but remaining a kingdom with the title regnun Noricum. It was under the control of an imperial procurator. It was not until the reign of Marcus Antoninus that the Legio II. Pia (afterwards called Italica) was stationed at Noricum, and the commander of the legion became the governor of the province. Under Diocletian, Noricum was divided into Noricum ripense (along the Danube) and mediterraneum (the southern mountainous district) and in 305 Noricum fell under a praeses, and both belonged to the diocese of Illyria in the prefecture of Italy. The Roman colonies and chief towns were Virunum (near Marisalas), Ovilava (Wels), Celeia (Cilliis), Juvavum (Salzburg), Lauriacum (Lorch, at the mouth of the Enns, the ancient Anisus).

See A. Mucher, Das römische Noricum (Grätz, 1829); T. Mommsen, Corpus inscriptionum Latinarum, iii. 587; J. Marquardt, Römische Staatsverwaltung, i. (2nd ed., 1881) p. 290; Smith’s Dict. of Gk. and Roman Geog. (1873); Mary B. Peake, The General Civil and Military Administration of Noricum and Raetia (Chicago, 1907); full references to ancient authorities in A. Holder, All-celtischer Sprachkampf ii. (1913), (J. H. F.)

NORMAN, SIR HENRY WYLIE (1826-1904), field-marshall and colonial governor, was born on the 2nd of December 1826, and entered the Indian army at the age of seventeen. In 1840 his father, who had been for many years a merchant in Cuba, became a partner in a mercantile house in Calcutta, where he was joined by his son in 1842. In 1844 the latter obtained a cadetship. He went through the second Sikh campaign and having attracted the favourable notice of Sir Colin Campbell was selected by him to accompany an expedition against the Kohat Pass Affghans in 1850 as officiating brigade-major. The subaltern of twenty-four was given a substantive appointment in this capacity for a splendid deed of gallantry, which is recorded by Sir Charles Napier in the following terms: “In the pass of Kohat a sepoy picket, descending a precipitous mountain under fire and the rolling of large stones, had some men killed and wounded. Four of the latter, dreadfully hurt, crept under some rocks for shelter. They were not missed until the picket reached the bottom, but were then discovered by our glasses, high up and helpless. Fortunately the enemy did not see them, and some sepoys volunteered a rescue, headed by Norman of the 31st Native Infantry and Ensign Murray of the 70th Native Infantry. These brave men—would that the names of all were known to me for record!—ascended the rocks in defiance of the enemy, and brought the wounded men down.” Norman served in numerous frontier expeditions between 1850 and 1854, and in the suppression of the Sonthal rebellion of 1855-56. In the Mutiny campaign he was constantly engaged, being present at the siege of Delhi, the relief of Lucknow and a number of other affairs. As adjutant-general of the Delhi Field Force he was one of the leading spirits of the siege, and afterwards became its chief chronicler. Altogether he was mentioned twenty-five times in despatches. He afterwards became assistant military secretary for Indian affairs at the Horse Guards, military secretary to the government of India, military member of the viceroy’s council and member of the secretary of state for India’s council. In 1883 Sir Henry began his colonial career as governor of Jamaica, an appointment from which he was transferred in 1888 to the governorship of Queensland. Here he remained until 1895, when he came home to act as Home, cotton and colonial secretary. In 1895 he was appointed governor of the British Raj. In 1896 he was appointed governor of Bengal, and in 1898 governor-general of India. In 1898 he was again governor of Bengal, and in 1899 became viceroy of India, a post he held until 1901. He died on the 26th of October 1904.


NORMAN, a city and township (coextensive) and the county-seat of Norman county, Oklahoma, U.S.A., about 2 m. N. of the Canadian river, and 18 m. S. by E. of Oklahoma City. Pop. (1890) 787; (1900) 2225; (1910) 3724. It is served by the Atchison, Topeka & Santa Fé railway. It is the seat of the university of Oklahoma (chartered, 1892; opened 1894; coeducational), which includes a college of arts and sciences, schools of applied science, medicine, pharmacy, mines and fine arts, and a preparatory school, and in 1908 had 56 instructors and 790 students. The Oklahoma Insane Asylum is in the city. Cottonseed oil, flour and ice are manufactured, and the neighbouring region produces much cotton, Indian corn, oats, alfalfa and wheat. Norman county, of which the city is the county-seat, was made in 1889, and Norman was chartered as a city in 1902.

NORMANBY, CONSTANTINE HENRY PHEPPS, 1ST MARQUESS OF (1797-1863), British statesman and author, son of Henry, 1st earl of Mulgrave (1755-1831), was born on the 15th of May 1797. The 1st earl (who was created baron in 1794 and earl in 1812), was a distinguished soldier, and Pitt’s chief military adviser; and he held the offices of chancellor of the Exchequer (1796), secretary for foreign affairs (1805), first lord of the admiralty (1807-1810), and master of the ordnance (1810-1818). In 1792 he inherited the earlier Irish barony of Mulgrave—created in 1677 for his father, Constantine (1722-1775) grandson of Sir Constantine Phipps (1656-1723), the lord chancellor of Ireland—from his elder brother Constantine (1744-1792), a distinguished naval captain. His son, the future marquess, passed through Harrow and Trinity College, Cambridge, and sat for the family borough of Scarborough as soon as he attained his majority. But, speaking in favour of Catholic emancipation, and dissenting in other points from the family politics, he resigned his seat, and went to live in Italy for some two years. Returning in 1821, he was elected for H serge, and made a considerable reputation by political pamphlets and by his speeches in the house. He was returned for Malton at the general election of 1826, becoming a supporter of Canning. He was already known as a writer of romantic tales, The English in Italy (1823); in the same year he made his appearance as a novelist with Malilda, and in 1828 he produced...
NORMANDY

another novel, Yes and No. Succeeding his father as earl of Mulgrave in 1831, he was sent out as governor of Jamaica, and was afterwards appointed lord-lieutenant of Ireland (1835-1839). He was created marquess of Normanby in 1838, and held successively the offices of colonial secretary and home secretary in the last years of Lord Melbourne's administration. In March 1846 to 1852 he was ambassador at Paris, and from 1854 to 1858 minister at Florence. The publication in 1857 of a journal kept in Paris during the stormy times of 1848 (A Year of Revolution), brought him into violent controversy with Louis Blanc, and he came into conflict with Lord Palmerston and Mr Gladstone, after his retirement from the public service, on questions of French and Italian policy. He died in London on the 28th of July 1863. He had married in 1818 the daughter of Lord Ravensworth, and was succeeded as 2nd marquess by his son, George (1819-1900), a liberal politician, who became governor of Queensland (1871-1874), New Zealand (1874-1879), and Victoria (1879-1884).

NORMANDY, a province of old France, bounded on the N.E. by the river Bresle, which falls into the Channel at Tréport and separates Normandy from Picardy, and then roughly by the Epte, which divides the Vexin into two parts. From the confluence of the Epte and Seine to Ivry, the boundary between Normandy and the Ile-de-France is artificial; it is afterwards practically determined by the course of the Eure and the Sarthe. But from there to the sea Normandy is separated by a narrow strip of land by the banks of the Loir. The county of Bretteville by the sea, which lies between the line of the Loir and the coast, is nominally a part of Brittany; it lies fairly regularly in the direction from E. to W. The boundary between the coast of Normandy and that of Brittany is formed by the mouth of the Couesnon. Normandy is washed by the English Channel and lies opposite to England. The northern part of the coast consists of cliffs, which cease at the mouth of the Seine, the estuary of which is 12 km. wide from Havre to Trouville; the coast of Calvados consists of rocks and beaches; that of the peninsula of Cotentin is sandy on the eastern side and granite on the west; in the north it forms height of 50 m. at the point of Barneville and the cape of La Hague a kind of concave arc in which lies the harbour of Cherbourg.

Historical Geography.—In the time of Caesar the country which has since gone to form Normandy was inhabited by several tribes of the Gauls, the Caleti, who lived in the district of Caux, the Velicioni, in the Vexin, the Lexovi, in the Lieuvain, the Uselli in Cotentin; these names have been preserved for A.D. 958 by Caesar. At the beginning of the 5th century, when the Notitia provinciarum was drawn up, Normandy corresponded to the Province Lugudunensis Secunda, the chief town of which was Rouen (Caesar: Rotomagensis). It included seven provinces of the kingdom of Rouen: those of Bayeux (C. Bajoceastium), Lisieux (C. Lexorionum), Coutances (C. Constantia), Avranches (C. Abricanum), Sées (C. Sees), and Évreux (C. Evreux). The western ecclesiastical province of Caletus has been included in Normandy since the 5th century. It formed the ecclesiastical province of Rouen, with six suffragan sees. For civil purposes, the province was divided into a number of pago; the civitas of Rouen formed the pago Rotomagensi (Rouen); the pago Calicetii (p. Caletii) (Caux); the pago Villicessus (Vexin); the pago Telouco (Talou); that of Bayeux the pago Bajoceastii (Bassin); and the Olixo Saxoniz; that of Lisieux the pago Lexivismus (Lieuvain); that of Coutance the pago Corinensis and p. Contimonti (Cotentin); that of Avranches the pago Abricanus (Avranchin); that of Sées the pago Osmentis (Hémius), the pago Sagensiz and p. Carbonensiz (Corbœu); and that of Évreux the pago Erivocis (Évreux); the pago circa Humberni (Caletus). The possession of the Normans in the country that Normandy owes its name, from the 10th century onwards it formed a duchy, roughly coextensive with the ecclesiastical province of Rouen. Under the feudal regime, the energy of the Norman dukes prevented the formation of many powerful lordships, and there are few worthy of note, save the countships of Evreux, Harcourt, Le Perche and Mortain.

The duchy of Normandy was created by Richard I. in 1198. The territory of the duchy was bounded in 1203 by King Philip II of France in the 16th century the gouvernement of Normandy; the extent of this gouvernement did not, as a matter of fact, correspond exactly to that of the duchy, for Le Perche, which belonged to the duchy of Normandy, was ceded to the government of Maine, while the Thimerais, which belonged to the countship of Blois, was joined to the gouvernement of Normandy. In the 17th century this gouvernement was divided into the généralités or intendances of Basse-Seine, Eure, Calvados, Manche and Orne.

History.—The prosperity of Normandy in Roman times is proved by the number and importance of the towns which existed there at that time. The most important was Lillébonne (Julubona), chief town of the Caleti, the Roman antiquities of which are famous. The evangelization of Normandy did not take place before the 3rd century: the first bishop of Rouen, about 260, seems to have been St Mallanus; it is possible, however, that before this date there were a few Christian communities in Normandy, as seems to be proved by the existence of St Nicarius, who was martyred in the Vexin.

The province of Lugudunensis Secunda, which at the end of the 5th century formed part of the kingdom of Syagrius, was conquered by Clovis before 506, and during the Merovingian times followed the fortunes of Neustria. In the 9th century this country was ravaged by the Northmen, who were constantly going up and down the Seine, and later on it was formally ceded to them. During these invasions Rouen was occupied several times, notably in 876 and 885.

The definitive establishment of the Normans, to whom the country owes its name, took place in 911, when by the treaty of Saint-Clair-sur-Epte, concluded between King Charles the Simple of France and Roll of Rollo, chief of the Normans, the territory comprising the town of Rouen and a few pago situated on the sea-coast was ceded to the latter; but the terms of the treaty are ill-defined, and it is consequently almost impossible to find out the exact extent of this territory or to know whether Brittany was at this time made a feudal dependency of Rouen. But the chronicler Dudo of Saint-Quentin's statement that Rollo married Gisela, daughter of Charles the Simple, must be considered to be legendary. In 924 Rollo received from the king of France Bessin and Maine. Although baptized, he seems to have preserved certain pagan customs. The history of Normandy under Rollo and his immediate successors is very obscure, for the legendary work of Dudo of Saint-Quentin is practically our only authority.

Rollo died in 927, and was succeeded by his son William "Long Sword," born of his union more danoix with Foppa, daughter of count Bèrenger; he showed some attachment to the Scandinavian language, for he sent his son William to Bayeux to learn Norse. The first two dukes also displayed a certain fidelity to the Carolingian dynasty of France, and in 936 William "Long Sword" did homage to Louis IV, d'Outremer. He died on the 17th of December 942, assassinated by the count of Flanders.

During the minority of his successor, Duke Richard, King Louis IV, who was making an expedition into Normandy, was captured by his troops and handed over to the English. From this time onwards the dukes of Normandy began to enter into relations with the dukes of France; and in 938 Duke Richard married Hugh the Great's daughter. He died in 966. At the beginning of the reign of his son, Richard II (966-1026), there was a rising of the peasants, who formed assemblies with a view to establishing fresh laws for the management of the forests. This attempt at insurrection, described by William of Jumièges, and treated by many historians, on the authority of the poet Wace, as a sort of democratic movement, was put down with the utmost severity. (p. 5). In 975 he seems to have been poisoned by his brother, Robert the Magnificent, or the Devil (1027-1039), who succeeded him. In 1031 Robert supported King Henry I of France against his brother Robert, who was laying claim to the throne, and in return for his services received the French Vexin. The duke died on a pilgrimage to Jerusalem, leaving as his heir an illegitimate son, William, born of his union with the daughter of a tanner of Falaise.

William was very young when his father started for the Holy Land, leaving him under the protection of the king of France. In 1037 Henry I. had to defend the young duke against an army of English nobles, whom he succeeded in beating at Val-Éclusines. In the following year the king of France was in his turn supported by the duke of Normandy in his struggle against Geoffrey Martel, count of Anjou; the two allies besieged
Moulines (1048); and the war was continued between the duke of Normandy and the count of Anjou by the siege of Alençon, which was taken by Geoffrey Martel, then retook by William, and that of Domfront, which in 1049 had to surrender to Duke William.

In 1054 William the Bastard married Matilda, daughter of Baldwin V., count of Flanders, in spite of the opposition of Pope Leo IX., who only gave his consent on condition that William and Matilda should each build an abbey: under these conditions were built the Abbaye-aux-Hommes and the Abbaye-aux-Dames at Caen. The king of France had at first protected William, but before long became alarmed at his ambitions; the first sign of his feeling of rivalry with the duke was the encouragement he gave to the Duke William Busus, count of Eu and Montreuil, who claimed the ducal crown. In 1054 he invaded Normandy with his brother Odo and this count, but Odo was beaten at Mortemer. In 1058 the king of France, joined by Geoffrey Martel, count of Anjou, tried to revenge himself, but was beaten at the ford of Varaville (1058).

Towards the same time took place the annexation of Maine to Normandy, for a short period only. Herbert II., the young count of Maine, who was a vassal of the count of Anjou, did homage to William the Bastard between 1055 and 1060, perhaps after the defeat of Geoffrey Martel; he promised to marry one of William's daughters, and to give his sister Margaret to the duke's son, Robert Curthose, on the understanding that, if he died leaving no children, the countship was to fall to William. After his death, the people of Maine revolted (1063), choosing as their lord Walter de Mantes, count of Vexin; but William the Bastard, after one campaign, succeeded in imposing the authority of Normandy. Three years later, William took possession of Anjou, of which he was crowned king in 1066. Normandy now became the scene of William's quarrels with his son, Robert Curthose, who laid claim to Normandy and Maine, and with the aid of King Philip I. of France succeeded in defeating his father at Gerberoy in 1070.

William the Conqueror died on the 7th of September 1087, and was buried in the church of St Etienne at Caen. After his death his eldest son, Robert Curthose, kept Normandy and Maine, and his second son, William Rufus, became king of England. In 1091 William Rufus made a vain attempt to recover Normandy; but in 1096 Robert departed on a crusade and pledged the duchy to his brother for 10,000 livres. When Robert returned, William Rufus had just died, and his younger brother, Henry Beauclerc, had already taken possession of the crown. Henry's ambition of uniting Normandy to England; in 1105, with the aid of Helias, count of Maine, and the son of Geoffrey Martel, count of Anjou, he took and burnt Bayeux, but failed to take Falaise. On the 28th of September 1106, by the help of William, count of Evreux, Robert, count of Meulan, Robert de Varenne, and Helias, count of Maine, he defeated his brother at Tinchebrai, took him prisoner, and seized Normandy. Duke Robert passed the rest of his life in captivity and died in 1134.

From 1106 to 1204 Normandy remained united to England. According to Ordericus Vitalis, whose Historia ecclesiastica is a chronicle of the greatest interest for the history of Normandy in the 11th and 12th centuries, Henry Beauclerc governed the two kingdoms wisely, checking the nobles, and protecting the Church and the common people. He carried on hostilities against the king of France and William Clito, son of Robert Curthose, whose claim to the duchy of Normandy was upheld by Louis VI., and won an important victory over his opponents at Brémule in Normandy (1119). After the disaster of the White Ship (1122), in which the Atheling William lost his life, Henry's only surviving child was a daughter, Matilda, wife of the emperor Henry V. In 1127 Matilda married Geoffrey the Fair, eldest son of Fulk V., count of Anjou. After the death of Henry I. in 1135, a struggle arose between Matilda, who claimed the kingdom of England and the duchy of Normandy in the name of her son Henry Plantagenet, and Theobald, count of Champagne, grandson of William the Conqueror on the side of his mother Adela, the candidate of the Normans of Normandy, while the Norman party in England supported Stephen, brother of Theobald. In 1144 Theobald, whose position had been much weakened since the taking of the castle of Rouen, gave up his rights in Normandy to Matilda's husband Geoffrey, count of Anjou, in favour of Henry Plantagenet. Between 1139 and 1145 Geoffrey, with French and Flemish help, gradually subdued Normandy, and on his death, in 1151, his son Henry Plantagenet was master of Normandy as well as count of Anjou. In 1152, by his marriage with Eleanor, duchess of Aquitaine, the divorced wife of Louis VII. of France, Aquitaine also was secured to himself and his descendants. Finally, in 1153, he was recognized by Stephen of Blois as heir to the throne of England. The duchy of Normandy, though nominally in feudal dependence on the king of France, 1156 became part of the great Angevin empire, of which the power and resources were more than equal to that of the French kings. The perennial struggle, dating from this period, between the kings of England and France is dealt with elsewhere (see FRANCE: History, and ENGLISH HISTORY).

From the first the French kings were fully conscious of the menace of the Angevin power. The reign of Louis VII. was occupied by the struggle against Henry II. In 1158 he committed the blunder of concluding a treaty with Henry, by which he ceded his rights in Anjou. In 1159 the marriage of Henry to the Countess of Eu was nullified, and his wife, the French Vexin as her dowry. The Vexin was consequently the scene of hostilities in 1159 and 1165. In 1173 Louis VII., resuming the policy of his grandfather and father, took advantage of the strife which broke out in the family of the king of England, and took the part of Henry II.'s sons who were in revolt against their father. He negotiated with Henry Short Mantle, duke of Normandy, as though he was king of England, but owing to his weakness did not gain any serious advantage. In 1173 he abjured the sign of Verneuil, in 1174 that of Rouen, and was no more successful in the matter.

Philip Augustus (1180-1223) pursued the same policy with greater tenacity and success. He began by taking part against Henry II. with his son and successor, Richard Cœur de Lion, who obtained the throne on the death of Henry II. in 1189. From the point of view of Normandy, the most important events of Richard's reign were: the truce of Issoudun, by which Philip Augustus kept the Norman Vexin which he had just conquered (1193), the building of Richard of Château-Gaillard (1196), and finally the defeat of Philip Augustus by Richard at Couvres in Normandy (1198). On the death of Richard at Chalus in 1190 the position of Philip Augustus was critical. This situation was modified under the reign of John Lackland, Richard's brother, who had himself crowned duke of Normandy at Rouen (April 25, 1199). Philip Augustus set up in opposition to him Arthur of Brittany, son of Geoffrey and grandson of Henry II., and the first phase of the struggle between the kings of France and England continued until the treaty of Goulart (1200). But in 1202 Philip made a fresh attempt to seize the continental possessions of the kings of England. An excuse for reopening hostilities offered itself in the abduction, by John, of Isabel of Angoulême, the betrothed of Hugh le Brun, son of the count of La Marche. The barons appealed to Philip Augustus, who summoned John to appear before the royal judges; he failed to appear, and was consequently condemned by default, as a disloyal vassal, to have all the fiefs which he held in France confiscated (April 1202). The confiscation, a purely legal and formal operation, was followed by the actual conquest.

In June 1202 Philip Augustus invaded Normandy and besieged the castle of Arques, near Dieppe; at the same time Arthur of Brittany was taken prisoner by John at Mirebeau, near Poitou, and imprisoned in the castle of Falaise, from which he was removed to Rouen and died, probably assassinated by John's orders. The conquest of Normandy began with the occupation of Château-Gaillard after an eight months' siege (September 1202-April 1204); the rest of Normandy was taken during the following months, Rouen surrendering in 1204 but
obtaining a guarantee of her privileges. The conquest of Normandy by the French was not, however, recognized officially till the treaty of Paris (1259).

Normandy enjoyed a time of comparative prosperity under French rule, up to the time of the Hundred Years' War. The institution of the Estates of Normandy even assured her a sort of independence. In 1320 the duchy of Normandy was revived in favour of John, son of King Philip VI.

Owing to her geographical position, Normandy suffered heavily from the Hundred Years' War. In 1346 Edward III, at the instance of Godefrid d'Harcourt lord of Saint-Sauveur, invaded Normandy, landing at Saint-Vast-la-Hougue (July 12); and arriving at Caen on the 27th of July, he laid waste the country as far as Poissy. After the accession of John II. (1350), Normandy was again separated from the crown and given as an appanage to the dauphin Charles. The treaty of London (1359) stipulated for its cession to England, but the provisions of the treaty were modified by those of the treaty of Brétigny (1360), and it remained in the possession of France.

One of the chief feudatories of Normandy, Charles the Bad, grandson of Louis X. le Hutin, and a claimant to the crown of France, was in 1365, owing to his continued treachery, deprived of the countship of Longueville, and in 1378 of all his other possessions in Upper and Lower Normandy. The most striking event of the war between the French and English which took place in Normandy during the reign of Charles V. was the siege of Saint-Sauveur-le-Vicomte, which was occupied by the English, and only surrendered after a siege of several years.

The opening years of the reign of Charles V (1380-1422) were marked by a revolt which broke out at Rouen against the aids which the royal government had tried to impose (1381); a cloth-merchant was proclaimed king of Rouen, and Charles was obliged to go in person to Rouen to put down the insurrection. In 1415 the war with England was resumed: an English army of 60,000 men landed on the 14th of August at the mouth of the Seine, took Harfleur on the 16th of September, and finally defeated the army of the king of France at Agincourt.

During the following years the whole of Normandy was occupied, Rouen holding out for nearly six months (July 29, 1418—January 13, 1419), and Henry V. of England entrusted the administration of Normandy to a special council. In spite of the moderation of the duke of Bedford's government, Normandy, ruined by the war, was in a state of great distress, and in the years following the treaty of Troyes (1420) there was a continual resistance offered to the English. This resistance became general after the expeditions of Joan of Arc and the treaty of Arras; at the end of 1435 the whole district of Caux, and in 1436 that of the Val de Vire revolted; Mont-Saint-Michel, which had never been taken by the English, continued to resist, and in order to keep guard over it the English built Granville. But Normandy was not recovered by the French till after the sack of Fougères (1440). Cotentin was reconquered by Richmond (see Arthur, duke of Brittany) and the duke of Brittany; Rouen surrendered on the 29th of October 1449. In face of these successes of the French, an English army was sent into Normandy under the leadership of Thomas Kyriel; it landed at Cherbourg and marched across Cotentin to Bayeux, but was met at Formigny (April 13, 1450) by the count of Clermont and utterly routed. Shortly afterwards Caen, and finally Cherbourg, capitulated.

After the French conquest, the history of Normandy is less eventful. In 1515 Normandy was given as an appanage to Charles, brother of King Louis XI. who was deprived of it in 1547. The kings of France tried to win the support of Normandy by certain favours, such as maintaining the provincial Estates and the University of Caen, founded by the kings of England, and transforming the Exchequer of Normandy into a permanent court of justice (1499) which was called the Parlement of Normandy and sat at Rouen in the famous Palais de Justice. Among the measures which contributed to the increase of the prosperity of Normandy should be noted the construction in 1752 of the Hâvre de Grace.

During the 16th century the Protestant Reformation met with some success in Normandy, where the Wars of Religion caused a certain amount of disturbance. The Reformation movement began with Pierre Bar in 1528, and the first apostle of the Reformation at Rouen was François Legay, called Bois-normand. In 1562 the town of Rouen was taken by the Calvinists, but retaken in the same year by the Catholics. Caen received the Reformed religion in 1531, and Alençon in 1582. In the massacre of Saint Bartholomew's day (1572) more than 10,000 victims were slaughtered by the Catholics.

In spite of the success of Protestant ideas, however, the Catholic party of the League succeeded after 1588 in establishing itself in Normandy, and King Henry IV. had to conquer it by force of arms. The most famous engagements during this expedition were the victories of Henry IV. at Arques and Ivry, but he failed to take Rouen, which was defended by Alexander Farnese, duke of Parma, and only surrendered after the abjuration of the king.

A history of Normandy in the 17th and 18th centuries contains few events of note, except for a few attempts at landing made by the English, such as Bedford's expeditions (2 vols., 1833-1836); in 1578 the English admiral Anson attacked Cherbourg, and in 1750 Admiral Rodney bombaraded Havre. From 1790 dates the creation of the departments, when Normandy ceased to have a separate political existence, and her history becomes one with that of France.


(R. La.)

NORMANS, the softened form of the word "Northman," applied first to the people of Scandinavia in general, and afterwards specially to the people of Norway. In the form of "Norm" (Norrmannen, Normannus, Normaund) it is the name of those colonists from Scandinavia who settled themselves in Gaul, who founded Normandy, who adopted the French tongue and French manners, and who from their new home set forth on new errands of conquest, chiefly in the British Islands and in southern Italy and Sicily. From one point of view the expeditions of the Normans may be looked on as continuations of the expeditions of the Northmen. As the name is etymologically the same, so the people are by descent the same, and they are still led by the old spirit of war and adventure. But in the view of general history Normans and Northmen must be carefully distinguished. The change in the name is the sign of a thorough change, if not in the people themselves, yet in their historical position. Their national character remains largely the same; but they have adopted a new religion, a new language, a new system of law and society, new thoughts and feelings on all matters. Like as the Norman still is to the Northman, the effects of a settlement of Normans are utterly different from the effects of a settlement of Northmen. There can be no doubt that the establishment of the Norman power in England was, like the establishment of the Danish power, greatly helped by the essential kindred of Normans, Danes and English. But it was helped only silently. To all outward appearance the Norman conquest of England was an event of an altogether different character from the Danish conquest. The one was a conquest by a people whose tongue and institutions were still palpably akin to those of the English. The other was a conquest by a people whose tongue and institutions were palpably different from those of the English. The Norman settlers in England felt no community with the earlier Danish settlers in England. In
fact the Normans met with the steadiest resistance in a part of England which was largely Danish. But the effect of real, though unacknowledged, kindred has none the less an important practical effect. There can be no doubt that this hidden working of kindred between conquerors and conquered in England, as compared with the utter lack of all fellowship between conquerors and conquered in Sicily, strongly came out of several ways. First, there was a difference between the Norman conquest of England and the Norman conquest of Sicily.

These two conquests, wrought in the great island of the Ocean and in the great island of the Mediterranean, were the main works of the Normans after they had fully put on the character of a Christian and French-speaking people, in other words, after they had changed from Northmen into Normans. The English and the Sicilian settlements form the main Norman history of the 12th century. The 10th century is the time of the settlement of the Northmen in Gaul, and of the change in religious and language of which the softening of the name is the outward sign. By the end of it, any traces of heathen faith, and even of Scandinavian speech, must have been mere survivals. The new creed, the new speech, the new social system, had taken such deep root that the descendants of the Scandinavian settlers were better fitted to be the armed missionaries of all these things than the neighbours from whom they had borrowed their new possessions. With the zeal of new converts they set forth on their new errand very much in the spirit of their heathen forefathers. If Britain and Sicily were the greatest fields of the enterprise, they were very far from being the only fields. The same spirit of enterprise which brought the Northmen into Gaul seems to carry the Normans out of Gaul into every corner of the world. Their character is well painted by a contemporary historian of their exploits. He sets the Normans before us as a race specially marked by cunning, despising their own inheritance in the hope of winning a greater, eager after both gain and dominion, given to imitation of all kinds, holding a certain mean between lavishness and greediness—that is, perhaps uniting, as they certainly did, these two seemingly opposite qualities. Their chief men, he adds, were specially lavish through their desire of good report. They were, moreover, a race skillful in flattery, given to the study of eloquence, so that the very boys were orators, a race altogether unbridled unless held firmly down by the yoke of justice. They were enduring of toil, hunger, and cold whenever fortune laid it on them, given to hunting and hawking, delighting in the pleasure of horses, and of all the weapons and garb of war. Several of these features stand out very clearly in Norman history. The cunning of the Normans is plain enough; so is their Impatience of restraint, unless held down by a yoke of justice. The greater or lesser lavishness of their conduct is marked. Little of original invention can be traced to any strictly Norman source; but no people were ever more eager to adopt from other nations, to take into their service and friendship from any quarter men of learning and skill and eminence of every kind. To this quality is perhaps to be attributed the fact that a people who did so much, who settled and conquered in so large a part of Europe, has practically vanished from the face of the earth. If Normans, as Normans, now exist anywhere, it is certainly only in that insular fragment of the ancient duchy which still holds itself down by a yoke of justice. As for lavishness, it was found in studii inserviis in tantum, ut etiam ipsos pueros quasi rhetores attendan, quae quidem, nisi judicium pretium, effrenatisse est; laboris, ineditis, algoris, ubi futura expendit, patiendi, venationi accepiturn exercitia inserviis. They were great in all the arts, military, legal, oratory. They were conquerors, but they were also admirers of their own dukes. Elsewhere, as the settlers in Gaul became French, the emigrants from Gaul became English, Irish, Scottish, and whatever we are to call the present inhabitants of Sicily and southern Italy. Every-

1 Geoffrey Malaterra, i. 3 "Est quippe gens astutissima, in- juriarum ultrix, spelius alius lucrandi, patrios agros vilipendens, quae et dominationis aida, cujuslibet rei simulatrix, interfateta et avariaetiam quodam modum habens. Principes vero delevit effrenatae similitudo, lamae largissimi, gens adulator sciens, eloquentissima in studii inserviis in tantum, ut etiam ipsos pueros quasi rhetores attendan, quae quidem, nisi judicium pretium, effrenatisse est; laboris, ineditis, algoris, ubi futura expendit, patiendi, venationi accepiturn exercitia inserviis."

2 This view of Ranulf Flamard's work, which on Freeman's authority superseded the older view, which attributed the feudal organization of England to the Conqueror himself, was subjected to a destructive criticism by Mr. J. H. Round in his Feudal England. (Ed.)
confiscations, his grants, all that he did, was a logical deduction from one or two legal principles, arbitrary certainly in their conception, but strictly carried out to their results. Even Norman lawlessness in some sort took a legal shape. In the worst days of anarchy, in the minority of William or under the no-reign of Robert, the robber-baron could generally give elaborate reasons for every act of wrong that he did.

It is perhaps less wonderful that this characteristic should have been left out in a picture of the Normans in Apulia and Sicily than if it had been left out in a picture of the Normans in Normandy and England. The circumstances of their Apulian and Sicilian occupancy were certainly less and too local to bring out this feature of their character so strongly as it was brought out by the circumstances of their English conquest. Possibly the same cause may have kept the chronicler from enlarging on their religious character; yet in Sicily at least they might pass for crusaders. Crusaders in fact they were before crusades were preached. Norman warriors had long before helped the Christians of Spain in their warfare with the Saracens of the Peninsula, and in Sicily it was from the same enemy that they won the great Mediterranean island. Others had done a kindred work in a more distant field as helpers of the Eastern emperors against the Turks of Asia. The Normans might pass for religious warriors, and they might really be so; it needed greater ingenuity to set forth the invasion of England as a missionary enterprise designed for the spiritual good of the benighted islanders. The Norman, a strict observer of forms in all matters, attended to the forms of religion with special care. No people were more bountiful to ecclesiastical bodies on both sides of the Channel; the foundation of a Benedictine monastery in the 11th century, of a Cistercian monastery in the 12th seemed almost a matter of course on the part of a Norman prince. The conqueror beyond doubt sincerely aimed at being a religious reformer both in his duchy and in his kingdom, while it is needless to say that his immediate successor was exceptionally ungodly, whether among Normans or among other men. But among their countrymen generally strict attendance to religious observances, a wide bounty to religious foundations, may be set down as national characteristics. On the other hand, none were less inclined to submit to encroachments on the part of the ecclesiastical power, the Conqueror himself least of all.

We thus see in the Scandinavian settlers in Gaul, after they had put on the outward garb of their adopted country, a people restless and entering above all others, adapting and spreading abroad all that they could make their own in their new land and everywhere else—a people in many ways highly gifted, greatly affecting and modifying at the time every land in which they settled, but, wherever they settled, gradually losing themselves among the people of the land. The Norman, as a visible element in the country, has vanished from England, and he has vanished from Sicily. The circumstances of his settlement in his two great fields of conquest were widely different; his position when he was fully established in his two inaural realms was widely different; yet the effect has been almost in both cases. Neither island has for ages been in any sense a Norman land, and the tongue which the Norman brought with him into both has not for ages been spoken in either. Norman influence has been far stronger in England than in Sicily, and signs of Norman presence are far more easily recognized. But the Norman, as a distinct people, is as little to be seen in the one island as in the other. His disappearance in both cases is an illustration of one of the features which we have spoken of in the Norman character, the tendency which in fact made Normans out of Northmen, the tendency to adopt the language and manners of the people among whom they found themselves. But, as far as outward circumstances are concerned, we may say that the same effect has been brought about by different and almost opposite causes. The whole circumstances of the conquest of England constrained the conquerors to become Englishmen in order to establish themselves in the conquered land. In William's theory, the forcible conquest of England by strangers was an untoward accident. The lawful heir of the English crown was driven against his will to win his rights by force from outside. But he none the less held his crown as an English king succeeding according to English law. Moreover, every Norman to whom he granted lands and offices held them by English law in a much truer sense than the king held his; he was deemed to step into the exact position of his English predecessor, whatever that might be. This legal theory worked together with other causes to wipe out all practical distinction between the conquerors and the conquered in a wonderfully short time. By the end of the 12th century the Normans in England might fairly pass as Englishmen, and the island had largely adopted the use of the English language. The fashionable use of French for nearly two centuries longer was far more a French fashion than a Norman tradition. When the tradition of speaking French had all but died out, the practice was revived by fashion. Still the tradition had its effect. The fashion could hardly have taken root except in a land where the tradition had gone before it.

The Normans in England therefore became Englishmen, because there was an English nation into which they could be assimilated. In the Norman occupation of Sicily, on the contrary, there assuredly was no Sicilian nation for them to be absorbed into. While the Normans in England were lost among the people of the land, the Normans in Sicily were lost among their fellow-settlers in the land. The Normans who came into Sicily must have been much less purely Norman than the Normans who came into England. The army of Duke William was undoubtedly very far from being wholly made up of Normans, but it was a Norman army; the element which was not Norman, though considerable, was exceptional. But it happened that the conquerors of Sicily were Normans in more than merely being commanded by Norman leaders. They were almost as little entitled to be called pure Scandinavians as the Saracens whom they found in the island were entitled to be called pure Arabs. The conquest of England was made directly from Normandy, by the reigning duke, in a comparatively short time, while the conquest of Sicily grew out of the earlier and far more gradual conquest of Apulia and Calabria by private men. The Norman settlements at Aversa and Capua were the work of adventurers, making their own fortunes and gathering round them followers from all quarters. They fought simply for their own hands, and took what they could by the right of the stronger. They started with no such claim as Duke William put forth to justify his invasion of England; their only show of legal right was the papal grant of conquests that were already made. The conquest of Apulia, won bit by bit in many years of what we can only call freebooting, was not a national Norman enterprise like the conquest of England, and the settlement to which it led could not be a national Norman settlement in the same sense. The Sicilian enterprise had in some respects another character. By the time it began the freebooters had grown into princes. Sicily was won by a duke of Apulia and a count of Sicily. Still there was a wide difference between the duke of the Normans and the duke of Apulia, between an hereditary prince of a hundred and fifty years' standing and an adventurer who had carved out his duchy for himself. And, besides this, warfare in Sicily brought in higher motives and objects. Though crusades had not yet been preached, the strife with the Mussulman at once brought in the crusading element; to the Christian people of the island they were in many cases real deliverers; still, the actual process and gathering round them followers from all quarters by which Apulia had been won. Duke William was undisputed master of England at the end of five years; it took Count Roger thirty years to make himself undisputed master of Sicily. The one claimed an existing kingdom, and obtained full possession of it in a comparatively short time; the other formed for himself a dominion bit by bit, which rose to the rank of a kingdom

1 Roger de Hauteville, the conqueror of Sicily, was a brother of the first four dukes or counts of Apulia, and was invested with the countship of Sicily by the pope before starting on his adventure.
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in the next generation. When Count Roger at last found himself lord of the whole island, he found himself lord of men of various creeds and tongues, of whom his own Norman followers were but one class out of several. And the circumstances of his conquest were such that the true Normans among his following could not possibly lose themselves among the existing inhabitants of the island, while everything tended to make them lose themselves among their fellow-adventurers of other races, among whose Norman, the old conquer, which other elements gathered, they could hardly have been a dominant element.

As far as concerned the lands in which the settlements were made, the difference lay in this, that, as has already been said, while there was an English nation, there was no Sicilian nation. The characteristic point of Norman rule in Sicily is that it is the rule of princes who were foreign to all the inhabitants of the island, but who were not more foreign to the inhabitants of the island than different classes of them were to one another. The Norman conqueror found in Sicily a Christian and Greek-speaking people and a Mussulman and Arab-speaking people. The relations between the two differed widely in different parts of the island, according to the way in which the Saracens had become possessed of different towns and districts. In one place the Christians were in utter bondage, in another they were simply tributary; still, everywhere the Mussulman Saracen formed the ruling class, the Christian Greek formed the subject class. We speak of the Saracen very much as we speak of the Norman; for of the Mussulman masters of Sicily very many must have been only artificial Arabs, Africans who had adopted the creed, language and manners of Arabia. In each case the Arab or the Norman was in the centre of the island, and all the other elements gathered and which gave its character to the whole. Besides these two main races, Greek and Saracen, others came in through the Norman invasion itself. There were the conquerors themselves; there were the Italians, in Sicily known as Lombards, who followed in their wake; there were also the Jews, whom they may have found in the island, or who may have followed the Norman into Sicily, as they certainly followed him into England. The special character of Norman rule in Sicily was that all these various races flourished, each in its own fashion, each keeping its own creed, tongue and manners, under the protection of a common sovereign, who belonged to none of them but who did impartial justice to all. Such a state of things might seem degradation to the Mussulman, but it was deliverance to the native Christian, while to settlers of every kind from outside it was an opening such as they could hardly find elsewhere. But the growth of a united Sicilian nation was impossible; the usual style to express the inhabitants of the island is "omnes or universi Siciliae populi." In the end something like a Sicilian nation did arise; but it arose rather by the dying out of several of the elements in the country, the Norman element among them, than by any such fusion as took place in England. That is, as has been already said, the Norman as such has vanished in two different ways. In England the Norman duke came in as a foreign intruder, without a native supporter to establish his rule over a single nation in its own land. He could not profess to be, as the count of Sicily could honestly profess to be, a deliverer to a large part of the people of the land. But, coming in by a title which professed to be founded on English law, establishing his followers by grants which professed no less to be founded on English law, he planted a dynasty, and established a dominant order, which could not fail to become English. The Normans in England did not die out; they were merged in the existing nation. The Normans in Sicily, so far as they did not die out, were merged, not in a Sicilian nation, for that did not exist, but in the common mass of settlers of Latin speech and rite, as distinguished from the older inhabitants, Greek and Saracen. The Norman conquest of England was at the moment a blessing. But the gradual and indirect results of the Norman conquest of England are easily to be seen to this day, and they have been largely, though indirectly, results for good. Its chief result has been, not so much to create anything new as at once to modify and to strengthen what was old, to call up older institutions to a new life under other forms. But whatever it has done it has done silently; there has not been at any time any violent change of one set of institutions for another. In Sicily and southern Italy there is hardly any visible Norman influence, except the great historic fact which we may call the creation of Sicily and southern Italy in their modern sense. The coming of the Norman ruled that these lands should be no longer seen as part of a smaller Italy. Its name sent over to Sicily as northern Italy, but that they should politically belong to the same group of states as the kingdoms and principalities of feudal Europe. William assuredly did not create the kingdom of England; Roger assuredly did create the kingdom of Sicily. And yet, notwithstanding all this, and partly because of all this, real and distinct Norman influence has been far more extensive and far more abiding in England than it has been in Sicily.

In Sicily then the circumstances of the conquest led the Norman settlers to remain far more distinct from the older races of the land than they did in England, and in the end to lose themselves, not in those older races of the land, but in the settlers of other races who accompanied and followed them. So far as there ever was a Sicilian nation at all, it might be said to be called into being by the emperor-king Frederick II. In his day a Latin element finally triumphed; but it was not a Norman or French-speaking element of any kind. The speech of the Lombards at last got the better of Greek, Arabic and French; how far its ascendency could have been built on any survival of an earlier Latin speech which had lived on alongside of Greek and Arabic this is not the place to inquire.

The language and nomenclature of the Normans in the two countries forms a remarkable contrast, and illustrates the circumstances of the two as they have just been sketched. The chroniclers of the conquest of Apulia and the Norman conquest of the North of England are the followers of the conquerors from Hauteville. It was the natural name for a body of men who must, by the time the conquest of Sicily was over, have been mixed, but whose kernel was Norman, whose strength and feelings and traditions all came from a Norman source. But if we turn to Hugo Falcandus, the historian of Sicily in the 12th century, the Norman name is hardly found, unless when it is used historically to point out that in Normandy the Normans were the older. As a kind of middle name, was of Norman descent. Of the various "Sicilii populii," we hear of Greeks, Saracens, Lombards, sometimes of Franchi, for by that time the greater part of the settlers had been mixed with the Franchi and Frischi, and the Franchi had become of Norman descent. There is a distinction between Christians and Saracens; among Christians there seems to be again a distinction between Greeks and Latins, though perhaps without any distinct "Sicilii Franchi Latinii," and again a distinction between "Sicilii Lombardi" and "Franci"; but Normans, as a separate class, do not appear. In England there is no room for such subtleties. Virtually all of the people of England, and particularly the Normans, could say with the Norman and the French names to express the followers of William. In the English chronicles "French" is the only name used. It appears also in the Bayeux Tapestry, and it is the only word used when any legal distinction had to be drawn between classes of Englishmen. "Franci" and "Angli" are often opposed in Domesday and other documents, and the formula went on in charters long after all real distinction had passed away. That is to say, there were several words for what it is now a single word: "French" or "Francesi" and "French"—the last name taken in all the followers of the Conqueror; there were no purposes for which there was any need to distinguish Frenchmen from Norman, or Normans from people or from others who spoke the French tongue. We can see also that, though several languages were in use in England during the time of the Norman rule, yet England was not a land of many languages, in the same sense which Sicily was. In the 12th century three languages were certainly spoken in London; yet London could not call itself the "city of threefold speech," as Palermo did. English, French, Latin, were all in use in England; but the distinction was rather the "English tongue" or the "seven tongue" than that they were used by three distinct races or even classes. No doubt there was a class that knew only English; there may have been a better small body among the Normans, who had acquired a pretended to high cultivation would speak all as a matter of course; Bishop Gilbert Foliot, for instance, was eloquent in all three. But in Sicily we see the quite different phenomenon of three, four, five classes of men living side by side, each speaking his own name, speaking its own tongue. If a man of one people knew the speech of any of the others, he knew it strictly as a foreign language. Before the Norman Conquest England had two official tongues; documents
were drawn up sometimes in English, sometimes in Latin, now and then in both. And the same usage went on after the Conquest; the uncultured King's court became cultivated; and a widespread code of manners under the first Angevins, but it is in favour of Latin that it dies out. French, the language which the Normans brought with them, did not become an official language in England till after strictly Norman rule had passed away. French documents are unknown till the days of Richard the Lionheart. It was a fashion to keep in Latin, and it was not till then the fashion had come in, that is, till deep in the 13th century. So it was in Sicily also; of all the tongues of Sicily French was the most needful in daily life. Of the Normans' Latinized name of Norman, and vulgar, as the Normans did officialism acknowledge even French, much less Italian, as a fit tongue for solemn documents. In England, English, French, Latin, were the three tongues of a single nation; they were their vulgus, its courtly and its learned tongue, and so many of these was fast giving way to the vulgar. In Sicily, Greek, Arabic, Latin and its children were the tongues of distinct nations; French might be the polite tongue, the Norman could not be set down as a vulgar tongue, Arabic even less than Greek.

The different positions then which the conquering Norman took in his two great conquests of England and of Sicily amply illustrate the way in which he could adapt himself to any circumstances in which he found himself, the way in which he could adopt whatever suited his purpose in the institutions of any other people, the way in which he commonly lost his national being in that of some other people. From England, moreover, he spread into Scotland, Wales and Ireland, and in each land his settlement put on a somewhat different character, according to the circumstances. From England he took the Normans, or Normans of England, as he might be called, as a mere visitor, and oddly enough he came as a visitor along with those whom he had himself overcome in England. Both Normans and English came to Scotland in crowds in the days of Margaret, Edgar and David, and Scottish national feeling sometimes rose up against them. In Scotland again the Norman settlers were lost in the mixed nationality of the country, but not till they had modified many things in the same way in which they modified things in England. They gave Scotland nobles and even kings; Bruce and Balliol were both of the true Norman type of a conqueror; Bruce, it may be doubted, but he was of the stock of the Francigenae of the Wale.

Conquest. In Wales the Norman came as a conqueror, more strictly a conqueror than in England; he could not claim Welsh crowns or Welsh estates under any fiction of Welsh law. The Norman settler in Wales, therefore, did not to any perceptible extent become a Welshman; the existing relations of England and Wales were such that he in the end became an Englishman, but he seems not to have been the same in doing Wales as he was in England. At least Giraldus Cambrensis, the Norman Welshman or Welsh Norman that Giraldus was, was certainly more alive to the distinction between Normans and English than any other of his contemporaries.

Ireland. The Norman was more purely a conqueror than anywhere else; but in Ireland his power of adaptation caused him to sink in a way in which he sank nowhere else. While some of the Norman settlers in Ireland went to swell the mass of the English of the Pale, others threw in their lot with the native Irish, and became, in the well-known saying, *Hibernis ipsis Hibertis* (see e.g. the article Burc).

Norman architecture in England and in Sicily.

There is yet one point in which we may profitably go back to our comparison between England and Sicily. Both countries are rich in works of architecture raised during the time of Norman rule. And the buildings of both lands show an instructive light on the Norman national character, as we have seen. The Norman Conquest in England and the Norman Spanish Conquest in Sicily in any style of architecture which makes use of the arched construction, can be less like one another than the buildings of the Norman kings in England and the buildings of the Norman kings in Sicily. In Sicily the Normans found the two most outwardly civilized of the nations of Europe, the two which had as yet carried the arts to the highest pitch. The Roman Greek and Greek Roman had taught the column to bear the cupola; the Saracen had taught it to bear arches of his own favourite pointed shape. Out of these elements the Saracens of Sicily had made a style, grand, serious, and strong, as constructed, rich and graceful in its characteristic detail. With the Saracens and the Greek as his subjects, the Norman had really no need to build arches; he had had them in his blood; he could build basilicas and cupolas, he could work for him instead of for any other. The palaces and churches of the Norman kings at Palermo and Monreale and Cefalu and Messina are in style simply Saracenic; they were most likely the work of the Saracens and their Saracenic workmen. Models in these buildings, as in those of Aquitaine, the pointed arch is the surest sign of Saracenic influence; it must never be looked for in the structures of the conquerors. The only style of form of art the pointed style of Sicily has nothing in common. A Sicilian church has nothing in common with a French or an English church; it is sometimes purely Oriental, sometimes a basilica with Italy in its veins, etc. If we saw the Saracen, others, the Greek gave the mosaic decorations of its walls. In such a case the ruling people, rather the ruling dynasty, had really nothing to add to what they found ready for them. They had simply to make it their own. On the other hand, the Normans did really bring in a new style of their own, their own form of Romanesque, differing widely indeed from the Saracenic style which they found. The characteristics of the Saracenic style, such as the cupola, are to be found in the Lombard buildings of northern Italy. But it took firm root on Norman soil; it made its way to England and became the style of England at an early stage of its growth, and from that time it went on developing and improving. In both Sicily and England we find, as in the case by which, throughout northern Europe, the Romanesque styles came to the Gothic. Thus the history of architecture in England and in Sicily is one history; it is the history of the art in Sicily during the same time. There were no Greeks or Saracens in England; there was no Greek or Saracen skill. England indeed had, possibly in a somewhat ruder form, the earlier style of Romanesque once common to England with Italy, Gaul and Germany. To this style it is no wonder that the Normans preferred their own, and that style therefore supplanted the older one. A comparison of Norman buildings in England and in Normandy will show that there is a peculiar style of the Normans, a style by the earlier style of England; but the modification was so slight, and it in no way affected the general character of the style. Thus in England we have the style of Normandy with very considerable Norman modifications, the architecture of England in that century was Norman with a very slight English modification. The difference then is plain. Where, as in Sicily, the Normans felt that they could not improve, they simply adopted the style of the country. Where, as in England, they felt that they could improve, they substituted for the style of the country their style is that is, what is the style that the Normans had adopted, which they had made thoroughly their own, and which they went on improving in England no less than in Normandy. That is, the discerning Norman, as ever, adapted himself, but he did it himself in England, not in Normandy, and that style is in England which he found himself. And this comes out the more clearly if we compare Norman work in England and in Sicily with Norman work in at least some parts of Apulia. At Bari, Trani and Bitonto we see a style which Italian and strictly Norman elements are really mingled. The great churches of those cities are wholly unlike those of Sicily: but, while some features show us that we are in Italy, there are some slight, even if not even of the Saracen, others distinctly carry us away to Caen and Peterborough. It is plain that the Norman settlers in Apulia were not so deeply impressed with the local style as they were in Sicily, while they thought much more of it than they thought of the local style of England in each of the three cases there is adaptation, but the amount of adaptation differs in each case according to local circumstances. In Normandy itself, the Norman, as we have seen, was in a sense a foreigner; it is French of a remarkably good type. The buildings of the latest French style keep a certain purity and sobriety in Normandy which they do not keep elsewhere.

(F. A. F.)

For a bibliography of the Normans and Normandy see Ullman, Chevalier, Répertoire des sources hist. du moyen-âge. Topobibliogr. (Montbéliard, 1903), ii, 2140; also, for sources for the Norman invasion of France, Mollinier, Sources de l'hist. de France (Paris, 1901), 1, 593; the following notes on history of art have been taken by André Du Chesne in his Hist. Normannor scritptores antiqui. 858-1220, &c. (Paris, 1919). Of modern works may be mentioned Le Normandie by Edouard Martin, Die Normandie heute by Karl Kulturkampen im Mitteleller (Berlin, 1875); A. H. Johnson, The Normans in England (1877); E. A. Freeman, Hist. of the Norman Conquest (Oxford, 1867-1879) and Hist. of Sicily (1881-1884); E. Nalson, L'Architecture normande en Normandie, Short, Hist. of the Normans in S. Europe (London, 1886); A. F. von Schack, Gesch. der Normannen in Sicilien (Stuttgart, 1889); L. von Heinemann, Gesch. der Normannen in Unteritalien und Spanien (Leipzig, 1894); W. Vogel, Die Normannen und das
NORMANTON—NORRIS, JOHN

His son Henry regained some of his father's lands and entered upon court life, being a member of parliament under Edward V. When Mary's reign he was one of those who were in daily attendance with the duty of the princess Elizabeth, and when the princess became queen she amply repaid the kindness which Norris had shown to her when he was her guardian at Woodstock. In 1566 he was knighted and was sent as ambassador to France, where he remained until 1570, and in 1572 he was created Baron Norris of Rycote. He died in June 1601. By his wife Margaret (d. 1599), daughter of John, Lord Williams of Thame, Norris had six sons, all of whom distinguished themselves in the field. The Norris monument, with figures of Lord and Lady Norris and their six sons, is in St Andrew's Chapel in Westminster Abbey.

The eldest son, Sir William Norris, died in Ireland in December 1570, leaving a son Francis (1570-1623), who succeeded to his grandfather's barony and also to the estates of his uncle Sir Edward Norris. In 1611 Francis was created earl of Berkshire. He left no sons and the earldom became extinct, but the barony descended to his daughter Elizabeth (d. 1643), the wife of Edward Wray (d. 1658). Their daughter Bridget (1627-1657) married as his second wife Montagu Bertie, 2nd earl of Lindsey, and as her third marriage (1654-1659) became Baron Norris (or Norreys) in 1657, and in 1660 was made Duke of Grafton. His descendants the Berties, earls of Abingdon, still hold this barony, and are the present representatives of the family of Norris.

Sir Edward Norris (d. 1603), the 1st Lord Norris's third son, served with the English troops in the Netherlands from 1583 to 1588. He is chiefly remembered owing to his fierce quarrel with Philip, count of Hohenlohe (1550-1606), called Hollock by the English, in August 1586 at Gettrydenberg (see J. L. Motley, The United Netherlands, vol. ii.). In 1590 he sailed with his brother Sir John and Sir Francis Drake on the expedition to Spain and Portugal, and from 1590 to 1599 he was governor of Ostend.

Sir Thomas Norris (1556-1599), another son of the first lord, went as a soldier to Ireland in 1579 and acted for a few months as president of Connaught. He fought against the Fitzgeralds and also in Ulster; in 1583 he became vice-president of Munster, and in 1597 he succeeded his brother, Sir John Norris, as president. The three remaining brothers were: Sir Henry Norris (1554-1599), who fought in the Netherlands and then in Ireland, where he was killed in 1599. Sir Francis Norris (1563-1604), who was killed in Britain in 1599, and Sir John Norris (g.s.).

Two other members of another branch of this family remain to be mentioned, namely, Sir William Norris and his brother Sir John. Sir William Norris (c. 1657-1702), having been created a baronet, was sent some time to the strength of England. He came by the command to the ebxpedition in 1701. The embassy, however, was a total failure: Norris was unable to make terms, and he died on the voyage to England.

Sir John Norris (c. 1660-1749) entered the navy and saw a good deal of service during the war with France under William III. and Anne. Under George I. he was sent several times with a fleet into the Baltic Sea to forward the policy of this king by giving the Danes a victory. At the Russians at Parnawa in 1719 he became an admiral and commander-in-chief. Norris, who was known as "foul-weather Jack," was a member of parliament from 1708 until his death.

NORRIS, JOHN (1657-1721), English philosopher and divine, was born at Collingbourne-Kingston in Wiltshire. He was educated at Winchester and Exeter College, Oxford, being subsequently elected to a fellowship at Trinity Hall. His first important work was Idea of Happiness (1680), in which, with Plato, he places the highest happiness or fruition of the soul in the contemplative love of God. Malebranche's Recherche de la vérité, which had appeared in 1674, made a strong impression upon him. Malebranche, he says, "is indeed the great Galileo of the intellectual world." He had also studied the works of Descartes himself, and most of what had been written for and against Cartesianism. Of English thinkers, More and Cudworth,
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the so-called Cambridge Platonists, had influenced him most; and in 1685 his study of their works led to a correspondence with the former, published after his death by Norris as an appendix to his Platonically conceived essay on The Theory and Regulation of Love (1688). He also corresponded with Mrs Astell (q.v.) and Lady Masham, the friend of Locke, to whom he addressed his Reflections upon the Conduct of Human Life (1689). Some time before this Norris had taken orders, and in 1689 he was presented to the living of Newton St. Lo, in Somerset.

In 1690 he published a volume of Discourses upon the Beatitude, followed by three more volumes of Practical Discourses between 1690 and 1698. The year 1690 is memorable as the year of the publication of Locke's Essay, and the book came into Norris's hands just as his volume of Discourses was passing through the press. He at once appreciated its importance, but its whole temper was alien from the modes of thought in which he had been reared, and its main conclusions moved him to keen dissent. He hastened to "review" it in an appendix to his sermons. These Cursory Reflections constitute Norris the first critic of the Essay; and they anticipate some of the arguments that have since been persistently urged against Locke from the transcendental side. Though holding to the "grey-headed, venerable doctrine" of innate ideas as little as Locke himself, Norris finds the criticism in the first book of the Essay entirely inconclusive, and points out its inconsistency with Locke's own doctrine of evident or intuitively perceived truths. He also suggests the possibility of subconscious ideas, on which Leibnitz laid so much stress in the same connexion.

He next complains that Locke neglects to tell us "what kind of these ideas these are which are let in at the gate of the senses." In other words, while giving a metaphorical account of how we come by our ideas, Locke leaves unconsidered the intellectual nature of the ideas or of thought in itself. Unless we come to some conclusion on this point, Norris argues, we have little chance of being right in our theory of how ideas "come to be united to our mind." He also saw the weakness of Locke's doctrine of nominal essences, showing how it ignores the relation of the human mind to objective truth, and instancing mathematical figures as a case "where the nominal essence and the real essence are all one." The last twenty years of Norris's life were spent at Bemerton, near Salisbury, the former home of George Herbert, to the living of which he had been transferred in 1691. In 1691-1692 he was engaged in controversy with his old enemies the "Separatists," and with the Quakers, his Malebranchian theory of the divine illumination having been confounded by some with the Quaker doctrine of the light within.

In 1697 he wrote An Account of Reason and Religion, in which he maintained the"truth of all points of Christian doctrine," and that "Christianity not more Mysterious." Norris adopts the distinction between things contrary to reason and things above reason, and maintains that the human mind is not the measure of truth. Reason, according to him, is nothing but the exact measure of truth, that is to say, divine reason, which differs from human reason only in degree, not in nature. In 1701 appeared the first volume of the systematic philosophical work by which he is remembered, An Essay towards the Theory of the Ideal or Intelligible World. The first volume treats the intelligible world absolutely; the second, which appeared in 1704, contains it in relation to the human mind and to objective truth, and instancing mathematical figures as a complete exposition of the system of Malebranche, in which Norris refutes the assertions of Locke and the sensualists. In 1708 Norris wrote A Philosophical Discourse concerning the Natural Immortality of the Soul, defending that doctrine against the assaults of Dodwell. After this he wrote little. He died at Bemerton, and a monument was erected to his memory in the parish church, with an inscription in which he is spoken of as one who "bene latuit."

Norris was neither an original thinker nor a master of style. His philosophy is hardly more than an English version of Malebranche, enriched by wide reading of "Platonic" thinkers of every age and country. His style is too Scholastic and self-involved. His Theory of the Intelligible World is an attempt to explain the objective nature of truth, which he blamed Locke for leaving out of regard. By the intelligible world Norris understands the system of ideas eternally existing in the mind of God, according to which the material creation is fashioned. This is a commoner version of the Malebranchian theory that the second person of the Trinity, the light which lighteth every man that cometh into the world. For it is these ideas and their relations that are alone the object-matter of science; whenever we know, it is of them we attend. Material things, as he sees, are but dark to us, except so far as the fact of their existence is revealed in sensation. The matter which we see that we know is the idea of matter; what we believe is the idea of belief.

When stripped of its semi-mythical form of statement, Norris's empirical assertion of the ideal nature of thought and its complete distinction from sense as such may be seen to contain an important truth. As the disciple and correspondent of More, he is, in a sense, the heir of the Cambridge Platonists, while, as the first critic of Locke's Essay, he may be said to open the protest of the church to the independent tendencies of that work. He occupies a place, therefore, in the succession of philosophers and mystical thinkers of whom Copleston is the last eminent example.


NORRIS, SIR JOHN (c. 1547-1597), English soldier, was the second son of Henry Norris, Baron Norris of Rycote, and gained his earliest military experience in the civil wars in France. In 1573 he went to Ulster with Walter Devereux, earl of Essex, winning fame by his conduct in the guerilla wars against the Irish, and being responsible for the massacre on the island of Rathlin in July 1575; and in July 1577 he crossed over to the Netherlands to assist the Dutch against the Spaniards.

Having added to his reputation by his valour at the battle of Rymenant, Norris, who in 1576 had been created viscount of Ulster, and in July he was sent to Ireland as lord president of Munster; he accompanied the lord deputy, Sir John Perrot, on a campaign in Ulster, and spoke eloquently in the Irish parliament; but he disliked his work and soon obtained his recall. In August 1585 he was again in the Netherlands, commanding the English army of 4,400 men which Elizabeth had sent to serve against the Spaniards. During his successful relief of Grave in April 1586 he was wounded, and just after this event he was knighted by the governor-general, the earl of Leicester; but he and Leicester were soon at variance, and many complaints of his conduct were sent to England. After taking part in the battle of Zutphen in October 1586 Sir John was recalled to England, but in 1587 he went again to the Netherlands and was soon quarrelling with his new superior, Peregrine Bertie, Lord Wilsoughby de Eresby, and with Sir William Stanley. In 1588, when the Spanish Armada was expected, he was marshal of the camp at Tilbury; later in the same year he served the queen as ambassador to the Dutch states, and in 1590 he and Sir Francis Drake led the fleet which ravaged the coasts of Spain and Portugal. In 1591, and again in 1593, he aided Henry IV. of France in his struggle with the League in Britain; and in May 1595 he landed again in Ireland, where he was still lord president of Munster. But this time he was entrusted with more extensive powers and was to assist the lord deputy, Sir William Russell, in subjugating Ulster. He did not, however, work harmoniously with Russell; his health was failing and the gigantic task was too much for him. After fighting and negotiating with the O'Neills in Ulster, and warning in Connaught, he asked for his recall. This was not granted, but he was supplied in his military command; and he retired to Munster and died at Millow on the 3rd of July 1597. His monument is in the church of Tattenham, Berkshire.


NORRIS, WILLIAM EDWARD (1837— ), English novelist, was born on the 18th of November 1847, the son of W. Norris, chief justice of Ceylon. He was educated at Eton, and called to the bar at the Inner Temple in 1874. His first story, Heaps up Heaps, appeared in 1871, and was followed by a long series of novels, many of which first appeared in the Temple Bar and Cornhill magazines. The best of his numerous novels are Mademoiselle de Mersac (1880), Matrimony (1881), No New
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Thing (1883), My Friend Jim (1886), The Rogue (1888), The Despoit Lady (1895), Matthew Austin (1895), The Widower (1898), Nature's Comedian (1904), Pauline (1906).

NORRISTOWN, the borough and the county-seat of Montgomery county, Pennsylvania, U.S.A., on the Schuylkill river, at the mouth of Stony Creek, opposite Bridgeport, and about 18 m. N.W. of Philadelphia. Pop. (1910 census) 27,875.

Norrinston is served by the Pennsylvania, the Philadelphia & Reading and the Stony Creek railways, by interurban electric railway to Philadelphia and Reading, and by the Schuylkill canal, and is connected by bridge with the borough of Bridgeport (pop. in 1910, 3860), where woollen and cotton goods are manufactured. Norristown is a residential suburb of Philadelphia, and commands fine views of the Schuylkill Valley. It has a State Hospital for the Insane (opened 1880), a fine County Court House, a general hospital, a Friends' Home, a home for aged women, St Joseph's Protectory (Roman Catholic) for girls, and the Norristown and McCann public libraries; in Montgomery cemetery are the tombs of General Winfield Scott Hancock and General John Frederick Hartranft (1830-1889), a distinguished Federal officer in the Civil War and governor of Pennsylvania in 1873-1879. Valley Forge is less than 6 m. distant to the W. The borough has a large trade with the surrounding country, which is supplied with goods to agriculture and abounds in limestone. Among Norristown's manufactures are hosiery and woollen goods; in 1905 its total factory product was valued at $5,025,243, an increase of 44.5% over the value in 1900.

Norrinston was founded in 1785, and was named in honour of Isaac Norris (c. 1671-1733), a friend of William Penn and a member of the Pennsylvania legislature, who had owned the land on which the borough is built. Norristown was incorporated as a borough in 1812, and its boundaries were extended in 1853.

Norrköping, a town and port of Sweden, in the district (län) of Östergötland, 113 m. S.W. of Stockholm by the Mälardal railway. Pop. (1880) 26,735; (1900) 41,508. It occupies both banks of the Motala, the wide and rapid emisary of lake Vättern, close to its outlet in the Bräviken, an inlet of the Baltic. Having been burned by the Russians in 1719 and visited by further fires in 1812, 1822 and 1826, the whole town has a modern appearance, with wide and regular streets. Among the more conspicuous buildings are St Olaf's church (erected by Gustavus Adolphus in 1616 and rebuilt in 1767-1767); St Hedvig's, built by the German colony in 1670; the town hall, dating from the beginning of the 18th century; the central school, with science rooms and technical and weaving schools. Norrköping is the fourth town in population and industrial importance in Sweden. The falls in the river afford motive power to the cloth and cotton mills (spinning and weaving)—the staple industries—and 10 factories for sugar, paper, lithography, tobacco and carpenters, joinery works and breweries. There are also shipbuilding yards and docks. Fine granite is quarried at Graafverso, 7½ m. N. The inlet of Bräviken affords excellent harbour accommodation, with from 33 ft. to 17½ ft. of water below the bridges in the town. The town returns two members to the second chamber of the Riksdag (parliament).

A bull of Pope Lucius III. shows that Norrköping existed in 1185. At the meeting of the states in 1604 Duke Charles assumed the Swedish crown as Charles IX.; and not long afterwards Duke John of Östergötland introduced German craftsmen into Norrköping, and thus originated its industrial activity. Under Charles XII. the town suffered not only from war but from pestilence, 2700 of its inhabitants perishing in 1710-1711. After the Russian invasion of 1710 the population was only 1000.

NORTH, BARONS. The English title of Lord North of Kirktling was created for Edward North (c. 1496-1564), son of Roger North, a London citizen, in 1554; he was a successful lawyer, clerk of the parliament (1531) and chancellor of the court of augmentations (1545). His second son was Sir Thomas North (q.v.), and he was succeeded as 2nd baron by his son Roger (1530-1600), a prominent courtier and soldier of Queen Elizabeth's day, who married the daughter of Lord Chancellor Rich, and whose eldest son, Sir John (c. 1551-1597), predeceased him. Dudley North, 3rd Baron North (1581-1660), son of Sir John North and of Dorothy, daughter and heiress of St. Valentine Dale, was born in 1581 and succeeded his grandfather, the 2nd Baron North, at the age of nineteen. He was educated at Cambridge, and married in 1599 Frances, daughter of Sir John Brockett of Brockett Hall in Hertfordshire. He travelled in Italy, took part in the campaign of 1602 in the Netherlands, and on his return became a conspicuous figure at court, excelling in athletic exercises as well as in poetry and music, and gaining the friendship of Prince Henry. In 1606, while returning from Eridge to London, he discovered the springs of Tunbridge Wells, which cured North himself of a complaint and quickly became famous. He also recommended the Epsom springs to the public. He supported and subscribed to the expedition to Guiana made by his brother Roger North (c. 1582-c. 1653) in 1610, and when Roger departed without leave Dudley was imprisoned for two days in the Fleet. In 1626 he attached himself to the party of Lord Saye and Sele in the Lords, who were in sympathy with the aims of the Commons; and when the civil war broke out he was on the side of the parliament. In 1641 he was a member of the Lords' committee on Religion, and served on the committee to consider the king's attainder. In 1644, finally voting for the ordinance in January 1645. He was placed on the admiralty commission in 1645, and acted as lord lieutenant for Cambridgeshire. He was one of the small group of Lords who continued attendance in the House of Peers, and on the 19th of December 1648, with three others, visited Fairfax, when they "cast down their honours at his Excellency's feet " and protested their desire not to retain any privileges prejudicial to the public interest.¹ He passed the rest of his life in retirement at Kirktling in Cambridgeshire, with his sons, daughters and grandchildren, finding employment with many airy entertainments as poetry, writing essays, building and designing villas and making paintings as his business.° He wrote A Forest of Varieties (1649), a miscellany of essays and poems, another edition of which was published in 1659 under the title of A Forest promiscuous of various Seasons' Productions. He died on the 16th of January 1666. North is described as "full of spirit and flame," of imperious temper but of well-balanced judgment, Lord Holland declaring that "he knew no man less swayed with passion and sooner carried with reason and justice." He left, besides one daughter, two sons, the elder of whom, Sir Dudley, succeeded him as 4th Baron North.

The eldest son, Charles (d. 1601), was created Lord Grey of Rolleston during his father's life, and succeeded his father as 5th Baron North; and on the death of his son, William, 6th Lord North, without issue, in 1734, the barony of North went to a cousin, Francis North, 3rd. Baron, afterwards 1st earl of Guilford. The title of Lord North is that by which the 2nd earl of Guilford, prime minister from 1770 to 1782, is best known in history (see Guilford, Barons and Earls of). George Augustus, 3rd earl of Guilford (d. 1802), left three daughters, and the barony of North fell into abeyance till 1847 when it vested in Susan, Baroness North (1797-1864), wife of John Hope, 2nd Viscount Lyndhurst. Her eldest son, Lord Hope, took the name of North when his step-grandfather died in 1882, and her death son William Henry John North (b. 1836) succeeded as 11th baron, the title now being separate from that of Guilford.

NORTH, SIR DUDLEY (1641-1691), English economist, was 4th son of Dudley, 4th Lord North, who published, besides other things, Passages relating to the Long Parliament, 1 Gardiner's Civil War, iv 285. ² Roger North's Autobiography, ed. by A. Jessop, 68.
of which he had himself been a member. He was born on the
16th of May 1641. In his early years he was carried off by
gipsies and recovered with some difficulty by his family—an
incident curiously similar to that which befell Adam Smith in
his infancy. He engaged in foreign trade, especially with
Turkey, and spent a number of years at Constantinople and
Smyrna. Some notices of the manners and customs of the east
were printed from his papers by his brother. Having returned
to London with a considerable fortune, he continued to prosecute
trade with the Levant. His ability and knowledge of commerce
attracted the attention of the government, and he was further
recommending himself by the influence of his brother Lord Guilford.
Duke of Buckingham, under Charles II. he was one of the
sheriffs forced on the city of London with an express view to
securing verdicts for the crown in state trials. He was knighted
and was appointed a commissioner of customs, afterwards of
the treasury, and again of the customs. Having been elected
a member of parliament under James II., “he took,” says
Roger North, “the place of manager for the crown in all matters
of revenue.” After the Revolution he was called to account
for his alleged unconstitutional proceedings in his office of
sheriff. He died on the 31st of December 1691.
His tract entitled Discourses upon Trade, principally directed
to the case of the interest, quantity, elhfection and increase of money
was published anonymously in 1691, and was edited in 1856 by
J. R. M'Culloch in the Select Collection of Early English Tracts
on Commerce printed by the Political Economy Club of London.
In this thorough-going and emphatic assertion of the free-trade
doctrines against the system of prohibitions which had gained
strength by the Revolution, North shows that wealth may
exist independently of gold or silver, its source being human
industry, applied either to the cultivation of the soil or to
manufactures. It is a miracle to suppose that stagnation of
trade arises from want of money; it must arise either from a
glut of the home market, or from a disturbance of foreign
ccommerce, or from diminished consumption caused by poverty.
The export of money in the course of traffic, instead of diminishing,
increases the national wealth, trade being only an exchange
of superfluities. Nations are related to the world just in the
same way as cities to the state or as families to the city. North
emphasizes more than his predecessors the value of the home
trade. With respect to the interest of capital, he maintains that
it depends, like the price of any commodity, on the proportion
of productive to the capital; that the relative increase of capital, and
cannot be brought about by arbitrary regulations, as had been proposed by Sir Josiah Child
and others. In arguing the question of free trade, he urges that
every advantage given to one interest over another is injurious to
the public. No trade is unprofitable to the public; if it
were, it would be given up; when trades thrive, so does the public,
of which they form a part. Prices must determine themselves,
and cannot be fixed by law; and all forcible interference
with them does harm instead of good. No people can
become rich by state regulations,—only by peace, industry,
freedom and unimpeded economic activity. It will be seen
how closely North’s view of things approach to that embodied
some eighty years later in Adam Smith’s great work. North
is named by Wilhelm Roscher as one of that “great triumvirate”
which in the 17th century raised the English school of economists
to the foremost place in Europe, the other members of the
group being Locke and Petty.

NORTH, MARIANNE (1830-1890), English naturalist and
flower-painter, was born at Hastings on the 24th of October 1830,
the eldest daughter of a Norfolk baronet, Sir John North (1817-1893).
She trained as a vocalist under Madame Sainton Dolby, but her voice failed, and she then devoted
herself to painting flowers. After the death of her mother in
1855 she constantly travelled with her father, who was then
member of parliament for Hastings; and on his death in 1869
she resolved to realize her early ambition of painting the flora
distant countries. In 1871-1872 with this object she went
Canada, the United States and Japan, and spent a year
in Brazil, where she did much of her work at a hut in the depths
of a forest. In 1875, after a few months at Tenerife, she
began a journey round the world, and for the two years was occupied in
painting the flora of California, Japan, Borneo, Java and Ceylon.
The year 1878 she spent in India, and after her return she
exhibited a number of her drawings in London. Her subsequent
offer to present the collection to the botanical gardens at Kew,
and to erect a gallery for their reception, was accepted, and the
new buildings, designed by James Ferguson, were begun in
the same year. At Darwin’s suggestion she went to Australia in
1880, and for a year painted there and in New Zealand.
Her gallery at Kew was opened in 1882. In 1883, after a visit by
her to South Africa, an additional room was opened at the Kew
gallery, and in 1884-1885 she worked at Seychelles and in Chile.
Miss North died at Alderly in Cheshire on the 30th of August
1890. The scientific accuracy with which she represented plant
life in all parts of the world gives her work a permanent value.

NORTH, ROGER (1653-1734), English lawyer and biographer,
was the sixth son of the 4th Baron North. He acquired a good
practice at the bar, being helped by his elder brother Francis,
who became lord chancellor and was created Baron Guilford
(elder brothers), and in 1684 he became solicitor-general. But the Revolution
stopped his advancement, and he retired to his estate of
Northamptonshire, where he was a vigorous supporter of
the daughter of Sir Robert Gayer. He collected books, and
was constantly occupied in writing. But he is best known
for his Lives of the Norths, published after his death, together
with his own autobiography (see the edition in Bohn’s Standard
Library, 1890, by Jessopp), a classic authority for the period.
He died at Rougham on the 1st of March 1734, leaving a family
from whom the Norths of Rougham are descended.

He is to be distinguished from Roger North (1588-1652), brother of the 3rd baron, one of the captains who sailed with Raleigh in 1617
and marrying the daughter of Sir Robert Gayer. He collected books, and
was constantly occupied in writing. But he is best known
for his Lives of the Norths, published after his death, together
with his own autobiography (see the edition in Bohn’s Standard
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from whom the Norths of Rougham are descended.

NORTH, SIR THOMAS (1552?-1601?), English translator
of Plutarch, second son of the 1st Baron North, was born about
1553. He is supposed to have been a student of Peterhouse,
Cambridge, and was entered at Lincoln’s Inn in 1575. In
1574 he accompanied his brother, Lord North, on a visit to the French
court. He served as captain in the year of the Armada, and was
knighted about three years later. His name is on the roll of
justices of the peace for Cambridge in 1592 and again in 1597,
and he received a small pension (240 a year) from the queen
in 1603. His Plutarch was published in 1663, with a supplement of other translated biographies.
He translated, in 1552, Guevara’s Reloj de Principes (commonly
known as Libro Aureo), a compendium of moral counsels
chiefly compiled from the Meditations of Marcus Aurelius, under
the title of Diial de Princes. The English of this work is one of the
earliest specimens of the ornate, copious and pointed style
for which educated young Englishmen had acquired a taste
in their Continental travels and studies. North translated from a French
copy of Guevara, but seems to have been well acquainted with the
Spanish version. The book had already been translated
by Lord Berners, but without reproducing the theatrical
artides of the original. North’s version, with its mannerisms
and its constant use of antithesis, set the fashion which was to culminate
in Lyly’s Euphues. His next work was The Morall Philosophie
de Doni (1570), a translation of an Italian collection of eastern
fables. The first edition of his translation of Plutarch, from the
French of Jacques Amyot, appeared in 1570. The first edition
was dedicated to Queen Elizabeth, and was followed by other editions
in 1595 and 1603, containing in each case fresh Lives.
If it is one of the most impressive works of North, I have no
of North. His vigorous English on contemporary writers, and some critics have called
him the first master of English prose. The book formed
the source from which Shakespeare drew the materials for his
Julius Caesar, Coriolanus and Antony
and Cleopatra. It is in
the last-named play that he follows the Lives most closely,
whole speeches being taken direct from North.

North’s Plutarch was reprinted for the “Tudor Translations”
(1893), with an introduction by George Wyndham.
NORTH ADAMS, a city of Berkshire county, Massachusetts, U.S.A., situated at the junction of the N. and S. branches of the Hoosac river, and the Boston & Maine (at the W. terminus of the Hoosac Tunnel) and the Boston & Albany railroads, in the extreme N.W. part of the state. Pop. (1905) 22,150; (1910) 22,019. Area, 109 sq. m. In the city are the villages of North Adams, Greylock and Blackinton. Within the city limits are a natural bridge across Hudson Brook, 50-60 ft. high, and ruins of Fort Massachusetts, which was captured in 1746 by French and Indians under the command of Pierre Le Moyne, Sieur d'Iberville, and the Riggs Family. North Adams is the seat of a state Normal School (1897). Among its manufactures are cotton (especially print) and woolen goods, and boots and shoes. In 1900 the factory products of the city were valued at $10,741,495, and in 1905 at $8,035,705. North Adams secured incorporation as an independent township in 1878. Township government was abandoned and city government was organized in 1865; in 1900 part of Williamstown was annexed.

NORTHALLERTON, a market town in the Richmond parliamentary division of the North Riding of Yorkshire, England, 30 m. N.W. from York by the railway. It is situated in a hollow, which is a small plain, with an irregular outline, and with a small stream flowing through it. The town consists of a considerable agricultural trade, and there are motor-engineering works. In the neighbourhood of Northallerton is the priory of Mount Grace, a Carthusian foundation of 1397. It consists of an outer court entered through a gatehouse, the church and chapter-house, with other buildings lying on the north side, partly surrounded by monastic dwelling-houses. These houses, with gardens attached, also surround three sides of the cloister court, which lies north of the outer court. In the vicinity are a monks' well and a ruined chapel of the 16th century.

Northallerton (Alvetune, Allerton) is said to have been a Roman station and afterwards a Saxon "burg," but nothing is known with certainty about it before the account given in the Domesday Survey, which shows that before the Conquest Earl Edwin had held the manor, but that the Normans had destroyed it so utterly that it was still waste in 1086. Soon after his accession William Rufus gave it to the bishop of Durham, whose successors continued to hold it until it was taken over by the ecclesiastical commissioners in 1865. As a borough by prescription Northallerton returned two members to the parliament of 1298, but was not represented again until 1640, when its ancient privileges were restored. The Municipal Reform Act of 1832 reduced the number of members to one, and in 1885 the town was disfranchised. The first account of the borough and its privileges is contained in an inquisition taken in 1333 after the death of Anthony, bishop of Durham, which shows that the burgesses held the town with the markets and fairs at a fee-farm rent of 40 marks yearly, and that they had two reeves who sat in court with the bishop's bailiff to hear the disputes of the townspeople. This form of government continued until 1851, when a local board was formed, which in 1894 was superseded by an urban district council. A weekly market on Wednesday was granted by King John to the bishop in 1205. A subsequent bishop obtained a grant of a fair on St Bartholomew's day, which according to Camden (circa 1585), had become almost "the most thronged" cattle fair in England, but is no longer held. In 1317 the town was burnt by the Scots under Robert Bruce, although the burgesses paid 3000 marks that it might be spared. In consequence they were exempted from taxes in 1319.

See Victoria County History, Yorkshire; C. J. D. Ingledew, The History and Antiquities of Northallerton in the County of York (1858); J. L. Saywell, The History and Annals of Northallerton (1885).

NORTH AMERICA. In the article AMERICA a brief geographical survey is taken of the two continents which bear this name; and their points of similarity and contrast are broadly indicated. When North America is compared with the northern continents of the Old World, an important correspondence is found between it and the greater part of Eurasia; but here the corresponding parts are reversed, right and left, like the two hands. The Laurentian highlands agree with Scandinavia and Finland, both having a great deal of water, and large stretches of water bodies (the Great lakes in North America; the southern Baltic, with Onega, Ladoga, &c. in Europe) occupy depressions that are associated with the boundary between the very ancient lands and their less ancient covering strata. The old worn-down and re-elevated Appalachian mountains of south-eastern North America agree well with the Hercynian mountains of similar history in middle Europe (Ardenne, Slate mountains of the middle Rhine, &c.), each range entering the sea at its Atlantic end (in Nova Scotia and Newfoundland; in Brittany, Wales and Cornwall), and dipping under younger formations at its inland end. Certain younger ranges are dimly recognized as mountains because they are mostly submerged in the American mediterra-
neanies (Gulf of Mexico and Caribbean Sea), but of great absolute relief and with crests rising in the larger West Indian islands—may be compared with the younger ranges of southern Europe (Pyrenees, Alps, Caucasus) bordering the classic Mediterranean and the seas farther east. The central plains of North America correspond well with the plains of Russia and western Siberia; both stretch from great enclosed water bodies on the south to the Arctic Ocean, and both are built of undisturbed Palaeozoic strata toward the axis of symmetry and of younger strata away from it. Finally, the Western highlands of North America may be compared with the great mountain complex of central and eastern Asia. In this remarkable succession of resemblances we find one of the best proofs of the continental unity of Eurasia. Moreover, the resemblances thus described controvert the idea, prevalent when geology was less advanced than to-day, that the New World of civilized discovery is an "old world" geologically, and that the Old World of history is geologically "new." Both worlds are so old, and both share so well the effects of successive climatic changes, that neither can regard the other as older or younger than itself.

There are several climatic similarities between North America and Eurasia. The Appalachians and the Hercynian mountains of middle Europe both contain extensive coal deposits of similar geological age, thus indicating a climatic and geographic resemblance at a time of great antiquity. The Laurentian highlands and the Scandinavian highlands were both heavily and repeatedly glaciated in recent geological times, and the ice sheets that crept out on all sides from those centres spread far over the lower lands to the south and away from the axis of symmetry towards the continental interior, scouring the highlands and leaving them rocky and barren, stirring extensive drift deposits over the peripheral areas, and thus significantly modifying their form and drainage; while the much loftier mountain ranges of western America and central Asia suffered, singularly enough, a far less extensive glaciation. At the present time, the plentiful and well-distributed rainfall of the continental border on either side of the Atlantic is succeeded by an increasing aridity towards the continental interior, until the broad plains towards the distant mountain complexes are comparatively barren or even desert. Within each greater mountain area extensive interior drainage basins are found holding salt lakes, and the recently determined former extension of these lakes in Central Asia agrees with the well-proved extension of Pleistocene lacustrine conditions in western North America.

The following sketch of the geological development of North America considers the larger physiographic divisions already indicated.

The extensive area of ancient crystalline rocks (Archean), stretching from Labrador past Hudson Bay to the Arctic Ocean, is of greatly disordered structure, and hence must have once had a
mountainous form. Moreover, the crystalline texture and deformed foliation of the crust that is but a few miles deep beneath the surface of an earlier time, for only at great depths can such texture and foliation be acquired. Both these lines of evidence lead to the conclusion that the whole of the Laurentian system is the result of a long period of erosion and dissection which has cut into the Palaeozoic and Mesozoic cover of the region. All the work of persisting erosion during a long continuance of dry land conditions, and hence that the region must be regarded as a worn-down mountain system. The worn-down old land is generally over lying relatively high points, and the lowest points, being more subject to the processes of erosion, have been most completely denuded of the Palaeozoic cover. This province must, however, be set aside from the undisturbed Laurentian region because of the repeated disturbances which have taken place. The oldest fossils found in the rocks of the region have been assigned to the pre-Cambrian system.

The earliest important mountain-making disturbances interrupted the conditions of deposition in Cambrian time, and produced what has been called the Green Mountain system. A later, and probably greater, disturbance, with its climax at the close of Carboniferous time, established the Appalachian Mountain system; but, as understood to-day, the "Appalachian revolution" of the older geologists is not, through the earlier epochs of the system, from the period of Cambrian time, the last important mountain-making disturbances occurred in the Mesozoic era, and produced the Appalachian Mountain system of to-day. The Appalachian mountains of to-day are chiefly the result of the Tertiary elevation and dissection of the previously worn-down mass—the additional height thus gained in Tertiary time to the pre-existent subdued mountain groups making them now the loftiest areas of the range, as in the White Mountains of New Hampshire (Mount Washington, 6293 ft.) and the Black Mountains of North Carolina (Mount Mitchell, 6711 ft.), which are the remains of the old Appalachian system, and which are nearly parallel to and closely associated with the axes of the earlier disturbances, but it lies somewhat to the north-west of its predecessors, and therefore involves considerable areas of flat-lying strata on the side of the previously disturbed belt from New York to Alabama, thus producing what is known as the Allegheny plateau (altitudes, 2000 to 4000 ft.). It should be added that the Ozark plateau of Missouri and the Ouachita mountains on the south, in Arkansas and farther west, are related to one another in much the same way as the Allegheny plateau and the middle ranges of the Appalachians—the two pairs corresponding to a condition of the earth's crust when the pre-Cambrian sea which once covered the continent had been more or less completely removed. The Tertiary movement of land was a long-lasting process, perhaps intermediate as long as the whole of Carboniferous time. A subordinate period of deposition and deformation occurred early in the Mesozoic time, marked by the accumulation and disturbance of several basins of Newark formation, roughly corresponding to the Triassic of Europe.

The Appalachians themselves were formed along the continent, beginning with the pre-Cambrian sea, which in the region of the modern New England coast was at that time probably a shallow warm sea, as indicated by the presence of coral reefs in the rocks of the region. As the coastline was carried northwards, the climate became colder, the sea was submerged beneath a conglomeration of various sediments, and finally the climate became cold enough to permit the development of the great glaciers of the Pleistocene period. The glaciers were large and moved slowly, and as they retreated they left behind them a great number of glacial landforms, such as drumlins, eskers, and till sheets. The Appalachians were uplifted during this period, and the resulting mountains were scoured and worn away by the action of the glacial ice. The resulting landscape is characterized by a number of large mountain ranges, such as the Appalachian Highlands and the Allegheny Plateau. These mountains are separated by valleys, such as the Great Valley of Virginia, which were formed during the erosion of the glacial deposits.

The Appalachians are a long and complex mountain range, stretching from Newfoundland to Alabama, and from the east coast to the interior of the United States. They are one of the oldest mountain systems in the world, and their history is a rich tapestry of geologic events. The region is rich in natural resources, including coal, iron ore, and timber, and it has been an important center of economic activity for centuries. The region is also home to a diverse range of flora and fauna, including species that are found nowhere else in the world. The Appalachian Mountains are a place of natural beauty and mystery, and they continue to fascinate and inspire people to this day.
sometimes styled the Cordilleras of North America (the Rocky Mountains being the eastern member of the system in the United States and Canada), differ from the Laurentian and Appalachian ranges in their much more regular mountain direction; there are no great undulations, nor are there any mountain ranges running at right angles to the main range. In other words, the Rocky Mountains are not a range of mountains in the middle of a great upland, but a great upland bounded on three sides by mountain chains. The upper ranges of the upper levels of the great upland thus become mountain chains, and the chief mountain uplands are really great mountain chains.

The Cordilleras of North America are, as is well known, the most peculiarly mountainous regions of the world. Lower mountain ranges, having been denuded of their upper portions, leave high, intricately dissected areas, having sharp ridges and narrow valleys. The mass of the ranges is elevated in an undulating manner, with the result that the region is divided into many smaller areas, each more or less isolated. The result is a great variety of relief and a great diversity of climate, the result being a diverse flora and fauna.

Furthermore, the Cordilleras of North America are a mountain chain of great length, running from Alaska to Mexico, and having a width of about 600 miles at its greatest extent. The mountains, as we have seen, are elevated in an undulating manner, and the result is a great variety of climate and a great diversity of flora and fauna.

In conclusion, the Cordilleras of North America are a mountain chain of great length, running from Alaska to Mexico, and having a width of about 600 miles at its greatest extent. The mountains, as we have seen, are elevated in an undulating manner, and the result is a great variety of climate and a great diversity of flora and fauna.
the eastern and the western areas have been extensively demuded, even to the point of being reduced to peninsulas. Their present altitude has been reduced by the sea to the level of 200 fathoms, to which elevation, they are now considered to be as a later elevation movement. The great river basins, for which North America is famous, have thus been formed between this and the eastern range, and the drainage of a vast area (about 1,240,000 sq. m.) for discharge to the south, while the Saskatchewan and Mackenzie gather their waters from somewhat less extensive areas in the north. Pleistocene glaciers and ice caps partially covered the eastern half of North America and the Drainage basins of the Atlantic, portions of the Gulf and of the Pacific, Winnipeg districts with extensive deposits of ice-land or water-lake drift, furnishing a generally smooth surface and a fertile soil: here and there as in some other cases.

The traditional continuity of the Cordilleras of North and South America has been broken by investigations in the isthmian portion of the northern continent. The structural peculiarities of the Basin and Range in the Great Basin, where it extends only to the east and west belt of great volcanoes by which the plateau of central Mexico is terminated on the south. The ranges of the Andes fail to reach Panama, and the Atro is a long island separating the Atlantic, and favourable to the growth of corals along the shores. Fringing and elevated reefs are known on many of the islands. The Bahamas are the slightly overlapping parts of a broad platform of coral and other calcareous marine deposits, of which the greater area constitutes extensive shallow banks which, rising by a steep slope, on the north-east to great depths in the Atlantic. The lownands of Yucatan resemble Florida in being the emerged part of a much larger area, of which an equal portion is still under water in the shelf around the Gulf of Mexico. All this region is luxuriantly productive and is admirably supplied with water by rivers which would be desert, like the Sahara, if replaced by lowlands.

The active volcanoes on the Pacific slope have built many cones and uplands, and some of their historic eruptions have been of terrible violence. Thus Lake Nicaragua, 90 miles in length and 85 in breadth, was drained and the island of Ometepe, one of the largest composed of volcanic debris, is now an island, and the body of the lake is a mere shallow depression, with a diameter of 8 to 9 miles. Gulf of Fonseca extends to the western ocean, raising the level of the lake behind the barrier and turning its discharge eastward to the Caribbean Sea across what was once the interoceanic isthmus.

The successive crustal movements by which the land area of what we now know as North America has been increased and connected through which the broader part of the continent is drained. The movements that resulted in the emergence of the Plains had the effect of engraving many ancient rivers of moderate size upon trunks of unusual dimensions. The Mississippi system, some of whose eastern branches probably date from early Mesozoic time, received great reinforcements by the addition of many long western branches in early tectonic time, roughly contemporaneous with the uplift of the Rocky Mountains, and the Gulf of Mexico, the river of the Gulf of Mexico, has been extended to the sea. The present headwaters of this river-trunk to which the name of Mississippi is applied, and which for that reason have gained an undue subjective importance, are of relatively modern date, as they are controlled by the aboriginal glacial deposits of northern Minnesota. The evolution of the Mackenzie resembles that of the Mississippi in a very general way, although some of its eastern branches are highly reduced in volume on account of its course through the Great Slave Lake, a colder climate, under a greater intervals, discharge, and overflows recur every spring. The Nelson and the St Lawrence systems, draining eastward to Hudson Bay and St Lawrence Gulf, receive drainage from a large area of the western United States, bisected by the Cordillera system under a simpler plan of continental growth; and there is much reason for thinking that this simpler plan obtained until the occurrence of those changes, in association with the Glacial period, whereby sea waters gained access to the depressions that now hold the bays and sounds of the north-eastern coast. In exemplification of the rule that the larger ocean receives the drainage of the smaller, the continental area, the rivers that flow into the Gulf of Mexico below those belonging to the Atlantic. The greatest is the Yukon, of farther Canada and inner Alaska, one of the great rivers of the eastern United States, drains a vast area of the basin for fields.

The Fraser drains much of the mountainous area of southern British Columbia, as the Columbia drains that of the north-western United States; the latter is peculiar in that one of its headwaters rises at the eastern limits of the Rocky Mountains, enters the Columbia, and flows westward through the ranges. The Colorado discharges a muddy current into the Gulf of California; but for the aridity of the drainage area its volume would be much larger. This is true of the Rio Grande, and there it would be better justified if so much of its basin were not semi-arid.

The most remarkable lacustrine region of the continent, rivaling that of Central America, forms a lake on the flanks of the Labradorian highland; here, in addition to ten large lakes, there are hundreds of medium size, and many thousand small lakes. They are peculiar in occupying a region of moderate relief, and the evaporation in recent geological time (unless in the case of Lake Superior), and thus in contrasting with the great African lakes which occupy rift-valleys or graben of comparatively recent fracture. The Laurentian lakes are further characterized by an intimate association with the ice-sheets of the Glacial period; but while glacial erosion and drift obstruction suffice to account for the smaller lakes, it is very probable that broad upland areas, with corresponding lake basins, were occupied as other processes in producing the great lakes. The northern Cordilleran region contains many beautiful lakes of moderate size in deep basins among the crowded ranges of northern mountains. Their size has not been much reduced. The basins among the sparsely inhabited middle and southern Cordilleras, in the United States and Mexico, contain many lakes that occupy shallow depressions on the mountains, and not all of them, it seems, have been formerly occupied by lakes of much greater size, some of which overflowed, implying a climate moister than that of to-day, probably correlated with the glacial climate of the regions farther north. Lakes in volcanic craters or behind volcanic barriers occur in Central America, while Florida possesses many small lakes in limestone basins. The following table is taken from Russell’s Lakes of North America:—

<table>
<thead>
<tr>
<th>Lake</th>
<th>Altitude</th>
<th>Area (Acre)</th>
<th>Depth (Ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario</td>
<td>427</td>
<td>7,200</td>
<td>738</td>
</tr>
<tr>
<td>Erie</td>
<td>587</td>
<td>9,000</td>
<td>210</td>
</tr>
<tr>
<td>Huron</td>
<td>582</td>
<td>23,332</td>
<td>750</td>
</tr>
<tr>
<td>Superior</td>
<td>602</td>
<td>31,000</td>
<td>1008</td>
</tr>
</tbody>
</table>

The climatic features of North America are best appreciated when considered as exhibiting modifications of those general climatic conditions which prevail in consequence of the globular form of the earth as a whole. In January, when the isotherms of 68° to 70° F. stretch almost from sea to sea in the north torrid zone, a mean temperature of zero or less invades the region north-west of Hudson Bay, which thus resembles north-eastern Asia in departing greatly from the mean temperature of the western ocean, and in bringing upon the northern lands an extension of frigid conditions that have no analogue in the southern or oceanic hemisphere. In July, when the isotherms of 40° and 50° have a tolerably direct course around the latitudes of the continent on the north, a great middle area of North America becomes warmer than the seas on the east and west, having a mean of over 80°, and in part over 90°. In January the Hudson Bay region is 30° colder than the mean of its own latitude, about 60° colder than the mean of the corresponding southern latitude; while in July the Arizona-Mexican region is 20° above the mean of its own latitude, about 40° above the mean of the corresponding southern latitude. In both winter and summer the isotherms are more closely crowded while crossing the continent than while crossing the adjacent oceans; or, in other words, the polumal temperature gradient is stronger on the land than on the ocean, and all these features should be regarded as inherent characteristics of the climate of North America in virtue of its being a continent chiefly in temperate latitudes.

An associated feature of continental climate found in North America is the transition from tundralike to grassland type, with the results indicated by the temperature zero isotherm, which is reduced to 40° to the north of the Great Lakes, and to 50° in the south. The range between the means of January and July exceeds 40° for the largest part of the lands, and 70° for much of the northern lands; the range in the south is much smaller. The northern lands are the basic areas in the northern hemisphere the range is little more than 20°, and in the southern hemisphere it is probably less than 10°. It must appear from this that if the largest part of North America is any thing near as abominable as the northern limits and in the Novem er, the winter cold is severe and the summer heat is excessive over much of the North American continent.

The several members of the terrestrial planid system, including
In the trade winds of a broadened torrid zone, the stormy westerly winds of middle latitudes and the irregular winds of the polar regions, are well exemplified over North America; but, as is the case with the system of monsoons, the broadening of the latitude is better seen in the drift of the clouds than in the movement of the surface winds, which are much modified by the changes from hill to valley, from mountain to plain. Nevertheless the prevalence of the general southward movement of the weather is obvious, as shown by the steady drift of the smoke from the factories of the Mississippi valley toward the Atlantic ocean near the American coast, where strong seasonal changes of temperature are carried forward by the westerly winds. It is particularly in this respect that the general climatic resemblances between the eastern United States and the European sub-tropical provinces for eastern Canada and western Europe are strikingly unlike in seasonal variations of temperature. Labrador is about 10° cooler than northern Germany in July, but nearly 40° colder in January.

The distribution of rainfall is in general controlled by the prevailing course of the winds. The West Indies receive abundant rain from the passing trades. In Mexico and Central America the eastern slopes are favored by easterly, and the western slopes by westerly winds; there come chiefly from the east (maximum over 100 in. in Guatemala and adjacent parts). Farther north the reverse holds true; the Pacific slope north of 40° latitude has an abundant rainfall (maximum over 200 in. on the mountains of California). The rainfall of the Mississippi valley is deficient. There are large areas of deficient rainfall (less than 20 in.) in the interior of the continent, where the intermontane basins and the piedmont plains that slope eastward from the mountains in middle latitude are, as a general rule, more arid because they are depressed by the winds from the west, and are infrequently disturbed by moisture from the Gulf of Mexico, where the wind is caught by the mountains, or from the Atlantic ocean near the American coast, where strong seasonal changes of temperature are carried forward by the westerly winds. It is particularly in this respect that the general climatic resemblances between the eastern United States and the European sub-tropical provinces for eastern Canada and western Europe are strikingly unlike in seasonal variations of temperature. Labrador is about 10° cooler than northern Germany in July, but nearly 40° colder in January.

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by its size alone, although it has not in this respect the extraordinary importance of Europe. The continent has the good fortune to lie chiefly in a temperate rather than in the tropics, in temperate latitudes to be much nearer to Europe than Asia. Whatever may have been the first home of the aboriginal inhabitants, the dominating people of to-day are derived from the leading countries of the Old World. Not only so; temperate North America has become the most progressive part of the continent because of receiving its new population chiefly from the most advanced nations of middle western Europe—Great Britain, France and Germany; while the torrid islands and the narrowing southern mainland of North America have been settled chiefly from the British Isles and southern Europe; and the inhospitable northern lands are hardly entered at all by newcomers, except in the recently discovered goldfields of the far north-west. From the plantation of colonies on the eastern coast, the movement inland has been governed to a remarkable degree by physiographic factors, such as form, climate and products. The cities of the Atlantic harbours and of the adjacent lowlands still take a leading part in industry and commerce, because of their longer establishment and of their relation to Europe. The uplands, ridges and mountains of the Appalachian system—the foreland of a century ago—remain rather thinly occupied except at certain centres where ore or other earth-product attracts an industrial population. Beyond the Appalachians the middle interior contains a very large proportion of habitable land. It was long ago recognized as a land of great promise, and it is to-day a land of great performance, covered with a network of railways, yielding an enormous product of grain, and developing industries of all kinds. Indeed, within and closely around an area marked by the St Lawrence system on the north, the Ohio on the south, and stretching from the Atlantic coast between the Gulf of St Lawrence and Chesapeake Bay inland to the Great Lakes and as far west as the Mississippi, the population, industry, progress, wealth and power of North America—the focus of attention from all other parts of the continent. The regions of the far north and north-east, including the greater part of the Laurentian highland and the extreme northern stretch of the medial plains and the western highlands, remain and will long remain thinly populated. The furs of wild animals are their characteristic product. Timber is taken from their more accessible forests; but only in mining districts do the population notably increase, as in the iron region around Lake Superior and the gold and silver mining regions. The outlying parts of the continent remain for the most part the domain of savage tribes, speaking many different languages, holding little intercourse with each other, and frequently engaged in intertribal wars, have given place in little more than two centuries to a great population of European origin, whose dominant parts speak one language, whose arts are highly advanced, whose home intercourse is most active, and whose foreign commerce had attained unexpected proportions at the opening of the 20th century.

Two centuries ago the aboriginal population of North America would have deserved description before the immigrant population. To-day the aborigines are displaced from nearly all the valuable parts of the continent. Never very numerous, they are now decreasing; many tribes are already extinct, many more are almost so. Those which remain less diminished are in the Far North or North-West where nature is rigorous; or in the tropical forests of Central America, where nature is too wet and too hot; or in the more desert parts of the Middle West where nature is arid. The replacement of the native races by the foreign has too often been harsh, cruel and bloody. It has been an interchange of civilians and savages, the former having little intercourse with the latter, and frequently engaged in intertribal wars, have given place in little more than two centuries to a great population of European origin, whose dominant parts speak one language, whose arts are highly advanced, whose home intercourse is most active, and whose foreign commerce had attained unexpected proportions at the opening of the 20th century.

NORTHAMPTON, EARLS OF

West of the Mississippi in middle latitudes the population rapidly decreases in density, and over a large extent of the semi-arid plains it must long remain sparse. The settlements bordering the plains on the east for a long time marked the “Frontier” of civilization, for the vast stretch of dry country was a serious hindrance to further advancement. But the pioneers have now crossed many railways leading to the Cordilleran region—the “Far West” —in large part too rugged or too arid for occupation, but rich in minerals from one end to the other, the seat of many mining camps of unstable population, and containing numerous permanent settlements in the intermontane basins. Great irrigation enterprises, conducted under the National Reclamation Service of the United States, are employing all available water supplies for agriculture; but large areas must remain permanently desert. One of the more northerly is a basin near the farther edge of the ocean, which has a rich soil and a climate that promises to be dry and sunny. The increase is rapid in the new states and the territories to which the pioneers have been moving. But the delay in the more southern states and territories is greater because of the many obstacles in the way, and the proportionate gains neither political nor social standing in the New World.

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NORTHAMPTON, EARLS AND MARQUEESSES OF. The title of Northampton was created in the reign of King Henry fifth, and was given to the Duke of Bedford, the founder of the house of Bedford. It was, however, not until 1372 that it was confirmed to the earl, and then only upon the death of the last member of the royal family. The title of earl of Northampton was created in 1351, and was held by various noblemen until 1372, when it was confirmed to the earl of Oxford by the king. The title of marquess of Northampton was created in 1627, and was held by various noblemen until 1735, when it was confirmed to the earl of Oxford by the king.

In 1372 William de Bohun (c. 1310-1360), a distinguished soldier, son of Humphrey de Bohun, 4th earl of Hereford and Essex, was created earl of Northampton, and his son Humphrey, who succeeded, fell heir in 1361 to the earldoms of Hereford and Essex, which then became united under that of Hereford. The titles, however, became extinct at his death in 1372.

In 1547 William Parr (1513-1571), son of Sir Thomas Parr and brother of Catherine Parr, was created marquess of Northampton, and though attained in 1533 was recreated marquess in 1559. He took part in suppressing the rising in the north of England in 1537, and after serving as member of parliament for Northamptonshire was made Baron Parr in 1539. In December 1543, just after his sister had married the king, he was summoned to the court of Henry VIII as a member of the council. In 1544 he was created earl of Northampton. In 1545 he was appointed one of the commissioners for the annexe of the clergy, and in 1547 he was made a judge. He was also a member of the council for the reform of the Roman Catholic law, Henry Bourchier, who had died in March 1540. Under Edward VI., who called him “his honest uncle,” Parr was equally prominent, being lord-lieutenant of five of the eastern counties, and being great chamberlain from 1550 to 1553. He favoured the claim of Lady Jane Grey to the English throne and consequently the accession of Queen Mary was quickly followed by his attainder. Although sentenced to death he was pardoned
and released from prison at the end of 1553. After enjoying the favour of Queen Elizabeth, Northampton died at Warwick on the 28th of October 1571. He left no children and his marquessate became extinct. In 1604 Henry Howard (see below) was created earl of Northampton, his title dying with him. It next passed into the Compton family, where it has since remained. The 1st earl of Northampton in this line, William Compton (d. 1630), who received the title in 1618, was a great-grandson of the Sir William Compton (1482–1528) who was with Henry VIII at the Field of the Cloth of Gold, and his son the 2nd earl is noticed below. The 9th earl, Charles Compton (1760–1828), was created a marquess in 1812, receiving at the same time the titles of Earl Compton and Baron Wilmington. His son Spencer Joshua Alwyne, the 2nd marquess (1790–1851), was president of the Royal Society from 1838 to 1848; the latter’s son Lord Alwyne Compton (1825–1906) was bishop of Ely from 1886 to 1905. The 5th marquess (b. 1851), son of the 4th marquess (1818–1897), was, as Earl Compton, a Liberal member of parliament from 1889 to 1897.

Henry Howard, earl of Northampton (1544–1614), was the second son of Henry Howard, earl of Surrey, the poet, and of Lady Frances Vere, daughter of the 5th earl of Oxford, and younger brother of Thomas Howard, 4th duke of Norfolk. He was educated first by Foxe the martyrlogist, afterwards by John White, bishop of Lincoln, with whom he acquired Romanist opinions, and finally at the charge of Queen Elizabeth at King’s College and Trinity Hall, Cambridge, where he obtained his M.A. degree in 1564, subsequently in 1568 being incorporated M.A. at Oxford. The discovery of his brother’s plot to marry Mary, Queen of Scots, and of his own correspondence with her, deprived him of Elizabeth’s favour, and he was arrested more than once on suspicion of harbouring treasonable designs. In 1583 he published a work entitled A Defensive against the Poison of supposed Prophecies, an ostensible attack upon astrology, which, being declared to contain heresies and treason, led to his imprisonment. On regaining his liberty he is said to have travelled in Italy. His flattery of the queen in lengthy epistles met with no response, and his offer to take part in the national defence against the Spanish invasion was refused. He attached himself, however, both to Essex and to Robert Cecil, and through the influence of the latter was in 1600 again received by Elizabeth. At the close of the queen’s reign he joined with Cecil in courting the heir to the throne in Scotland, the main object of his long letters of advice, which James termed “Asiatic and endless volumes,” being to poison the royal mind against Sir Walter Raleigh and other rivals, whom he at the same time hoped to ensnare into compromising relations and correspondence with Spain. These methods, which could not influence Elizabeth, were completely successful with James, and on the latter’s accession to the crown Howard was made a privy councillor, on the 1st of January 1604 lord warden of the Cinque Ports, and on the 13th of March earl of Northampton and Baron Howard of Marnhull in Dorset; on the 24th of February 1605 he was given the Garter and on the 29th of April was appointed Lord Privy Seal. In 1609 he was elected high steward of the university of Oxford, and in 1612 chancellor of Cambridge university. The same year he was appointed one of the commissioners of the treasury. He was one of the judges at the trials of Raleigh and Lord Cobham in 1603, of Guy Fawkes in 1605, and of Garnet in 1606, in each case pressing for a conviction. In 1604 he was one of the commissioners who composed the treaty of peace with Spain, and from that date he received from the Spanish Court a pension of £1,000. The climax of his career was reached when he assisted his great-niece, Lady Essex, in obtaining her divorce from her husband in order to marry the favourite Somerset, whose mistress she already was, and whose alliance Northampton was eager to secure for himself. He obtained the divorce by the decree of a special commission, and when Sir Thomas Overbury’s influence seemed likely to prevent Somerset completing the marriage project, he caused the former to be imprisoned in the Tower. Shortly afterwards Overbury died from the effects of poison administered by the direction of Lady Essex; and the close intimacy which existed between the latter and Northampton, together with his appointment of Sir Gervase Elwes or Helwys, a friend of his own, as the keeper of the victim, leaves his name tarnished with the blackest suspicions. The discovery of the crime was not made till some little time after Overbury had succumbed, and meanwhile Northampton’s own death anticipated his fall, together with that of Somerset, from power. He advised against the summoning of parliament in 1614, and when forced to do so opposed Henry’s proposed dissolution; he died unmarried on the 15th of June 1614, when his title became extinct, and was buried in the chapel of Dover Castle, the monument erected above his grave being subsequently removed to the chapel at Greenwich College. His will shows that he died a Roman Catholic.

Northampton, who was one of the most unscrupulous and treacherous characters of the age, was nevertheless distinguished for his learning, artistic culture and public charities. He built Northumberland House in London and superintended the construction of the fine house of Audley End. He founded and planned several hospitals. Bacon included three of his sayings in his “Apophthegms,” and chose him as “the learnedest councilor” in the kingdom to present to the king his Advancement of Learning. He was the author of a Treatise of Natural and Moral Philosophy (1569; MS. in the British Museum), History of Prophecies (1578; MS. in the British Museum), and of the famous Apophthegms (1589; MS. in the British Museum), and of The Discourses of Natural and Moral Philosophy, vol. 1. In Somers Tracts (ed. 1806), i. 136, his opinions on the union between England and Scotland are recorded. See the life in Surrey’s and Wyatt’s Poems, ed. by G. F. Nott (1815), and Sidney Lee’s article in the Dict. Nat. Biog.

Spenser Compton, 2nd earl of Northampton in the Compton line (1605–1643), was the son of William, 1st earl, lord president of the marches, whose father had been created Baron Compton by Elizabeth, and of Elizabeth, daughter and heir of Sir John Spencer, lord mayor of London. On the 3rd of November 1616 he was created a Knight of the Bath, and was elected for Ludlow in the parliament of 1621, the same year being appointed master of the robes to the prince of Wales and attending the latter in the adventure to Spain in 1623. He warmly supported the king in the Scottish expeditions, at the same time giving his advice for the summoning of the parliament, which “word of four syllables” he declared was “like the dew of heaven.” On the outbreak of the Civil War he was entrusted with the execution of the commission of array in the Midlands. After varying success and failure in the Midlands he fought at Edgehill, and after the king’s return to Oxford was given, in November 1642, the military supervision of Banbury and the neighbouring country. He was attacked in Banbury by the parliamentary forces on the 22nd of December, but relieved by Prince Rupert the next day. In March 1643 he marched from Banbury to relieve Lichfield, and having failed there proceeded to Stafford, which he occupied. Thence on the 19th of March, accompanied by three of his sons, he marched out with his troops and engaged Sir John Gell and Sir William Brereton at Hopton Heath. He put to flight the enemy’s cavalry and took eight guns, but in the moment of victory, while charging too far in advance, he was surrounded by the parliament soldiers. To these who offered him quarter he answered that “he scorned to take quarter from such base rogues and rebels as they were,” whereupon he was despatched by a blow on the head. Clarendon describes his loss as a great one to the cause. Northampton married Mary, daughter of Sir Francis Beaumont, by whom besides two daughters he had six sons, of whom the eldest, James (1622–1681), succeeded him as earl. Henry Compton (1672–1713) became bishop of London, and Charles, William and Spencer all distinguished themselves in the king’s cause. The 3rd earl’s third

NORTHAMPTON

son Spencer (1737-1743) was a favourite of George II. and in 1728 was created earl of Wilmington, a title which became extinct at his death.

See the article in the *Dict. of Nat. Biog.* by C. H. Firth; E. B. G. Warburton's *Life of Prince Rupert*; S. R. Gardiner's *Hist. of England and of the Civil War*; *Thomason Tracts*, E. 99 (18) [Hopton Heath and Middle Colne]; E. 111 (17), E. 110 (8) 1642 [Proceedings at Banbury], E. 83 (47) [speech].

NORTHAMPTON, a municipal, county and parliamentary borough and the county town of Northamptonshire, England, 66 m. N.W. by N. from London by the London & North Western railway; served also by a branch of the Midland railway. Pop. (1891) 75,075, (1901) 87,021. It lies in a slightly undulating district mainly on the north bank of the river Nene. The main roads converging upon the town meet near the centre in a spacious market-place, where stands a fountain on the site of the ancient cross destroyed by the fire of 1675 which levelled a great part of the town. There were formerly seven ancient parish churches, but only four remain. Of these All Saints church was rebuilt after the fire of 1675, but retains its Decorated embattled tower, with which the style of the later building scarcely harmonizes, the principal feature being the fine Ionic portico. The church of St Giles was originally a cruciform structure of the beginning of the 12th century, but has been greatly changed, and besides a rich Norman doorway contains specimens of Early English, Decorated and Perpendicular work. St Peter's, near the site of the ancient castle, is supposed to be of the same date with it, and its interior is a fine specimen of Norman architecture. St Sepulchre's, one of the four round churches still remaining in England, may have been built by the Knights Templars at the close of the 11th century. There are several modern parish churches. Northampton is the seat of a Roman Catholic bishop, and there is a pro-cathedral, designed by A. W. Pugin (1864). In the neighbourhood of the town there were a Cluniac priory of St Andrew, a house (Delapré) for nuns of the same order, and one for Augustinian canons dedicated to St James; but the first has disappeared, the site of the second is occupied by a modern mansion, and of the third there are only slight fragments. Some portions of the castle were re-erected on a new site after their destruction when the Castle station was built by the London & North Western Railway Company. In the populous parish of Hardingstone, S. of the town, is one of the original Eleanor crosses, of which only three remain out of twelve erected by Edward I. to mark the resting-places of his queen's body on its way from Harby (Nottinghamshire) to burial at Westminster. The chief public buildings of Northampton are a town hall, county hall, county council room, corn exchange, antiquarian and geological museum, free library and barracks. The free grammar school was founded in 1552; the Northampton and county modern and technical schools were incorporated with it in 1894. There are a Roman Catholic convent with schools, and various charity schools. The charitable foundations include St John's hospital, founded in the 12th century; St Thomas's hospital, founded in 1450 in honour of Thomas à Becket, an infirmary, asylum, dispensary, &c. There is a race-course north of the town. The staple trade is the manufacture of boots and shoes, which is very large. There are also considerable currying and tanning works, breweries, iron foundries, and brick and tile works. The cattle market is extensive. The county borough was created in 1888. The municipal borough is under a mayor, 8 aldermen and 24 councillors. Area, 3469 acres. British and Roman remains have been discovered near Northampton (Hamstone, Northstone), and it became the chief settlement of the Angle tribes who pushed their way up the Nene in the early part of the 6th century. It was occupied by the Danes in the reign of Edward the Elder and is said to have been burnt by Sweyn in 1010. In the reign of Edward the Confessor the town was re-built by his great-grandson in his 33rd year. In his time the number had decreased to 47 in 1086, a new borough containing 40 burgesses had been formed. The burgesses rendered yearly to the sheriff £50, 10s. "which belonged to his farm," and was probably the beginning of the fee farm which they were allowed to pay directly to the king in 1185 and which was then increased from £100 to £120. Forty marks of this farm were pardoned by Richard III. in 1484 because "the town had come to such ruin" that the bailiffs had to pay more than £53 from their own goods. The mayor was the chief officer in the 13th century, and Henry VI. granted the incorporation charter in 1460 under the title of mayor, bailiffs and burgesses. The town has been represented by two members since 1395. Tanning was an industry of Northampton in the time of Edward I., and in 1675 a law was made by the corporation forbidding strangers to purchase hides in the town except on fair-days. Boots and shoes are known to have been made here in the reigns of John and Edward I., although probably only for the use of the town-people, and by the 17th century Northampton was one of the most noted places in England for their manufacture.

Northampton has been the meeting-place of several important councils and parliaments. In the wars between John and his barons the castle withstood a siege by the latter, but in 1264 it was occupied by the barons under the earl of Leicester. In the Wars of the Roses it was the scene of the battle in which Henry VI. was defeated and taken prisoner in 1460. During the Civil Wars of the 17th century it was held for the parliament by Lord Brooke. In 1675 the town suffered severely by fire, 600 houses being destroyed.

See *Victoria County History, Northampton; C. H. Hartshorn, Historical Memorials of Northampton* (1845).

NORTHAMPTON, ASSIZE OF, a short code of English laws issued in 1176, is drawn up in the form of instructions to six committees of three judges each, which were to visit the six circuits into which England was divided for the purpose. Though purporting to be a reissue of the Assize of Clarendon (1166), it contains in fact many new provisions. As compared with the earlier assize it presupposes greater severity of punishment for criminal offences; arson and forgery were henceforth to be crimes about which the jurors are to enquire; and those who failed at the ordeal were to lose a hand as well as a foot. In what is perhaps the most important section we may probably see the origin of the possessory action of *mort d'ancist*, an innovation scarcely less striking than the institution of the *novel disseizin* in the winter of 1166. The justices were also ordered to try proprietary actions commenced by the king's writ for the recovery of land held by the service of half a knight's fee or less. In their fiscal capacity they were to enquire into escheats, churches, lands and women in the king's gift. The royal bailiffs were to answer at the exchequer for rents of assize and all the perquisites which they made in their offices, and apparently the duty of enforcing this provision was entrusted to the justices. As a result of the rebellion of 1173-1174 it was provided that the tax of fealty should be taken by all, 4, to wit, barons, knights, freeholders and even villeins (rustici), and that any one who refused should be arrested as the king's enemy, and the justices were to see that the castles whose demolition had been ordered were completely razed.


NORTHAMPTON, a city and the county-seat of Hampshire county, Massachusetts, U.S.A., situated on the Connecticut river, about 16 m. N. of Springfield. Pop. (1910 census) 104,341. The city has an area of 35:3 sq. m. The chief village, Northampton, is on the New York, New Haven & Hartford, and the Boston & Maine railways. It lies on the border of the meadow-land, and with its irregular, semi-rural streets, and venerable trees is considered one of the prettiest villages in New England. Northampton is about 12 m. E. and 11 m. N.W. of Northampton (Hampshire, Mass.), 75m. N.E. of Boston, 23 m. W. of Holyoke (95 ft.), which may be ascended by carriage road and mountain railway, and the summit of which commands a magnificent view. The city is the seat of a state hospital for the insane;
of the Clarke School for the Deaf (1867, founded by John Clarke of Northampton); of Smith College, one of the foremost colleges for women in the country; of the Mary A. Burnham School for Girls (1871), a preparatory school chiefly for Smith College, founded by Miss Mary A. Burnham; and of the Miss Clarke School (preparatory) for girls. Besides the college library, there are in Northampton two public libraries, the Clarke (1850) and the Forbes (1854). The Forbes library was established with funds left by Charles E. Forbes (1795-1881), from 1848 to 1881 a justice of the state supreme court. The People's Institute was started as a Home-Culture Clubs movement by George W. Cable, who became a resident of Northampton in 1886. The Smith Charities is a peculiar institution, endowed by Oliver Smith (1766-1842) of Hatfield, who left an estate valued at $370,000 in 1864, to be administered by a board of three trustees, chosen by electors representing the towns of Northampton, Hadley, Hatfield, Amherst and Williamsburg in Hampshire county and Greenfield and Whately in Franklin county—the beneficiaries of the will. The will was contested by Smith's heirs, but in 1847 was sustained by the supreme judicial court of Massachusetts. Of the total sum, $200,000 was to accumulate until it became $400,000. Of this $30,000 was to found Smith's Agricultural School at Northampton, which opened for instruction in 1903, and an income of $10,000 was to be paid to the American Colonization Society, but in 1903 this amount was increased to $20,000 by the will, and the $10,000 was incorporated with the Agricultural School fund; and $36,000 was devoted to indigent boys and girls, indigent young women and indigent widows. The remainder of Smith's property was constituted a contingent fund to defray expenses and keep the principal funds intact.

Florence, a village on the Mill river in the city limits, is a manufacturing village, silk being its principal product, and cutlery and brushes being of minor importance. The value of the city's factory products increased from $4,776,820 in 1900 to $6,776,381 in 1905, or 22.3%. Northampton was founded in 1656, and was incorporated as a city in 1833. In September 1786, at the time of the Shays Rebellion, the New Hampshire Gazette (still published; daily edition since 1896) was established here in the interest of the state administration. Jonathan Edwards was pastor here from 1727 to 1750. Caleb Strong (1745-1819), a member of the Federal Constitutional Convention of 1787, and governor of Massachusetts in 1800-1807 and 1812-1816; Joseph Hawley (1723-1788), one of the most prominent patriots of western Massachusetts; Timothy Dwight; Arthur (1736-1805), Benjamin, and John (1728-1873) Tyng, prominent philanthropists and anti-slavery men; and William D. Whitney were natives of Northampton.


NORTHAMPTONSHIRE, an east midland county of England, bounded N. by Lincolnshire, N.W. by Rutland and Leicestershire, W. by Warwickshire, S.W. and S. by Oxfordshire, S.E. by Buckinghamshire, and E. by Bedfordshire, Huntingdonshire and Cambridgeshire. The area is 1,003 sq. m. The surface is undulating and somewhat monotonous, notwithstanding that the country is richly cultivated and in some parts finely wooded. Elevations over 700 ft. are few. The most picturesque scenery is found in the western and south-western districts. For long Northamptonshire has been famed for its ash trees, and there are also some very old oaks, such as that associated with Cowper's posthumous poem—"Yardley Oak," in Yardley Chase near Northampton, as well as a few fine avenues of elm. The north-eastern extremity belongs to the great Fen District. The county forms the principal watershed of central England, nearly all the more important rivers of this region having their sources within its boundaries. The Avon, with a westerly course, forms for some distance the northern boundary of the county, till near Lilbourne it passes into Warwickshire. The Nene passes southward past Northampton, whence it takes an easterly course, skirting the eastern boundary of the county. The Welland flows in an easterly direction, forming the boundary of the county with Leicester, Rutland and Lincoln. The Cherwell, rising in a spring at Charwelton, where it is crossed by a very ancient bridge, passes into Oxfordshire, and then forms for a considerable distance the southernmost portion of the county. A branch of the river is the river Chet, which, after passing through the town of Daventry, the largest town in the county, turns southward into Northamptonshire; the Leam forms a portion of the boundary with Warwickshire. The Ouse, which rises near Brackley, soon afterwards leaves the county, but again touches it near Stony Stratford, separating it for some distance from Buckinghamshire.

Geology.—With the exception of the superficial glacial and river deposits, all the rocks exposed in the county are of Jurassic age; these rocks are seen in a series of cliffs on the southern borders, and outcrops being from south-west to north-east. The oldest rocks exposed belong to the Liassic formation; they come to the surface over a large area in the south-west and centre, around Banbury, Daventry and Market Harborough, and by the removal of the overlying Oolitic strata they are exposed along the rivers and stream courses near Towcester, Northampton, Wellingborough and Kettering. The Lower Lias, blue clay with limestone bands and cement stones, has few exposures; it has been cut through by the railways at Kilsby and Catesby, and at Braunston it is dug for brick-making. The Middle Lias consists of grey micaceous marls, sandstones and clays, and even limestones, as at Kettering, where at the top is the marlstone or "rock bed," used as a building stone and for road metal. The Upper Lias is again a blue argillaceous series of strata, with limestones and cement stones; it is employed for building, and is often used in structure-making. In the south-east to south-west is an elevated tract of Oolitic rocks which contrasts strongly with the low-lying grass-covered Liassic ground. The lowest part of the Oolitic series is the Permian Beds, an important source of iron ore, with from 9 to 12 ft. of workable beds at Blisworth, Kettering, Northampton, Thrapstone, Towcester and Wellingborough. The flaggy sandstone of Duston (variable beds) belonging to the Upper part of the Northampton sands is known as the Lower Estuarine Beds; these are white and reddish clays and sands. In the north-east part of the county from about Maldon, the Lincolnshire Limestone is developed at the expense of the Northampton Sand; the well-known building stone of Barnack (Barnack Rag) and Weldon belong to this horizon; a hard shelly variety is known as Weldon or Stamford Limestone. Locally known as the Hunsbury Sand, it is a series of flaggy strata, the Collyweston slates. The Great Oolite series comprise the Upper Estuarine Beds, the Great Oolite Limestone, Great Oolite Clay, Forest Marble and Cornbrash (very fissile at Rushden). On the south-east border a belt of Oxford Clay occupies the surface; good exposures occur in the brick-fields about Peterborough. Glacial sands and gravels, including the great Chalky Boulder Clay, occur in patches on the older rocks, as at Hillmorton, and fill up old channels of the rivers sometimes as a considerable depth, as in the valley of the Ouse at Furtho, where the Boulder Clay is 100 ft. thick. Borings have revealed the existence of Rhetic and Keuper rocks resting on the Oxford Clay, but the entire country beneath the Carboniferous strata probably consists of Permian Beds. Gayton and Northampton the Carboniferous and possibly Old Red Sandstone strata have been proved, but no Coal Measures were encountered. The water-bearing strata of Northamptonshire include the Permian Beds, the Lower Estuarine Beds, the Oolitic beds and ironstone beds of the Inferior Oolite, and the Cornbrash and Great Oolite Limestone.

Climate and Agriculture.—The climate of Northamptonshire is mild and genial, while the absence of lofty hills renders it much drier than many other inland districts. The mean annual rainfall at Wellingborough is 27.2 ins. The prevailing soil is a rich brown but light and crumbling mould, sometimes with a rocky subsoil. The richest soil is the black mould of the fen country, which is specially suited for growing grasses, as are all the heavier soils. Nearly all the land is capable of cultivation, although there is some stiff wet soil on the slopes of the hills. Nearly nine-tenths of the total area, a high proportion, is under cultivation, and of this considerably over three-fifths is in permanent pasture, the acreage devoted to this use increasing steadily. Less than one-fifth is under grain crops, and the area decreases. Wheat and barley are the principal grain crops. The fattening of cattle is the chief occupation of the Northamptonshire farmer. The favourite stock for breeding purposes is the shorthorn, but the commonest breed in the county is the Durham, and the Border and Irish cattle in the spring and summer fatten them on the rich pastures, a few being retained and fed for the Christmas market. In autumn additional cattle are brought in to eat the coarse grass off the pastures, and these are usually retained during winter. The most common breed of sheep on the rich pastures is the improved Leicester, which is preferred on account of its length.
of wool; but the Southdown, on account of its superior flesh, is also largely kept.

Manufactures.—The iron industry is of considerable importance, though only a small proportion of the metal is smelted in the county. The industry is carried on in the central part of the county, as in the Kettering, Wellingborough and Thrapston districts, and in the north near Stamford. But Northamptonshire is more famous for its manufacture of boots and shoes, which is chiefly prosecuted in the towns and villages of the central and southern districts, and along the eastern border. This trade occupies some three-quarters of the total number of hands employed in factories in the county.

Communications.—The main line of the London & North Western railway passes through the south-western portion of the county, with an alternative route to Northampton, and branches to Peterborough and elsewhere. With it are connected at Bletsow Junction the East and West Junction railway to Towcester, Woodford and Stratford-on-Avon, and the Northampton and Banbury Junction railway, which Central main line, crossing the county in the south, has connexion with the Great Western railway at Banbury from Woodford. The Midland railway serves Wellingborough, Kettering and Northampton, and an important junction of systems is effected at Peterborough, which is served by the Midland Northern railway. Branch lines of this and the Midland system complete the railway communications of the county. The Grand Junction Canal, which is connected with the Oxford Canal, enters the county at Braunston on the borders of Warwickshire, and passes by Daventry and Billesworth into Buckinghamshire, a branch connecting it with Northampton. The Grand Union Canal unites with the Oxford and Kennet and Avon lines at Daventry, and a branch north from the Leicester Canal at Foxton, branches passing to Welford and Market Harborough.

Population and Administration.—The area of the county is 641,992 acres, with a population in 1801 of 392,183 and in 1901 of 338,024. The area of the administrative county of Northampton is 583,148 acres, and that of the administrative county of the soke of Peterborough 53,464 acres. In Domesday the county is mentioned as containing 30 hundreds, but it then included a considerable part of Rutland. These divisions were first reduced to 28, and in the reign of Henry II. to 20, their present number. The administrative counties include four municipal boroughs, namely, Brackley (pop. 2467), Daventry (3790), Higham FERRERS (2540) and Peterborough (30,572), together with the municipal and county borough of Northampton (67,021). The urban districts are: Desborough (3578), Finedon (2991), and Peterborough (4314). There are two parliamentary boroughs, Peterborough (2404), Raunds (3811), Rothwell (4193), Rushden (12,453), Wellingborough (18,412). There are one court of quarter sessions and nine petty sessional divisions. The borough of Northampton and the liberty of the soke of Peterborough have each a separate court of quarter sessions and a separate commission of the peace. The total number of civil parishes is 346, of which 33 are in the soke of Peterborough. The ancient county contains 297 entire ecclesiastical parishes or districts, wholly or in part, of most of them in the diocese of Peterborough; but small parts of the counties fall within the dioceses of Oxford, Ely and Worcester. For parliamentary purposes the county is divided into four divisions (Northern, Eastern, Mid and Southern), and includes the parliamentary borough of Northampton, and part of the parliamentary borough of Peterborough, each returning one member, except the borough of Northampton, which returns two members.

History.—At some time in the 7th century the district which is now Northamptonshire suffered a simultaneous invasion by the West Saxons from the south and the Anglian tribes from the north. The relics discovered in the county testify to a mingling of races, at the soke of the county, and run north until it joins the river never spread farther north than a line from Daventry to Warwick, and with the extension of the Mercian kingdom under Penda and the conversion of the midland districts ceased altogether. The abbey at Medehamsted (now Peterborough) was begun by Peada in 655, and about the same time foundations were established at Peaak, Weedon Beck, Castor and Oundle. In 870 the district was overrun by the Danes, and Northampton was one of the five Danish boroughs; until 921 it was recovered by Edward the Elder, who fortified Towcester in that year. In the 11th century Northamptonshire was included in Tosti's northern earldom; but in 1065, together with Huntingdonshire, it was detached from Northumbria and bestowed on Wulfric. The only monastic foundation which survived the Conquest was Peterborough. Norman castles existed at Rockingham, Barnwell, Lilbourne and Northampton.

As a shire Northamptonshire was probably of Danish origin, representing in the 10th century the area which owed allegiance to Northampton as a political and administrative centre. In 921 this area extended to the Welland, the present northern limits of the county, and at the time of the Domesday Survey the boundaries were identical with those of the present; Northamptonshire is first mentioned by name in the Historia Elenis, in connexion with events which occurred at the close of the 10th century.

The Gild roll of the time of William I. and the Domesday Survey of 1086 mention 28 hundreds in Northamptonshire, and part of Rutland is assessed under this county. By 1316 the divisions had undergone considerable changes, both in name and in extent, and had been reduced to their present number, 30, except in Rutland. They have remained practically unaltered. The names of the hundreds point to primitive meeting-places, gradually superseded by villages and towns, and the court for Fawsley hundred met under a large beech tree in Fawsley Park until the beginning of the 18th century, when it was transferred to Everdon. The shire-court originally met at Northampton.

Northamptonshire was originally included in the diocese of Lincoln. The archdeaconry of Northampton is mentioned in the 12th century, and in 1291 included the deaneries of Peterborough, Northampton, Brackley, Oundle, Higham, Daventry, Preston, Weldon, Rothwell and Haddon. The diocese of Peterborough was created in 1541, and in 1835 the archdeaconry of Oakham was formed and included in this county the first and second deaneries of Peterborough and the deaneries of Oundle, Weldon and Higham Ferrers. Northampton archdeaconry now includes the first, second and third deaneries of Brackwell and Rothwell; the first and second deaneries of Haddon and Preston, and the deaneries of Daventry, Northampton and Weldon.

At the time of the Domesday Survey the chief lay-tenant in Northamptonshire was Robert, earl of Mortain, whose fief crested to the crown in 1106. The estates of William Paynel, founder of the abbey of St James at Northampton, also escheated to the crown in the 12th century. Holdenby House was built by Sir Christopher Hatton, privy councillor to Queen Elizabeth, and Yardley Hastings was named from the Hastings, formerly earls of Pembroke. Higham Ferrers was the seat of the Ferrers family; Braybrook Castle was built by Robert de Braybrook, a favourite of King John; and Burghley House gave the title of baron to William Cecil.

Northampton was a favourite meeting-place of the councils and parliaments of the Norman and Plantagenet kings. In 1215 John was besieged in Northampton Castle by the barons, and in 1264 Henry III. captured the castle from the younger Simon de Montfort. During the Wars of the Roses Henry VI. was defeated at Northampton in 1460. In the Civil War of the 17th century the county declared almost unanimously for the parliament. A royalist garrison was placed at Towcester by Prince Rupert in 1644, but almost immediately withdrawn.

The iron-mines and stone- quarries of Northamptonshire were worked in Roman times, but the former were entirely neglected from the Plantagenet period until their re-discovery in 1859, while the two most famous quarries, those of Barnack and Stanion, were exhausted about the 16th century. The wool and leather industries flourished in Norman times. In the 17th century the weaving industry declined in the Northampton district, but became very flourishing about Kettering. Other early industries were charcoal-burning, brick and tile manufacture and brewing. The industries of whip-making, pipe-making, silk-weaving and paper-making were introduced in the 17th and 18th centuries.

In 1290 Northamptonshire returned two members to parliament, and in 1295 Northampton also returned two members.
In 1547 Brackley and Peterborough returned each two members, and in 1557 Higham Ferrers returned one member. Under the act of 1832 the county returned four members in two divisions, and Brackley and Higham Ferrers were disfranchised.

Antiquities.—Although Northamptonshire was rich in monastic foundations, remains, except of the Abbey church of Peterborough, afterwards the cathedral, are of small importance. At Geddington, and also at Hardingham, near Northampton, there is an Eleanor cross, erected by Edward I. to the memory of his queen, in good preservation. For the architecture of its churches Northampton holds a place scarcely inferior to any other English county. To the Saxon period belong the tower of Earls Barton church, which stands on an eminence, probably the mound of an old English strong-house; the tower and other portions at Brigstock; the ground plan and other portions at Wittering; the remarkable towers at Barnack, and Brixworth church, constructed in part of Roman materials, and by some believed to include part of a Roman basilica. Of Norman, besides the cathedral of Peterborough, the finest examples are St Peter's and St Sepulchre's, Northampton, and the tower of Castle church. St Mary's church, Higham Ferrers, formerly collegiate, Early English and Decorated, is one of the finest churches in the county, and, as specially noteworthy among many beautiful buildings, there may be mentioned the churches at Irthlingborough and Lowick, with their lantern towers, Wartington, a very fine specimen of Early English work, Rushden, St Mary's; Barnwell Castle, constructed in the church of the castle at Easton Maudit, Percy, author of the Reliques, and afterwards Bishop of Dromore, was recto.

A gateway at Rockingham, and earth-works at Higham Ferrers and Brackley are worthy of mention. Some castellated ruins remain of the castle at Fotheringhay, famous as the scene of the imprisonment, trial and execution of Mary, Queen of Scots. Barnwell Castle, founded by William the Conqueror, an interesting example of the defensive construction of the period, is still a fine ruin, which includes four of the round towers and a circular fortification of stone. Holkham Hall, the residence of Christopher Hatton (1540-1591) was born, and where Charles I. was staying when he was carried away by Cornel Joyce, is largely restored. Among ancient mansions are Castle Ashby, the seat of the Comptons, the oldest portion belonging to the reign of Henry VIII.; Althorp, the seat of the Spencer's, of various dates; Drayton House, of the time of Henry VI.; the vast pile of Burghley House, Stamford, founded by Lord Burleigh (1553), but more than once altered and enlarged; and Kirby Hall, a beautiful Elizabethan building once the residence of Sir Christopher Hatton. See Victoria County History, Northamptonshire.

North Berwick—North Cape

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NORTH CAPE (Nordkapp), a promontory on the island Magerö off the north coast of Norway in 79° 10' 30" N., 25° 45' E., 78 m. N.E. of Hammerfest. Knivskjaerodden, an island a little to the west, actually reaches a point a little farther north than the North Cape, and Nordkyn, 45 m. E., is the northern extremity of the mainland (71° 7' N.). The desolate cape, rising abruptly

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over 1000 ft. from the sea, is frequently visited during the summer period of the “midnight sun,” but travellers are often prevented from seeing this phenomenon by adverse atmospheric conditions.

NORTH CAROLINA, a South Atlantic state of the United States of America, situated between latitudes 33° 51' 37" (the southernmost point of the southern boundary—35° is the northernmost) and about 36° 54' 25.5" N., and between longitudes 75° 27' W. and 84° 20' W. It is bounded N. by Virginia, E. and S.E. by the Atlantic Ocean, S. and S.W. by South Carolina, S. also by the Georgia and S.W. ridge across Tennessee. North Carolina has an extreme length from E. to W. of 5941 m. It is greater than that of any other state east of the Mississippi River. Its total area is 52,426 sq. m., of which 3686 sq. m. are water surface.

Physical Features.—The state lies wholly within the three leading topographical regions of the eastern portion of the United States: the Coastal Plain Region, which occupies approximately the eastern half, the Piedmont Plateau Region, which occupies about 20,000 sq. m. in the middle, and the Appalachian Region, which occupies about 5000 sq. m. In the western part of the state the Big Smoky Mountain Chain, an outer coast line is formed by a chain of long narrow barrier beaches from which project capes Hatteras, Lookout and Fear, whose outlying shoals are known for their dangers. Between Hatteras and Lookout is Raleigh Bay and between Lookout and Fear is Onslow Bay; between the chain of islands and the deeply indented mainland Currituck, Albemarle, Pamlico and other sounds form an extensive area, especially to the northward, of shallow, brackish and almost tideless water. Projecting into these sounds and between the estuaries of rivers flowing into them are extensive tracts of swamp land—the best known of these is Dismal Swamp, which lies mostly in Virginia and is about 30 m. long and 10 m. wide. Through most of the Coastal Plain Region, which extends inland from 80 to 150 m., the country continues very level or only slightly undulating, and rises to the westward at the rate of little more than 1 ft. to the mile. Along the W. border of this region, however, the slope becomes greater and there are some hills. The "Fall Line," the boundary between the Coastal Plain and the Piedmont Plateau, has a very irregular course across North Carolina, but lies in a general S.W. direction from the Unaka and Northampton counties to Anson county on the South Carolina border and marks a rapid increase in elevation of about 200 ft. The Piedmont Plateau Region extends from this line to the Blue Ridge Escarpment, toward which its mean elevation increases at the rate of about 3½ ft. to the mile. It is traversed from N.E. to S.W. by a series of ridges which in the E. portion produce only a general undulating surface but to the westward become higher and steeper until the country assumes a bold and rugged aspect. The S.E. face of the Blue Ridge Escarpment, which rises precipitously 1200-1500 ft. or more above the Piedmont Plateau, forms the S.E. border of North Carolina's Appalachian Mountain Region, which includes the high Unaka Mountain Range, segments of which are known by such local names as Iron Mountains, Bald Mountains and Great Smoky Mountains. These ranges reach their culmination in this state, and with a series of more or less interrupted cross ranges constitute the greatest masses of mountains in the E. half of the United States. Four peaks along the Blue Ridge have an elevation exceeding 5000 ft.—one of these, the Grandfather, rises 5904 ft. and about thirty peaks in the Unaka and S.W. dieral cross ranges exceed 6000 ft., the highest being Mount Mitchell or Mitchell Dome (6711 ft.), of the Black Mountains, a short cross range extending N. from the Blue Ridge through Yancey County. Other noteworthy peaks are Black Brother (6690 ft.) and Hairry Bear (6681 ft.), the next highest mountains. Many of the neighbouring mountain ridges have uniform crests, but a greater number terminate in numerous peaks, some sharp, rugged and rocky, but more of them rounded domes. Throughout the whole region the slopes vary greatly: the N.W. slope of the Blue Ridge is almost imperceptible, or confounded with the numerous mountain slopes that rise above it. As a rule the mountain slopes are well graded and subdued, but a few are steep and some are precipitous. The numerous valleys are usually narrow and deep, though few, if any, descend to less than 2000 ft. above the sea.

The Blue Ridge is the principal water parting of the state. West of it the Hiwassee, the Little Tennessee and the French Broad rivers flow, or N.W. into Tennessee. Farther N. are the headwaters of the New River, which drains eastern North Carolina. On the S.E. slope of the Blue Ridge rise the Broad, the Catawba and the Yadkin, which flow for some distance a little N. of E., then turn to the N.W. and rise into the Piedmont Plateau, turn to the S.S.E. and across the boundary line into South Carolina, in which state their waters reach the Atlantic. In the N.W. part of the Piedmont Plateau Region, and a little to the N. of the most N.E. corner of the Yadkin, the N.E. rises the Dan, which in its N.N. point extends into Virginia, where it becomes a tributary of the Roanoke, in which its waters are returned to North Carolina near the "Fall Line." The other principal rivers—the Cape Fear, the Neuse and the Tar—rise in the N.E. part of the Piedmont Plateau Region, have their S.E. courses wholly within the state, and, with the Roanoke, drain the Coastal Plain Region. In the Mountain Region are dozens of streams. Certain Plat species, have been observed numerous falls and rapids which afford a total water power unequalled perhaps in any other state than Maine on the Atlantic Coast, the largest being on the Yadkin, Roanoke and Catawba; and in crossing some of the mountain streams especially to the N.W. of the state, one sees narrow gorges that are much admired for their scenery. In contrast with the rivers of those regions those of the Coastal Plain are sluggish, and are shown in their mouths to the east.
clams are caught in the sounds, in the lower courses of the rivers flowing into them, or in the neighbouring waters of the sea.

Agriculture.—Until the Civil War agriculture was about the only industry in the state, and as late as 1860, in the midst of the war, it was still the leading one; but from 1880 to 1900 the ratio of agriculturists to all inhabitants of the state has steadily decreased. In the last ten years the percentage of farm land in the state has increased from 75.3 to 64.1%. The land included in farms is estimated to be about 224,743,530 acres. Of the total land surface of the state, the percentage of farm land that was improved increased from 26.5 in 1870 to 36.6 in 1900. Throughout the period of the state's history, the agricultural conditions have been influenced by the topography and climate of the state, as well as by the development of railroads and the colonization of western lands. The state's agricultural industry has been characterized by a strong emphasis on cotton production, which has been a major economic driver for much of the state's history. However, more recently, there has been a shift towards diversification, with an emphasis on produce and other agricultural products.

Minerals.—At the beginning of the 20th century a great number of banks and other financial institutions were established in North Carolina to lend money to farmers, and most of them in such small quantities as to be of little or no commercial value, and in 1902 the total value of the products of the mines and quarries was only $27,476; but in 1907 their combined value was $112,107. In the latter year, 75% of the gold ore was found in the county of Wake, and 75% of the silver ore was found in the county of Iredell. The State Geological and Economic Survey has made a careful study of the fishes of North Carolina, of the shad fisheries, of oyster culture, and of the development of terrapin. Beaufort the United States Bureau of Fisheries has a marine biological laboratory, established in 1901 for the study of the aquatic fauna of the south-east coast.

The principal crops are cotton, Indian corn, tobacco, hay, wheat, sweet potatoes, apples and pears. The yield of cotton increased from 62,901,790 lb in 1869 to 307,500,000 lb in 1899. In 1899 29,588 bales of cotton were produced. The total area of the state in cotton land is 45,556,000 bales; 570,000 acres to wheat, with a crop of 5,415,000 bushels; and 196,000 acres to oats, with a crop of 3,234,000 bushels.

The principal minerals are gold, silver, and corundum. The gold was mined here before any European settlement of the country seems proved by numerous excavations and by huge heaps on which are large oak and chestnut trees, some fallen and decayed. The gold was also found in the river bottoms in the counties of Surry and Caswell. The corundum, or sapphire, is found in the state in the counties of Surry and Caswell. The corundum, or sapphire, is found in the state in the counties of Surry and Caswell. The corundum, or sapphire, is found in the state in the counties of Surry and Caswell.
NORTH CAROLINA

deposits the importance of those of North Carolina greatly declined. It was along the coast of North Carolina that Europeans in 1585 made the first discovery of iron ore within the present limits of the United States. Iron ores are widely distributed within the state, and the first attempts to work them were made when the mining of it was an industry of relatively great importance. In 1808 the product amounted to 42,522 long tons (all magnetite), and was valued at $76,877; almost the entire product is from the Carolinas. The two small areas in which bituminous coal occurs; one in the basin of the Dan and one in the basin of the Deep. Very little coal was produced in the state in the 18th century. In 1863, 30,000 short tons were obtained for the relief of the Confederate government, an amount which up to 1905, when the yield was only 1557 short tons (falling off from 7000 short tons in 1904), had been a record. In 1905, only 14,962 tons was produced in the state; the most valuable immediate product of the state's mines and quarries for nearly every year from 1890 to 1908 was building stones of granite and gneiss, which are found in all parts of the state. The granite quarries are chiefly in Gaston, Iredell, Rowan, Surry and Wilkes counties. The value of the building stone increased from $150,000 in 1892 to $800,177 (of which $764,272 in granite) in 1908. Coal also is widely distributed in the state; the most extensive beds are in the south-western counties, Swain and Cherokee.

GEOLOGICAL STRUCTURE.-During the quarter of a century between 1880 and 1905 a great change was wrought in the industrial life of the state by the phenomenal growth of cotton manufacturing. A cotton mill was erected in Lincoln county about 1813, and by 1840 about 250 were in the state. State. When the War was over, the abnormally high price of cotton made cotton raising for more than a decade a great assistance to the people in recovering from the economic effects of the previous long depression. In 1870 the value of cotton raised in the state was $11,897. In 1890, when the cotton market was in a low condition, it was $11,170. In 1905, the cotton crop amounted to $25,488,721. In 1890 the lumber and timber products, valued at $5,867,472, ranked second among the state's manufactures; but in 1905 their value had increased to $11,221,370. The value of the state's factory product for 1900 was $85,274,054, and that for 1905, $112,520,776, an advance of 36.1%. The cotton mills are mostly in the Piedmont Plateau region; Durham, Durham county, and Forsyth county, are leading centers of the state's manufactures, and High Point (pop. in 1900, 4163) in Randolph is noted for its manufacture of furniture.

CIVIL GOVERNMENT.-The first building was begun in the state in 1586 with the Raleigh & Gaston line, opened from Raleigh to Gaston in 1834 and extended to Weldon in 1852. A longer line, that from Wilmington to Weldon, was completed in 1840. But the greatest period of construction was from 1880 to 1905, when the total mileage was increased from 1,846 m. to 3128 m., or 1642 m., which was more than one-third of all that had been built up to the year 1905, when the total mileage was 4454.14. The principal systems of railroads are the Atlantic and Gulf, Atlantic, Southern and the Seaboard Air Line. By means of its navigable waters and safe harbours the state has an extensive coastering trade. The harbours along the sounds and in some of the counties are well protected from the storms of the ocean by the long chain of narrow islands in front, but navigation by the largest vessels is interrupted by shoals in the sounds, and especially by bars crossing the inlets between islands. The channel leading to the harbour of Wilmington has been cleared to a depth of 20 ft. or more by dredging and by the construction of jetties and an immense dam, works which were begun by the state in 1823 but from 1828 were carried on from time to time by the U.S. government. The harbour, once navigable to Weldon and the Cape Fear river to Fayetteville; the Neuse is navigable for small vessels only to Newbern.

Population.-The population of North Carolina increased from 1,399,759 in 1880 to 1,617,949 in 1890, or 15.6%; to 1,836,810 in 1900, a further increase of 17.1%; and to 2,265,871 in 1910, an increase of 16.5% since 1900. Of the total in 1900 only 4492, or less than 1/10 of 1% were foreign-born, nearly half of these being Germans or English. Of the total, 1,853,493 were white, and 624,469 negroes, 568 Indians and 51 Chinese. Nearly one-fourth of the Indians are Cherokees, who occupy, for the most part, the Qualla Reservation in Swain and Jackson counties, not far from the south-western extremity of the state. The others, numbering in 1907 nearly 5000, living mostly in Robeson county, are of mixed breed and have been named the Croatans, or the other name (probably baseless) that they are the descendants of John White's lost colony of 1587. The Cherokees have no ambition to accumulate property, but both they and the Croatans have been generally peaceable and many of them send their children to school—for the Croats the state provides separate schools. The Baptist and Methodist churches are the leading religious denominations in the state; but there are also Presbyterians, Lutherans, members of the Christian Connexion (O'Kellys), Disciples of Christ (Campbellites) Episcopalians, Friends, Roman Catholics, Moravians and members of other denominations. The Croats have comparatively few. The state of the Carolinas there was not a town in North Carolina that had a population of 1000, and the urban population of the state was exceptionally small at the beginning of the rapid rise of the manufacturing industries about 1860. In 1900 the urban population (in places having 4000 inhabitants or more) was 152,019, or 8% of the total; the semi-urban (in incorporated places having less than 4000 inhabitants) was 186,258 or 9.8% of the total; and the rural (outside of incorporated places) was 1,195,782 or 70.8% of the total. Between 1890 and 1900 the urban population increased 56.6% and the semi-urban 67.6% while the rural increased only 6.5%.

The principal cities are Wilmington, Charlotte, Asheville, Raleigh (the capital), Greensboro, Winston and Newbern.

Administration.—North Carolina has been governed under the charters of 1665 and 1665 (1665-1719), under commissions and instructions from the crown (1729-1776), and under the state constitutions of the 18th of December 1776 (amended in 1835, 1856, and in the Secession Convention of 1861) and of April 1868 (amended in 1872-1873, 1875, 1879, 1888 and 1890). The present constitution, as amended, prescribes that no congregation of the people of the state may be called by the legislature unless by the concurrence of two-thirds of all the members of each house followed by an affirmative vote of a majority of the electors voting on the question; and that an amendment to the constitution may be adopted only by a three-fifths of each house followed by an affirmative vote of a majority of electors voting on the question. The suffrage provisions containing the famous "grandfather clause" (in Art vi. section 4), were adopted in the form of a constitutional amendment, ratified in August 1905, and in effect on the 1st day of July 1906. All persons, of whatever sex, who can read and write any portion of the constitution in the English language and have paid on or before the 1st of May the poll tax for the previous year. An exception to the educational requirement is made in favour of any male person who was, on the 1st day of January 1867, or at any time prior thereto, entitled to vote under the laws of any state in the United States wherein he then resided, and in favour of lineal descendants of such persons. This exception remained in force until the 1st of December 1908, after which time all who were on the list became (unless disqualified because convicted of felony) life voters, but new applicants had to stand the educational test.

Perhaps the most notable feature about the administration is the weakness of the governor's position. He is elected by popular vote for four years, and cannot succeed himself in office. His power is limited by a council of state, a relic of colonial days. This body is not, however, a special board, as in Maine, New Hampshire, and Massachusetts, but a kind of administrative cabinet as in Iowa, consisting of the secretary of state, the auditor, the treasurer, and the superintendent of education.
public instruction, and advising the governor in the administration of his office. Judges, heads of departments, and executive boards are elected, and there is the legal sanctity of the government to effect the confirmation of the Senate is necessary. Furthermore, in North Carolina the governor has no veto power. In addition to the executive officials mentioned above there are a lieutenant-governor, an attorney-general, a Bureau of Labor Statistics, established in 1857, and a Corporation Commission, which in 1899 supervised the Railroad Commission, established in 1891. The governor and the lieutenant-governor must at the time of their election be at least thirty years of age, and must have been citizens of the United States for five years and residents of the state for three years. Senators of the General Assembly are elected biennially, beginning on the Wednesday after the first Monday in January. The Senate is composed of fifty members elected biennially by senatorial districts as nearly as possible equal to one another in population, and the House of Representatives (in the Constitution of 1776 called the House of Commons) of one hundred and twenty, elected biennially and chosen by counties according to their population, each county having at least one representative, no matter how small its population. A senator must at the time of his election be at least 25 years of age, and must have resided in the state for at least two years, and a resident in his district for one year immediately preceding his election; and a representative must be a qualified elector of the state and must have resided in his county for at least one year immediately preceding his election. The pay for both senators and representatives is four dollars per day for a period not exceeding sixty days; should the session be prolonged the extra service is without compensation. Extra sessions, called by the governor on the advice of the council of state, are limited to twenty days, but may be extended under the same limitations in regard to compensation. The Senate may sit in the court of impeachment to try cases presented by the House, and a two-thirds vote is necessary for conviction.

There is a supreme court consisting of a chief justice and four associates, elected by popular vote for eight years, and a superior or circuit court, composed of sixteen judges elected by the people in each of the sixteen districts for a term of years.

The county officials are the sheriff, a coroner, a treasurer, a register of deeds, a surveyor and five commissioners, elected for two years. The commissioners supervise the penal and charitable institutions of the state, and their functions are similar to those of the board of supervisors in most states. Subordinate to them are the township boards of trustees, composed of a clerk, and two justices of the peace.

By the constitution personal property to the value of $500 and any homestead to the value of $1000 is exempt from sale for debt, except for taxes on the homestead, or for obligations contracted for the purchase of said premises. Under the revised code (1905) a wife may hold property which she had acquired before marriage free from any obligation of her husband, but in general she is not permitted to make contracts affecting either her personal or real estate without the written consent of her husband. Neither can the husband convey real estate without his wife's consent, and a widow may dissent from her husband's will at any time within six months after the probate of the same, the effect of such dissent being to allow her the right of one-third of her deceased husband's property interest. The same rule applies if the wife is the sole heir by descent.

The constitution prescribes that "all marriages between a white person and a negro, or between a white person and a white person of negro descent to the third generation inclusive, are hereby forever prohibited." Until 1905 the only grounds for an absolute divorce were adultery, natural impotence, and pregnancy of the wife at the time of marriage; but an amendment of 1907 allows a divorce whenever there has been a separation of husband and wife for ten successive years, provided the parties have lived in the state for that period and the parties have been divorced on the ground of cruelty. Children under twelve years of age in any factory or manufacturing establishment is unlawful, the working of children between the ages of eight and fourteen, and that they be employed as apprentices and have attended school for at least four months during the preceding year; and no boy or girl under fourteen is to work in such places during night time. An anti-convict law of 1897 makes the sale or purchase within the state of the sale of 50% of an article to raise or lower the price of that article with the intention of injuring a competitor. On the 26th of May 1908 the people of the state voted against a injunction act against beer and wine, and the prohibition act thus approved went into effect on the 1st of January 1909. State prohibition had been defeated in 1881 by a vote of 257,792 for 1,379,000 and in 1891 by 342,354 for 1,000,000 and in 1903 the Watts Law enacted rural prohibition, giving towns local option, under which many of the towns voted "no license"; and in 1905 severe police regulations were provided for towns in which saloons were licensed.

Charitable and Penal Institutions.—In the systematic care of the dependent and defective classes North Carolina was one of the first states in the Union. An orphan and blind asylum was established at Morganton in 1845, and another for the deaf and dumb at Morganton in 1844; by a law of 1897 every deaf child of sound mind must attend, between the ages of eight and fifteen, a state school for the deaf. The_supreme Court held that an act of 1899, by a law of 1908 every blind child (between seven and seventeen), if of sound mind and body, must attend some school for the blind (at Mechanicsville, N.C.); the homes of the State Board of Education at Morganton and Wadesboro, the State Industrial School for boys at Raleigh; these became a state Institution in 1891. In 1908 a state tuberculosis sanatorium was opened near Aberdeen, Moore county. The state also takes good care of the unfortunate among the negro race. The Institute for the Colored Deaf, Dumb and Blind (1867) at Raleigh and the Eastern Insane Hospital (1880) near Goldsboro are the oldest institutions of the kind for negroes in the world; in connexion with the last there is an epileptic colony for negroes. The Asylum for Insane at Oxford (1872) is supported partly by the Masonic Order and partly by the state. A movement begun by the Confederate Veterans Association in October 1889 resulted in the establishment of a hospital for the blind at Morganton, the convicts are released into the work of the state. The lease system does not prevail, but the farming out of convict labour is permitted by the constitution; such labour is especially valuable for the correction of such prisoners, which now are being used at all times cared for and guarded by state officials. A reformatory for white youth between the ages of seven and sixteen, under the name of the Stonewall Jackson Manual Training and Industrial School, was opened at Concord in 1909, and in March 1909 the Foukoll Reformatory and Manual Training School for negro youth was provided for. Charitable and penal institutions are under the supervision of a Board of Public Charities, appointed by the governor for a period of six years, the terms of the different members expiring in different years. Private institutions for the care of the insane, idiots, feeble-minded and inebriates may be established, and their licences may be granted by the County Board of County and each term of the "Horseman of the South" by his wise reforms. He kept the public schools going through the Civil War, having advised against the disturbance of the public instruction and the superintendent of education. The present school system is supervised by a state board of education consisting of the governor, lieutenant-governor, secretary of state, treasurer, auditor, attorney-general, and superintendent of public instruction. In the counties there is a board of education and there is also a local school committee of three in each township. The compulsory attendance at school of children between the ages
of eight and fourteen for sixteen weeks each year by a state law is optional with each county. A state library commission was established in 1909.

Among the earliest steps toward the establishment of the state system of education is the university of North Carolina at Chapel Hill, chartered in 1789 and opened in 1795, one of the oldest state universities in the country and one of the oldest universities in the South; it consists of the college, the grammar school, and the preparatory school (the department of medicine, 1890, part of whose work is done at Raleigh) and the department of pharmacy (1897). In 1907-1908 it had 75 instructors and 775 students. Other state educational institutions are the College of Agriculture and Mechanical Arts (1886) at Raleigh, which in 1907-1908 had 42 instructors and 436 students; the State Normal and Industrial College (1892) for women, at Greensboro; and the State Industrial College for Colored (1889) at Durham. For the higher education of the negroes the state supports an Agricultural and Mechanical College (1891) at Greensboro, and normal and industrial schools at Fayetteville, Elizabeth City and Winston. The most important sectarian schools are the North Carolina Wesleyan College, opened 1834 as a "manual labour and classical institute", as a college, 1835) at Wake Forest, 16 m. north of Raleigh, with 371 students in 1907-1908; Davidson College (Presbyterian, 1837) at Davidson, with 308 students (1907-1908); Biddle University (Presbyterian) at Charlotte, for negroes; Greensboro Female College (Methodist Episcopal, South; 1846); Guilford College (coeducational; Society of Friends, 1837) near Greensboro; Trinity College (coeducational, Methodist, 1852) at Durham; Lenoir College (Lutheran, 1890) at Hickory; Catawba College (Reformed, 1851) at Newton; Waverlyville College (Methodist Episcopal, 1873) at Waverlyville; Elon College (Methodist, 1854); Belmont College (Roman Catholic, 1877), under the charge of Benedictines, at Belmont; Shaw University (Baptist, 1865), for negroes, at Raleigh; and Livingston College (Methodist Episcopal, 1895), for negroes, at Raleigh.

Finance.—The revenues of the state come from two sources; about two-thirds from taxation and about one-third in all from the earnings of the penitentiary, from the fees collected by state officials, from the proceeds from the sale of state publications, and from the dividends from stock and bonds. The state owned, in 1909, 30,002 shares of stock in the North Carolina Railroad Company,1 a market value (1907) of $5,580,372 (the stock being quoted at $186), and an annual income of $120,014 and $126,666 shares of stock in the Atlantic & North Carolina Railroad Company, from which the annual income is $31,665. In addition to the ordinary general property taxes, all parts of the state, with the exception of a few counties, levy an income tax on individuals and a general sales tax and an income tax. North Carolina is one of the few states to experiment with the inheritance tax, but the last law dealing with that subject was repealed in 1893. The total receipts of the general fund for the fiscal year 1907 were $2,665,293, and the total disbursements for the same year were $2,665,282.

The state debt at the close of the fiscal year 1907 amounted to $6,880,540. It may be divided into three parts: that contracted between 1848 and 1861 for the construction of roads, railroads and canals; that contracted during the Civil War for other than war purposes; and that contracted during the Reconstruction era, amounting to $4,010,719, from the second or Reconstruction debt. In the impoverished condition it was impossible for the people to bear the burden, so an act was passed in 1879 scaling part of the debt 60% part of it 75% and part of it 85%. The remainder, $12,805,000, and an additional $82,480,000 held by the United States, was impaired the obligation of a contract, but under the Eleventh Amendment to the Constitution of the United States the bondholders could not bring suit against the state in Federal Courts. The state could do so, however, and in 1904, certain creditors having given ten of their bonds to South Dakota, the case of South Dakota versus North Carolina came before the Supreme Court. The court decided, four judges dissenting, that North Carolina must pay the amount due or suffer her railway bonds to be seized and sold to satisfy the judgment (192 U.S. Reports, 286. See also 108 U.S. 76).

History.—The history of North Carolina may be divided into four main periods: the period of discovery and early colonization (1520-1663); the period of proprietary rule (1663-1720); the period of royal rule (1729-1776); and the period of statehood (from 1776).

It is possible that some of the early French and Spanish explorers visited the coast of North Carolina, but no serious attempt was made by Europeans to establish a settlement until near the close of the 16th century. After receiving from Queen Elizabeth a patent for colonization in the New World, Sir Walter Raleigh, in April 1584, sent Philip Amadas, or Amidas (1559-1611), and Arthur Barlowe (c. 1559-c. 1620) to discover in the region bordering on Florida a suitable location for a colony. They returned in September with a glowing account of what is now the coast of North Carolina, and on the 9th of April 1585 a colony of about 108 men under Ralph Lane (c. 1530-1603) sailed from Plymouth in a fleet of seven small vessels commanded by Sir Richard Grenville. The colony was established at the north end of Roanoke Island on the 17th of August, and about a week later Grenville returned to England. Threatened with famine and with destruction from hostile Indians, the entire party was forced to return to England. Of the adventurers, Virginia Dare (b. 18th August 1587), was the first English child born in America. White soon returned to England for supplies, and having been detained there until 1591 he found upon his return no trace of the colony except the word "Croatian" carved on a tree; hence the colony was supposed to have gone away with some friendly Indians, possibly the Hatteras tribe, and proof of the assumption that these whites mingled with Indians is sought in the presence in Robeson county of a mixed people with Indian habits and occasional English names, calling themselves "Croatian." The gunner, White's grand-daughter, Virginia Dare (b. 18th August 1587), the duke of Albemarle (1668-1760), and six other favourites of Charles II. By a second charter issued in 1665 the limits were extended to 29° and 30° 36′.

The proprietors had all the powers of a county palatine and proposed to establish a feudal and aristocratic form of government. To this end John Locke drafted for them in 1669 the famous Fundamental Constitutions providing for the division of the province into eight counties and each county into seigniories, baronies, precipices and colonies, and the division of the land among hereditary nobles who were to grant three-fifths of it to their freemen and govern through an elaborate system of feudal courts. But these constitutions, several times revised, actually served only as a theoretical standard for the proprietors and were abrogated altogether in 1693, and the colonists were governed by instructions which granted them much greater privileges. From the very beginning the territory tended to divide into two distinct sections, a northern and a southern. The northern section was first called Albemarle, then "that part of our province of Carolina that lies north and east of Cape Fear," and about 1689 North Carolina. Settled largely by people from Pennsylvania, this section came to be closely associated with the continental colonies. The southern section, influenced by its location, by the early settlers from Barbados, and by its trade connections, was brought into rather more intimate relations with the island colonies and with the mother country. The proprietors struggled in vain to bring about a closer union. In 1691
one governor was placed over both settlements, but it was found necessary to appoint a deputy for North Carolina, and finally in 1712 again to allow her a governor of her own. So long as the intervening territory was a wilderness no effort was made to define the boundary line. The first steps were taken in that direction just after the close of the proprietary period in 1720, but the work was not completed until 1815.¹

The first permanent English colony in North Carolina was established at Albemarle on the Chowan river about 1660 by people from Virginia. The colony grew rapidly, and at the close of the colonial period (1767) the population numbered approximately 150,000, including English Protestants, French Protestants, the Iroquois, and about 40,000 negroes. According to Dr Weeks "the earliest settlers . . . were not religious refugees, . . . they came to the province not from religious but economic motives."

The proprietary period (1663-1729) was a turbulent one, in spite of the supposedly peaceful influence of the Quakers. Six out of sixteen governors or deputy-governors were driven from office between 1674 and 1712, and there were two uprisings which have been deemed worthy of the term rebellion. The first, under John Culpeper in 1677, was primarily economic in character, the chief grievance being the payment of an export duty on tobacco. It was evidently influenced by the recent uprising in Virginia under Nathaniel Bacon. The insurrection of dissenters (1708-1711), which was headed by Thomas Carey, who was deputy-governor while the trouble was brewing, was in opposition to the establishment of the Church of England; it was ultimately unsuccessful, the Church was established in 1711, a law was passed which deprived Quakers of the privilege of serving on juries or holding public office, and the establishment was continued until the War of Independence. A war with the Tuscarora Indians, in 1711-1712, resulted in the defeat of the Indians and the removal of the greater part of the tribe to New York, where they became the sixth nation of the Iroquois confederacy.

North Carolina did not join South Carolina in the revolution of 1719 (see SOUTH CAROLINA), but remained under proprietary rule until 1729. In that year an act was passed by parliament establishing an agreement with seven of the Lords Proprietors for the surrender of their claims to both provinces. They were allowed $77,500 for their rights and £5000 for arrears of quit rent, which was accepted with enthusiasm. The proprietors then passed an act of one-eighth undivided share until 1744, when he gave up his claim in return for a large strip of land in North Carolina lying between latitude 35° 34' and the Virginia line (36° 30'). So that while the king was governmental head of the whole of North Carolina from 1729 to 1776 he was, after 1744, territorial lord of only the southern half. The political history during the royal period is, like that of the other colonies, the story of a constant struggle between the representatives of the people and the representatives of the crown. The struggle was especially bitter during the administrations of the last three royal governors, Arthur Dobbs (1684-1765), William Tryon (1729-1788) and Josiah Martin (1737-1786). There were disputes over questions of government, of commerce, of finance and of religion. The ship which brought stamps and stamped paper to Wilmington in 1766 was not permitted to land, and the stampmaster was compelled by the people to take an oath that he would not exercise the functions of his office. Through the vigilance of Governor Tryon, however, the Assembly was prevented from sending delegates to the Stamp Act Congress. The colonists were also angered by the attempt to

¹ Between 1735 and 1746 the southern boundary was first definitely established by a joint commission of North Carolina, South Carolina, and Georgia. The line was resurveyed in 1764, and in 1772 it was extended; parts of the line were resurveyed under acts of the assembly of 1803, 1804, 1806, 1813, 1814 and 1815, and by an act of 1810 the last extension, to the Tennessee line, was confirmed and established. According to the charter the northern boundary was to be the line of 36° 30', but the surveys (of 1728, 1749 and 1779) were not strictly correct, and the actual line runs irregularly from 36° 33' 15" at its eastern to 36° 34' 25.5" at its western end. The boundary between North Carolina and Tennessee was surveyed in 1799 and 1821. Enforce the acts of trade and navigation and by the parliamentary statute of 1764 forbidding the issue of bills of credit; and the Scotch-Irish among them in particular were aroused by the repeal of an act of 1771 allowing Presbyterian ministers to perform the marriage ceremony and of another act of the same year for the establishment of Queen's College in Mecklenburg county for Presbyterians. In the "back country" extortionate fees, excessive taxes, and the oppressive manner of collecting them brought about a popular uprising, known as the Regulation, which was organized by the Iroquois, and about 40,000 negroes. According to Dr Weeks "the earliest settlers . . . were not religious refugees, . . . they came to the province not from religious but economic motives."

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inhabitants of the county to form a military and civil organization independent of the crown of Great Britain which should operate until the Provincial Congress should otherwise provide or the British parliament should "resign its unjust and arbitrary pretensions with respect to America." The "Mecklenburg Declaration," which it is alleged was passed on the 20th of the same month by the same committee, "dissolves the political bonds which have connected the county with the mother country," "proclaims the people of the same allegiance from all allegiance to the British Crown," declares them "a free and independent people," and abounds in other phrases which closely resemble phrases in the great Declaration of the 4th of July 1776.

The Resolutions were published in at least two newspapers only a few days after they were passed. As for the "Declaration," the original records of the transactions of Mecklenburg county were destroyed by fire in 1800, but it is claimed that a copy of the "Declaration" was made from memory in the same year, and when in 1819, a controversy had arisen as to where the movement for independence originated, this copy was published, first in the Raleigh Register and North Carolina Gazette and then in many other newspapers. Several aged men also testified that they had heard a declaration of independence read at Charlotte, the county-seat, in March or April 1776, and still carried to the Continental Congress. Thomas Jefferson and John Adams, however, declared that they had never heard of it before, and both believed it spurious. But Jefferson was charged with plagiarism by those who wished to disprove the correctness of his narrative. In 1830, there was discovered a proclamation of Governor Martin, dated the 8th of August 1775, in which he mentioned a publication in the Cape Fear Mercury of a series of resolutions by a committee of Mecklenburg county delegates to the Provincial Congress, to be presented to the latter in the name of the county. Another stage of the controversy was reached in 1835–1847 when the Mecklenburg Resolutions of the 31st of May 1775 were discovered either in part or in full in newspaper files. There seems practically no basis for the contention that a declaration of independence was adopted on the 20th other than the tradition that independence was declared by the Mecklenburg Committee on that day, and the occasional references in print, even before 1819, to a declaration of independence in the county in 1775. Those who believe the "Declaration" to be spurious would no more argue the nonexistence of the Resolutions than those who believe the Resolutions might easily be thought of as a declaration of independence, that Governor Martin in all probability had knowledge only of these and not of the alleged "Declaration," and that the dates of publication in the Raleigh and Charleston newspapers, and the politics of those papers, show that the Resolutions are authentic. In July 1905 there appeared in Collier's Weekly (New York) what purported to be a facsimile reproduction of a copy of the Cape Fear Mercury which was referred to by Governor Martin in which contained the "Declaration"; but this was proved a forgery.

The first and the second provincial congress did little except choose delegates to the Continental Congress and the management of affairs passed in large measure from the royal government to the several county committees. The third provincial congress, which met on the 21st of August 1775, still required its members to sign an oath of allegiance to King George III, but formed a provisional government consisting of a provincial council and six District Committees of Safety. The first sanction of independence by any body representing the whole province was given by the fourth provincial Congress on the 12th of April 1776, and the same body immediately proceeded to the consideration of a new and permanent form of government. Their labours ended, however, in another provincial government by a Council of Safety, and the drafting of North Carolina's first state constitution was left to a constitutional convention which assembled at Halifax on the 12th of November.

North Carolinians fought under Washington at Brandywine and Monmouth and played a still more important part in the Southern campaigns of 1778–1781. The state was twice invaded, in 1780 and 1781, and two pitched battles were fought upon her soil, Moore's Creek on the 27th of February 1776 and Guilford Court House on the 13th of March 1781.

The territory now comprising the state of Tennessee belonged to Carolina under the charters of 1663 and 1665, and fell to North Carolina when the original province was divided. To this territory settlers, many of them from North Carolina, had gone immediately before and during the War of Independence, and had organized a practically independent government. In 1776 this was formally annexed to North Carolina, but in 1784 the state ceded this district to the national government on condition that it should be accepted within two years. The inhabitants of the district, however, objected to the cession, especially to the terms, which, they contended, threatened them with two years of anarchy; declared their independence of North Carolina and organized for themselves the state of Franklin. But the new state was weakened by factions, and after a brief and precarious existence it was forced into submission to North Carolina by which in 1790 the territory was again ceded to the national government with the proviso that no regulation made or to be made by Congress should tend to the emancipation of slaves (see TENNESSEE).

North Carolina sent delegates to the Philadelphia Constitutional Convention of 1787, but the state convention, at Hillsboro, called to pass upon the constitution for North Carolina, did not meet until the 21st of July 1788, when ten states had already ratified. On the first day of this convention the opponents to the constitution, among whom were most of the delegates from the western counties, were ready to reject it without debate, but yielded to a proposal for discussing it clause by clause. In this discussion, which was continued for nine days, the document was most strongly opposed because it contained no bill of rights and on the ground that it would provide for such a strong central government that the state governments would ultimately be sacrificed. At the conclusion of the debate the convention by a vote of 84 to 54 declared itself unwilling to ratify the constitution because a bill of rights had been added and it had been amended in several other particulars so as to guarantee certain powers to the states. By reason of this rejection the relations of North Carolina with the other states were severed upon the dissolution of the Confederation, and it took no part in the first election or in the organization of the new government. However, there was a speedy reaction against the opposition which had in no small measure been inspired by fear of a requirement that debts be paid in gold and silver. A second convention met at Fayetteville in November 1789 and the constitution was speedily ratified (on the 13th) by a vote of 195 to 77.

The period from 1790 to 1835 was marked by a prolonged contest between the eastern and the western counties. When the state constitution of 1776 was adopted the counties were so nearly equal in population that they were given equal representation in the General Assembly, but the equality in population disappeared in the general westward movement, and in 1790 the West began to urge a new division of the state into representative districts according to population and taxation. This was doubly urged by West Carolina, which had a different attitude as the East opposed its projects for internal improvements for which the West had the greater need. In 1823 the West called an extra-legal convention to meet at Raleigh, and delegates from 24 of the 28 western counties responded, but those from the far West, in which there were practically no slaves, wished free white population to be made the basis of representation, while those from the Middle West demanded the adoption of the basis for the national House of Representatives and the convention made only a divided appeal to the people. Ten years later, however, at the election of assemblymen, 33 of the western counties polled an extra-legal vote on the question of calling a constitutional convention, and 30,000 votes were cast for it to only 1000 against it. The effect of this was that in January 1835 the legislature passed a bill for submitting the question legally to all the voters of the state, although this bill itself limited the proposed convention's power relating to representation by providing that it should so amend the constitution that senators be chosen by districts according to public taxes, and that commoners be apportioned by districts according to Federal representation, i.e. five slaves to be counted equal to three whites. When the popular vote was taken, in the following April, every eastern county gave a majority against the convention, but the West, even with the limitation which was decided
favourable to the East, voted strongly for it and carried the election with a total majority in the state of 586 votes. Again, however, the advantage was with the East, for the delegates were chosen by counties, two from each; but in the convention, which was in session at Raleigh from the 4th of June to the 11th of July, the East made some concessions: such as the popular election of the governor (who had previously been elected by the two houses of the legislature), the disfranchisement of free negroes, and the abolition of representation from 6 boroughs, 4 of which were in the East. The number of senators was reduced to 50, the number of commoners to 120, and the manner of choosing senators and commoners was changed as directed in the act providing for the convention. The electorate gave its approval to the revision by a vote of 26,771 to 21,066, and with this the agitation over representation ceased.

The fundamental points of difference between North Carolina and South Carolina were exemplified in the slavory conflict. South Carolina led the extreme radical element in the South and was the first state to secede. North Carolina held back, worked for a compromise, sent delegates to the Washington Peace Convention in February 1861, and did not secede until the 20th of May 1861, after President Lincoln’s call for troops to preserve the Union. Liberal support was given to the Confederacy, both in men and supplies, but Governor Vance, one of the abest of the Southern war governors, engaged in acrimonious controversies with President Jefferson Davis, contending that the general government of the Confederacy was encroaching upon the prerogatives of the separate states. Owing to the dispute between the leader, the state convention dissolved and the invasion until near the close of the war. Wilmington was captured by the Federals in February 1865; General Sherman’s army crossed the southern boundary in March; a battle was fought at Bentonville, March 19-21; Raleigh was entered on April 13; and the Confederates under General Joseph E. Johnston surrendered near Durham Station, in Durham county, on the 26th.

Reconstruction was a costly experience here as in other Southern states. Jonathan Worth (1852-1869), elected governor under the presidential plan in 1865, was an honest and capable official, but the government established in accordance with the views of Congress in 1868 was corrupt, inefficient and tyrannical. Carpet-baggers, negroes and unscrupulous native whites, known as scalawags, were in control of affairs, while the people of wealth, refinement and education were disfranchised. Governor William Woods Holden (1818-1823; governor 1868-1870) was so weak and tyrannical that he was impeached by the legislature in December 1870. Under his successor, Tod R. Caldwell (1818-1874), there was some improvement in the condition of affairs, and in 1875 a constitutional convention, in session at Raleigh, with the Democrats slightly in the majority, amended the constitution, their work being ratified by the people at the state election in 1876. The native white element completely regained possession of the government in the following year, when the Democrats came into office under Governor Zebulon B. Vance. Since that time the most interesting feature in the political history has been the rise and fall of the People’s party. The hard times which followed the financial panic of 1893 made it possible for them, in alliance with the Republicans, to carry the state in the election of 1894. Afterwards their strength declined, because the people came more prosperous, because the national Democratic party in 1896 and 1900 adopted their views on the money question, and because of the unpopularity of a coalition with Republicans, which made it necessary to give the coloured people a share of the offices. The race question was the chief issue in the election of 1898, the Democrats were successful, and what amounted to a negro disfranchising amendment to the constitution was adopted in August 1900. In 1907 there was a serious clash between the state authorities and the Federal judiciary, arising from an act of the legislature of that year, which fixed the maximum railway fare at 2½ cents a mile and imposed enormous fines for its violation. The two principal railway corporations, the Southern and the Seaboard Air Line, contends that the act was clearly contrary to the 14th Amendment to the Federal Constitution in that it denied the equal protection of law. The promise of the railways to give to every purchaser of a ticket a rebate check until the question of the validity of the act should be decided by the courts was not satisfactory to the state authorities, who arrested a ticket agent of the Southern railway, convicted him of violating the law, and sentenced him to the chain-gang for a year. Thereupon the attorneys for the railway applied to Judge Jeter Connelly Pritchard (b. 1857) of the United States Circuit Court for a writ of habeas corpus; this was granted and the prisoner was released. The governor of the state, Robert Brodax Glenn (b. 1854), nevertheless urged the state courts and attorneys to proceed with the prosecution of other ticket agents, and threatened to resist with the force of the state any further interference of Federal judiciary; but in March 1908 the Supreme Court of the United States declared the North Carolina rate law unconstitutional on the ground that it was confiscatory.

**Governors of North Carolina**

**Proprietary Period** (1663-1729).

<table>
<thead>
<tr>
<th>Governor</th>
<th>Term</th>
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<tbody>
<tr>
<td>William Drummond</td>
<td>1663-1667</td>
</tr>
<tr>
<td>Samuel Stephens</td>
<td>1667-1669</td>
</tr>
<tr>
<td>Peter Carteret</td>
<td>1669-1673</td>
</tr>
<tr>
<td>John Jenkins, president of the council</td>
<td>1673-1676</td>
</tr>
<tr>
<td>Thomas Eastchurch</td>
<td>1675-1680</td>
</tr>
<tr>
<td>Thomas Miller, president of the council</td>
<td>1676-1678</td>
</tr>
<tr>
<td>John Harvey, president of the council</td>
<td>1678-1679</td>
</tr>
<tr>
<td>John Jenkins</td>
<td>1679-1681</td>
</tr>
<tr>
<td>Henry Wilkinson</td>
<td>1680-1685</td>
</tr>
<tr>
<td>Seth Sothel</td>
<td>1683-1689</td>
</tr>
<tr>
<td>Philip Ludwell</td>
<td>1689-1691</td>
</tr>
<tr>
<td>Alexander Lillington, deputy-governor</td>
<td>1691-1694</td>
</tr>
<tr>
<td>Thomas Harvey, deputy-governor</td>
<td>1694-1699</td>
</tr>
<tr>
<td>Henderson Walker, president of the council</td>
<td>1699-1704</td>
</tr>
<tr>
<td>Robert Daniel, deputy-governor</td>
<td>1704-1705</td>
</tr>
<tr>
<td>Thomas Carey, deputy-governor</td>
<td>1705-1706</td>
</tr>
<tr>
<td>William Glover, president of the council</td>
<td>1706-1707</td>
</tr>
<tr>
<td>Thomas Carey (contestants (Carey’s rebellion)</td>
<td>1709-1710</td>
</tr>
<tr>
<td>William Glover</td>
<td>1710-1712</td>
</tr>
<tr>
<td>Edward Hyde, deputy-governor</td>
<td>1712-1714</td>
</tr>
<tr>
<td>Thomas Pollock, president of the council.</td>
<td>1714-1722</td>
</tr>
<tr>
<td>Charles Eden</td>
<td>1714-1722</td>
</tr>
<tr>
<td>Thomas Pollock, president of the council</td>
<td>1722-1724</td>
</tr>
<tr>
<td>William Reid, president of the council</td>
<td>1724-1725</td>
</tr>
<tr>
<td>George Burton</td>
<td>1725-1729</td>
</tr>
<tr>
<td>Edward Mosely, president of the council.</td>
<td>1729-1731</td>
</tr>
<tr>
<td>Sir Richard Everard</td>
<td>1731-1734</td>
</tr>
</tbody>
</table>

**Royal Period** (1729-1776).

<table>
<thead>
<tr>
<th>Governor</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>George Burtinon</td>
<td>1731-1734</td>
</tr>
<tr>
<td>Nathaniel Rice, president of the council</td>
<td>1735-1739</td>
</tr>
<tr>
<td>Gabriel Johnston</td>
<td>1734-1752</td>
</tr>
<tr>
<td>Nathaniel Rice, president of the council</td>
<td>1752-1753</td>
</tr>
<tr>
<td>Matthew Rowe, president of the council</td>
<td>1753-1754</td>
</tr>
<tr>
<td>Arch Dobbs</td>
<td>1754-1755</td>
</tr>
<tr>
<td>William Tryon</td>
<td>1755-1771</td>
</tr>
<tr>
<td>James Hassell, president of the council</td>
<td>1771-1772</td>
</tr>
<tr>
<td>Josiah Martin</td>
<td>1771-1775</td>
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</tbody>
</table>

**Statehood Period** (1776—):  

<table>
<thead>
<tr>
<th>Governor</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richard Caswell</td>
<td>1777-1779</td>
</tr>
<tr>
<td>Abner Nash</td>
<td>1779-1781</td>
</tr>
<tr>
<td>Thomas Burke</td>
<td>1781-1782</td>
</tr>
<tr>
<td>Alexander Martin</td>
<td>1782-1784</td>
</tr>
<tr>
<td>Richard Caswell</td>
<td>1785-1786</td>
</tr>
<tr>
<td>Samuel Johnston</td>
<td>1787-1790</td>
</tr>
<tr>
<td>Alexander Martin</td>
<td>1790-1792 (Federalist)</td>
</tr>
<tr>
<td>Richard Dobbs Spaight, Sr.</td>
<td>Dem.-Rep. 1791-1795</td>
</tr>
<tr>
<td>Samuel Ashe</td>
<td>1795-1799</td>
</tr>
<tr>
<td>William Richardson Davie.</td>
<td>1798-1799</td>
</tr>
<tr>
<td>Benjamin Williams</td>
<td>1799-1802</td>
</tr>
<tr>
<td>James Turner</td>
<td>1802-1805</td>
</tr>
<tr>
<td>Nathaniel Alexander</td>
<td>1805-1807</td>
</tr>
<tr>
<td>Benjamin Williams</td>
<td>1807-1808</td>
</tr>
<tr>
<td>David Stone</td>
<td>1808-1810</td>
</tr>
<tr>
<td>Benjamin Smith</td>
<td>1810-1814</td>
</tr>
<tr>
<td>William Hawkins</td>
<td>1814-1817</td>
</tr>
<tr>
<td>William Miller</td>
<td>1817-1820</td>
</tr>
<tr>
<td>John Branch</td>
<td>1817-1820</td>
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</tbody>
</table>

1 Burrington was appointed in 1730, but did not arrive in the province until February 1731. Either Everard held over or the president of the council was acting-governor from 1729-1731.
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NORTHCOTE, JAMES (1746-1831), English painter, was born at Plymouth on the 22nd of October 1746. He was apprenticed to his father, a poor watchmaker of the town, and during his spare hours was diligent with brush and pencil. In 1769 he left his father and started as a portrait-painter. Four years later he went to London and was admitted as a pupil in the house of households and House of Commons. At the same time he attended the Academy schools. In 1775 he left Reynolds, and about two years later, having acquired the requisite funds by portrait-painting in Devonshire, he went to study in Italy. On his return to England, three years later, he revisited his native county, and then settled in London, where Opie and Fuseli were his rivals. He was elected associate of the Academy in 1786, and full academicians in the following spring. The "Young Princes murdered in the Tower," his first important historical work, dates from 1786, and it was followed by the "Burial of the Princes in the Tower," both paintings, along with several others, being executed for Boydell's Shakespeare gallery. The "Death of Wat Tyler," now in the Guildhall, was exhibited in 1787; and shortly afterwards Northcote began a set of ten subjects, entitled "The Modest Girl and the Wanton," which were completed and engraved in 1796. Among the productions of Northcote's later years are the "Entombment" and the "Agony in the Garden," besides many portraits, and several animal subjects, like the "Leopards," the "Dog and Herron," and the "Lion"; these latter were more successful than the artist's efforts in the higher departments of art, as was indicated by Fuseli's caustic remark on examining the "Angel opposing Balaam." — Northcote, you are an angel at an ass, but an ass at an angel. The works of the artist number about two thousand, and he made a fortune of £4,000. He died on the 13th of July 1831.

Northcote was emulous of fame as an author, and his first essays in literature were contributions to the Artiz, edited by Prince Hoare. In 1770 he published a series of seven poems, The Saviour of Old North Carolina (1st ed., 1788; 2nd ed., 1818), and his old manuscript edition of the poems of Reynolds. His Fables—the first series published in 1828, the second posthumously in 1833—were illustrated with woodcuts by Harvey from Northcote's own designs. In the production of his Life of Reynolds, his last work, which appeared in 1830, he was assisted by William Hazlitt, who previously, in 1826, had given to the public in the New Monthly Magazine his recollections of Northcote's pungent and cynical "conversations," the bitter personalities of which caused much trouble to the painter and his friends.

NORTH DAKOTA, one of the North Central states of the American Union, between 45° 35' and 49° N., and 96° 25' and 104° 3' W. It is bounded N. by the Canadian provinces of Saskatchewan and Manitoba, S. by South Dakota, W. by Montana and E. by Minnesota, from which it is separated by the Missouri River. North Dakota has an extreme length, E. and W., of 360 m., an extreme width, N. and S., of 210 m., and a total area of 70,837 sq. m., of which 654 sq. m. are water surface.

Topography.—North Dakota lies in the Prairie Plains and Great Plains physiographic provinces. The escarpment of the Coteau du Missouri is the dividing line, that portion to the N. and E. lying in the Prairie Plains, that to the S.W. in the Great Plains. The surface presents few striking topographic features, and may be subdivided into three vast plains or prairie tablelands. They have been named the parents of the two famous, most together constituting the Prairie Plains portion of the state. The lowest of these plains is the valley of the Red river, and this valley extends along the eastern edge of the state and varies in width from 25 to 70 m. Its elevation is 965 ft. at
Wahpeton, in the extreme S.E.; 903 ft. at Fargo; 836 ft. at Grand Forks; and 798 ft. at Pembina, in the extreme N.E., which is the lowest point within the state. To the W. of this valley lies a second plain, ranging in height from 1200 to 1600 ft. above sea level, and here met the traveller, in the S. to 1000 ft. in the N. This plain is separated from the Red river valley in the N. by an abrupt slope rising to a height of from 300 to 500 ft. above the surrounding country, and called the Manitoba escarpment, because the greater part of it lies in the province of Manitoba. The Pembina Mountains, low hills near the international boundary and about 30 m. W. of the Red river, form a portion of this escarpment. From these hills southward the ridge gradually becomes less abrupt until in Walsh county it vanishes into prairie. The ascent to the upper plain then becomes very gentle, though the full height of 400 or 500 ft., until it reaches the southeastern portion of Sargent county and changes into the more abrupt Coteau des Prairies, a plateau about 2000 ft. above the sea. The second plain, while not so level as the Red river valley, contains but one group of hills, the Turtle Mountains; these rise from 300 to 400 ft. above the general level, near the centre of the northern boundary. The prairies in this second table-land are gently rolling, and are covered with drift from the continental ice-sheet of the glacial period. They are bounded on the W. by a ridge from 300 to 400 ft. in height and from 20 to 50 m. in width, which roughly marks the divide between the lands of the plains and the prairies to the S. and the grazing lands of the W. The northern portion of this ridge forms the water-parting between the streams that empty into Hudson Bay and those that flow into the Gulf of Mexico. To the W. of this ridge lies the third and highest plain within the state, the so-called Coteau du Missouri. It occupies nearly one half of the state, and rises gradually westward until it attains a general level of about 2700 ft. East of the Missouri river this region is covered with glacial drift, and is noticeably different from the more level lands of the lower plains. The ice-sheet worked its way west in the black and blue ground, filling the ravines with debris until the surface has a billowy appearance. As the Missouri river marks approximately the lower edge of the ice-sheet, the region W. of this stream is almost free from glacial deposits and presents a strong contrast to the rest of the state. The billowy plains still remain in places, but in the vicinity of streams the billows give way to deep ravines. The sands and clays found here are fine and soft, and as there is scant vegetation to protect the hillsides they are easily eroded by the rains. As a result, the surface has been carved into fantastic forms. The early French explorers called the region les terres mauvaises, on account of its stony character. And in this, the French equivalent, "the Bad Lands," this appellation still remains. High winds and seas of burning lignite coal have aided the rains in giving the Bad Lands their peculiar configuration. Prairie fires or spontaneous combustion have ignited many coal seams. Some have already burnt out; others still emit smoke and sulphurous fumes from the crevices in the hillsides, and through the fissures may be seen the glowing coal and rock. The earth surface above these natural furnaces has been hardened, cracked and sometimes melted into a reddish slag, called scoria, which, seen in its accumulation to lava, gives the impression of an incorrect impression that the region was once the centre of volcanic disturbances. The picturesque effect of this sculpturing by water, wind and fire is greatly enhanced by the brilliant colours along the faces of the hills and ravines—grey, yellow, black and every shade of red and brown. Here too are found petrified forests and other evidences of a vegetable growth that has long ago disappeared. The lands are bad for the traveller and the farmer, but not for the ranchman. A few miles from the streams the country is less broken, and there are deep grassy valleys, in which the animals may find shelter in winter. Cattle sometimes congregate in cold weather around a burning coal seam and enjoy the warmth. The lignite in this region also warms the ranchman's cabin, being easily mined where a seam is exposed in the walls of a ravine or on the side of a hill.

North Dakota has a mean elevation of 1900 ft. The highest point in the state, about 3500 ft., is in the southern part of Bowman county, east of the Little Missouri river.

**Rivers.—** There are three drainage systems within the state: the Red river of the North (in the S.W. corner), the Souris, river and its tributaries, and the Missouri river and its tributaries. The Red river flows in a winding channel along the eastern margin of the state, empties into Lake Winnebago in Canada, thence reaching Hudson Bay through the Nelson river. Its tributaries are small, and are remarkable chiefly for the fact that they at first flow in a direction almost opposite to that of the main stream, and then recede in a south-westerly direction. Next to the Souris, river, the Park and the Pembina rivers are the most important of these streams. The Mouse, or Souris, river rises in Canada, crosses the international boundary near the meridian of 102° W. long., and flows for about 150 m. into North Dakota, where it is joined by the Missouri river. The Missouri river, the longest in the state, and the most important, crosses the western boundary near the 48th parallel, and after pursuing a winding course in a general south-easterly direction, leaves the state near the centre of its southern boundary. The James river, flowing southward into South Dakota, is the Missouri's only important eastern tributary within the state. From the W. the Missouri receives the waters of the Little Missouri, Cannon Ball, Heart and Knife rivers. All that portion of the state lying W. of the Pembina Mountains and E. of the Missouri river valley is practically without river drainage, and for its surface and sub-surface drainage, Devil's Lake, an irregular body of water about 40 m. in length and with an area of 400 sq. m., is of great importance. This lake, which is 50 ft. in depth, is strongly saline. The entire region W. of the Red river valley and E. of the Missouri river is dotted with small lakes. The Missouri river and its tributaries, and the waters of the Mouse and Missouri rivers are dotted with small lakes. The morainic belts and other obstructions in the drift plains hem in the lakes, and the interfluves are dotted with "slack water lakes," varying in diameter from a few yards to several miles. All the lakes of the state are of this character, and many are strong with salt and alkali. The drift plains also contain numerous shallow hollows, locally termed "pots" and "wet holes," which receive the drainage of their vicinity and form sloughs.

**Prairie and Flora.—** Before the advent of the white man, herds of bison covered the plains. The prairie dog and the prairie chicken were numerous. The exception of deer and bears, large game is to be found only in the Bad Lands. Here are found the lynx, the "mountain lion" or puma, the prairie and timber wolves, the jack rabbit, the prairie chicken, and the prairie dog. The prairie grass, 2 ft. high, is the dominant vegetation. A few fur-bearing animals, the mink, beaver and raccoon, still remain. The prairie dog is found everywhere. Among the lakes, sloughs and stubble-fields of the prairies, teal, ducks, geese and gulls are found in abundance. Other prairie birds are the prairie chicken, and there are a great many birds that sing while flying; among them are the horned lark, bobolink, Smith's longspur and chestnut collared longspur, lark-sparrow, lark-bunting and Sprague's pipit.

The flora of North Dakota is typical of a semi-arid country. The prevailing plant-colour is a greyish green, due to a hard dry crust which veils the plants, and causes the exception of exception of deer and bears, large game is to be found only in the Bad Lands. Here are found the lynx, the "mountain lion" or puma, the prairie and timber wolves, the jack rabbit, the prairie chicken, and the prairie dog. The prairie grass, 2 ft. high, is the dominant vegetation. A few fur-bearing animals, the mink, beaver and raccoon, still remain. The prairie dog is found everywhere. Among the lakes, sloughs and stubble-fields of the prairies, teal, ducks, geese and gulls are found in abundance. Other prairie birds are the prairie chicken, and there are a great many birds that sing while flying; among them are the horned lark, bobolink, Smith's longspur and chestnut collared longspur, lark-sparrow, lark-bunting and Sprague's pipit.

The peculiar bow shape of these western tributaries of the Red river is due to the fact that these streams originally flowed S.E. into Lake Manitoba, now extinct. As the waters of the lake gradually receded, the rivers reached it by pushing their channels eastward through what was once its bed. The southern part of the lake bottom was finally uplifted by a movement of the earth crust, and the waters of the S. and E. streams were thus drained, and continued to recede, and the tributaries, in cutting their way through the sediments, followed the slope of the land and gradually turned northward.

Soil fertility settlers found the bones of the bison scattered over the prairies, and after the construction of railways the gathering and shipping of these for use in sugar refining and in the manufacture of starch and glue, has been of great importance. Between January and August 1889 a single dealer at Minot shipped 1200 tons, which sold at $8 a ton.
only on Turtle Mountains, in the vicinity of streams, and in a few other places. Six million acres of the state are forested. The woodland area is estimated at 600 sq. m., or less than 1% of its entire surface. No other state in the Union has such a relatively small area of forest. By an executive proclamation, which came into effect in 1890, the state takes over all timber on land belonging to the government valued at $21,249,328.

Forest. - The forest timber, which is chiefly of the coniferous kind, is valued at $31,300,000. The Black Leg spruce exhibit a vegetation typical of semi-arid regions. Cottonwoods flourish along the Little Missouri river, and in sheltered ravines growing along the Missouri, as well as along the streams. The larger trees are covered with a protective covering of some sort of resin. Poplars grow in the valleys, and the cactus and sage brush are common. The faces of buttes and ravines that are turned toward the sun are usually devoid of vegetation. Cottonwoods are unprotected from the wind, which often comes with great force from the west. These trees are sheltered with a variety of shrubs, particularly the willows and the poplars.

Water. - The Missouri river is the most important water course, and is navigable for 200 miles from St. Louis, Missouri. Lake Manley is the largest lake in the state, and is navigable for 25 miles. The lake is 76 miles long, and covers 43,000 acres.

Agriculture. - Agriculture is by far the most important industry of the state, and, owing to climatic conditions, it is rigidly limited to a few staple crops. The growing season is too short for maize or tobacco. Potatoes, wheat, flaxseed, and hay are the most important products. In 1905, 5,135,029 acres were cultivated, of which 4,463,992 acres were in wheat, 2,687,347 acres in flaxseed, and 700,000 acres in hay. The yield of wheat in 1905 was 7,760,333 bushels, valued at $10,542,640. The value of the farm property in the same decade rose from $11,261,982 in 1899 to $19,933,819 in 1909. The total area under cultivation increased from 1899 to 1909 from 21,249,328 to 27,740,975 acres.

The average size of the farms (excluding farms under 3 acres with products valued at less than $500) was 277.4 acres in 1899 and 349.6 acres in 1909. The larger farms, those of 500 acres and over, were operated by their owners, 15.2% by part owners and 7.2% by tenants. Hay and grain formed the principal source of income, 28.8% of the total receipts, and wheat 26.8% of the total receipts.

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Population.—In 1870 the population of that portion of Dakota Territory included within the present limits of North Dakota was 2,905; in 1880, 35,629. The population of the state in 1890 was 136,713; in 1900, 310,146; in 1905, 437,070; in 1910, 583,885. The number of the foreign-born population in 1900 was 13,001, or 35 1/4%, the highest proportion to be found in any state of the Union. The principal elements composing the white foreign population were as follows: Norwegians, 30,306, English Canadians 25,004, Russians 14,979, Germans 11,546, Swedes 8,419. The coloured population consisted of 4,692 Indians not taxed, 2,796 Indians taxed, 286 negroes, 148 Japanese and 32 Chinese. Most of the Indians not taxed live on reservations, of which there are four: Devils Lake Reservation, in the north central part of the state, bounded by the Red and Missouri rivers, containing 308,000 acres, and consisting of Sisseton, Wahpeton, and Cut Head (or Pabakan) Sioux; Turtle Mountain1 Reservation, in Rolette county, established in 1882, and now allotted (excepting 186 acres for church and school purposes), had a population in 1905 of 2,558, being for the most part a mixture of Pembina (or Turtle Mountain) Chippewa with French Canadians; Fort Berthold Reservation in the west central part of the state, on the Missouri river, established in 1870, had in 1909 an area of 1382-4 sq. m., and a population of 309 Arikara (Caddoan), and, of Siouan stock, 453 Hidatsa or Gros Ventres as they are known, the central band of Mandans; and Standing Rock Reservation, on the western bank of the Missouri river, was established in 1875, and in 1909 contained 2887-2 sq. m. (about three-fifths of which lies in South Dakota and much of which was opened to settlement in 1898-1909) and a population of 3,399 Sioux. The population of the state is largely rural. The larger municipalities with the population of each in 1905 were: Fargo (12,512), Grand Forks (10,127), Jamestown (9,093), Bismarck, the capital, (4,913), Minot (4,125), Valley City (4,905), Dickinson (3,485), Wahpeton (3,714), Mandan (2,714), Grafton (2,423) and Devils Lake (2,467); in 1910 there were fifteen other municipalities with a population of over 1,000. In 1906 the Roman Catholic Church had the largest number of communicants (61,261 out of a total of 150,053 members of all denominations), and there were 59,023 Lutherans.

Administration.—The state is governed under its constitution of 1889, as subsequently amended. The governor is chosen biennially, and has a limited pardoning power. He may veto appropriation bills by items, but any of his vetoes may be overruled by a two-thirds vote of each house. The governor and lieutenant-governor must be at least thirty years old. The lieutenant-governor succeeds to the executive office, if necessary, by seniority, and in the event of the death of the governor. The other administrative officers are the auditor, treasurer, superintendent of public instruction, commissioner of insurance, three commissioners of railways, attorney general and commissioner of agriculture and labour; each of these offices is chosen biennially and must be at least twenty-five years of age. The legislative department consists of a Senate, with members chosen every four years, and about half chosen at each biennial election; and a House of Representatives, with members chosen biennially. The sessions of the legislature are biennial, and are limited to sixty days. The minimum age for senators is twenty-five years and for representatives twenty-one years. Bills may originate in either house. A lieutenant-governor, chosen biennially, presides over the Senate. In 1907 the legislature proposed an amendment providing for the application of initiative and referendum to statutory laws and constitutional amendments; two years later the legislature passed a substitute resolution, which omits the clause regarding amendments of the constitution, and which, if passed by the legislature of 1911 will be put to popular vote at the general election of 1912. The judicial department consists of the supreme court, district courts, county courts, municipal courts, and justices of the peace. The supreme court consists of three judges (minimum age thirty years), chosen by popular vote for six years. Their number may be increased to five whenever the population of the state shall amount to 600,000.

For each judicial district (the tenth district was created in 1907) there is one district judge, elected for four years; the district courts have original jurisdiction (except in probate matters) and certain appellate jurisdiction. The judge of the county court is chosen for two years. This court has exclusive original jurisdiction in probate matters, and in counties with over 2000 inhabitants its jurisdiction may be extended by popular vote to include concurrent jurisdiction with the district courts in civil matters involving amounts less than $1,000, and in criminal actions below the grade of felony. Justices of the peace have jurisdiction in civil cases involving no land titles and sums of money not exceeding $200. They may also try misdemeanours in counties without other criminal jurisdiction. For each township the law provides a township board. If the county is divided into counties, the state is divided into counties (46 in 1910). In those counties that have not adopted a township organization county affairs are administered by a board of county commissioners; where the township organization has been adopted the county government is administered by the chairmen of the several township boards. For each county there are a judge, clerk, register of deeds, auditor, treasurer, sheriff and state's attorney.

All citizens of the United States residing in North Dakota are declared to be citizens of the state. The right of suffrage is conditioned on the payment of the state poll tax ($1 if the person is citizens of the United States or have declared their intention of becoming citizens, and who have resided in the state one year, in the county six months, and in the voting precinct ninety days preceding the election. Civilized Indians who have severed their tribal relations two years before an election are entitled to vote. Women may vote for all school officers and upon all questions relating solely to school matters, and are eligible to any school office.

Amendments to the constitution must be passed by both houses of the legislature at two consecutive sessions, and must then be ratified by a majority of the elected members of both houses of the legislature, by a majority of those who were citizens of the United States or have declared their intention of becoming citizens, and who have resided in the state one year, in the county six months, and in the voting precinct ninety days preceding the election. Civilized Indians who have severed their tribal relations two years before an election are entitled to vote.

The amount of homestead exempt from seizure for debt is limited in value to $5,000, and may not include more than two acres in a town plot or more than 160 acres elsewhere. The exemption is not valid against a debt created for the purchase money, or against taxes levied on the property, or against mechanics' or labourers' liens for work done or material furnished for improvements, or against a mortgage acknowledged by both husband and wife. The act allowed the granting of divorces of fifteen years by the county court for cruelty, desertion (one year), neglect (one year), habitual drunkenness (one year) and conviction for felony; residence in the state for one year is required before application for divorce.

North Dakota is one of the few American states whose constitution forbids the manufacture, importation or sale of intoxicating liquors. Attempts to secure the repeal of this provision have been unsuccessful. Apothecaries may secure a licence to sell liquors for purely medicinal purposes upon a petition signed by twenty-five reputable free-holders and twenty-five reputable women. In 1909 the advertisement of liquors, solicitation of orders for liquors, and the sale of cigarettes to minors were prohibited.

Education.—At the head of the public school system is a superintendent of public instruction, chosen for two years. He, with the governor and the president of the state university, constitutes a high-school board, having supervision of the secondary schools. In each county there is a county superintendent, elected biennially, and in each school district a board of directors. The proceeds of the sale of public lands donated to the state for educational purposes, and all escheats to the state, constitute a trust fund, the interest from which, with the proceeds of all fines for the violation of state laws, is annually apportioned among the school districts according to the number of school children in each district. The State Tuition Fund in 1908 was $357,238. This income is supplemented by local taxation. The minimum school term allowed by law is six months.

1 The Devils Lake Reservation and the Turtle Mountain Chippewa are both under the Fort Totten School, which is on the Devils Lake Reservation.

2 Before the law passed by the first Legislative Assembly of the state to carry out this provision could come into effect, it was partially annulled by the decision of the United States Supreme Court in the case of Lessee v. Hardin (1890), in which the court held that such property might be imported into any state and sold in the original package (gazette) without reference to local prohibitory or restrictive laws.
months, and the schools are open to all pupils between the ages of six and twenty-one years. For children between the ages of eight and fourteen attendance for twelve weeks, six being consecutive, is compulsory. The total enrollment in the public schools in 1890 was 135,181, of which 51,017 were girls. The public schools are also maintained at a large expense, and the facilities are also furnished by the state through university and school of mines at University, near Grand Forks, normal schools (opened in 1890) at Valley City and Mayville, an agricultural college and experimental farm at Grand Forks, and industrial schools (opened in 1890) at Ellendale, a school for the deaf (1890) at Devils Lake, a scientific school (opened in 1903) at Wahpeton, and a school of commerce and domestic arts at Bottineau. Fargo College at Fargo, founded in 1887 by Congregationalists, is now non-sectarian. The Episcopal Church maintains Wesley College near Grand Forks (formerly the Red River Valley University at Wahpeton), affiliated with the University of North Dakota. There is a state institution for the insane, a public library, and a penitentiary. The state supports a hospital for the insane at Jamestown, an institution for the feeble-minded at Grafton, a home for old soldiers at Lisbon, a blind asylum at Bathgate, a reform school (opened 1902) at Mandan and a penitentiary at Bismarck. There is a state sanatorium for tuberculosis (1900).

Finance.—The chief source of revenue for the state, counties and municipalities is the general property tax. There are no special corporation taxes, but licence-charges are levied upon express and sleeping-car companies, and a tax is laid on the premiums of insurance companies. No poll tax is levied for state purposes, but counties are authorized to levy such a tax for school purposes. There are boards of equalization and review for the state, counties and municipalities. The state board fixes the rate of the state tax. For defraying the expenses of the state government, exclusive of the internal department, there is a statute fixed, by which the state is required to pay the cost of the state capital at an average of four mills on the dollar of assessed valuation. The state debt, excluding the amount of Territorial indebtedness assumed when the state was created, does not exceed $3,259,668. Local indebtedness is limited to 5% of the assessed value of the local property, but incorporated cities may by special vote increase this limit. The total bonded debt of the state on the 31st of October 1908 was $641,500 and was incurred for the most part for the construction of public buildings during the Territorial period. At the close of the fiscal year ending on the 31st of October 1908, the net debt for the year amounted to $2,299,668, the expenditures to $3,476,073, and the balance remaining on hand was $1,176,195.

History.—The first attempts to establish permanent settlements in what is now North Dakota were made by traders of the Hudson's Bay Company, who began their operations in the Red river valley about 1793.1 In 1797 C. J. B. Chaboillez, a French trader in the service of the North-West Fur Company, built a trading post on the southern bank of the Pembina river, near its mouth, but this was soon abandoned. Three years later Alexander Henry, the younger (d. 1814), built two trading posts in the present limits of the state for this company, one on the North Fork of Red river, the other near Devils Lake, where he lived until 1808. David Thompson (1770-1857), an employee at different times of the Hudson's Bay and North-West Fur companies, explored the region of the Missouri river in 1797-1798, and thus anticipated the work of Lewis and Clark, who entered the present limits of the state in 1804 and wintered among the Mandans, constructing Fort Mandan in what is now McLean county. In 1801 John Cameron (d. 1804) erected a trading post for the North-West Fur Company on the site of the present Grand Forks. The first real homeseekers to enter the state of whom there is any record were a colony of Scottish Highlanders who had first settled at Kildonan (Winnipeg) in 1812 under a grant from the Hudson's Bay Company to Thomas Douglas, 5th earl of Selkirk. A part of the Winnipeg colony soon migrated southward and settled on the site of the present city of Pembina, at the mouth of the Pembina river, which they thought to be in British territory, and named the settlement Fort Daer. When Major Stephen H. Long, commanding an exploring expedition to the Minnesota and Red rivers, reached Fort Daer in 1823, he found there about six hundred persons, a few being Scotch, but the greater part being half-breeds.

North Dakota is a part of the region ceded by France to the United States by the Louisiana Purchase in 1803. From 1803 to 1805 it was included in the District of Louisiana, and from 1805 to 1812 it was a part of the Louisiana Territory, the name of which was changed to Missouri Territory in 1812. In 1834 that part of the present state E. of the Missouri river was included in the newly organized Territory of Michigan, and became successively a part of Wisconsin Territory in 1836, of Iowa Territory in 1838, and of Minnesota Territory in 1849. In 1845 the Territory of Nebraska was organized from a portion of the Missouri Territory, and the part of the Dakotas W. of the Missouri, then locally called "Mandan Territory," was included in its limits. After Minnesota entered the Union, in 1858, the country between the Red and the Missouri rivers had no Territorial government for three years, but the inhabitants formed a provisional government. On the 2nd of March 1861 the Territory of Dakota was created, including the present Dakotas and portions of Wyoming and Montana. The seat of the Territorial government was at Bismarck, and it was in session there until 1883, when it was removed to Bismarck. The name of the Territory was derived from the Dakota Indians; the word "Dah-ko-ta" (signifying "allied" or "confederated"), being originally applied to the Sioux Confederation. In 1863 when Idaho Territory was formed, the boundaries of the Dakotas were fixed at practically their present limits. The boundary between Dakota Territory and Nebraska was slightly altered in 1870 and 1872. The Territory had hardly been organized before its settlement was impeded by the Civil War and the Indian troubles that followed the war. During the years 1868 to 1870 there was a series of bloody massacres along the frontiers of Minnesota and Dakota.

In the following year General Alfred Sully (1821-1879), commanding United States troops, marched up the Missouri river as far as Bismarck, and thence to the valley of the James river. On the 3rd of September 1863 with 1200 men he routed 2000 Sioux near the present town of Ellendale, in Dickey county, in an engagement called the battle of White Stone Hills. Four hundred warriors were slain, and a great number were captured. In 1864 Sully defeated the Sioux at the battle of Takaakwta, or Deer Woods, on the Knife river, and a few days later he again encountered them, and after a desperate struggle of three days administered a crushing defeat; the warriors abandoned their provisions and escaped into the Bad Lands. The Indians still remained hostile, however, and in 1865 Sully found it necessary to conduct his troops N. as far as Devils Lake, and thence W. to the Cannon Ball river. By these operations the Indian frontier was fixed W. of the Missouri river, and forts and garrisons were placed along this stream. The worst of the Indian troubles in northern Dakota were then at an end, though for many years there were occasional outbreaks. A period of rapid development in the Red river basin followed the entrance of the Northern Pacific railway into this region in 1872. At the election in November 1887 the question of the division of the Territory into two states at the "seventh standard parallel" was submitted to the people, and was carried at the polls. In accordance with the Enabling Act, which received the president's approval on the 22nd of February 1889, a constitutional convention met at Bismarck on the 4th of July following, and drafted a frame of government for the state of North Dakota. In October this was ratified at the polls. The chief interest in the election turned on the prohibition clause in the constitution, which was submitted separately, and received a majority of only 1,159 votes. On the 2nd of November 1889 President Harrison issued a proclamation declaring North Dakota a state. By an agreement between North and South Dakota, embodied in their constitutions, each state assumed the debt created for the erection of public buildings within its limits during the Territorial period.

In the development of the state since its admission into the Union the railways have been important factors. In 1874 they inaugurated the so-called "concentration movement," and began to conduct annual excursions into North Dakota, thus bringing into the state thousands of immigrants. They have also adopted the policy of selecting favourable town-sites on the uninhabited prairie, erecting grain elevators at such points, and furnishing transportation facilities by means of branch roads tapping the main lines of travel. Under this system prosperous towns and villages have sprung up among the prairies.

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1 There seems to be no good authority for the statement often made that the first settlement in North Dakota was made by French Canadians in 1780.
of a cyclone across America is usually from W. to E., and the cyclonic system of circulation would produce these results; but in the North American cyclones usually originate east of the Rocky Mountains, and the warm air drawn from the Gulf of Mexico is not only followed by the cold air drawn from the Arctic regions, but the body of cold air slides down the eastern slopes of the Rockies and advances as a solid wedge (the "cold wave") under the cyclone itself. "Uncomfortably warm in the lightest clothing," a traveller upon the prairies of Texas may become "uncomfortably cold before he can wrap his blanket around him" (W. Ferrel, A Popular Treatise on the Winds). The temperature may fall 50° F. in twenty-four hours.

NORTHFIELD, a city of Rice county, Minnesota, U.S.A., on the Cannon river, about 35 m. S. of St. Paul. Pop. (1905) 348. It was incorporated by act of the legislature in 1865. It succeeded the townships of Great Western, the Chicago, Milwaukee & St. Paul, and the Chicago, Rock Island & Pacific railroads. It is a shipping centre for the products of the farming and dairying region in which it lies, but it is most widely known for its educational institutions. It is the seat of the Baker School for Nervous and Backward Children, a private institution; of St Olaf College (Norwegian Lutheran), founded in 1874; and of Carleton College (founded in 1866 by Congregationalists but now non-sectarian, opened in 1870), one of the highest grade small colleges in the West, and the first in the North-west to abolish its preparatory academy. Carleton College has the North-Western University Observatory, which gives time to the railways of the North-west, and publishes a magazine, Popular Astronomy. The Scoville Memorial Library (1896) of the College had 23,000 volumes in 1909. Northfield has a public library and the Minnesota Odd Fellows' Widows and Orphans Asylum. Named in honour of John W. North, who laid out Northfield and several other western towns, it was settled about 1851, incorporated as a village in 1868, and chartered as a city in 1875.

NORTHFIELD, a village of Washington county, Vermont, U.S.A., in Northfield township, about 35 m. S.E. of Burlington, on the Green Mountains region of the state, and of the township 19; of the township 3229. It is seated by the Central Vermont railway. It is the seat of Norwich University, founded in 1859 as the American Literary, Scientific and Military Academy at Norwich, Windsor county, Vermont, by Captain Alden Partridge (1783-1854). Captain Partridge was a professor in the U.S. Military Academy in 1813-1816 and acting superintendent of the Academy in 1816-1817, and was president of Norwich University until 1843; he founded various other military schools besides the one at Norwich. Norwich University was incorporated in 1834 under its present name, and in 1866, when the buildings at Norwich were burned, was removed to Northfield. The educational "Theoretical, practical, instruction, both theoretical and practical," and the discipline of the institution is military in form and principle. In 1808 the university was recognized by the General Assembly of Vermont as the military college of the state. It offers courses leading to the degrees of Bachelor of Arts and Bachelor of Science in civil engineering, in electrical engineering and in chemistry. In 1908 it had 13 instructors and 168 students. Dewey Hall (1902), the administration building, was named in honour of Admiral George Dewey, a former student in the university. In the township there are outcomes of forests of native and of the antique, and along a range of hills E. of the village there is a deposit of very fine black slate. The hills furnish excellent grazing for cattle, and much milk is shipped to New England cities. The township of Northfield was incorporated in 1781; the original settlement on the site of the present village was made in 1785, and the village was incorporated in 1835.

NORTHFLEET, an urban district of Kent, England, within the parliamentary borough of Gravesend, on the Thames, 22 m. E. by S. of London by the South Eastern and Chatham railway. Pop. (1901) 12,606. The church of St Botolph is of Norman foundation, but the nave is principally Decorated and the chancel Perpendicular, and the tower, having fallen down, was rebuilt in 1628. The church contains a brass of the 14th
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century and other interesting monuments. The nave and chancel have undergone modern restoration. Huggens College, with residences for impoverished ladies, was established in 1849 by John Huggens of Sittingbourne. Besides chemical manufactures, there are chalk, lime, cement and brick works and a shipbuilding yard. Swanscombe almost adjoins Northfleet on the south-west. Its name is said to be derived from a camp formed here by the Danish king, Sweyn, and tradition fixes at this spot the meeting between William the Conqueror and the men of Kent, to whom was confirmed the possession of all their ancient laws and privileges.

NORTH HOLLAND, a province of the kingdom of Holland, lying between the North Sea and the Zuider Zee, and on the landward side bounded by the provinces of South Holland and Utrecht. Pop. (1904) 1,053,883; area, 1,070 sq. m. The province also includes the islands of Texel, Vlieland and Terschelling, belonging to the group of the Frisian Islands, as well as Wieringen, Marken and Urk in the Zuider Zee. There are three natural divisions—foreshore and sand-dunes, inner dunes and the geest grounds, and low fens and clay lands.

The dunes form the great natural barrier against the sea behind which the province lies secure. But the fact of there being no inhabited inhabited part of Holland along the sea-board, the only exception being Ymuiden, which has arisen at the mouth of the North Sea channel from Amsterdam. On the other hand the broad, gently-sloping, sandy beach is peculiarly fitted for sea-bathing, and in the absence of harbours permits the beaching of the characteristic flat-bottomed fishing boats. Petten, Egmond-on-Sea, Wyk-on-Sea and Zandoort are fishing villages and watering-places.

In the depressions of the dunes and on the geest grounds at their foot, small woods have been planted in places, and in this sheltered strip market-gardening and horticulture are practised. Horticulture flourishes, especially along the margin of the geest grounds from about 5 m. north of Haarlem to twice that distance south, hyacinths, tulips, narcissus and crocuses being the flowers chiefly cultivated. The sight of these flowers in spring, with mile after mile of brilliant and varied colours, attracts visitors even from foreign countries. This region of the province was one of the earliest inhabited and includes the oldest towns and villages, such as Schagen, which was flourishing in the 12th century and was created into a lordship in the beginning of the 13th century for the benefit of a natural son of Count Albericht of Holland. The town was destroyed in the 17th century, but two towers (restored in 1879) are standing. Among interesting places may be mentioned Alkmaar, Heiloo, Egmond, Kaatskrikum and Beverwyk, which, like Velzen a few miles south, was granted by Charles Martel to Willemrode, the apostle of the Frisians, in the first half of the 8th century. The name is a corruption of Bedevaartswijk, "the village on the pilgrims' road," and refers to the pilgrimages once made to the church of St Agatha in the neighbourhood. Brederode, another ancient village, was the seat of the illustrious family of the same name. The remains of the castle are extensive. Other ancient towns are Zaanpoort, Bakenes, Haarlem and Bennebroek, once the seat of a nunnery removed hither from Egmond by Dirk II. in the 10th century.

The third division of the province comprises by far the largest area, that is, namely, which lies at or below sea-level. The reclama-
tion of land which has been effected here is noteworthy. The whole of the lakes to the north of the former Y, including the famous Purmer and Bemster lakes, and the Wieringerwaard and Zype sea-polders, were drained in the beginning of the 17th century; but the Waard-en-Groet, the Anna Paulowna and the Korten sea-polders of the north of the province were only added to the mainland in the first half of the 19th century. This region is traversed by the North Holland canal (1816–1825), between Amsterdam and the naval station of den Helder. The Y, which was formerly an inlet of the Zuider Zee, was drained, and the North Sea ship canal was formed in its stead (1865–1870), and carried through the dunes to Ymuiden. Of the drained lakes south of the former Y, the most important is the Haarlem Lake. The landscape in this division of the province is the most typical of Holland; green meadows stretching as far as the eye can see, dotted with windmills and cattle, and slashed by the regular lines of the drainage canals, bordered with pollarded willows.

As in Friesland, cattle-rearing and the making of cheese, chiefly of the Edam description, are the main industries, but agriculture and even a little market-gardening are also practised in the heavier clay lands, such as the Y and Anna Paulowna polders. Purmerend, Alkmaar and Enkhuizen are the chief market centres. Though the country is naturally poor in minerals, springs containing iron have been discovered, such as the Wilhelminabron at Haarlem. The security of the Zuider Zee for trade and fishing purposes was the first factor in the commonwealth development of Hoorn, and the cities of Medemblik, Enkhuizen, Hoorn, Edam and Monnikendam, though now little more than market centres for the surrounding district, possessed a large foreign commerce in the 16th and 17th centuries. This prosperity finally concentrated itself upon the Y (that is, upon Amsterdam) and the series of industrial villages situated on its offshoot the Zaam, of which Zaandam and Wormerveer are the most important.

NORTHINGTON, ROBERT HENLEY, 1st Earl of (c. 1708–1772), lord chancellor of England, was the second son of Anthony Henley, of Newby in the county of York, and his family in Hambred, who was a Whig member of parliament, and a well-known wit and writer. Robert was educated at Westminster school and St John's College, Oxford; and after gaining a fellowship at All Souls he was called to the bar in 1732. In 1747 he was elected member of parliament for Bath, of which borough he became recorder in 1751. He acquired a lucrative practice at the bar, and in 1756 was appointed attorney-general. In the following year he was promoted to the office of lord keeper of the great seal, being the last person so designated. For three years Henley, though still a commoner, presided over the House of Lords while his brother held office; but in 1760 he was created Baron Henley of Grainge in the county of Southampton. The delay in raising him to the peerage was due to the hostility of George II., who resented Henley's former support of the prince of Wales's faction, known as the Leicester House party; and it was in order that he might preside as lord high steward at the trial of Earl Ferrers for murder in 1760 that he then received his patent. On the accession of George III. the office of lord chancellor was conferred on Henley, and in 1764 he was created Viscount Henley and earl of Northington. In 1765 he presided at the trial of Lord Byron for killing William Chaworth in a duel. Northington, who was a member of the group known as "the king's friends," was instrumental in procuring the dismissal of the marquess of Rockingham and the recall of Pitt to office in 1766, and he himself joined the government as lord president of the council, Lord Camden becoming chancellor. He resigned office in 1767, and died at his residence in Hampshire on the 14th of January 1772. He married, in 1743, Jane, daughter of Sir John Huband of Ipsley, Warwickshire, by whom he had three sons and five daughters. His youngest daughter, Elizabeth, married Morton Eden, who in 1790 was created Baron Henley in the peerage of Ireland; and her grandson, the 3rd Baron Henley of this creation, was in 1885 created earl of Northington.

Lord Chancellor Northington was in his youth a man of conivall and boisterous manners, much addicted to swearing, Horace Walpole commented on his undignified bearing at the trial of Lord Ferrers; but Lord Eldon considered him "a great lawyer, and his integrity was unquestioned. His notes of cases tried by himself in the Court of Chancery were published in two volumes in 1818. ROBERT HENLEY, 2nd earl of Northington (1747–1786), only surviving son of the lord chancellor, was appointed a teller of the exchequer in 1763, and lord lieutenant of Ireland in 1783, an office which he administered in a spirit of concession to popular feeling. In Ireland he employed his father's system of stimulation of the economy, by which he made himself beloved by the Irish people. He resigned in 1784, and died unmarried on the 5th of July 1786, when the titles granted to his father became extinct.

North Sea, a sea bounded by the continent of Europe and W. by Great Britain. At its southern end it communicates with the narrow Strait of Dover with the English Channel, and so with the Atlantic, and towards the north it widens out gradually to 345 m. between St. Ab's Head and the coast of Denmark, and narrows again to 270 m. between Duncansby Head and the coast of Norway. To the north of Scotland it communicates with the Atlantic westwards by the Pentland Firth and the channel between the Orkney and Shetland Islands, and northwards with the Norwegian Sea.

Its total area is given by Murray as 162,000 sq. m., and by Krümmell as 577,010 sq. km., or 220,820 sq. statute m. Murray estimates the volume of the North Sea at 11,000 cubic miles, at 730 cubic km. or 12,880 cubic km., giving mean depths of 61 and 48 fathoms respectively. The North Sea is thus on the whole shallow; its bed is part of the continental shelf on which the British Isles stand, and it slopes upwards with fair regularity from north to south. In the south and east there is a broad coastal strip over which the depth nowhere exceeds 20 fathoms, and the whole south-eastern part of the area is less than 30 fathoms deep. In about its middle latitude the Dogger Bank crosses the North Sea from east to west, extending for about one-third of the whole distance. This bank is not, however, to be regarded as one of the deep troughs, but the depth here is under 10 fathoms and it increases eastwards to about 20 fathoms. South of the Dogger there are local depressions, mostly of small area, in which the depth is as much as 45 fathoms, as in the "Silver Pit." Krümmell points out that a line drawn from the northern edge of the Dogger to the middle of the Skagerrack constitutes a rough boundary of the shallow southern basin, the depth increasing very slowly beyond this line to the "Norwegian Channel"—a deep gully closely following the Scandinavian coast, and extending into the Skagerrack, in which the depth increases to as much as 400 fathoms, or 53 cub. km. According to Jukes-Browne, the North Sea, in its present form, first took shape as a result of the tectonic movements indicated by the break between the older and newer Pliocene deposits. The southern end of the North Sea was probably little affected by the general subsidence which occurred during the Glacial period; its boundary in this direction was apparently within the present land area of France and Belgium, while a narrow inlet may have run westwards between France and England in the present position of the Strait of Dover. Meanwhile immense quantities of water are still pouring into the North Sea from the Rhine. Of the Rhine's discharge at Koblenz is 571,910 sq. ft., and the whole region was subsequently raised above sea-level, constituting the "structural surface" upon which the present river system was developed as a series of tributaries to a great river which formed a continuation of the Rhine. Finally the land subsided again, the plain of the North Sea was again submerged, and the western inlet of Pleistocene times became the Strait of Dover.

For reasons which will be sufficiently obvious from the historical sketch just given, the coasts of the southern part of the North Sea are of no great height. In England they consist of low cliffs with sandy beaches, while on the continental side are immense flats and marshes, with parts below sea-level protected by sand-dunes and artificial dykes. It is said that no evidence is forthcoming of tectonic movement since the Bronze Age, and the rapid changes of coast-line now taking place in many parts are therefore wholly due to the action of the sea, which is probably specially effective on account of the relatively recent opening of the Strait of Dover. The erosion of the North Sea coasts has been made a subject of minute study (in England especially by the British Association, and a committee of the Royal Geographical Society, and Harmer has obtained interesting results by comparing the British and Continental coasts as characteristic "weather" and "lee" shores.

The physical conditions of the waters of the North Sea have been extensively studied by expeditions sent out by the Swedish, Norwegian, Danish, German and British governments; and since 1902 by the International Council for the Study of the Sea, which owes its origin mainly to the work of the earlier expeditions. Professor Peterson of Stockholm, to whom the initial impulse of much of this work is due, classifies the waters found in the North Sea as follows: (1) oceanic water of 35 pro mille salinity or more; (2) water of salinity 34 to 35 pro mille, called "North Sea" water; (3) water of salinity 32 to 34 pro mille, found along the coasts of Holland, Germany, Denmark, and Norway, and called "bank-water"; (4) water of 32 pro mille salinity or less, belonging to the stream flowing out from the Baltic. Of these (1) and (4) are to be regarded as "inflowing" waters, while the others are due to movements which may not take place in the North Sea itself. The oceanic water constitutes a mixture of waters of Atlantic and Polar origin; it enters the North Sea from the north-west partly from the Norwegian sea, and partly from the Faeroe channel by the passage between the Orkney and Shetland islands, and makes its way southwards along the coast of Scotland, especially during the early summer months.

The International Council, and more particularly the North Sea, Winters Investigation Committee of the Fishery Board for Scotland, have studied the periodic and irregular variations in the distribution of these waters in minute detail; and the conclusion of these observers, has established the conclusion that the supply of fresh coastal waters from the land on both sides of the North Sea is greatest in late summer, after the occurrence of the maximum inflow of oceanic water. The autumn and early winter months accordingly represent a period of mixing rather than of inflow, and this mixing is clearly an extremely complicated process, depending on the relative amounts of the mixing waters (which are themselves liable to great variation), on their temperature and salinity, and also on the action of winds and tides.

In the southern part of the North Sea area tidal action alone is sufficiently vigorous to ensure complete mixing of the waters from surface to bottom at all times. The tides of the North Sea are of great complexity, and have not been fully investigated. The tidal wave of the Atlantic enters by the Strait of Dover and by the channels in the north. In the latter place a division into two parts takes place, one wave travelling southwards along the coast of Scotland in comparatively shallow water, while another moves with greater speed across the deeper water to the Norwegian Channel, and thence southwards to the Skagerrack, and finally the North Sea. The southwards-moving waves are greatly retarded in the shallow water over the Dogger Bank; the trough of the "Silver Pit" accordingly gives the Scottish wave a strong easterly component, and the three systems—the Scottish, Norwegian and Channel waves—meet to the east of the Dogger, producing complicated interference phenomena. Along the English coasts the tidal streams are for the most part normal, the flood stream running south to south-east and the ebb north to north-west, but on the Continental coast the movements become very complex on account of the varying influence of the waves from different sources.

The North Sea is particularly rich in organisms of all kinds, and the abundance of food attracts fish in such quantities that the North Sea fisheries are the most productive in the world. Flat fishes, and those feeding at the bottom on smooth ground, are chiefly caught by means of the trawl. The favourite trawling-grounds are the Dogger Bank in winter, and the shallow waters off the Continental coasts in summer; these yield halibut, soles, turbot, brill, plaice, cod, haddock, whiting, &c. In rough ground where the trawls cannot be used, bottom-lining by the oblique-catch most successfully; and "mid-water" fish are also taken in this way, although the trawl and line-fishing overlap considerably. Herring and mackerel are caught by means of drift-nets. The herring fishing off the British coasts exhibits a remarkable variation during summer and autumn, beginning in Shetland in June, and becoming progressively later southwards, until it ends off the Norfolk coast in November. Various attempts have

Fauna.
be served (T. branch Northumberland, 280; town 336).

VEXIRES (Scotland) Act 1893 forbids the use of three-mile limit areas outside the 1882 limits.

A Supplementary Convention was signed at the Hague, November 16th, 1887, among the same High Contracting Parties, relating to the liquor traffic in the North Sea. It applies to the area set out in art. 4 of the Convention of May 6th, 1882, and forbids the sale of spirituous liquors within it to persons on board fishing vessels. A reciprocal right of visit and search is granted under this convention to the cruisers entrusted with the carrying out of its provisions.

NORTH SHIELDS, a seaport of Northumberland, England, within the municipal and parliamentary borough of Tynemouth (q.v. for history, &c.). The town of that name adjoins it on the E.

NORTH SEA FISHERIES CONVENTION. This convention, dated May 6th, 1882, was the result of a conference which was held for the purpose of regulating the police of the fisheries in the North Sea. It was entered into by Great Britain, Germany, Denmark, Holland, Belgium, France, and for a period of five years and was thereafter to run on until notice of intention to terminate it, such notice to affect only the power giving it. The convention is operative only outside the three-mile limit from land. This limit was extended under the following conditions:

"The fishermen of each country shall enjoy the exclusive right of fishing within the distance of 3 m. from low-water mark along the whole extent of the coasts of their respective countries, as well as of the islands and banks, and the distance of 3 m. shall be measured from a straight line drawn across the bay, in the part nearest the entrance, at the first point where the width does not exceed 10 m. The present article shall not in any way prejudice the freedom of navigation and anchorage in territorial waters accorded to fishing boats, provided they conform to the special police regulations enacted by the powers to whom the shore belongs."

The Herring Fishery (Scotland) Act 1889, the Scottish Fishery Board was empowered by by-law to forbid beam-trawling and otter-trawling within a line drawn from Duncansby Head to Rattras Point. Acting under this power, it forbade these methods of trawling. This gave rise to litigation on the question of whether the prohibition applied to non-British ships beyond the three-mile limit (see Mortensen et Peters, July 20th, 1906). The High Court of Justiciary in Edinburgh held that it was not incumbent on the court to draw a distinction between foreigners and British subjects which had not been made by the legislature, and that therefore any infringements of general rules relating to the beam or otter trawl should be treated as a breach of the Conditions under which the burgh, or from the Niagara river. North Tonawanda was first settled as a part of Tonawanda in 1809; it became part of Wheatfield township in 1837; was incorporated as a village in 1865, and chartered as a city in 1891. In 1825 Major Mordecai Enoch Noah (1785-1851), a New York journalist and politician of Portuguese Jewish descent, attempted unsuccessfully to found on Grand Island (area 27 sq. m.; pop. 1910: 914), Erie county, W. of North Tonawanda, the city of Ararat, a temporary refuge for Jews, who should return thence to the Holy Land.


NORTHUMBERLAND, EARLS AND DUKES OF. The earldom, and later the dukedom, of Northumberland, famous in English history by its connexion with the noble house of Percy (q.v.) is to be traced from an origin anterior to a strictly regulated system of peerage. The Saxon kingdom of Northumbria embraced a far more extensive territory than the modern county of Northumberland; and for at least a century after the Norman Conquest Northumberland, as the name imports, comprised a great portion of the country north of the Humber, including the cities of Durham and of York. The geographical position of this territory, contiguous with the kingdom of Scotland, conferred vast responsibility as well as power on the earl or governor to whom its administration was entrusted; and it appears to have been the policy of William the Conqueror and his immediate successors to acknowledge the rights of the men who, though sometimes spoken of as earls, were in no strict sense members of the feudal nobility created by the Norman monarchy. William the Conqueror found Northumberland in the possession of Morcar, a younger son of Algar, the Saxon earl of Mercia, who on giving in his submission was confirmed in the government of the district, but was soon afterwards imprisoned for rebellion, and was replaced by Copsi, an uncle of Morcar's predecessor, Tostig. Copsi was murdered a few weeks after receiving the dignity, and the same fate befell several of his successors; those who escaped it being not infrequently deprived of the post for rebellion or incapacity. Henry, earl of Huntingdon, only son of David I., king of Scotland, was made governor of Northumberland in 1139, and was styled "earl of Northumberland" by the contemporary chronicler Roger of Hoveden. It was not for a long period, however, that the earldom of Northumberland came into existence as a title of honour heritable according to peerage law. Even since the Conquest the house of Percy (q.v.) had been growing in power and importance, and at the coronation of Richard II. in 1377 Henry de Percy, 4th Baron Percy, who had distinguished himself in the French wars, officiated as marshal of England, and
was then created earl of Northumberland. With his son Sir Henry Percy, the celebrated "Hotspur," the earl played a leading part in the turbulent of the older period, especially in bringing about the deposition of Richard II. and the accession of Henry IV. The quarrel of Northumberland and his son with King Henry over the ransom of their Scottish prisoners taken at Homildon Hill on the 14th of September 1402 has been immortalized by Shakespeare; and in consequence of their rebellion all the earl's honours were forfeited in 1406. He was not himself present at the battle of Shrewsbury in July 1403, when Hotspur was killed, but he was slain, heading a fresh rebellion, at Bramham Moor on the 19th of February 1408.

The 1st earl of Northumberland was succeeded by his grandson, Henry Hotspur, 2nd son of Henry (c. 1394-1455), who was restored to the earldom and the estates of the Percies in 1414 and was killed at the battle of St Albans in May 1455. The title then descended in the male line till the death of the 6th earl in 1537. During the Wars of the Roses the Percies took the Lancastrian side, which led to the attainder of Henry the 3rd earl (1421-1461) during the year of the Yorkist triumph, his forfeited title being conferred in 1464 by Edward IV. on John Neville, Lord Montagu (see the separate article below), by a patent which was cancelled a few years later. The earldom together with the earldom of Northumberland which had been forfeited by marriage, was restored in 1473 to Henry Percy, son of the 3rd earl, who attached himself to Edward IV., acquiesced in the accession of Richard III., and submitted to Henry VII., by whom he was received into favour. His grandson Henry, the 6th earl (c. 1502-1537), left no direct heir, and the latter's nephew, Thomas Percy, was debarred from the succession by an attainder passed on his father for his participation in the Pilgrimage of Grace. In 1549, however, Thomas was restored in blood, and in 1555 he became by a new creation earl of Northumberland, 7th of his line. Meanwhile, in 1551 the eldest son of the 7th earl, who was created duke of Northumberland (see the separate article below), his title being, however, forfeited by attainder in 1555.

The earldom restored to the house of Percy by the creation of 1555 continued without interruption in the male line till 1670. The 7th earl was beheaded in 1572 for sharing in a conspiracy in which he was joined by the earl of Westmorland with the object of securing the release of Mary Queen of Scots and the free exercise of the Catholic religion. By the earl's attainder the baronies of Percy and of Poyning and the earldom of Northumberland were forfeited to the crown of England, the eldest son of the 7th earl having been previously omitted from the patent. The elder earldom and the other honours conferred in 1555 passed to his brother Henry (c. 1532-1583), who, however, is usually known as the 8th and not the 2nd earl.

Henry's grandson, Algernon Percy, 10th earl of Northumberland (1602-1668), son of Henry the 9th earl (1564-1632), became a peer in his father's lifetime as Baron Percy in 1626. During the years immediately preceding the Civil War he served as an admiral, making earnest but unsuccessful efforts to reform the navy, and in 1643 he was made lord high admiral of England. In 1639 Charles I. appointed him general of the forces north of the Trent, and a member of the council of regency. Northumberland played a distinguished and honourable part in the troubled times of the Civil War. He was a friend of Strafford, and gave evidence at his trial which, though favourable on the important point of bringing the Irish army to England, was on the whole damaging; and he afterwards leaned more and more towards the popular party, of which he soon became leader in the House of Lords. He was a member of the committee of safety, and later of the committee of both kingdoms; and he took an active part in the attempts to come to terms with the king, whom he visited at Oxford for that purpose in 1643 and at Uxbridge two years later. Northumberland helped to organize the new model army; and in 1646 he was entrusted by parliament with the charge of the king's younger children. He led the opposition in the House of Lords to the proposal to bring Charles I. to trial, and during the Commonwealth he took no part in public affairs. At the Restoration he was called to the privy council by Charles II., and with his habitual moderation he deprecated harsh proceedings against the regicides. His second wife, Elizabeth (d. 1705), daughter of Theophilus Howard, 2nd earl of Suffolk, brought him Northumberland House in the Strand, London, which was demolished in 1874 to make room for Northumberland Avenue. On the death of his son Joceline, the 11th earl, in 1670, the male line became extinct.

George Fitzroy (1665-1710), third son of Barbara, duchess of Cleveland, the wife of Roger Palmer, earl of Castlemaine, by King Charles II., was created by his father earl of Northumberland in 1674, and duke in 1683. This second dukedom of Northumberland became extinct on his death at Epson on the 3rd of July 1716.

Meanwhile Elizabeth Percy, daughter of Joceline, the 11th earl, had married Charles Seymour, 6th duke of Somerset; and her son Algernon, the 7th duke, was in 1749 created Baron Warkworth and earl of Northumberland, with remainder to his son-in-law, Sir Hugh Smithson, Bart., son of Langdale Smithson of Langdale, Yorkshire. Sir Hugh Smithson (c. 1714-1786) took the name and arms of Percy on inheriting the earldom in 1750; in 1766 he was created Earl Percy and duke of Northumberland, and in 1785 he was further created Baron Lovaine of Alnwick, with the special remainder to his second son, Lord Algernon Percy. He took a somewhat prominent part in politics as a follower of Lord Bute, and was one of George III.'s confidential advisers, holding the office of lord-lieutenant of Ireland from 1762 to 1765, and that of master of the horse from 1778 to 1780. He was a man of cultivated tastes, and spent large sums of money in repairing and improving Alnwick Castle and his other residences. His wife, Elizabeth (1716-1776), who was a prominent figure in society, inherited in her own right her father's barony of Percy. The duke was succeeded by his eldest son Hugh; and his son Algernon, Lord Lovaine, was created earl of Beverley in 1790.

Hugh, 2nd duke of this line (1742-1817), first inherited his mother's barony of Percy. He was present at the battle of Minden, and although in parliament, where he was member for Westminster from 1763 to 1776, he had opposed the policy that led to the American war, he proceeded to Boston in 1774 as colonel commanding the 5th Fusiliers, a regiment that has since then been known as the Northumberland Fusiliers. His liberality to his men made him exceedingly popular in the army; he was generally prominent in 1793, and after succeeding to the dukedom in 1786 he exercised considerable influence in politics, though he never obtained office. His son Hugh, 3rd duke (1785-1847), was lord-lieutenant of Ireland in 1829-1830, when the Catholic Emancipation Act was passed, and was pronounced by Sir Robert Peel "the best chief governor who ever presided over the affairs of Ireland." Both he and his brother Algernon, 4th duke (1792-1856), who was created Baron Prudhoe in 1816, died without issue; the barony of Percy devolved on their great-nephew, the duke of Atholl, and the dukedom passed to George (1779-1856), eldest son of Algernon, 1st earl of Beverley, and so to his son Hugh; and his son, the 6th duke (1830-1899), and grandson, the 7th duke (b. 1846), who married the daughter of the 8th duke of Argyll. The 7th duke's eldest son, Earl Percy (1871-1910), seemed destined to take a great place in public life when he was prematurely cut off; he had a distinguished career at Oxford and from 1895 in the House of Commons, being under-secretary for India in 1902-1903 and under-secretary for foreign affairs in 1903-1905.


NORTHUMBERLAND, JOHN DUDLEY, Viscount Lisle, Earl of Warwick, and Duke of (c. 1502-1553), was the eldest son of Henry VII.'s exxtortionate minister, Edmund Dudley (q.v.), by his second wife Elizabeth, daughter of Edward Grey, Viscount Lisle, and co-heiress of her brother John, Viscount Lisle. He was probably descended from the old baronial house of Sutton alias Dudley; but his father's attainder and execution
in 1509 clouded his prospects. His mother, however, married as her second husband in 1511 Arthur Plantagenet, the illegitimate son of Edward IV., who in 1523 was created Viscount Lisle in his wife's right; and Lisle's was Hend VIII.'s favour brought young Dudley into prominence. In 1512 he was restored in blood and in 1518 he was made deputy to his stepfather, who was governor of Calais, and he does not appear to have suffered by Lisle's temporary disgrace and imprisonment in the Tower. Lisle died early in 1542 and Dudley was created Viscount Lisle on the 12th of October and was made warden of the Scottish marches in November, and lord high admiral of England in 1543 in succession to his future rival, Edward Seymour, earl of Hertford. He was also created a knight of the garter and sovereign of the privy council on the 3rd of April 1543. In 1544 he accompanied Hertford to the capture and burning of Edinburgh. On the capture of Boulogne in September Lisle was given command of the town and of the Boulonnais; in 1545 he directed the operations of the fleet in the Solent which foiled the French attack on Portsmouth and the Isle of Wight; and he was sent to Paris to ratify the peace concluded in 1546.

Lisle had thrown in his lot with the reforming party, and he took an active share in the struggle at Henry VIII.'s court for control of affairs when Henry should die. Hertford and he were brought about his deposition. He was one of the highest places in Henry VIII.'s affections and as being the only noblemen of fit age and ability to carry on the government. The Howards were infuriated by the prospect, and Surrey's hasty temper ruined their prospects. Lisle quarrelled bitterly with Bishop Gardiner, served as commissioner at Surrey's trial, and was nominated one of the body of executors to Henry's will from which Norfolk and Gardiner were excluded. On Henry's death Lisle was raised to the earldom of Warwick and promoted to be lord great chamberlain of England, again in succession of Hertford, who was a privy councilor of Somerset and Protector. But he was not long content with Somerset's superiority, though he concealed his resentment and ambition for the time. He accompanied Somerset on his Pinike campaign, and materially contributed to the winning of that victory. Nor did he exhibit any sympathy with the intrigues of the Protector's brother, Thomas Seymour, the lord high admiral; his subterfuge policy was to exasperate the brothers and thus weaken the influence of the house of Seymour. He took a leading part in the proceedings which brought the admiral to the block in March 1549; and then used the Protector's social position to procure the dismissal of the privy council, detested Somerset's ideas of liberty and his championship of the peasantry against the inclosure movement; one of his own parks was ploughed up as a result of a commission of inquiry which Somerset appointed; and when the peasants rebelled under Kett, Warwick gladly took the command against them. His victory at Dussindale made him the hero of the landed gentry, and as soon as he had returned to London in September 1549, he organized the general discontent with the Protector's policy into a conspiracy. He played upon the prejudices of the Catholics and Catholics alike, holding out to one the prospect of more vigorous reform and to the other hopes of a Catholic restoration, and to all gentry the promise of revenge upon the peasants.

The coalition thus created effected Somerset's deposition and imprisonment in October 1549; and the parliament which met in November carried measures of political coercion and social reaction. But the coalition split upon the religious question. Warwick threw over the Catholics and expelled them from office and from the privy council, and the hopes they entertained were rudely dashed to the ground. But it was difficult to combine coercion of the Catholics with the proscription of Somerset; the duke was therefore released early in 1550 and restored to the privy council; and his daughter was married to Warwick's son. Warwick himself assumed no position of superiority over his colleagues, and he was never made protector. But he gradually packed the council with his supporters, and excluded his enemies from office and from access to the king. His plan was to dominate Edward's mind, and then release him from the trammels of royal minority. He abandoned the Tudor designs on Scotland, and made a peace with France in 1550 by which it recovered Boulogne and was left free to pursue its advantage in Scotland. Nor did the betrothal of Edward to Henry's daughter Elizabeth prevent the French king from intrigue to undermine English influence in Ireland. In domestic affairs Warwick pushed the Reformation with none of the moderation shown by Somerset; and the difference between the two policies is illustrated by the change effected between the first and second Books of Common Prayer. Warwick, however, was widely distrusted; and the more arbitrary his government grew, the more dangerous became Somerset's position. A parliament had indeed been started for Somerset's restoration. Warwick therefore kept away from meeting, and the consequence lack of supplies drove him into the seizable of church plate, sale of chantry lands, and other violent financial expedients. At length he resolved to get rid of his opponent; his opposition was magnified into conspiracy, and in October 1551, after Warwick had made himself duke of Northumberland and his ally Dorset, duke of Suffolk, and had scattered other rewards among his humbler followers, Somerset was arrested, condemned by the peers on a charge of felony, and executed in the year 1552.

Parliament was permitted to meet on the following day, but for the next eighteen months Northumberland grew more and more unpopular. He saw that his life was safe only so long as he controlled the government and prevented the administration of justice. But Edward VI. was slowly dying, and Northumberland's plot to alter the succession was his last desperate bid for life and power. Its folly was almost delirious. Edward had no legal authority to exclude Mary, and the nation was at least nine-tenths in her favour. Northumberland bullied the council, and, with few exceptions, the rest of England was in an uproar, and as he rode out one day, he said to Mary, not a soul cried "God speed." A few days later he returned as Mary's prisoner. He was tried for treason, confessed himself a Catholic in the delusive hope of pardon, and was executed on the 22nd of August. He was a competent soldier and one of the subtlest intrigues in English history; but he had no principles. He was, says a contemporary French account, "de parole allez, se composant à graceuseté et douceur, mais au dedans felon, orgueilleux, vindicatif s'il en fut jamais." The violence of his rule and his pretended Protestantism was largely responsible for the reaction of Mary's reign. His best-known son was Robert Dudley, earl of Leicester, Queen Elizabeth's favourite.

See Letters and Papers of Henry VIII.; State Papers, Domestic and Foreign, Edward VI. and Mary; MS. 15,888, Bibliothèque Nationale de France; G. E. Cokayne, Complete Peerage; A. G. Pollard, England under Somerset (1900), Life of Cranmer (1904) and vol. vi. of the Political History of England (1910). (A. F. P.)

NORRTHUMBILD, JOHN NEVILLE, EARL OF (c. 1430-1471), English soldier, was the third son of Richard Neville, earl of Salisbury, and a brother of Richard Neville, earl of Warwick, the "king-maker." At the battle of Bosworth Heath in 1485 John Neville was taken prisoner by the Lancastrians, although the Yorkists under his father had won the victory; he was among those who were attainted in the parliament of Coventry, and he was not released until 1460 when his own party had gained the upper hand. Just afterwards he was created Lord Montagu and was made chamberlain of the royal household. He was not present at the battle of Wakefield, when his father was taken prisoner, but he was again a captive after the second battle of St Albans in 1461. He was speedily released by Edward IV., whom he served in the north of England, being rewarded with lands and honours. In 1463 he became warden of the east marches towards Scotland, and he was responsible for the Yorkist victories at Hedgeley Moor and at Hexham in April and May 1464; after the latter battle he secured the execution of Henry Beaufort, duke of Somerset, and other captives of high station. In this year (1464) he was created earl of Northumberland, the
Percies being now crushed, and their head, Henry Percy, being in prison. Northumberland did not at first join his brother Warwick and the other Nevilles when they revoluted against Edward IV, but neither did he help the king. Edward, doubtless suspecting him, restored the earldom of Northumberland and its vast estates to Henry Percy, while John Neville's only recompense was the barren title of marquess of Montagu. At Pontefract in 1470 he and his men declared for Henry VI, a proceeding which compelled Edward IV to fly from England, and under the restored king he regained his position as warden, but not the earldom of Northumberland. He did not attempt to resist Edward IV, when this king landed in Yorkshire in March 1471, after the death of his father. Borsley Hall, near Barnet, was taken on the 14th of April 1471. His son George (d. 1483) was betrothed to Elizabeth, daughter of Edward IV, and was created duke of Bedford in 1470, but the marriage did not take place and he was deprived of his dukedom in 1477.

Northumberland, the northernmost county of England, bounded N.W. by the Scottish counties of Berwick and Roxburgh, W. by Cumberland, S. by Durham, and E. by the North Sea. The area is 2089 sq. m. It has a general inclination eastward from the hill-borders of Scotland and Cumberland. The county of Northumberland extends into Scotland, and reaches in the Cheviot, its culminating point north-eastward, the greatest elevation in the county, 2675 ft. The elevation of the Cheviots rarely falls below 1300 ft. along the Border, and generally exceeds 1600. A line of high ground, boding southward, forms the watershed between the North and Irish Seas. The boundary with Cumberland crosses the low divide between the Irthing and the South Tyne, after coinciding with the former river for a short distance, and giving Northumberland a small drainage area westward. In the south-west a small area of the Pennine uplands is included in the county, reaching elevations up to 2200 ft. In Kilhope Law, Pennine eminences break the general eastward incline, which appears as a wide bowllowing series of confluent hills that for half the year mingle tints of brown, russet, and dun in a rich pattern, and at all times communicate a fine sense of altitude and expanses. The Simonside Hills (1447 ft.) form not one very conspicuous exception. The configuration of much of these uplands has a certain linearity in its details due to groups and ranges of ridges, crags, and terrace-like tiers, termed edges (escarpments) by the country folk, and generally facing the interior, like broad ends of wedges. These parallelized crags and prow-like headlands between the North and South Tynes along the verge of which the Romans carried their wall is a fine specimen. Passing eastwards from the uplands the moors are exchanged for enclosed grounds, "drystone" walls for hedgerows, and rare sprinklings of birch for a sufficiently varied wooding. The hills and moors sink to a coast generally low, a succession of sands, flat tidal rocks and slight cliffs. Its bays are edged by blown sandhills; its borders are severely wind-swept. Several islands lie over against it. Holy Island, the classic Lindisfarne, 1351 acres in extent, but half "links" and sandbanks, is annexed to the mainland and accessible to conveyance every tide. The Farne Islands (q.v.) are a group of rocky islets farther south.

Deep glens and valleys, scoring the uplands, and richly wooded except at their heads, are characteristic of the rivers. Of these the chief are the Tweed, forming the north-eastern part of the Scottish border, its tributary the Till (with its feeder the Glen and College), the Aln and the exquisite Coquet, flowing into Alnemouth Bay, the Wansbeck, with its tributary the Font, the Blyth and the Tyne, forming part of the boundary with Durham, thus dividing the North and South Tynes. Many of the upland streams attract trout-fishermen.

Geology.—The core of the county, in a geological aspect, is the northern Cheviots from Redesdale head nearly to the Tweed. Its oldest rocks are gritty and slaty beds of Carboniferous age, above the head of the rivers Rede and Coquet and near the Breamish south of Ingram—a part of the great Silurian mass of the southern uplands of Scotland. Volcanic activity about the period of the Old Red Sandstone resulted in the fossiliferous porphyrites, passing into the syenites and granites, that form the mass of the northern Cheviots. Round this core there now lie relays of Carboniferous strata dipping east and south, much faulted and repeated in places, but passing into Coal Measures and Magnesian Limestone in the south-eastern part of the county. The whole system consists of (1) the Carboniferous Limestone series in three divisions; (2) the Millstone Grit; and (3) the Coal Measures and Magnesian Limestone. The Cheviot group, the first envelope of sinking Cheviot-land, some reddish shore-like conglomerates lie in places at its base, as at Dodd Bane; its shales are often tinged with destemper greens; and the coal measures are then shale and sandstones, and its calcareous matter much diffused. Upon this lies the Calcareous group; its lime occurs in well-individualized marine beds, cropping up to the surface in greenish-white and yellow shales, with a thin layer of Magnesian Limestone, and the shales and sandstones form the extreme of the hill. The coal measures that are a bed of Limestone and coal forming the Cheviots. The middle division becomes thinner and more like the Coal Measures in passing northwards, and the upper division, thinning also, loses many of its limestones. The Millstone Grit is traps in the lowest Carboniferous, are all intrusive. An irregular mass possesses the same zone-like arrangement that prevails in the Lime- stone series, but are without limestones. They also are divided, sub-division formed by the debris, into the lower and upper. The lower seam downwards, has some traces of Gannister beds, and its coal- seams are thin. The famous Hutton collection of plants was made chiefly from the roof-shales of two seams—the Bensham and the Willington. The upper limestone is the "Romans Rock," as its name comes from the latter. The Coal Measures lie along the coast in a long triangle, of which the base, at the Tyne, is produced westwards on to the moors south of that river, where it is wedged against lower rocks. The sea shore is the straight line of the coast, and the signs of departing from the easterly dip that has brought them there where they are, and along a line between its apex (near Amble) and an easterly near, lies the line at which they turn up north-eastwards, promising coal-seas under the coast. The top of the Coal Measures is wanting. After a slight tilting of the strata and the denudation that removed it, the Permian rocks were broken. The Tertiary, composed largely of sands, and of many thin marine deposits, extends from Greenhead near Gilspind to the Kyloe Hills. Numbers of basalt dykes cross the county, and were probably connected with the plateau of Miocene volcanic rocks in the Hebrides. Every- where the glacial period left its marks, especially the glacial Kames which were beyond the range of the glacier, and from them extends from Greenhead near Gilspind to the Kyloe Hills. Numbers of basalt dykes cross the county, and were probably connected with the plateau of Miocene volcanic rocks in the Hebrides. Every- wherever the glacial period left its marks, especially the glacial Kames which were beyond the range of the glacier, and from them extends from Greenhead near Gilspind to the Kyloe Hills. 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Climate.—The climate is bracing and healthy, with temperate summers (e.g. the average July temperature at Alnwick is 57°-9° F.). In spring east winds prevail over the whole county. The lambing
season in the higher uplands is fixed for the latter half of April, and winds are general. The rainfall gradually increases as the country rises from the coast, thus the mean annual fall at Shields is 26.32 in., at Alnwick 31.04 in., while on the western borders 40 to 60 in. are received. The very heavy fall, varies so much that at times the smell from the coal-field, the lighter grime of which is detected as far as Cumberland, is taken by the shepherd for a sign of wet.

Agriculture, &c.—About five-ninths of the total area is under crops, and the rest is pasture and rough ground. There are also about 470,000 acres under hill pasture. South of the river Coquet there is a broad tract of cultivation towards the coast that sends levelling strips up the valleys into the interior. From the Tyne to Berwick a belt of cultivated ground, which is almost continuously along the base of the Cheviot hills. In the basin of the Till it becomes very fertile, and towards the Tweed the two streams unite. In the porphyry Chevies the lower hills show a great extent of sound surface and good grass. The average hill-farms support about one sheep to 2 acres. A coarser pasturage covers the Carboniferous hills, and the proportion of stock to surface is somewhat less. In the highest fells the congeries of bags, bogs and sandstone scars, with many acres dangerous to sheep, are worthless to the farmer. The lower uplands are a patchwork of coarse grasses (mown by the “muirmen” into “hem-hay” and heather, or in the rough pastures, “trows,” and “heath and meadow,” for it is blanched for eight months in the year. Heath is the natural cover of the sandstones and of the sandy glacier-debris near the coast. The north-west of Northumberland is much more apt to be cold and strong, but are much relieved by patches and inworkings of gravel, especially north of the Wansbeck. The prevalent stream-alluvium is sandy loam, with a tincture of peat.

The bulk of the upland is one of the largest sheep-raising counties in Great Britain. Of these, the half-breeds—crosses between the Leicester (or Shropshire) and Cheviot breeds—occupy the lower enclosed grounds, the pure Cheviots are on the uplands and the harder black-faced breeds lie out on the exposed heathery heights. The cattle are chiefly short-horns and Galloways. They are very largely raised, chiefly for fattening purposes.

When wages did not pass greatly into disuse, none of the shepherds still receive “stock-wages,” being allowed to keep forty or fifty sheep and several cows on their employment. In the arrangement, which makes them really co-partners, has probably done much to render them the singularly fine class of men they are.

Other Industries.—The manufactures of the county chiefly come from the Tyne, which is a region of ironworks, blast-furnaces, shipbuilders, and engineering. There is a large glass trade, largely concernced in pit-sinking and mine-working. In the other parts of the county there are a few small cloth-mills, a manufactuary of manuf

Communications.—Communications are provided almost wholly by the North-Eastern railway, of which the main line enters the country at Newcastle and runs N. by Morpeth, and near the coast, to Berwick, where a junction on the East Coast route from London to Scotland is effected with the North British railway. Numerous branch railways serve the populous south-eastern district, and there are excellent land routes westward to Hexham and Carlisle, up the Tweed valley into Scotland, and by the North British line up the North Tyne valley to Rothbury. The principal portsbesides Blyth, Amble, Warkworth Harbour, Alnemouth and Berwick. The Tyne is one of the most important centres of the coal-shipping trade in the world.

Population and Administration.—The area of the ancient county is 1,291,515 acres with a population in 1801 of 506,442, and in 1901 of 603,498. In physique the Northumbrians is stalwart and robust, and seldom corpulent. The people have mostly grey eyes, brown hair and good complexions. The inhabitants of the fishing villages appear to be Scandinavian; and part of the population bears the name of the old Brit-Celt, and a trace of the Gipsy blood of the Faas of Yetholm. The natives have fine characteristics: they are clean, thrifty and plodding, honest and sincere, shrewd and very independent. Their virtues lie rather in simplicity than in aspiration.

Northumbrian speech is characterized by a “rough vibration of the soft palate” or phrynx in pronouncing the letter w, well known as the “burr,” a peculiarity extending to the towns and liberties of Berwick, and absent only in a narrow strip along the north-west. Over the southern part of the county there is the same duplication of vowel-sounds, such as “pool” for “pool,”“the” and “on” pronounced “da,” “j” and “d,” and English forms of speech strike the ear, such as “to butch a beef,” “i.e., to kill a bullock, and curious inversions, such as “they can not help,” There is the Old-English distinction in the use of “thou” to familiars and “ye” to superiors.

The area of the administrative county is 1,291,515 acres. The county is divided into nine wards, answering to hundreds. Population is densest in the south-east, where the mining district and the parish of Bamburgh is located. The principal towns of the district are: Newcastle-upon-Tyne (city, county of a city and county borough; pop. 215,288), Tynemouth (county borough, 1,291, Morpeth (6158), Wallsend (2,361). In this district the following are urban districts: Amble (4248), Ashington (13,950), Bedlington (18,766), Blyth (5472), Cowpen (17,879), Cramlington (6437), Earlsdon (9020), Gosforth (10,606), Newbiggin-by-the-Sea (2032), Newburn (12,900), Seaburn (2121), Whitley and Monkseaton (7705), Willington Quay (7941). The remainder of the county contains the municipal borough of Berwick-upon-Tweed (13,427) and the urban districts of Alnwick (6716), Hexham (7155), Warkworth (6804), and the five parishes of the north-eastern circuit, and assizes are held at Newcastle-upon-Tyne. The total number of civil parishes is 352. The ancient county, which is in the Diocese of Newcastle, is divided into civil parishes, which in that of Durham, contains 173 ecclesiastical parishes or districts, wholly or in part. The parliamentary divisions of the county are Berwick-upon-Tweed, Hexham, Wansbeck and Tyneside, each represented by a single member, while the municipal borough of Newcastle-upon-Tyne returns two members, and those of Morpeth and Tynemouth one member each.

History.—The first English settlement in the kingdom of Bernicia, which included what is now Northumberland, was effected in 547 by Ida, who, accompanied by his six sons, pushed through the narrow strip of territory between the Cheviots and the sea, and set up a fortress at Bamburgh, which became the residence of the Saxon kings. In 616, after the death of Bernicia was first united with the rival kingdom of Deira under the rule of Æthelrith, and the district between the Humber and the Forth became known as the kingdom of Northumbria. In 634 Cadwalla was defeated at Hafenfeld (the site of which lies in the modern parish of St John Lee) by Oswald, under whom Christianity was definitely established in Northumbria, and the bishop’s see was fixed at Hexham, where Bishop Wilfrid erected the famous Saxon church. Oswald also erected a church of stone at Tynemouth, which was destroyed in 865 in an incursion of the Danes. Under Hingrave and Hubba, the extent of the Danish influence in Northumberland has been much exaggerated, however, for though in 876 Halden, having conquered the whole of Northumbria, portioned out the lands among his followers, the permanent settlements were confined to the southern portion of the kingdom. In the northern half, which is now Northumberland, the English princes continued to reign at Bamburgh as vassals of the Danes, and not a single place-name with the Danish suffix “by” or “thorpe” is found north of the Tyne. In 938 Æthelstan annexed Northumberland to his dominions, and the Danish authority was annulled until its re-establishment by Canute in 1013. The vigorous resistance of Northumbria to the Conqueror was punished by ruthless harrying. The Normans rebuilt the Saxon monasteries of Lindisfarne, Hexham and Tynemouth; Eustace Fitz John founded Alnwick Abbey, and other Norman abbey were Brinkburn, Hulne, Blanchland and Newminster. Castles were set up at Alnwick, Warkworth, Prudhoe, Dunstanborough, Morpeth, Ford, Chillingham, Langley, Newcastle, Bamburgh, Wark and Norham, a stronghold of the palatine bishops of Durham.

The term Northumbrian is first used in its contracted modern sense in 1065 in an entry in the Saxon Chronicle relating to the northern rebellion. The county is not mentioned in the Doomsday Survey, but the account of the issues of the county, as rendered by Ódard the sheriff, is entered in the Great Roll of the Exchequer for 1131. In the reign of Edward I. the county of Northumberland was found to comprise the whole district
between the Tees and the Tweed, and to have within it the several liberties of Durham, Sadberg and Bedlington south of the Coquet, and Norham beyond the Coquet, all subject to the bishop of Durham; and in 1293 formed the archdeaconry of the archbishop of York; that of Tynedale to the king of Scotland; that of Emildon to the earl of Lancaster; and that of Redesdale to Gilbert de Umfraville, earl of Angus. These franchises were all held exempt from the ordinary jurisdiction of the shire. By statute of 1405-1406 the lordship of Tynedale was annexed to Northumberland on account of flagrant abuses of the liberties of the franchise; the liberty of Hexham was annexed to Northumberland in 1572; Norhamshire, Islandshire and Bedlingtonshire continued to form detached portions of Durham until 1845, when they were incorporated into the county of Tyne and Wear; and division into wards existed at least as early as 1295, the Hundred Roll of that year giving the wards of Coquetdale, Bamburgh, Glendale and Tynedale.

The shire-court for Northumberland was held at different times at Newcastle, Alnwick and Morpeth, until by statute of 1549 it was ordered that the court should thenceforth be held in the town and castle of Alnwick, and under the same statute the sheriffs of Northumberland, who had lately been in the habit of appropriating the issues of the county to their private use, were required to the better deliver in their accounts to the Exchequer in the same manner as the sheriffs of other counties. The assizes were held at Newcastle, and the itinerant justices, on their approach to the county, were met by the king of Scotland, the archbishop of York, the bishop of Durham and the prior of Tynemouth, who pleaded their liberties either at a well called Chille near Gateshead, if the justices were proceeding from York, or, if from Cumberland, at Forstanes. In these franchises the king’s writ did not run, and their owners performed the office of sheriff and coroner. Among other Northumbrian landowners claiming privileged jurisdiction in 1293 was Robert de Quonla, whose hundreds at Widdrington, destitute of the lands and liberties of the shire and wapentake; the prior of St Mary of Carlisle claimed to exclude the king’s bailiffs from executing their office in his fee of Corbridge, and that he and his men were quit of the suits of the shire and wapentake. The burgesses of Newcastle claimed return of writs in their borough, and Edmund, the brother of Edward I, claimed return of writs and exemptions from the sheriff’s jurisdiction in his manor of Stamford. Newcastle was made a county by itself by Henry IV, in 1400, and has jurisdiction in admiralty cases. Ecclesiastically the county was in the diocese of Durham, and the bishop of Durham was the ordinary of the archdeaconry of the archbishop of York’s archdeaconry of Northumberland, comprising the deaneries of Newcastle, Corbridge, Bamburgh and Alnwick. In 1335 the archdeaconry included the additional deanery of Morpeth. The archdeaconry of Lindisfarne was formed in 1845, and subdivided into the rural deaneries of Alnwick, Bamburgh, Morpeth, Norham and Rothbury; the archdeaconry of Northumberland then including the deaneries of Bellingham, Corbridge, Hexham and Newcastle-upon-Tyne. In 1885 the additional deaneries of Tynemouth and Bedlington were formed in the archdeaconry of Northumberland, and in 1900 the deanery of Glendale in the archdeaconry of Lindisfarne.

Pre-eminent among the great families connected with Northumberland is that of Percy (q.v.). Ford and Chipchase were seats of the Heron family. The Widdringtons were established at Widdrington in the reign of Henry I. and frequently filled the office of sheriff of the county. The barony of Prudhoe was granted by Henry I. to the Umfravilles, who also held the castles of Otterburn and Alnwick as the liberty of the franchise of Bedlington. From the Ridleys of Willimot-Wythe, who was descended Bishop Ridley, who was martyred in 1555. Aydon Castle was part of the barony of Hugh Balio. The Radcliffes, who held Dilston and Cartington in the 15th century and afterwards acquired the extensive barony of Langley, became very powerful in Northumberland after the decline of the Percies, and were devoted adherents of the Stuart cause.

From the Norman Conquest until the union of England and Scotland under James I, Northumberland was the scene of perpetual inroads and devastations by the Scots. Northumberland and Wark were captured by David of Scotland in the wars of Stephen’s reign, and in 1290 it was at Norham Castle that Edward I. decided the question of the Scottish succession in favour of John Baliol. In 1295 Robert de Ros and the earls of Athol and Menteith ravaged Redesdale, Coquetdale and Tynedale. In 1314 the county was ravaged by Robert Bruce, and in 1328 by special enactment the earl of Northumberland was ordered to remain on his estates in order to protect the county from the Scots. In 1388 Henry Percy was taken prisoner and 1300 of his men slain at the battle of Otterburn, immortalized in the ballad of "The Haus of Percy". The Percy Chieftains of Dunstanborough were garrisoned for the Lancastrian cause in 1462, but after the Yorkist victories of Hexham and Hedgeley Moor in 1464, Alnwick and Dunstanborough surrendered, and Bamburgh was taken by storm. In 1513 the king of Scotland was slain in the battle of Flodden Field on Branxton Moor. During the Civil War of the 17th century Newcastle was garrisoned for the king by the earl of Newcastle, but in 1644 it was captured by the Scots under the earl of Lennox, and in 1646 Charles was led there a captive under the charge of David Leslie. The chief Northumberland families were ruined in the rebellion of 1715.

The early industrial development of Northumberland was much impeded by the constant ravages of internal and border warfare, and in 1376 the commonalty of Northumberland begged consideration for their sheriff, who, although charged £100 for the profits of the county, through death and devastation by the Scots could only raise £35, 3s. 4d. Again Aeneas Sylvius Piccolomini (Pope Pius II.), who passed through the county disguised as a merchant in 1456, leaves a picture of its barbarous and desolate condition, and as late as the 17th century, Camden, the historian of his country, describes the roads from Alnwick to Norhamshire, and the cold and desolate state of the mountainous country, and the mineral resources, however, appear to have been exploited to some extent from remote times. It is certain that coal was used by the Romans in Northumberland, and some coal workings, of which very few remain, were situated near Hexham and Morpeth. The Romans at Hexham had a lead-pan worked in the 2nd century. A salt-pan is mentioned, and the Blyth coal-field was worked throughout the 14th and 15th centuries. The coal trade on the Tyne did not exist to any extent before the 13th century, but from that period it developed rapidly, industry being in the 14th century established on the river shipping and coal-trade. Lead was exported from Newcastle in the 12th century, probably from Hexhamshire, the lead mines of which were so prosperous throughout the 16th and 17th centuries. In a charter from Richard I. to Bishop Pudsey creating him earl of Northumberland, mines of silver and iron are mentioned, and in 1240 the monks of Newminster had an iron forge at Stretton. A salt-pan is mentioned at Warkworth in the 12th century; in the 13th century the salt industry flourished at the mouth of the river Blyth, and in the 15th century formed the principal occupation of the inhabitants of North and South Shields. In the reign of Elizabeth glass-houses were set up at Newcastle by foreign refugees, and the industry spread rapidly along the Tyne. Tanning, both of leather and of nets, was largely practised in the 16th century, and the salmon fisheries in the Tyne were famous in the reign of Henry I.

The county of Northumberland was represented by two members in the parliament of 1290, and in 1295 Bamburgh, Corbridge and Newcastle-upon-Tyne each returned two members. From 1397, however, Newcastle was the only borough represented, until in 1524 Berwick acquired representation and returned two members. Morpeth returned two members from 1553. Under the Reform Act of 1832 the county returned four members in two divisions; Berwick and Newcastle were represented by two members each, and Morpeth and Tynemouth by one member each. Under the act of 1885 the county now returns four members in four divisions.
NORTHUMBRIA

Antiquities.—Of Anglo-Saxon buildings the Dunes lade left almost nothing. The crypt of Wilfrid's abbey at Hexham is one undoubted remnant; portions of several other churches are very doubtfully pre-Norman. Some thousand Saxon stycaes found buried in the fristround bank and an ornate cross now shared between Rothbury and Newcastle are the only vestiges of Saxon times. The Black Dyke, a bank and ditch crossing the line of the Roman wall about 3 m. east of the Irthing, is supposed by some to be the remnant of the old British line of the Cartrall at Peel Fell; the latter was the probable boundary-fence between the Saxon Bernicia and the British Strathclyde.

The ecclesiastical buildings of the county suffered greatly at the hands of the Scandinavians, not a few of the churches having been converted into mansions or for use as mansions. Lindisfarne Priory, the oldest monastic ruin in the country, dates from the time of Iona. Hexham Abbey, ruined over the crypt of Wilfrid's cathedral, has now become a ruin of historic architecture. Of Brinkburn Priory the church remains, and has been well restored. Hulne Abbey was the first Carmelitine monastery in Britain. Besides these there are fragments of Newcastle Abbey (1139), Alnwick Abbey (1147) and others. An exquisitely graceful fragment of Tynemouth church is associated with some remains of the older priory. St Nicholas's church, Newcastle (1350), was the prototype of St Giles's, Edinburgh. It stood on the site of an old church at Norham, and other Norman and Early English churches at Mitford, Bamburgh, Warkworth (with its hermitage), Alnwick (Schott, 1825) stand with them with square towers. The stone roof of the little church at Bellingham, with its heavy semicircular girders, is said to be now unique.

"It may be said of the houses of the gentry herein," writes Fuller in 1654, "that they are not a few of them large and castle-like." Except a few dwellings of the 16th century in Newcastle, and some mansions built after the Union of England and Scotland the older houses are all castles. A survey of 1540 mentions this number of "castles" in the county. Many of these are, however, not probably including all the bastle-houses or small peels of the yeomen. At the Conquest Bamburgh, the seat of the Saxon kings, was but the only castle of North York. Norham Castle was built in 1121. None of the "bosal castes" are left us in the time of Henry the Third. A grass mound represents Wark Castle. Alnwick Castle is an array of walls and towers covering about five acres. Warkworth, Prudhoe and Delvalle are fineCastles of the same kind. Waller has still its romantic memories of the earl of Derwentwater. Bel sault, Haughton, Featherstone and Chipchase castles are joined with modern mansions. The peel-towers of Elsdon, Whiston (Rothbury), and Embleton were used as fortified rectorcy-houses. Seaton Delaval was the work of Vanbrugh.

The place-names of the county may be viewed as its etymological antiquities. The Danish test-suffix by is absent. Saxon finals, hams, clesges (cliffs or ravines) and various patronyms are met with in great numbers; and the Gaelic knock (hill) and Cymric coar, dwer (water), efn (ridge), bryn (brow), &c., mingle with the Saxon. Many current names are pure norlhanhymbrorum (1147) or efn (ridge), bryn (brow), &c., mingle with the Saxon. Many current names are pure


NORTHUMBRIA (regnum Northumbriamor), one of the most important of the Anglo-Saxon kingdoms, extended from the Humber to the Forth. Originally it comprised two independent kingdoms, Bernicia and Deira (q.v.). Each of these had a dynasty of its own. The first known king of the former was Ida, who, according to tradition, acquired the throne in 547 and reigned twelve years. To him the foundation of Bamburgh is attributed. Four of Ida's sons successively occupied his throne: Ospur, 549-556; Edwin, 556-560; Oswald, 560-568; and Theodoric 572-575. Of the first three nothing is known, but Theodoric is said (Historia Brittonum) to have been besieged by the Welsh under Urien in Lindisfarne. Theodoric was succeeded by Frithwulf 579-585 or 586 and Husse 586-592 or 593. Then Æthelfrith (q.v.), son of Ethelric, came to the throne.

He greatly extended his territories at the expense of the Welsh, and eventually provoked an invasion of Aidan, king of the Scots, whom he defeated at a place called Daesaatan (603). The first king of Deira of whom we know was Ealla, or Aelle, who, according to Bede, was still reigning when Augustine arrived in 597. The Saxon writer, after which the Welsh less reliable authority, the Northumbrian history, places his death in the year 588. The compiler of this work, however, seems to have used a regnal list of the Bernician kings, which differed considerably from most of those found in our early authorities. Æthelthryth eventually acquired possession of Deira, probably in 604 or 605, perhaps on Ellia's death, expelling his son Edwin (q.v.). Thenceforward, with rare intervals, the two kingdoms remained united. Æthelthryth became involved in war with the Welsh towards the end of his reign and captured Chester, probably about 613. Shortly afterwards, in 616, he was defeated and slain in battle on the river Idle by Edwin, who was assisted by the East Anglian king Raedwald. Edwin now became king over both Northumbrian provinces. By his time the kingdom must have reached the west coast, as he is said to have conquered the islands of Anglesea and Man. Under Edwin the Northumbrian kingdom became the chief power in the country. At his death in 633 the kingdom was again divided, Deira falling to his nephew Osric, while Bernicia was occupied by Eanfrith son of Æthelthryth. Both these kings were slain by Ceawinwalr in the following year, but the kingdom afterwards recovered its independence. Eadberht, brother of Eanfrith, who reigned the whole of Northumbria under his sway and acquired a supremacy analogous to that previously held by Edwin. After Oswald's defeat and death at the hands of Penda in 642 Bernicia fell to his brother Oswiu, while Osric son of Osric became king in Deira, though probably subject to Oswiu. Oswiu's death was compassed by Oswiu in 651, and the throne of Deira was then obtained by Æthelwald son of Oswald. He is not mentioned, however, after 655, so it is probable that Deira was incorporated in the eastern kingdom of Bernicia. About 664 Penda invaded the kingdom of Northumbria, and after the defeat of Oswald over Penda in 654-655 he annexed the northern part of Mercia to his kingdom and acquired a supremacy over the rest of England similar to that held by his predecessors. The Mercians, however, recovered their independence in 658, and from this time onward Northumbria played little part in the history of southern England. But Oswiu and his son Egfrith greatly extended their territories towards the north and north-west, making themselves masters of the kingdoms of Strathclyde and Dalriada, as well as of a large part of the Pictish kingdom. Oswald's successor, Coenred, is described as a learned man and a patron of scholars, and during his reign the Northumbrian kingdom partially recovered its prosperity. He was succeeded in 705 by his son Osred, and under him and his successors Northumbria began rapidly to decline through the vices of its kings and the extravagance of their donations. Osred was slain in 716. He was succeeded by Coebrid 716-718, and Coebrid by Osric 718-729. The next king was Ceolwulf, to whom Bede dedicated his Historia Ecclesiastica in 731. In the same year he was deposed and forced to become a monk, but was soon restored to the throne. In 737 he voluntarily retired to a monastery, and left the kingdom to his cousin Eadberht. The latter appears to have been a vigorous ruler; in the year 740 we hear of his being involved in war with the Picts. Æthelhald of Mercia seems to have taken advantage of this campaign to ravage Northumbria. In 750 Eadbeth is said to have annexed a large part of Ayrshire to his kingdom. Finally in 756, having now allied himself with
Engus king of the Picts, he successfully attacked Dumbarton (Alcuith), the chief town of the Britons of Strathclyde. Eadberht showed considerable independence in his dealings with the church, and his brother Oswulf, to whom the well-known letter of Bede is addressed, was from 734 to 766 archbishop of York. In 758 Eadberht resigned the kingdom to his son Oswulf, and became a monk. After his abdication Northumbrian history degenerates into a record of dynastic murders. Oswulf was slain by his household at a place called Mchill Wonton in 759. Moll Æthelwald, who may have been a brother of Eadberht, succeeded, and after a victory over a certain Oswine, who fell in the battle, abdicated and became a monk probably under compulsion in 765. His successor Alcuith died in 789. Æthelwald was the son of Æthelred and was murdered at Corbridge in 796. Oswulf, who is called patricius by Simcon of Durham, succeeded, but reigned only twenty-seven days, when he was expelled and eventually became a monk. Eardwulf dux, who had apparently fled abroad to escape the wrath of Æthelred, was now recalled to the crown and ruled until 800. Æthelred then became king, but Eardwulf was restored in 808 or 809 after appealing to the emperor and the pope. Eanred, son of Eardwulf, probably came to the throne in 809 and reigned until 814. It was during his reign in 827 that Northumbria acknowledged the supremacy of Egbert, king of Wessex. Eanred was succeeded by his son Æthelred, who was slain in 850, when Osberht came to the throne and reigned until 863. On the expulsion of Osberht, Ella or Ælle, succeeded. The chroniclers emphasize the fact that this king was not of royal descent. He is said to have slain Ragnar Lodbjorg. In the year 866 Lothborna, the young earl, and Hemdu, Uthb, and others brought a vast army to England to avenge the death of their father. In the following year they obtained possession of York. Ella seems now to have made peace with the exiled king Osberht, and their united forces succeeded in recovering the city. In the great battle which ensued the Northumbrian army was annihilated and both kings slain (the death of Ella, according to Irish tradition, being due to the treachery of one of his followers). The southern part of Northumbria now passed entirely into the hands of the invaders, but they allowed a certain Egbert to reign over the portion of the kingdom north of the Tyne. Egbert was expelled in 877 and died in the course of the following year. His successor Ricigd died in 876 and was followed by Egbert II., who reigned until 878. He was the last English king who reigned in Northumbria. After him the chief power north of the Tyne came into the hands of a certain Eadulf of Bamburgh, who did not take the kingly title, but accepted the overlordship of Alfred the Great perhaps in 886. In the winter of 874-875 Healfdene returned to Northumbria, which he partitioned among his followers. He was probably killed in Ireland in 877. Simeon of Durham, made his brother Egberht, to whom the same position, after he had been expelled from his country and had lost his reason as a punishment for his misdeeds. After an interregnum of a few years a certain Guthred became king in 883. He is said to have been a slave and to have been appointed king at the command of St Cuthbert, who appeared to Eadred the abbot ofCarlisle in a dream. There is some reason for the conjecture that he belonged to the family of Lozbirk. He died in 894, after which date little is known of Northumbrian history for a number of years. About the year 970 the country was invaded by Ragnald (Rügnard, grandson of Ivarr), a Norwegian king from Ireland, who seized York and occupied the lands of St Cuthbert. Aldred, the son of Eadulf, who now ruled north of the Tyne, appealed to Constantine II., king of the Scots, for help, but the Scottish and Northumbrian armies were defeated at Corbridge. Shortly after this, however, all the northern princes submitted to Edward the Elder. Raeganald was succeeded by Sihtric (Sigtrygg, another grandson of Ivarr), who married Æthelstan’s sister. He died in 926, and his brother and successor Guthfrith was soon afterwards expelled by Æthelstan, the successor of Eadred. The latter, however, both submitted to Æthelstan, and Guthfrith was again driven into exile. He died in 934, leaving a son Anlaf (Olaf), Godfredsson or Godfredson. In 934 Æthelstan invaded Scotland as far as the Tay. In 937 a great fleet and army were brought together by Constantine and Anlaf, the son of Sihtric, another Norwegian chieftain who had allied himself with the Scots, helped by Anlaf Godfreysyn from Ireland. Æthelstan, however, won a complete victory over them at a place called Brunanburgh, probably Burnsward in Dumfries- shire. Anlaf Godfreysyn returned to Ireland and died in 941—perhaps by the order of the king. King Eric II. of Sweden, the son of Sihtric again came to England in 940 just after the death of Æthelstan. He became king of Northumbria and extended his territories as far as Watling Street. Peace was made with King Edmund by the capture of King Anlaf, and a good deal later by the confirmation of King Raegnald, brother to Anlaf Godfreyson and cousin to Anlaf Sihtricson. About two years later, however, both these kings were expelled by Edmund, and the whole of Northumbria was brought under his power. About the second year of Eadred’s reign there was another revolt and Eric Bloodaxe, the exiled king of Norway, obtained the throne. During the next few years the kingdom alternated between Eric and Anlaf until 954, when Eadred finally succeeded in establishing his power. Eric was killed by Maccus, the son of Anlaf, while Anlaf himself withdrew to Ireland, where he died in 980. Eadred placed Northumbria in the hands of a certain Osulf, who is called high-reeve at Bamburgh. In the reign of Edgar, Osulc was appointed earl of southern Northumbria, but he was banished at the beginning of the following reign. The next earl was Waltheof and after him Úhtred, who defeated Magnus and Stephen, sons of King Haakon the Great and Norway, and afterwards took the title of king of the Scots. The Northumbrians, however, were completely defeated at Carhan, and Lothian was annexed by the Scots (see Lothian). Úhtred was slain by the orders of Canute, who gave the province to Eric (Eirikr) earl of Lade. Shortly afterwards, however, part of it at least came into the hands first of Eadulf and then Aldred and another Eadulf, the brother and sons respectively of Úhtred. The younger Eadulf was slain by Siward, probably in the reign of Hardacanute. Siward held the ealdom till his death in 1035, when it was given to Tostig, son of earl Godwine, and after his banishment to Morkere, son of Ælfgar, earl of Mercia. Tostig’s banishment led to the invasion of Harold Hardrada, king of Norway, and the battle of Stamford Bridge, in which both perished.

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NORTH WALSHAM, a market town in the eastern parliamentary division of Norfolk, England; 131 m. N.E. by N. of Norwich, on the broad flat land of the valley of the river Bure (1901) 3981. It lies in a pastoral district near the river Ant, a tributary of the Bure. The church of St Nicholas is a fine Perpendicular structure exhibiting the flint-work common to the district, and possessing a beautiful south porch and the ruin of a massive western tower which partly collapsed early in the 18th century. A grammar school was founded in 1606, and reorganized and moved to new buildings in modern times. There
is a market house of the 16th century. A considerable agri-
cultural trade is carried on, and cattle-shows and fairs are held.
The river Ant provides a route southward to the Norfolk Broads.
The coast village of Mundesley, 5 m. N.E. by a broad railway which runs
in favour as a watering-place, having fine sands beneath the cliffs.
In the district between this and North Walsham are Paston,
taking name from the family which is famous through the
Paston Letters (q.v.), and the fragments of Bromholm
Priory, a Clinkian foundation. These are of various dates from
Norman onwards, but are incorporated with farm buildings.
The road of Bromholm was a reputed fragment of the Cross
which attracted many pilgrims. To the south of North Walsham
is North Walsham Heath, whither in June 1381 a body of in-
surgents, Retreating with the King of Bohemia's army, was driven
from before Norwich by Henry le Despenser, bishop of Norwich,
and defeated; after which their leader, Geoffrey Lister, and
others were sent to the scaffold.

NORTH-WEST FRONTIER PROVINCE, the most northerly
province of British India, created on the 25th of October 1901.
Roughly it may be defined as the tract of country N. of Baluch-
istan, lying between the Indus and Afghanistan. More exactly
it consists of (1) the Cis-Indus district of Hazara; (2) the com-
paratively narrow strip between the Indus and the hills con-
tinuing the tracts of Peshawar, Kohat, Bannu and Dera Ismail Khan;
and (3) the rugged mountains and plains which lie between
these districts and the borders of Afghanistan, which is
inhabited by independent tribes. This last region is divided into
to five agencies: Dir, Swat and Chitral, with headquarters at
Malakand; Khyber, Kurram, Tochi and Wana. The province
lies between 33° 4' and 36° 57' N., and 70° 16' and 74° 7' E. The
approximate area is 38,665 sq. m., of which 13,193 sq. m. are
British territory and the remainder is held by tribes under
the political control of the Agent to the Governor-General.
On June 1878, the frontier area was ceded by Afghanistan to
by Baluchistan and Dera Ghazi Khan district of the Punjab,
by the E. by Kashmir and the Punjab, and on the W. by
Afghanistan.

1. Hazara District.—The district of Hazara extends north-
eastwards into the outer Himalayan Range, tapering to a narrow
point at the head of the Kagan valley. The mountain chains which
enclose Kagan sweep southward into the broader portion of the
district, throwing off well-wooded spurs which break up the country
into numerous isolated glens. Approaching Rawalpindi district
the peaks of the Outer Himalayas gradually subside into the plain of
hilly, wooded uplands. The Babusar Pass at the head of the Kagan valley marks the first direct approach
to Chilas and Gilgit from the plains of India. (See HAZARA).

2. Harkot District.—The Harkot district of the frontier
consists of four open districts, Peshawar, Kohat, Bannu and
Dera Ismail Khan, divided one from the other by low hills. The vale
of Peshawar is for the most part highly irrigated and has a
 represents in the spring and autumn a picture of waving cornfields
and smiling orchards framed by rugged hills. It has, however, an
ever name for malarial fever. Adjoining Peshawar, and separated
by it from the Jowaki hills, lies the district of Kohat, a generally
hilly tract intersected by narrow valleys. The largest of these
traverses the district from Kushalgarh on the Indus to Thal on the
Kurram, narrowing in places, but usually opening out into wide
and pastures dotted with the dwarf palm. This district
affords striking contrasts of scenery, from the sheltered fields
of Miran梓ar to the barren desolation of the salt mines. The southern
spurs of the Kohat hills gradually subside into the Bannu plain.

3. The Country of the Independent Tribes.—Turning to the moun-
tainous region between the settled districts and Afghanistan, to the
extreme north lies the agency of Dir, Swat and Chitral. Chitral itself
is a narrow valley enclosed by ranges of mountainous ranges.
Below Chitral are found the thickly timbered forests of Dir and
Bajaur, and the fertile valleys of the Panjkora and Swat rivers.
Between this agency and the Khyber Pass lies the Mohmand hills,
a rough country with but little cultivation, under the political control
of Afghanistan. This country is inhabited by the Pathan tribes of the
of the Afridis and the Orakzais. The boundary of the
province here follows the line of the Safed Koh, which overlooks
the Kohat district and the upper Kurram valley. Dotted with towered
hamlets and stations, the road winds south-east from the Peiwar Kotal
(great below the peak of Sikaram), past Thal in the Miranzai valley, through the southern Kohat hills
between the Kohat and Bannu districts, and then south-west to the
from Waziristan, an isolated mountainous district bound on the
by the Gomal and the gorges that lead to the Wana plain.
The lower ridges of the frontier mountain system are usually bare
of forest, but here and there they are occupied by a
Waziristan and round Kaniguram in the south, are forest clad
and enclosed narrow but fertile and well-irrigated dales. In places, too,
where narrow glens receive the summer rains on the ground of the
Waziristan and the in the pastures of Dir Ghul Khan are
pasturage and a fair sprinkling of deodars. The valleys of the Tochi
and Wana are both fertile, but are very different in character.
The Gomal the latter is a wide open alluvial plain, cultivated
on one side, and for the rest rough stony waste. South of the
Gomal the Sulman Range culminates in the famous Takht-i-
Suliman in the Larcha Shanani country, a political dependency
of Dera Ismail Khan district. The Kaisargai peak of the Takht-i-
Suliman is 11,300 ft. above sea-level.

4. The Pathan Races.—The North-West Frontier Province as
now constituted may be described as the country of the Pathans
(q.v.). The true Pathan is possibly of Indian extraction. But
around this nucleus have collected many tribes of foreign origin.
The whole have now become blended by the adoption of a common
language, but remain tribally distinct; all alike have accepted
Islam, and have invented traditions of common descent which
express their present association. For centuries these tribes
have been in their turn conquerors of the Afghan tribes of the
present kingdom of Afghanistan. In the 15th century
they began to settle in the plains. The 16th century saw the
Pathan tribes established in their present homes. The spirit
of independence which always characterized them soon brought
them into collision with the Mogul empire. In the 17th century,
after a long struggle, the settlers in the plains wrested from
Aurangzeb terms which left them almost as independent
as their brothers in the hills. The invasion in 1738 of Nadir Shah,
who traversed the province from Peshawar to Dera Ismail Khan.
NORTH-WEST TERRITORIES

is a landmark in the history of the frontier. From his death to the rise of Ranjit Singh, the frontier districts remained an appendage of the Durani empire. Little control was exercised by the rulers of Kabul, and the country was administered by local chiefs or Afghan Sirdars very much as they pleased. The Sikh invasions began in 1849, and from that date to the annexation by the British government the Sikhs were steadily making themselves masters of the country. After the Second Sikh War, by the proclamation of the 29th of March 1849, the frontier districts were annexed by the British government. From that time until the creation of the North-West Frontier Province the settled districts formed part of the Punjab, while the independent tribes were controlled by the British government, and the government of India. Their turbulence still continued, and since 1849 they have been the object of over fifty punitive expeditions. The chief tribes, under the political control of the N.W. Frontier agency, besides Chitralis and Bajauris, are the Utman Khel, Yusafzais, Hassanais, Mohmands, Afridis, Jowakis, Mullagaris, Orakzais, Zaimukhans, Chamanis, Kakhtas, Bangashes, Turis, Waziris, Battannis (Bhitanis) and Sheranis. These tribes are referred to under separate headings.

Creation of the Province.—The North-West Frontier Province differs from the older provinces of India in having been artificially built up out of part of a previous province together with new districts for a definite administrative purpose. The proposal to make the frontier districts into a separate province, administered by an officer of special experience, dates back to the viceroyalty of Lord Lytton, who, in a famous minute of the 22nd of April 1877, said:

"I believe that our North-West Frontier presents at this moment a spectacle unique in the world; at least I know of no other spot where, after 25 years of peaceful occupation, a great civilized power has obtained so little influence over its semi-savage neighbours, and acquired so little knowledge of them, that the country within a day's ride of its most important garrison is an absolute terra incognita, and that there is absolutely no security for British life a mile or two beyond our border."

The result of this minute was that a frontier commissionership, including Sind, was sanctioned by the home government, and Sir Frederick (afterwards Lord) Roberts had been designated as the first Commissioner, when the outbreak of the Second Afghan War caused the project to be postponed. It was afterwards shelved by Lord Ripon. Twenty-three years elapsed before Sir Frederick and another appointed by Lord Curzon, whose scheme was on a much more modest scale than Lord Lytton's. It omitted Sind altogether, and confined the new province to the Pathan trans-Indus districts north of the Gomal. The purpose of the change was to subject all the independent tribes from Chitral to the Gomal Pass to the control of a single hand, and to ensure a firm and continuous policy in their management. The administration of the province is conducted by a chief Commissioner and Agent to the Governor-General.

Population.—In the census of 1901 the operations were extended for the first time to the Kurram Valley and the Sherani country, trans-frontier territories containing a population of 66,628 souls, which had not been previously enumerated. The military cantonments and posts in Malakand, Dir, Swat and Chitral were also enumerated, as were those in the Tochi Valley (the Northern Waziristan Agency) and in the Gomal (the Southern Waziristan Agency), the former figures being included in the census returns of Bannu district, and those of the latter in the returns of Dera Ismail Khan. The total population of the province was 1,219,480; but this figure omits the great majority of the frontier tribes. The province is almost wholly agricultural. The urban population is only one-eighth of the total, and shows no tendency to increase. There are no large industries to attract the population to the towns; these, except Peshawar and Dera Ismail Khan, are either expansions of large agricultural villages or bazaars which have grown up round the many cantonments of the province. The great majority of the population are Pathan by race and Mahomedan by religion. The predominant language is Pushtu (q.v.). The conquered strata of the population speak servile Indian dialects, called Hindki in the north, Katchi in the south, and Gujar in the south of Peshawar.

Crops and Climate.—The area under cultivation represents an average of 1,3 acres per head of the total, and of nearly 1,3 acres per head of the rural population. The limit of profitable cultivation has almost been reached. It is therefore from an improvement in the methods of agriculture rather than to an extension of the area under cultivation that recourse must be had to supply the needs of a rapidly increasing population. The Pathan, however, is a slovenly cultivator and slow to adopt any new methods which involve some effort. The crops commonly cultivated are wheat, barley, maize and bajra; in the spring, wheat, barley and gram. Rice and sugarcane are largely grown on the irrigated lands of Hazara, Dera Ismail and Bannu districts, and the well and canal irrigated tracts of Peshawar district produce fine crops of cotton and tobacco.

In the trans-border agencies the valleys of the Swat, Kurrum and Tochi rivers yield abundant rice crops. The province is mainly a rice shipper and a receiver of rice by rail from Bengal. The lower Indus plain is watered by the Indus and its tributaries, the Suba and the Chenab. The former is navigable for 20 miles below Lahore. The Swat and Kabul river canals, which were constructed by and are the property of government, and are managed by the irrigation department.

About 20% of the cultivated area is irrigated by canals, 2% by wells and 3% by perennial streams. Throughout the province the area in which well-cultivation is possible is extremely limited, and the field which has already been cultivated in Kohat and Hazara any considerable extension of canal irrigation is out of the question, but in the remaining districts much can still be done to promote irrigation.

Railways.—The railways of the province are mostly intended in the first instance for strategic purposes. The main line of the North-Western railway runs from Rawalpindi to Peshawar, whence it branches off. There are two lines of railway, the first to Dargai and the Kallu Pass. From Nowshera a frontier light line, involving a break of gauge, is carried to Dargai at the foot of the Malakand Pass. From Rawalpindi again another branch extends to the Indus at Chichawatni. A branch line has been begun across the Swat and runs through Kohat to Chilayat. A line is also continued through to Kohat to Thal at the entrance of the Kurrum valley.

See North-West Frontier Province Gazetteer (Calcutta, 1908); Sir Thomas Holdich, The Indian Borderland (1907); Paget and Mason, Record of Frontier Expeditions (1884).

NORTH-WEST TERRITORIES. The North-West Territory was at first a general name given to all the districts of British North America lying N.W. of the St Lawrence basin. In the British North America Act of 1867 provision was made for the admission to Canada of "Rupert's Land and the North-West Territory." Manitoba was formed out of this district in 1870. The territory remaining was then called the "North-West Territories," and until other arrangements were made was to be under the governor of Manitoba. In 1876 the district of Keewatin was established; in 1882 the limits of Manitoba were enlarged; in 1885 the districts of Keewatin, Ungava, Mackenzie and Franklin were organized. In 1905 the two first of these with some modification became the province of Saskatchewan, and the two last the province of Alberta. The territories of Canada outside of the eight provinces and Yukon district of the mainland are now organized as the North-West Territories, and are under an administrator or acting governor. They include the districts of Keewatin, Ungava, Mackenzie and Franklin. These territories have an Indian population of about 8,500, the
Indians throughout the southern part being chiefly Chipewyans, or as they are sometimes called, Tinâé. The northern parts are inhabited by Eskimo. In these territories a short hot summer is followed by a long cold winter with extremely low temperatures, the spirit thermometer at times showing 60° to 65° F. below zero. The following observations may be quoted:

<table>
<thead>
<tr>
<th></th>
<th>Feet above Sea-level</th>
<th>Mean Temperature,°F.</th>
<th>Average Precipitation, Inches.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway House, Keewatin</td>
<td>710</td>
<td>48.7</td>
<td>19.26</td>
</tr>
<tr>
<td>York Factory</td>
<td>0</td>
<td>12.6</td>
<td>28.73</td>
</tr>
<tr>
<td>Fort Simpson, 45° 61' N.</td>
<td>400</td>
<td>50.4</td>
<td>-16.7</td>
</tr>
<tr>
<td>Fort Franklin, 65° 12' N.</td>
<td>500</td>
<td>50.4</td>
<td>-17.0</td>
</tr>
</tbody>
</table>

With the exception of southern Keewatin and the district south of James Bay the animals of the North-West Territories are chiefly fur-bearing. Great herds of musk-oxen are found in Mackenzie, and vast flocks of ducks, geese and other migratory birds spend summer in the northern wilds. Except in southern Keewatin and the James Bay district the flora is decidedly northern, becoming Arctic in the far northward and ill formed. Sedges abound, exceeding grasses; mustards are abundant, and saxifrages plentiful. Mosses and lichens are numerous.

The history of the north-west follows three different branches. (1) The story of Arctic exploration and the search for the North-West Passage, with a concentration of interest upon the name of Sir John Franklin, whose loss was owned by a great development of investigation in the Arctic regions; (2) the story of the fur trade, connected with the Hudson Bay forts, from the establishment of the first Charles Fort in 1669; (3) the story of immigration, the beginning of which is to be found in the coming of the Selkirk colonists, the real founders of Manitoba (q.v.), to Red river by way of Hudson Bay.

NORTHWICH, a market town in the Northwich parliamentary division of Cheshire, England, 17½ m. N.W. of London, on the London and North-Western railway and the Cheshire lines. Pop. of urban district, 17,611. It lies in a low open valley at the confluence of the rivers Weaver and Dane, and is the centre of the principal salt-producing district in the United Kingdom. In its narrow and irregular streets many of the houses are strongly bolted to keep them secure from the subsidences which result not infrequently from the pumping of brine. Despite these precautions many accidents have occurred; some of the houses have sunk or stand at fantastic angles, and in 1892 a portion of the High Street, which had subsided below the level of the Weaver, had to be raised 6 ft. Both rock salt and white salt obtained by evaporation from brine are exported. The amount supplied by the whole district, which includes the neighbouring town of Winsford 6 m. south, is about 1,500,000 tons annually. The white salt is shipped chiefly to America. The principal buildings are the church of St Helen, Witton, noted for its finely carved roof of the 17th century, a museum and free library and market house. The Verdin Park was presented to the town by Robert Verdin, M.P. for Northwich, in 1857. There is a considerable industry in the building of flat boats to convey salt to Liverpool, the river Weaver being navigable, and connected by a hydraulic lift, 1 m. from the town, with the Trent and Mersey Canal on a higher level. Rope- and brick-making, iron and brass-foundling, chemical manufactures, brewing and tanning, are also carried on.

NORTON, CAROLINE ELIZABETH SARAH (1868-1877), a daughter of Lady Stirling-Maxwell, English writer, was born in London in 1828. One of the three beautiful granddaughters of Richard Brinsley Sheridan, daughters of his son Thomas, the "three Graces" of London society in the reign of George IV., she began to write before she was out of her teens. Her two sisters Helen and Georgina became respectively Lady Dufferin and Duchess of Somerset. Lady Dufferin described the sisters to Disraeli with characteristic modesty. "Georgey's the beauty," she said, "and Carry's the wit, and I ought to be the good one, but I am not." At the age of seventeen, Caroline published a merry satire, The Dandies' Rout, illustrated by herself, and full of girlish high spirits and wit. Her first essay in serious verse was made in 1829 with The Sorrows of Rosaline, the next in 1825 with The Undying One, a version of the legend of the Wandering Jew. She made an unfortunate marriage in 1827 with the Hon. George Norton, brother of Lord Granville. After three years of protests on her part and good promises on his, she had left his house for her sister's, had "condoned" on further good promises, and had returned, to find matters worse. The husband's persecutions culminated in 1836 in an action brought against Lord Melbourne for seduction of his wife, which the Jury found and with which the wife left the box. The case against Lord Melbourne was so weak that it was suggested that Norton was urged to make the accusation by Melbourne's political enemies, in the hope that the scandal would prevent him from being premier when the princess Victoria should succeed William IV. In 1853 legal proceedings between Mrs Norton and her husband were again entered on, because he not only failed to pay her allowance, but demanded the proceeds of her books. Mrs Norton made her own experience a plea for addressing to the Queen in 1851: she has been sumptress and handmaid, and her writings did much to ripen opinion for changes in the legal status of married women. George Meredith, in Diana of the Crossways, used her as the model for his "Diana." Mrs Norton was not a mere writer of elegant trifles, but was one of the priestesses of the "reforming" spirit; her Voice from the Factories (1836) was a most eloquent and rousing condemnation of child labour. The Dream, and other Poems appeared in 1840. Aunt Carry's Ballads (1847), dedicated to her nephews and nieces, are written with charming tenderness and grace. Later in life she produced three novels, Stuart of Dunleith (1851), Last and Sived (1856), and Old Sir Douglas (1860). Mrs Norton's last poem was the Lady of La Garoye (1862), her last publication the half-humorous, half-heroic story of The Rose of Jericho in 1870. She died on the 15th of June 1877. Mr Norton died in 1875; and Mrs Norton in the last year of her life married Sir W. Stirling-Maxwell.

See The Life of Mrs Norton, by Jane G. Perkins (1899).

NORTON, CHARLES BOWYER ADDERLEY, 1st Baron (1814-1905), English politician, eldest son of Charles Clement Adderley (d. 1818), one of an old Staffordshire family, was born on the 2nd of August 1814, and inherited Hams Hall, Warwickshire and the valuable estates of his great-uncle, Charles Bowyer Adderley, in 1826. He was educated at Christ Church, Oxford, and in 1841 he became one of the members of parliament for Staffordshire retaining that seat until his death. Sir Charles was elected Baron Norton. Adderley's official career began in 1858, when he served as president of the board of health and vice-president of the committee of the council on education in Lord Derby's short ministry. Again under Lord Derby he was under-secretary for the colonies from 1866 to 1868, being in charge of the act which called the Dominion of Canada into being, and from 1874 to 1878 he was president of the board of trade. He died on the 28th of March 1905. Norton was a strong churchman and especially interested in education and the colonies. In 1842 he married Julia (1820-1897) daughter of Chandon, 1st Lord Leigh, by whom he had several sons. His eldest son Charles Leigh (b. 1846) became 2nd Baron Norton. Another son, James Granville Adderley (b. 1861), vicar of Saltley, Birmingham, became well known as an advocate of Christian socialism.

See W. S. Childe-Pemberton, The Life of Lord Norton (1909).

NORTON, CHARLES ELIOT (1827-1908), American scholar and man of letters, was born at Cambridge, Massachusetts, on the 16th of November 1827. His father, Andrews Norton (1780-1853) was a Unitarian theologian, and Dexter professor of sacred literature at Harvard; his mother was Catherine Eliot, Charles William Eliot, president of Harvard, being her cousin. Charles Eliot Norton graduated from Harvard in 1848, and started in business with an East Indian trading firm in
Boston, for which he travelled to India in 1849. After a tour in Europe, he returned to America in 1851, and thenceforward devoted himself to literature and politics.

In 1858 Norton inaugurated the Dante Society, whose first presidents were Longfellow, Lowell and Norton. He translated the Vita Nuova (1860 and 1867) and the Divina Commeda (1861-1862, 2 vols.). After work as secretary to the Loyal Publication Society during the Civil War, he edited from 1864-1868 the North American Review, in association with James Russell Lowell. In 1861 he and Lowell helped Longfellow in his translation of Dante and in the starting of the informal Dante Club. In 1873 he was appointed professor of the history of art at Harvard, a chair which was created for him and which he held until 1888. The Archaeological Institute of America chose him to be the first president (1879-1890).

From 1876 until 1874 Norton spent much time in travel and residence on the continent of Europe and in England, and it was during this period that his friendships began with Carlyle, Ruskin, Edward FitzGerald and Leslie Stephen, an intimacy which did much to bring American and English men of letters into close personal relation.

Norton, indeed, had a peculiar genius for friendship, and it is on his personal influence rather than on his literary productions that his claim to remembrance mainly rests. From 1884 he had confined himself to the study of Dante, his professorial duties, and the editing and publication of the literary memorials of many of his friends. In 1883 came the Letters of Carlyle and Emerson; in 1886, 1887 and 1888, Carlyle's Letters and Reminiscences; in 1894, the Orations and Addresses of George William Curtis and the Letters of Lowell. Norton was also made Ruskin's literary executor, and he wrote various introductions for the American "Brantwood" edition of Ruskin's works. His other publications include Notes of Travel and Study in Italy (1859), and an Historical Study of Church-building in the Middle Ages: Venice, Siena, Florence (1880). He organized exhibitions of the drawings of Turner (1874) and of Ruskin (1879), for which he compiled the catalogues.

He died on the 21st of October 1908 at "Shady-hill," the house where he was born. He bequeathed the more valuable portion of his library to Harvard. In 1856 he had married Miss Susan Sedgwick. He had the degrees of Litt.D. (Cambridge) and D.C.L. (Oxford), as well as the L.H.D. of Columbia and the L.L.D. of Harvard and of Yale.

THOMAS, T., 1813-1874, English lawyer, politician and writer of verse, was born in London in 1813. He was educated at Cambridge, and early became a secretary to the Protector Somerset. In 1855 he was admitted a student at the Inner Temple, and married Margery Cranmer, the daughter of the archbishop. From his eighteenth year Norton had begun to compose verse. We find him connected with Jasper Heywood; as a writer of "sonnets" he contributed to Todd's Miscellany, and in 1560 he composed, in company with Sackville, the earliest English tragedy, Gorboduc, which was performed before Queen Elizabeth in the Inner Temple on the 18th of January 1561. In 1562 Norton, who had served in an earlier parliament as the representative of Gatten, became M.P. for Berwick, and entered with great activity into politics. In religion he was inspired by the sentiments of his father-in-law, and was in possession of Cranmer's MS. code of ecclesiastical law; this he permitted John Foxe to publish in 1571. He went to Rome on legal business in 1570, and from 1580 to 1583 frequently visited the Channel Islands as a commissioner to inquire into the status of these possessions. Norton's Calvinism grew with years, and towards the end of his career he became a rabid fanatic. His punishment of the Catholics, as their official censor from 1581 onwards, led to his being nicknamed "Rackmaster-General." At last his turbulent puritanism made him an object of fear even to the English bishops; he was deprived of his office and thrown into the Tower. Walsingham presently released him, but Norton's health was undermined, and on the 10th of March 1584 he died in his house at Sharpenhoe, Bedfordshire.

The Tragedie of Gorboduc was first published, very corruptly, in 1565, and, in better form, as The Tragedie of Fereex and Forreex, in 1570. Norton's early lyrics have in the main disappeared. The most interesting of his numerous anti-Catholic pamphlets are those on the rebellion of Northumberland and on the projected marriage of Mary Queen of Scots to the duke of Norfolk. Norton also translated Calvin's Institutes (1601) and Alexander Novell's Catechism (1670).

Gorboduc appears in various dramatic collections, and was separately edited by W. D. Cooper (Shakespeare Soc. 1847), and by Miss Toulmin Smith in Volkmöller's Englische Sprach- und Literatur-denkmale (1883). The best account of Norton, and his place in literature, is that of Sidney Lee in his Dictionary of National Biography. (E. G.)

NORWALK, a city of Fairfield county, Connecticut, U.S.A., on the Norwalk river, in the township of Norwalk, adjoining the city of South Norwalk in the same township, and 13 m. W.S.W. of Bridgeport. Pop. (1900) 6125 (1023 foreign-born and 189 negroes); (1910) 6045; of the township (1900) 19,932; (1910) 24,211. The city is served by the New York, New Haven & Hartford railroad, by interurban electric lines, and by steamboats to New York. The city has a green with some old churches and some fine elms, a public library, a hospital, a state armory and a music conservatory. The Old Walk Chapter of the Daughters of the American Revolution have erected here a drinking fountain in memory of Nathan Hale, who obtained in Norwalk his disguise as a Dutch school teacher and then started on his fatal errand to Long Island. Norwalk has some manufactures, including woolen goods and typewriting machines; and there is some coasting trade, oysters especially being shipped from Norwalk.

The site of the township was purchased from the Indians in 1619 by Roger Ludlow and Daniel Patrick, Ludlow giving six fathoms of wampum, six coats, ten hatchets, ten hoes, ten knives, ten scissors, ten jew's harps, ten fathoms of tobacco, three kettles of six hands, and about ten looking-glasses for all the land between the Norwalk and Saugatuck rivers and extending one day's walk N. from the Sound. The first settlement in the township was made in 1650 at what is now the village of East Norwalk by a small company from Hartford, and the township was incorporated in the next year. The village was burned by the British under Governor Tryon on the 12th of July 1779, and the chair in which it is alleged Tryon sat, on Grummans Hill, as he watched the flames, has been kept as a relic. Norwalk was incorporated as a borough in 1836 and was chartered as a city in 1893.

See C. M. Selleck, Norwalk (Norwalk, 1896); and Norwalk after Two Hundred and Fifty Years, an Account of the Celebration of the 250th Anniversary of the Charter of the Town (South Norwalk 1879).

NORWALK, a city and the county-seat of Huron county, Ohio, U.S.A., about 55 m. W.S.W. of Cleveland. Pop. (1900) 7974, including 702 foreign-born and 101 negroes; (1920) 7858. It is served by the Lake Shore & Michigan Southern, and the Wheeling & Lake Erie railways, and by interurban electric lines. It has a public library in which a small museum is maintained by the Firelands Historical Society. The city is the centre of a rich agricultural district. Among its manufactures are machine-shop products (the Wheeling & Lake Erie has shops here), iron and steel, pianos and automobile fittings.

Norwalk was settled in 1817 and was named from Norwalk, Connecticut; it was incorporated as a town in 1829 and chartered as a city in 1881. Huron county and Erie county immediately N. are the westernmost of the counties created from the "Western Reserve," and comprise the "Fire Lands" grant made in 1792 by the state of Connecticut to the people of Greenwich, Fairfield, Danbury, Ridgefield, Norwalk, New Haven, East Haven and New London to indemnify them for their fire losses during the British expeditions in Connecticut under Governor Tryon in 1779 and Benedict Arnold in 1781. The Connecticut grantees were incorporated in 1803 as "the proprietors of the half-million acres of land lying south of Lake Erie."
NORWAY, a kingdom of northern Europe, occupying the W. and smaller part of the Scandinavian peninsula. Its E. frontier marches with that of Sweden, except in the extreme N., where Norway is bounded by Russian territory. On the N., W., S. and E. the boundary is the sea—the Arctic Ocean, that part of the Atlantic which is called the Norwegian Sea, the North Sea and the Skagerrak successively. The S. extremity of the country is the island of Slettaingen in 57° 58′ N., and the N. that of Knivskjøerdøen, off the North Cape in 71° 11′ N. Of the mainland, the southernmost promontory is Lindsnes, in 59° 49′ N., while the northern most is Nordkyn, in 71° 7′ N. The S. of the country, that is to say, the projection between the Skagerrak and the North Sea proper, lies in the same latitude as the N. of Scotland and Labrador, and the midland of Kamchatka. The most western island, Utvær, lies off the mouth of the Sogne Fjord (4° 30′ E.), and the easternmost point of the country is within the Arctic lands, near Vardø (31° 11′ E.). The direct length of Norway (S.W. to N.E.) is about 1100 m. The extreme breadth in the S. (about 61° N.) is 270 m., but in the N. it is much less—about 60 m. on the average, though the Swedish frontier approaches within 6 m. of a head-branch of Ofoten Fjord. The coast-line is about 3700 m. long. The length of the coast line is difficult to estimate; measured as an unbroken line it is nearly 1700 m., but including the fjords and greater islands it is set down as 12,000. The area is estimated at 124,495 sq. m.

Physical Features. Relief.—The main mountain system of the Scandinavian peninsula hardly deserves its name of Kjølen (the keel). It may rather be described as a plateau deprived of the appearance of a plateau, being on the one hand grooved by deep valleys, while on the other many salient peaks tower above its average level. Such peaks, during the later Glacial period, stood above the ice-field. Peaks and ridges were formed by the action of small glaciers cutting out each its circular hollow (botn) just as they still work on the remaining snow-fields. But where the power of the main ice-mass was at work, the characteristic rounded forms of base rock are seen, close above the sea along the coast, but even as high as 5000 ft. in some inland localities. The high plateau lies along the W. side of the peninsula, so that except in the S.E. Norway is mountainous throughout. Even the part excepted is hilly, but it partakes of the character of the long mountain or Swedish slope of the peninsula. Beyond the coast line their floors sink far below sea-level, and thus are formed the fjords and the belt of rugged islands which characterize almost the entire seaboard of Norway. Where Norway marches with Russia, a few heights exceed 3000 or even 4000 ft., but the land is not generally of great elevation. But from the point of junction with Swedish territory the mountains increase considerably in height. For a short distance, as far south as Lake Tornet, the loftiest points lie within Norwegian territory, such as Jøgevarre (6283 ft.), between Lyngen and Ulfsfjord, and Kiste Fjeld (5623 ft.) farther inland. Thereafter the principal heights lie immediately along the crest-line of the plateau and within Swedish territory. Sulitjelma, however (6158 ft.), lies on the frontier. Southward again the higher summits fall to Norway. S. of Bodø, Svartisen ("the black ice"), a magnificent snow-field bordering the coast, and feeding many glaciers, culminates at 5246 ft. Thereafter, Okstindene or Østindene (6273 ft.), and the Store Børge Fjeld (5987 ft.) are the principal elevations as far as 64° N. A little S. of this latitude the so-called Trondhjem depression is well marked right across the central west coast. The height of the mountain top often exceeds 5000 ft., while the peaked form characteristic of the heights which rose clear of the glaciers of the later Glacial period is wanting. It is from this point too that Norwegian territory broadens so as to include not only the highest land in the peninsula, but a considerable part of the general E. and S.E. slope. The high plateau broadens and follows the S.W. sweep of the coast. Pursuing it S. the Dovre Fjeld is marked off by the valleys of the rivers Driva and Sundal, Laagen (or Laugen) and Raum, and the fjords of the coastland of Nordmøre. Here Snehetta reaches a height of 7615 ft., and the Romsdal (the name under which the Rauma valley is famous among tourists) is flanked by many abrupt jagged peaks up to 6000 ft. high. The valley of the Laugen forms the upper part of Gudbrandsdal. East of this and S.E. of the Dovre is another fjeld, Rondane, in which ranges rise to 6300 ft. South of the Otta valley is Jotunheim, or Jotun Fjeld, a sparsely peopled, in parts almost inaccessible, district, containing the highest mountains in Scandinavia, Galdhopiggen reaching 8390 ft. On the seaward side of Jotunheim is Jostedalsbreen, a great snow-field in which Lodalskaupen reaches a height of 6795 ft. South of Sogne Fjord (61° N.) mountains between 6000 and 6600 ft. are rare; but in Hallingkarvet there are points about 6700 ft. high, and in the Hardanger Vidda (waste), a broad wild upland E. of Hardanger Fjord, Haartøgen reaches 6693 ft. The highland finally sinks to the sea again, thus marking the limit of the great ranges of hills, separated by valleys radiating S.E., S. and W.

Glaciers.—The largest glacier in continental Europe is Jostedalsbreen, with an area of 350 sq. m., the snow-cap descending to 4000 or 4500 ft. Several of its branches fall nearly to the sea, as the Bøumblebreen above the Fjærland branch of Sogne Fjord. The largest branch is the Nigardsbreen. Skirting Hardanger Fjord, and nearly isolated by its main channel and two arms, is the great glacier of Folgefonna (108 sq. m.). Two branches descending from the main mass are visited by many who penetrate the Hardanger—Buñarbreen on the E., falling towards Lake Sandven above Odde, and Bondhusbreen on the W. The extreme elevation of the Folgefonna is 5270 ft. Continuing N. other considerable snow-fields are those of Hallingskarvet, the Jotunheim, Snehøttet in Dovre Fjeld, and Store Børge Fjeld at the head of the Namsen valley. Next follow Svartisen, second in extent to Jostedalsbreen (nearly 400 sq. m.), the Sulitjelma snow-field and Jøkel Fjeld, between Kvænang and Ofjord. One glacier actually reaches the edge of Jøkel Fjord, a branch of Kvænang Fjord, so that detached fragments of ice float away on the water. This is the only instance of the kind in Norway. The Selaun snow-field, on Selaun island near Hammerfest, is the most northerly seen in Europe. The snow-line in Norway is estimated at 3080 ft. in Selaun, 5150 ft. on Dovre Fjeld, and from 4100 to 4900 ft. in Jotunheim. The lowness of the snow-line adds to the grandeur of Norwegian mountains.

Coast.—The flanks of the plateau break abruptly to the sea almost throughout the coast-line, and its isolated fragments appear in the innumerable islands which fringe the mainland. This island fringe, which has its counterpart in a modified form along the Swedish coast, is called in Norwegian the skjeragard or islands-fence.
great elevation, especially the more northerly; thus the jagged peaks characteristic of Loreto are reminiscent of 4800 ft. Hornelen, near the mouth of Nordfjord, 3000 ft. high, rises nearly sheer above the Frøifjord, and vessels pass close under the towering cliff. Torghatten ("the market raft"), N. of Namssos, in Trøndelag, at 380 and forms a very fine view above the sea; and Hetmandø ("horsemans island"), on the Arctic circle, is justly named from its form. The dark blue waters of the inner leads and fjords are clouded, and show a milky tinge on the surface imparted by the glacier-fed rivers. Bare rock is the dominant feature of the coast and islands, save where a few green fields surround a farmhouse. In the N., where the snow-line sinks low, the scenery at all seasons has an Arctic character.

Christiania Fjord, opening from the N. angle of the Cattegatt and Skagerrack, differs from the great fjords of the W. Its shores are neither so high nor so precipitous as theirs; it is shallower, and contains a great number of little islands. From its mouth, round Lindesnes, and as far as the Bukken Fjord (Stavanger) there are many small fjords, while the skjærgård provides an inner land only intermittently. Immediately S. of Bukken Fjord, from a point N. of Egersund, the flat open coast of Jæderen, dangerous to shipping, fringed by a narrow lowland abundant in peat-bogs for some 30 m., forms an unusual feature. Bukken Fjord is broad and island-studded, but thrown off several inner arms, of which Lyse Fjord, near Stavanger, at 50 ft. deep, forms a narrow and narrow-bottomed valley, and the steepness of its lofty shores. The Hardanger Fjord, penetrating the land for 114 m., is known to more visitors than any other owing to its southerly position; but its beauty is exceeded by that of Sogne Fjord and Nord Fjord farther N. Sogne is the largest and deepest fjord of all; its head is 136 m. of the sea, and its extreme depth approaches 700 fathoms. Stor Fjord opens inland from Aalesund, and one of its head branches, Geiranger Fjord, is among the most celebrated in Norway. Trondhjem Fjord, the next great fjord northward, which broadens interminably from a narrow entrance, lacks grandeur, as might be expected of the land is reduced where the Trondhjem depression interrupts the average height of the plateau. The coast N. of Trondhjem, though far from losing its beauty, has not at first the grandeur of that to the south, nor are the fjords so extensive. The principal of these are Namsen, Folden and Vefsøen, at the mouth of which lies Alstoen Island, with the mountains called Siv Søstre (Seven Sisters), and Ranen, not far S. of the Arctic circle. Svatrassen sends its glaciers seaward, and the scenery increases in magnificence. Salten Fjord, to the N. of the great snow-field, is connected with Skjerstad Fjord by three narrow channels, where the water therefrom is seen to the narrow entrance, lacks grandeur, as might be expected of the land is reduced where the Trondhjem depression interrupts.

N. of Salten is unsurpassed. The Lofoten and Vesteralen islands are separated from the mainland by the Vest Fjord, which is continued inland by Ofoten Fjord. If these two be considered as one fjord, its length is about 175 m., but the actual penetration of the mainland is little more than a fifth of this distance. The main fjords N. of Vesteralen have a general northerly direction; among them is Lyngen Fjord near Tromsø, with high flanking cliffs and glaciers falling nearly to the sea. Alten Fjord is remarkable for its vegetation on its shores. From Lofoten N. there is a series of fjords, islands, and skerries, like Stjernø, Slettan, Ingø and Magerøya. These extend to the North Cape, but hereafter the skjærgård ceases abruptly. The E. is of widely different character; flat mountain wastes descend precipitously to the sea without any islands beyond, save Vardo, with two low islets at the E. extremity of Norway. The fjords are broader in proportion to their length. The chief are Porsanger, Laxe and Tana, opening N., and Varanger opening E. N. of this fjord the land is low and the landscape monotonous; on the S. a few island and branch fjords break the line of the shore. Stavanger is remarkable for its extreme rapidity; Hardanger Fjord 355, Sogne Fjord 560, Nordfjord 340, Trondhjem Fjord 300, Ranen Fjord 235, Vestfjord 340, Alten Fjord 225, and Varanger Fjord 230. Marine terraces are met with in the E. of the country, and near Trondhjem, at 600 ft. above sea-level; and they are also seen at a slighter elevation at the heads of some western fjords. Moreover, at some points (as on the Jæderen coast)" giant kettles" may be observed close to sea-level, even below the level of high tide; and these glacial formations indicate the greater elevation of the land towards the close of the Glacial epoch. Former beach-lines are most commonly seen on the northern coast of Norway (e. g. in Alten Fjord), in Aursund Lake, and flowing with a southerly curve parallel with the frontier for 350 m. to the Skagerrack, is the largest river in the Scandinavian peninsula. Its upper middle valley is called Osterdal, the richest timber district in a certain regularity, at elevations above 400 m. Seven miles above its mouth it forms the fine Sarsfoss, and not far above this it traverses the large lake Oieren. A right bank tributary, the Vormen, has one of its sources (under the name of Laagen in Lake Lesjekogen, which also drains in the opposite direction by the Rauma. The stream, after watering Gudbrandsdal, enters Mjøsøyen, the largest lake in Norway. It is 60 m. long, but, like the greater number of the lakes of the N. and E., it is narrow in its course, and has, however, an extreme depth of 1500 ft. The Drammen river, which enters a western arm of Christiania Fjord below the town of Drammen, is the common outlet of several large rivers. The Halling, from the bed of the Halden Lake Krøderen, which is connected with the Drammen river by the Snuran. A short distance above the junction the Drammen flows out of Lake Tyffjord, 50 m. sq. in area, into which it is fed by a tributary running from the Rauma river, to the east of Vrång, the Bergna. The whole basin of the Drammen has an area of 6600 sq. m. The rivers between Christiania Fjord and Lindesnes preserve the characteristics of those of the Glommen and Drammen systems. They rise on the Hardanger Vidda or adjacent uplands. The most important are the Laagen (to be distinguished from the river of that name in Gudbrandsdal), draining the Numedal; the Skien, the Vindel, the Oppland Otra, and the Inner Varanger. These and those already named, being Nordsjo on the Skien river, Tinsjo in the same system, which receives the river Maan, famous as forming the Kjørkano (smoking fall) of 415 ft., and Nissawerd on the Nid. The larger lakes, with a certain regularity, at elevations above 400 ft. above the sea, and it is considered that their basins were the heads of fjords when the land lay at a lower level, and were formed during an earlier glacial period than the present fjords. The great lake of Lake Hjorundfjord, lying E. of the Glommen valley and drained by the river of the same name, which becomes the Klar in Sweden, to which country it mainly belongs, is similar in type to the lakes of the north Uplands of Sweden. The whole of Jæderen reach the sea through sluggish channels, brown with peat.

Not only do the valleys of the W. far surpass in beauty those of the S. and E., but they carry streams of much greater volume in proportion, owing to the larger area of snow and ice. The first to be noted is that of the Sand or Løven river, a brilliant, rapid stream, famous for its salmon-fishing, which debouches at Sand into Sands Bay, a branch of the Glommen. The inner branch (Sør fjord) of Hardanger Fjord, is noted as containing two of the finest waterfalls in Norway. The one, Loko (which is joined by the smaller Skarsfoss), is a powerful cataract following a tortuous cleft. The other, Eslandfoss, is formed by a very small stream; it falls quite sheer and spreads out like a fine veil. The only other considerable river entering Hardanger Fjord is the Bjoeara, with its mouth at Vik in Eidfjord. On this stream is the magnificent Vøringfoss. Lesser streams within the basin of the Hardanger form the Skjeggedal and several other beautiful falls. From Hardanger N. to Romsdal the streams of the W. slope are insignificant, but there are several considerable falls at the outlet of the Romsdalfjord. The headwater of this branch of Sogne fjord, or the valleys which sink S. and N. from the Jostedalabre to the head branches of Sogne Fjord and Nordfjord respectively. Above those of Nordfjord, the mighty waters are supplied almost directly from the Jostedal glaciers, while above Eidsfjord a corresponding trough contains Lake Hornindal. The next important valley is the Romsdal, the stream of which is joined by the outlet of the Jostedalsbreen as the Laagen forms the E. This lake, which lies 211 ft. above sea-level, is the most remarkable example of an indefinite watershed to be found in S. Norway. N. from there the rivers debouch into Sula, draining Orkedal, the Gulaincluding Guldal, and the Nea or Nid, draining Lake Selbu, and...
forming the Lefros, enter Trondhjem Fjord from the S., and range in length from 70 to 100 m. The Stjordal, a beautiful wooded valley, becomes narrower and narrower towards the lower pass over the Trondelag depression (at Storlien), and is followed by the railway from

Trondhjem into Sweden.

N. of Trondhjem Fjord, in spite of the close proximity of the mountains, numerous river and coastal rivers, frequently discharging generally about N.E. or S.W., in valleys nearly parallel to the coast. Such are the Namss (85 m. in length) and the Velsen, discharging into Namsen Fjord and Velsen Fjord respectively, and the Dverghamn and the Didselv, which flow into the North Sea at the N. end of the fjord. The Velsen is the short Rër river, which drains Rër Vald, second in extent of the Norwegian lakes. In the extreme N., where the coastward slope of the Lofoten and the island of Vardø are the last large islands in the archipelago, the river discharging into the fjord of that name, and the Tana, also giving name to the fjord into which it flows, and forming a great part of the Russo-Norwegian frontier. It is 180 m. long, and drains an area of 460 sq.

Though the lakes of Norway are not comparable with those of Sweden as regards either number or size, they are very numerous and are estimated to cover somewhat less than one-fourth of the total area.

Glacial Action.—While the coast is considered to owe its fjords and islands to the work of former great glaciers, the results are even more patent inland. The tracts of the coast of Norway are consolable by the phenomena of modern glaciers, and observations show that the western mass has been pushed over to the eastern upon a great thrust-plane. The relations, in fact, are similar to those between the Dalradian schists of the Scottish Highlands and the Cambrian slate-beds of the Labrador Peninsula. In Scotland, however, it is the eastern rocks which have been pushed over the western. Corresponding with the difference in structure between the E. and the W. regions there is a certain difference in the nature of the depots themselves. In the Christiania district the Cambrian, Ordovician and Silurian beds consist chiefly of shales and limestones. Farther north sandstones predominate, and especially the Sparagmite, a felspathic sandstone or arkose at the base of the Cambrian series. In the Trondhjem district, on the other hand, belonging to the folded belt, basic tufts and lavas are interstratified with the normal deposits, showing that in the interior of Norway, E. of the North Cape, there is sandstone not unlike the Sparagmite of the S., which is said by Reusch to contain ice-worn pebbles and to rest upon a striated pavement of Archaean rocks.

The Mesozoic era is represented only by the sandy deposits with seams of lignite which occur on the island of Andøen in the Vester- ailen. The contents of palaeoecological remains have been correlated with the Lower Oolite of Great Britain. No Tertiary beds have been found, but Pleistocene deposits of various kinds are met with. The evidences of ice action during the Glacial Period are conspicuous over the whole country and are similar to those in other glaciated regions. But the most remarkable features produced in recent geological times are the terraces which appear as if ruled on the sides of the valleys and fjords. They are partly platforms cut in the solid rock, partly accumulations of gravel and sand like a modern beach, and they were evidently formed by the action of waves. Some of them contain marine shells of living species and mark the former position of the sea-levels, but others are of more doubtful origin and may indicate the shores of lakes formed by the damming of the lower part of the fjords by means of glaciers, as in the case of the Parallel Roads of Glen Roy. They occur at various levels, and have been observed as high as 3000 ft. above the sea.

No volcanic rocks of modern date are known in Norway, but great igneous intrusions of Palaeozoic rocks have been correlated with the Mesozoic era, although it is probable that the hot-water or geothermal springs of the landscape, such as those in the interior of Norway, E. of the North Cape, have been caused by the action of the earth's interior. It is to be noticed that in the extreme N. of Norway, E. of the North Cape, there is sandstone not unlike the Sparagmite of the S., which is said by Reusch to contain ice-worn pebbles and to rest upon a striated pavement of Archaean rocks.
NORWAY

Kautokeino, contrasted with 205 at Vardø. In the S. uplands (as at Fjellberg) there is an average of 200 such days, and at Christiansia about 120. On the S.W. coast there is no day of which the mean temperature and is lower than 5°C. The contrast is, however, such as Utne and Skudeneshoved on Norwegian fjord, record frost during some part of 60 days. The lowest winter average temperature is found in a central S. N. where Bordeland or Sogn and Fjordane and Russian territory as well as Norwegian. The Norwegian station of Karasjok, within it, records 4° during December, January, February, and in this area there have also been observed the extreme minimum of 25° below zero, in the month of February. The contrast with the S.W. coast is 10°-5°. It may be noted here that in several cases the lower-lying inland stations in the south show a distinctly lower winter temperature than the higher in the immediate vicinity. Thus, for example, at Rasen (300 ft.) in the parish of Tønsel; at Listad in Gudbrandsdal (900 ft.) it is 16°-5°, but at Jerkin in the Dovre Fjell (3160 ft.) it is 17°-5°. The summer is hottest in S.E. Norway (Christiansia, July, 62°-5°). On the other hand, the lowest summer average in the Interior of Finnmarken is not less than 53°-5° in July; but at Vardø it is only 48° in August, usually the warmest month on this coast. In the lofty inland tracts of the S.E. the July temperature ranges, according to the high station of Jerkin. The interior having a warm summer and a cold winter, and the coast a cool summer and a mild winter, the annual range of temperature is remarkably greater inland than on the coast.

An important result of the warm Atlantic drift is that the fjords are not penetrated by the cold water from the lower depths of the outer ocean, and in consequence are always ice-free, except in winter. In the fjords, especially in the innermost parts of fjords, and along shallow stretches of coast.

The sun is above the horizon at the North Cape continuously from the 12th of June until the 22nd of August. The sun rises above the Arctic circle, from the 3rd of June to the 7th of July. Even at Trondhjem there is practically full daylight from the 23rd of May to the 20th of July. Even in the extreme S. of Norway there is no darkness from the end of May to the middle of August. In winter, on the other hand, the sun does not rise above the horizon at the North Cape from the 18th of November, to the 25th of January, and at Bard on the 13th of December to the 17th of January. The sun is above the horizon at midnight. In the extreme S. the sun is above the horizon for 6½ hours at mid-winter.

The prevailing winter winds are from the land seaward, while the system is reversed in summer. The winds in Norway of Finnmarken have over three cloudy days to one clear day; in the interior of the country clear and cloudy days are about equally divided. Fog is most frequent on the W. and N.W. coasts in summer; on the other hand, during the winter months, the S. and S.E. parts of the coast have much more fog than the N. Norway.

The forests of Norway consist chiefly of conifers. The principal forest regions are the S.E. and S. Here, in the Trondhjem district, and in Nordland there are extensive forests of pine and fir. In the coastal and fjord region of the W. the pine is the only coniferous species. In the S. the spruce and pine are mixed, but the highest limit of conifers is from 2500 to 3000 ft. above sea-level; in the inland parts of the Trondhjem region it is from 1600 to 2000 ft. above sea-level. The higher and more northerly parts of the S. is limited to about 800 ft., and on the heads of the fjords during severe cold or with a breeze from the land.

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of births over deaths, about as 1 to 1, is much above the European average; the death-rate is also unusually low. The number of marriages is rather low, and the average age of marriage is high. The percentage of illegitimacy has shown some increase, but is not so high as in Sweden or Denmark. The percentage of longevity is high. The preponderance of females over males (about 1073 to 1000) is partly accounted for by the number of males who emigrate. The higher mortality of males is traced in part to the dangers of a seafaring life.

Down to the middle of the 19th century drunkenness was a strongly-marked characteristic of Norwegians. A strict licensing system was then introduced. Licences were then given a wide control over the issue of licences, and in 1871 companies (samlag) were introduced to monopolize and control the retail trade in spirits. Their profits do not, as in the Gothenburg system, go to the municipal funds, but are applied directly to objects of public utility. In 1894 a general referendum resulted in the entire prohibition of the sale of spirits in some towns for five years. The control of retail trade in beer and wine by the samlag has been introduced to some extent.

The only strongly individual national character is to be expected, combined of an ancient conservative and simple and practical. The one finds no better illustration than the individuality of modern Norwegian music and painting. The other is still strong. Such customs as the lighting of the midsummer fires and the attendant celebrations still survive. Peculiar local costumes are still met with, such as those associated with weddings. In the coastwise shipping trade and the fisheries of the north, high-prowed square-sailed boats are frequently employed which are the direct descendants of the vessels of the early vikings. Some examples of the ancient farmstead, composed of a group of wooden buildings each of a single chamber, are preserved, and medieval ornamental woodwork is met with. Wood is the principal building material except in some larger towns where brick and stone have superseded it. Where this is not the case, fire has left few, if any, ancient domestic buildings, but the preservation of ancient models in wooden houses makes Norwegian towns peculiarly picturesque.

Norway retains a few highly interesting examples of ecclesiastical architecture. There are the peculiar small wooden churches (stavekirke) dating from the 12th to the 14th century, with high-pitched roofs rising in tiers so as to give the building something of the form of a pyramid. The roofs are beautifully shingled in wood. The wall timbers are vertical. To protect them from the weather, the roofs overhang deeply, and the lowest sometimes covers a species of external colonnade. The carving is often very rich. The most famous of these churches is that of Borgund near Lærdalsøren; another fine example is at Hitterdal on the Kongsberg-Telemark road. On the other hand there are a few Romanesque and Gothic stone churches. In some of these the influence of English architecture is clear, as in the metropolitan cathedral of Trondheim and the nave of Stavanger cathedral. St Mary's Church at Bergen, however, tends towards the French models. A good example of the smaller stone church is at Vossevangen, and there are several of Late Romanesque character in the Trondheim district. There are ruins of a cathedral at Hamar, and a few monastic remains, as at Utstein, north of Stavanger, and on the island of Selje off Statland. Remains of pure Early English work are occasionally found, as at Ogne in Jæderen, but the later Gothic styles were not developed in Norway.

Tourist Traffic and Communications.—During the later decades of the 19th century Norway was rapidly opened up to British, American and German visitors. 

**Routes.**

Great Britain are maintained chiefly between Hull and Stavanger, Bergen, Aalesund, Christiansund and Trondheim; Hull, London and Christiania, Hull and London, and the North; London and Christiania, &c., and there are also passenger services from Grimsby, Grangemouth and other ports. Yachting cruises to the great fjords and the North Cape are also provided. A daily service of mail steamers works between Christiania and all ports to Bergen; thence the summer service is hardly less frequent to Trondheim. From each large port small steamers serve the fjords and inner waters in the vicinity, and there are also

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<table>
<thead>
<tr>
<th>Amter</th>
<th>Population 1900.</th>
<th>Area in sq. m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smaalenene</td>
<td>136,167</td>
<td>1,600</td>
</tr>
<tr>
<td>Akershus</td>
<td>178,096</td>
<td>2,018</td>
</tr>
<tr>
<td>Christiania (city)</td>
<td>229,101</td>
<td>5-6-5</td>
</tr>
<tr>
<td>Buskerud</td>
<td>112,743</td>
<td>5,789</td>
</tr>
<tr>
<td>Jardberg and Laurvik</td>
<td>101,003</td>
<td>9,678</td>
</tr>
<tr>
<td>Bratsberg</td>
<td>98,998</td>
<td>5,883</td>
</tr>
<tr>
<td>Nedenes</td>
<td>75,025</td>
<td>3,680-5</td>
</tr>
<tr>
<td>Lister and Mandal</td>
<td>78,359</td>
<td>2,804</td>
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<tr>
<td>South-eastern (inland)</td>
<td>126,703</td>
<td>10,618</td>
</tr>
<tr>
<td>Hedemerkem</td>
<td>116,280</td>
<td>9,790</td>
</tr>
<tr>
<td>Westen—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stavanger</td>
<td>125,568</td>
<td>5,350-5</td>
</tr>
<tr>
<td>South Bergenhus</td>
<td>132,667</td>
<td>6,024-5</td>
</tr>
<tr>
<td>Bergen (city)</td>
<td>72,179</td>
<td>5-5</td>
</tr>
<tr>
<td>North Bergenhus</td>
<td>36,214</td>
<td>7,130</td>
</tr>
<tr>
<td>Romsdal</td>
<td>131,819</td>
<td>5,786</td>
</tr>
<tr>
<td>South Trondhjem</td>
<td>134,718</td>
<td>7,182</td>
</tr>
<tr>
<td>Northern—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Trondhjem</td>
<td>83,449</td>
<td>8,788-8</td>
</tr>
<tr>
<td>Nordland</td>
<td>150,637</td>
<td>14,513</td>
</tr>
<tr>
<td>Tromsø</td>
<td>72,066</td>
<td>10,131</td>
</tr>
<tr>
<td>Finnmarken</td>
<td>33,367</td>
<td>16,291</td>
</tr>
</tbody>
</table>
steamers on several of the larger lakes. The season lasts from June to the middle of September. The voyage to the North Cape is taken by many in order to see the "midnight sun" in June and July. The largest of the lakes, Lake Sjøulf, is 30 miles in length and is a popular resort for anglers. The largest lake in the west the following may be mentioned. (1) The road from Sand on Sandsfjord (a branch of Bukken Fjord), which follows the Sand river up to the foot of Lake Suldal, near the head of which is Næs. From here a low, but very elegant road runs up the Bukkedalsdalen, crosses the Horrebække and descends past Seljedal to Odde at the head of a branch of Hardanger Fjord. (2) From Eide on another branch of the same fjord a road runs up the Sandeugdalen, which is connected by rail to the important road lines to Bergen and Kristiania, and continues N. to Stalheim, where it descends through the Nærødal to Gudvangen on a branch of Sogne Fjord. (3) From Vadheim on this fjord a road runs N. to Sandene and Omegndalen, which contains the important road to Fjellide by Grodas on Lake Hornindal to Helleslyt on Sunavl Fjord and Oje on Norang Fjord, and (5) that from the same station or from Visnes, by way of Lake Stryn, to Grotlid, and Merok on Oye Fjord. The roads to Sandeugdalen, branching off from the main road, is one of the most beautiful in Norway. The branch roads to the eastern parts of the county are much better and more important. The telephone is extensively used; and in Sandeugdalen there is a government station.

Roads.—The telephone is extensively used; and in Sandeugdalen there is a government station. The government station for the western part of the county is in Trondheim.

Forestry.—Forest industries are confined chiefly to the S.E. and to the Trondhjem-Namnet district. Logging is an important industry. Forestry is controlled by the Department of Agriculture, and its higher branches are taught at the Aas college.

Fisheries.—The sea fisheries are of high economic importance. The herring is the most important of these, and is landed thereon the coal on the coastal banks for the purpose of spawning, and this gives rise to the well-known fishery for which the Lofoten Islands are the principal base. In April and May shoals of capelin appear off Finnmarksbotn, followed by cod and other fish, small whales, &c., and they prey upon them; this affords a second fishery. For herring there is a spring fishery off Stavanger and Haugesund, and one in November and December off Nordland. Mackeral fisheries are important from Trondhjem Fjord S. to the Skagerrack. Salmon and trout fisheries are important in the rivers and still more off the coast. Fishermen from Tönnesberg, Tromsö, Hammerfest, Vardø, Vadsø, &c., in the far North, drop their lines off the islands of the archipelago, and land to Spitsbergen and Novaaya Zemlya. A fishery board at Bergen administers the Norwegian fisheries. The annual value of the coast fisheries ranges from £1,000,000 to £1,500,000.

Manufacturing Industries.—The most important are works connected with the timber trade, foundries and engineering shops, spinning and weaving mills, brick and tile works, breweries, paper- making, tobacco factories, flour-mills, glass works, and pottery. Nail works, shipbuilding yards, rope works, factories for preserved food (especially fish), margarine, matches, fish guano, boots, and saddlery, hosiery, &c. (developed in the 19th and 20th centuries). Granite is quarried near Fredrikstad,Fredrikshald and Sarsborg, and exported as paving sets and kerb-stones, mostly to Great Britain and Germany. Good marble is found near Fredrikshald, and in the Salten and Rauen districts.

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Shipping and Commerce.—The Norwegians, in proportion to their numbers, are the best seamen in the world in the mercantile marine industry. Actually their mercantile marine is only exceeded by those of Great Britain, Germany and the United States. From 1850 the foreign trade tonnage has exceeded from 280,000 to 350,000. The tonnage now exceeds the latter figure, but steam has greatly increased the carrying power. In 1880 Norwegian steam vessels had a tonnage of about $2,000; they now exceed 600,000 tons. The foreign trade tonnage exceeds $10,000,000. The growth of both may be judged from period averages—

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1851-1855</td>
<td>$2,800,000</td>
<td>$1,600,000</td>
</tr>
<tr>
<td>1866-1870</td>
<td>$5,600,000</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>1886-1890</td>
<td>$9,000,000</td>
<td>$6,000,000</td>
</tr>
</tbody>
</table>

Great Britain and Germany are the countries principally trading with Norway. Great Britain takes about 40% (by value) of Norwegian exports, and sends about 26% of the total imports into Norway; Germany takes 14% of the exports, and sends 28% of the imports.

The fisheries of Norway are divided between those destined principally to Great Britain, and fish products, principally to Germany, Sweden and Spain. These make 65% of the exports—other of these are paper, ships, ice, stone and nails. Of the imports about 58% by value are for consumption, 42% material for production. Among the first are cereals (principally from Russia), groceries (from Germany), and clothing (from Germany and Great Britain). Among the second are steel and iron, and from Great Britain, coffee, tobacco, dyestuffs and skins, cotton and wool, oil and machinery, steamships, and metal goods (from Great Britain, Germany, and Sweden).

Government.—Norway is an independent, constitutional and hereditary monarchy, the union with Sweden having been dissolved on the 7th of June 1905, after lasting 91 years. The constitution rests on the fundamental law (grundlov) promulgated at Eidsvold on the 17th of May 1814, and altered in detail at various times. The executive is vested in the king, who

mangcorn (a mixed crop of oats and barley), rye and wheat, the last being little cultivated. Cattle and sheep are kept in large numbers. Farmers commonly hold upland summer pastures together with their own land. The chief food crops are potatoes and barley; for the consideration of the period, under certain conditions, a family which has part or since 1850, it has been growing and is now at a great height. —land alienated by its owner may on his death be acquired by his next of kin. The chief crops are oats, barley, potatoes,
comes of age at eighteen. His authority is exercised through, and responsibility for his official acts rests with, a council of state consisting of a minister and councillors, who are the heads of finance, public accounts, church and education, defence, public works, agriculture, commerce, navigation and industry and foreign affairs. The king appoints these councillors and high officials generally in the state, church, army, navy, &c. He can issue provisional ordinances pending a meeting of parliament, can declare war (if a war of offence, only with the consent of the Storting, and only when the Swedish king has come to terms with the army and navy. The legislative body is the parliament (storting), the members of which are elected directly by the people divided into electoral divisions, each returning one member. Until the election of 1906 the members were chosen by electors nominated by the voters. Elections take place every three years. The franchise is extended to every Norwegian male who has passed his twenty-fifth year, has resided five years in the country, and fulfils the legal conditions of citizenship. Under the same conditions, and if they or their husbands have paid taxes for the past year, the franchise is extended to women under a measure adopted by the Storting in June 1907. Members of parliament must possess the franchise in their constituency, and must have resided ten years in the country; their age must not be less than thirty. The Storting meets at Christiania, normally for two months in each year; it must receive royal assent to the prolongation of a session. After the opening of parliament the assembly divides itself into two sections, the upper (lagthing) consisting of one-quarter of the total number of members, and the lower (odelthing) of the remainder. Every bill must be introduced in the Odelthing; if passed there it is sent to the Lagthing, and if carried there the royal assent gives it the force of law. If a measure is twice defeated in the Odelthing and rejected by the Lagthing, it is decided by a majority of two-thirds of the combined sections. The king has a veto, but if a measure once or twice vetoed is passed by three successive parliaments it becomes law ipso facto. This occurred when in 1899 the Norwegians insisted on removing the sign of union with Sweden from the flag of the mercantile marine. Members of parliament are paid 135. rd. a day during session and their travelling expenses. Parliament fixes taxation, and has control of the members of the council of state, who are not allowed to vote in either house, though they may speak.

Finance, &c.—The annual revenue and expenditure are each about £5 millions sterling. Considerable sums, however, have been raised by loans, principally on the London market, and are being repaid each year, the financial year ending the 31st of March) to nearly £4,500,000. The principal sources of revenue are customs, railways, post office and telegraphs, the income tax (which is graduated and not levied in incomes below 1000 kroner or £6, 8s., &c.), and excise. The principal items of expenditure are railways, defence (principally the army), the post office, interest on debt, the church and education, and justice. The Bank of Norway is a private joint-stock corporation, in which the state has large interests. It is governed by special acts of parliament, and its chief officers are publicly appointed. It alone has the right to issue notes, which are in wide circulation. The Mortgage Bank (Norges Hypothekbank) was established by the state to grant loans on real estate. The currency of Norway is based on a gold standard; but the monetary unit is the krone (crown), of 1.41d. value, divided into 100 öre. The metric system is in use. The year is divided into four quarters, the first quarter being the reserve (landtarn), and the second reserve (landstorn). All capable men of twenty-two years of age and upwards are liable for conscription (except the clergy and pilots), and when called they serve 6 years as reserve, 4 years as reserve and 4 years with the second reserve. In war, men are liable to service from the 18th to the 60th year of age. Only the line can be sent out of the country. The navy only meet for military training from 18 to 102 days in each year. The peace establishment of the line is 12,000 men, with 750 officers; its war footing 25,000, or more, but may not exceed 18,000 without the authority of parliament. Of enlisted troops there are only fortresses, and canons. There are no conscription, of men. The principal forts are Oscarsborg on Christiania Fjord, Agdenes (Trondhjem Fjord), Bergen, Tonsberg and Christiansand. A number of fortresses and forts along the S. Swedish frontier were dismantled under the convention with Sweden of 1905, when a neutral zone was established on either side of the frontier southward from 61° N. The navy consists of about 1200 officers and men on permanent service; but all seawarriors between twenty-two and thirty-eight are liable for maritime conscription, and are put through some preliminary training. The war vessels include four battleships of 3500 to 4000 tons each, and about 16 other vessels, besides a torpedo flotilla—intended for local defence only. The chief naval station is Karlsburg (Horten).

Justice.—Civil cases are usually brought first by a commission of mediation (forligskommisjon), from which an appeal lies to the council of state (kommisjon); they also lie before the court (domstol) and are worked by judges on circuit and assizes. There are three superior courts of appeal (overrettet), at Christiania, Bergen and Trondheim, and one at Stockholm, which decides on points of law. Criminal cases are tried either in jury courts (lagmandsret) or cases of misdemeanours (moddomsret). The first is for more serious offences; the second deals with minor offences and is a court of first instance. Military crimes are dealt with by a military judicial organization, which is, in effect, a high court of impeachment (rigsret), before which members of parliament, the government, &c., are tried for misdemeanours committed in their public capacity.

The territory of Norway is divided into twenty counties (amter) (see population), the cities of Christiania and Bergen being included in these. Other towns are formed into parishes, governed by representatives, from whom a council (formand) is elected by themselves. Rural communities (herrerred) are similarly administered, and their chairmen form a county council (amstingning) for each county. At the head is the amland, the county governor. The electoral franchise is local and individual, for the county (amter), for the municipal franchise, and, like it, is extended in a limited degree to women.

Education.—The state religion, to which the king must conform, is Evangelical Lutheran. Only about 24 per cent of the population are dissenters. All Christian sects except Jesuits are tolerated. The king nominates the clergy of the established church. Nonconformists are registered in the state (amter), and are taxed. Christiansand, Bergen, Trondjem, Tromso; and these into deaneries (provstiet), with subdivisions into clerical districts (prastegjeld), parishes and sub-parishes. The clergy take a leading part in primary education, which is, in spite of the difficulties arising in a sparsely populated country, reaches a high standard. Education is compulsory, the school-going age being from 6 to 14 years in towns and 7 to 15 years in villages. About 94 per cent of the children in school-going age attend the primary schools, which are administered by school boards in the municipalities and the counties. Teachers must belong to the established church. Their training colleges include one in Christiania (Christiania, 1892); and in Bergen (Bergen, 1898). W. C. Slingsby, Norway, The Northern Playground (on mountaineering) (Edinburgh, 1904); H. H. Reusch, Der Nordländische Norges Geolog (Christiania, 1892); T. Kjersn, Udas in over de sydlige Norges geologi (Christiania, 1879); a German translation was published at Bonn, 1880); W. C. Böttger, Die Silurischen Elegien 2 und 3 (Christiania, 1882); see also a series of memoirs on the Silurian rocks of the Christiania region in Videnskabsselskets Skrifter (Christiania); A. E. Tornebohm, Grundlagen der Aufgaben, Bd. 1. (Stockholm, 1893); A. Bjorn, Die Stufe der Nordische, Bd. 1. and 2. (Stockholm, 1893); A. Videnskabsselskets Skrifter (1895); M. N. and A. Blun, Norges Flora (Christiania, 1861-1867); C. Hartman, Handbok i Skandinaviska Flora (Stockholm, 1879); J. M. Norman, Norges Arktiske Flora (Christiania, 1894); Statistisk Aarbog for Kongeriget Norge (Christiania, annual); H. L. Brekstad, Constitution of the Kingdom of Norway (London, 1905); F. Nansen, Norway and the Union with Sweden (London, 1895); Supplem. (London, 1895). On the licensing system in Norway—Foreign Office Report, Misc. series, 279 (London, 1893); Board of Trade Rep. on Production and Consumption of Alcoholic Liquors (London, 1893); H. E. Berner, A report on general questions (London, 1894).

History.

Early History.—Archaeological and geological researches have revealed a fishing and hunting population in Norway, possibly
as far back as c. 6000 B.C. Until lately this aboriginal people, which was certainly non-Aryan, was held to be Lappish, but recent investigations seem to show that the Lapps only entered Norway about A.D. 900–1000, and that the original population was probably of Finnish race, though only distantly allied to the Ugro-Finns now inhabiting Finland. To them belong perhaps certain non-Aryan names for natural features of the country, such as Toten, Velsen, Bukn.

The time of the immigration of a Teutonic element is far from certain. It did not extend N. beyond the Trondhjem district until about the beginning of our era, but there can be little doubt that the immigrants’ advance was extremely slow, and it is suggested, on the evidence of archaeology, that the Teutonic element entered S. Norway towards the end of the (Scandinavian) later Stone age, c. 1700 B.C. (see SCANDINAVIAN CIVILIZATION). But whatever were the stages of the process, the language of the older race was superseded by Teutonic, and those aborigines who were not incorporated (probably most often as slaves) were driven into the mountains or the islands that fringe the coast. In the highlands and the fringes of the flat Tertiary plain, Teutonic tongues survived for centuries, and perhaps into historic times.

The new Teutonic element of population seems to have flowed into Norway from two centres; one western, probably from Jutland, the other eastern, from the W. coast of Sweden. The western stream covered Agder, Rogaland and Hordaland (the modern districts of Christiansand and Sondre Bergenhus), and finally extended N. as far as Søndmøre, while the eastern stream flowed across Romerike and Hadeland through the Dales to the Trondhjem district, where it divided, one stream flowing down the W. coast till it met the western settlements, another penetrating N. into Haalogsland (which included the modern Nordland as well as Helgeland), and a third E. into the N. Swedish districts of Jämtland and Helsingland. The bodies of immigrants were no doubt more or less independent, and each was probably under a king. It is probable that the Horder, who gave their name to Hordaland and Hardanger, were a branch of the Harudes whom Ptolemy in the 2nd century mentions as living in Jutland, where their name remains in the present Hardeyssel. The Ryger, who gave their name to Rogaland, and the modern Ryttýrlke, are probably akin to the Rugi, an E. Germanic tribe at one time settled in N.E. Pomerania, where we have a reminiscence of their name in Rügenwalde. The first mention of any tribe settled in Norway is by Ptolemy, who speaks of the Chaldenoi or Heiners, inhabiting the W. of his island Scandia.

The system of settlement in Norway appears to have been different from that adopted by the same race in other lands. In Denmark, for instance, a group of as many as twenty settlers held land more or less in common, but this system, which demanded that a considerable extent of land should be readily accessible, was not feasible in the greater part of Norway, and except in one or two flatter districts each farm was owned, or at least worked, by a single family.

When history first sheds a faint light over Norway we find each small district or “fylke” (Old Norse fylkir, from folk, army) settled under its own king, and about twenty-nine fylker in the country. At times a king would win an overlordship over the neighbouring tribes, but the character of the country hindered permanent assimilation. The king always possessed a hird, or company of warriors sworn to his service, and his inherited royal birth and the possession of such a hird, and not land or subjects, were the essential attributes of a king. There was no law of primogeniture, and on the death of a kinsome of his heirs would take their share of the patri
dom in valuables, gather a hird, and spend their lives in warlike expeditions (see VIKINGS), while one would settle down and become king of the fylke. There are indications that these conditions were fostered by a matriarchal system, and that it would often occur that a wandering king would marry the daughter of a fylkes-king and become his heir. Probably the king’s power was only absolute over his own hird. He was certainly commander-in-chief and perhaps chief priest of the fylke, but the administrative power was chiefly in the hands of the borgars, or freemen of the fylke, and possibly of an earl. The position of earls is vague, but it is noticeable that both those of whom we hear in Harald Haarfager’s time take the opposite side to their king. The herser (Old Norse hersir), of whom there were several in each fylke, united high birth with wealth and political power, and with the holder, the class of privileged hereditary landowners from which they sprang, formed an aristocracy of which there seems little trace in the other Scandinavian countries at this period.

The rise in Norway is perhaps due to the fact that the nature of the country, as well as the individualistic system of settlement, led to few complete changes in the wealth and possessions of the people, and the inequalities of wealth than in Denmark or Sweden. Once a family had become wealthy enough to fit out Viking ships, it must have added wealth to wealth, besides enormously raising its prestige. The lands of almost all the most powerful families were on islands, whence it was easy to set forth on roving expeditions. The family property of the earls of Lade, for instance, whose representative in the latter half of the 9th century was the most powerful man of the district, was on the island of Nærö. These islands had been the refuge of the aborigines, and it is possible that, as A. Hansen has suggested, the rise of the aristocracy depends here, as elsewhere, on a subject population. Among the proper names of thralls in a poem in the Elder Edda are several which can only be explained on the hypothesis that they are Finnish, e.g. Klums, Lasmer, Drumba. Harald Haarfager’s decree concerning “those who clear forests and burn salt, fishermen and hunters” probably refers to the Fins as a class apart. There can be no doubt that, in Haalogsland for instance, the aristocracy gained its wealth not only from the tribute extorted from the Fins in Finnmark, but also from slave labour.

The eight Trondhjem fylker had a common thing or assembly very early, but these districts were remote, while the wealthy western districts were too much cut off from each other to unite effectively, though here also a common Thing was early established. The first successful attempt at unification originated round Veatfold, the modern Jarslsberg and Laurvik Amt on the Christiania fjord. There also there was a certain degree of union very early, and it is possible that national feeling was fostered by proximity to the Danish and Swedish kingdoms. The district was thickly populated, and a centre of commerce. Tradition made the royal family a branch of the great Yngling dynasty of Upsala, which claimed descent from the god Frey. Through several generations this family had extended its kingdom by marriage, conquest and inheritance, and by the end of the reign of Halfdan the Black, it included the greater part of Hamar and Oslo Stift, and the fylke of Sogn, the district round the modern Sognefjord.

Halfdan’s son, Harald Haarfager, having no brothers, succeeded to the whole kingdom, and was further fortunate in that an uncle helped him to maintain his rights. By 866 his power was so well established in S. Norway that he contemplated the conquest of the whole land. After all, the chief obstacle appears to have been the resistance, not only of the petty kings, but of the aristocratic families, who dreaded the power of a monarchy established by force, and consequently supported the vaguer authority of their own kinglets. There can be no doubt that Harald introduced a feudal view of obligations towards the king, and landowning families, who had regarded their edal, or inherited property, as absolutely their own, resented being forced to pay dues of it. In each district Harald offered the herser the opportunity of becoming his vassals, answerable to him for the government of
the district. The increased dues and the grants of land made by Harald rendered the position of one of his earls more lucrative than that of king under the old system; and it shows to what a paramount position the old aristocracy must have attained, that numbers of the *herser* and *holder* could not reconcile themselves to the limitation of their independence, but quitted the lands which were their real title to influence, rather than submit to the new order. But the little kingdoms only made futile attempts at combination, except in the western districts of Agde (comprising the modern Listir and Mandal and Nedenas), Rogaland and Hordaland. Here was the home of the "western Vikings" who for nearly a century had owed wealth and fame to the trade with the English isles. After by land was impossible, and Harald had to gather men and ships for three years before he could meet the fleet of the allied kings at Hafsfjord. The battle (872) resulted in a victory to him, and with it all opposition in Norway was at an end. An expedition to Scotland and the Scottish isles (c. 891) dispersed enemies who could harry the Norwegian coast, many of them taking refuge in Iceland; and the earldom of the Orkneys and Shetlands became an appanage of the Norwegian Crown. For the moment the whole country was under a single king, but Harald himself destroyed his work, in accordance with old custom, by giving about twenty of his sons the titles of kings and subdividing the country among them only, qualifying this retrograde step by installing his favourite son Erik Blodøxe as over-king (930). Moreover, Harald had established no common Thing for the whole of his kingdom. Norway is naturally divided into three parts, and each of these remained more or less separate for centuries, even having separate laws until the second half of the 13th century. The Frostathing district (so called from Frosta near Trondhjem) included the eight Trondhjem fylker, and also Naumdal, Nordmøre and Raumsdal. The Gulathing district consisted of Söndmøre, Firdafylke, Sogn, Valdres, Hallingdal, Hordaland and Agde, and met at Gula in Hordaland. The third, the Eidsauathing, met on the shores of Lake Mjøsøen, and included the Uplands and also the "Vik," i.e., all the districts round Christiana fjord, until St Olaf established the Borgarting at Sarpsborg as a centre for this latter. The king's council was composed of the local *lendermænd*, and thus varied with the district he happened to be visiting, an arrangement that had its advantages, since the local chiefs were acquainted with the laws of their district, though it was another hindrance to unification. It was only in 1339 that a permanent council was formed, the *Riget Råd*.

Harald died in 933. Erik Blodøxe (Bloody-axe) only managed to rid himself of two rival over-kings, Olaf and Sigfred, his half-brothers, for on hearing of his father's death, another son, Haakon (q.v.), called the Good, who had been brought up at Athelstan's court, came to Norway with a small force and succeeded in ejecting Erik (934). After Haakon's death in 961 at the battle of Fitje, where his long struggle against Erik's sons and their Danish allies terminated, these brothers, headed by Harald Graafeld (grey-cloak) became masters of the W. districts, though the ruling spirit appears to have been their mother Gunhild. Earl Sigurd of Lade ruled the N., and the S. was held by vassal kings whom Haakon had left undisturbed. By 969 the brothers had succeeded in ridding themselves of Sigurd and two other rivals, but the following year Harald Graafled was lured to Denmark and treacherously killed at the instigation of Earl Haakon, son of Sigurd, who had allied himself with the Danish king Harald Gormsson. With the latter's support Earl Haakon won Norway, but threw off his yoke on death and was succeeded by his eldest son, Tingesir in 972. The S.E. districts, however, still held by Harald Grønse, whose father had been slain by the sons of Erik. Haakon ruled ably though tyrannically, and his prestige was greatly increased by his victory over the Jomsvikings, a band of pirates inhabiting the island of Wollan at the mouth of the Oder, who had collected a large fleet to attack Norway. The date of their defeat at Hjørringaasen, now Lidvaag, is uncertain. But finally the earl's disregard of the feelings of the most powerful "bonder," or landed proprietors, worked up to revolt, and, in 995, there landed in Norway Olaf, great-grandson of Harald Haarfager and son of the king Trygve of the Vik whom Gudröd Eriksson had slain, and whose father Olaf had been slain by Erik Blodøxe.

The earl was treacherously killed by his thral while in hiding, and Olaf entered unopposed upon his short and brilliant reign. His great work was the enforced conversion to Christianity of Norway, Iceland and Greenland. In this undertaking both Olaf and his successor and namesake looked for help to England, whence they obtained a bishop and priests; hence it comes that the organization of the early church in Norway resembles that of England. No more than England did Norway escape the struggle between Church and State, but the hierarchic party in Norway only rose to power after the establishment of an archiepiscopal see at Trondhjem in 1152, after which the quarrel raged for over a century. Until the year 1100, when tithes were imposed, the priests depended for their livelihood on their duties, and Adam of Bremen informs us that this made them very avaricious. 

In the year 1000 Olaf fell at the battle of Svolde off Rügen, fighting against the combined Danish and Swedish fleets. The allies shared Norway between them, but the real power lay in the hands of Sigfred of Orkneys and Svein, sons of Earl Haakon. In 1015, when Erik was absent in England, another descendant of Harald Haarfager appeared, Olaf, the son of Harald Grenske, a great-grandson of Harald Haarfager (see Olaf II. Haraldssön). He defeated Svein at Nesje in 1016, which left him free to work towards a united and Christian Norway. For some years he was successful, but he strained the loyalty of his subjects too far, and on the appearance of Knut the Great in 1029 he fled to Russia. His death at the battle of Stiklestad on his return in 1030 was followed by a few years of Danish rule under Svein Knutsson, which rendered Olaf's memory sweet by contrast, and soon the name of St Olaf came to stand for internal union and freedom from external oppression. In 1035 his young son Magnus, afterwards called the Good, was summoned from Russia, and was readily accepted as king. A treaty was made with Hardeknut which provided that whichever king survived should inherit the other's crown. Hardeknut died in 1042, and Magnus became king of Denmark, but a nephew of Knut the Great, Svein Estridsøn, entered into league with Harald Haarfager (see Olaf) of Hordaland, who had just returned from the East. As soon, however, as overtures were made to him by Magnus, he forsook the cause of Svein, and in 1046 agreed to become joint king of Norway with Magnus. The difficulties arising out of this situation were solved by Magnus's death in 1047. Harald's attempts to win Denmark were vain, and in 1066 he set about a yet more formidable task in attacking England, which ended with his death at Stamford Bridge in 1066. His son Olaf Kyrre (the Quiet) shared the kingdom with his brother Magnus until the latter's death in 1069, after which the country enjoyed a period of peace. A feature of this reign is the increasing importance of the towns, including Bergen, which was founded by Olaf. In 1093 Olaf was succeeded by his turbulent son Magnus Barford (barefoot) and by Haakon, son of Magnus the Good. The latter died in 1095. Besides engaging in an unsuccessful war against the Swedish king Inge, in which he was defeated at Foxerne in 1101, Magnus undertook three warlike expeditions to the Scottish isles. It was on the last of these expeditions, in 1107, that he was killed on board his flagship, *Eystein*, by his own men. The war was continued by his three sons, Eystein, Sigurd and Olaf. Olaf died young. Sigurd undertook a pilgrimage, from which he gained the name of Jorsalfar (traveler to Jerusalem). He won much booty from the Moors in Spain, from pirates in the Mediterranean, and finally at Sidon, which he and his ally Baldwin I. of Jerusalem took and sacked. Eystein died in 1122. Sigurd lived till 1130, but was subject to fits of insanity in his later years. He was the last undoubted representative of Harald Haarfager's race, for on his death
his son Magnus was ousted by Harald Gille, or Gilchrist, who professed to be a natural son of Magnus Barfoed.

Harald Gille was slain in 1386 by another pretender, and anarchy reigned during the reign of his sons Eystein, Inge and Sigurd Mund. At last Inge's party attacked and killed first Sigurd (1353) and then Eystein (1357). Inge fell in a fight against Sigurd's son Haakon Hervede in 1161, but a powerful baron, Erling, succeeded in getting his son Magnus made king, on the plea that the boy's maternal grandfather was King Sigurd Jorsalfar. Descendant through females was not valid in succession to the throne, and to render his son's position more secure, Erling obtained the support of the Church. In 1164 the archbishop of Tornhjem crowned Magnus, demanding that the crown should be held as a fact of the Norwegian Church. Owing to such concessions the Church was gaining a paramount position, when a new pretender appeared. Sverre (O.N. Sverrir) claimed to be the son of Sigurd Mund, and was adopted as leader by a party known as the Birkebeiner or Birchlegs. He possessed military genius of a rare order, and in spite of help from Denmark, the support of the Church and of the majority of barons, Magnus was defeated twice after, till he met his death at the battle of Nordnes in 1184. The aristocracy could offer little further opposition, and its leading hands in the Church against Sverre, the local chiefs had got out of touch with the small landowners, with whose support Sverre was able to build up a powerful monarchy. Sverre's most dangerous opponent was the Church, which offered the most strenuous resistance to his efforts to cut down its prerogatives. The archbishop found support in Denmark, whence he laid his whole see under an interdict, but Sverre's counter-claim of his own divine right as king had much more influence in Norway.

Sverre died in 1202, his last years harassed by the rise of the Baglers, or " Corymen," with a new claimant at their head. His son Haakon III. died two years later, perhaps of poison, but the Birkebeiner party in 1217 succeeded in placing Haakon's son and namesake on the throne (see Haakon IV.). In 1240 the last of the rival claimants fell, and the country began to regain prosperity. The acquisition of Iceland was at length realized. Haakon's death occurred after the battle of Largs in the Orkneys in 1263. The war with Scotland was soon terminated by his son Magnus, who surrendered the Hebrides and the Isle of Man at the treaty of Perth in 1266, when he ceded many of his suzerainty over islands which had lost their value to Norway since the decay of Viking enterprise. He gained his title of Law-Mender from the revision of the laws, which had remained very much as in heathen days, and which were still different for the four different districts. By 1274 Magnus had secured the acceptance of a revised compilation of the older law-books. The new code repealed all the old wergeld laws, and provided that the major part of the fine for manslaughter should be paid to the victim's heir, the remainder to the king. Henceforward the council comes more and more to be composed of the king's court officials, instead of a gathering of the lendaermond or barons of the district in which the king happened to be. During Magnus's reign we hear of a larger council, occasionally called polliment (parliament), which is summoned at the king's wish. The old landed aristocracy had lost its power so completely that even after Magnus's death in 1280 it was unable to reestablish itself during the minority of his son Erik.

Erik was succeeded in 1299 by his brother Haakon V., who in 1308 felt himself strong enough to abolish the dignity of the aristocracy. In his paralysis of the aristocracy, perhaps no doubt partly to be ascribed to the civil wars, but in part also to the gradual impoverishment of the country, which told especially upon this class. Russia had long eclipsed Norway as the centre of the fur trade, and other industries must have suffered, not only from the civil wars, but also from the supremacy of the Hansatic towns, which dominated the North, and could dictate their own terms. In earlier times the aristocratic families had owed their wealth to three main sources: commerce, Viking expeditions and slave labour. Trade had been a favourable means of enrichment among the aristocracy up to the beginning of the 13th century, but now it was almost monopolized by Germans, and Viking enterprise was a thing of the past. The third source of wealth had also failed, for it is clear from the laws of Magnus that the class of thralls had practically disappeared. This must have greatly contributed to shatter the power of the class which had once been the chief factor in the government of Norway.

Haakon's daughter Ingeborg had married Duke Erik of Sweden, and on Haakon's death in 1319 their three-year-old son Magnus succeeded to the Norwegian and Swedish thrones, the two countries entering into a union which was not definitely broken till 1371. It was during this reign that Norway was ravaged by the Black Death. In 1343 Magnus handed over the greater part of Norway to his son Haakon VI., who married Margrethe, daughter of King Valdemar III. of Denmark. Their young son Olav VI., already king of Denmark, succeeded to his father's throne on Haakon's death in 1368, but did not reign, leaving the royal line extinct, and the nearest successor to the throne the hostile King Albrecht of Sweden, of the Mecklenburg family. The difficulty was met by filling the throne by election, but innovation in Norway, though it was introduced in Sweden and Denmark. The choice fell on King Erik's widow Margrethe, but a couple of years later, chiefly in order to gain German support in a coming struggle with the Mecklenburgers, the Norwegians elected as king the young Erik of Pomerania, great-nephew of the queen, who henceforth acted as regent. Erik had claims on the Swedish and Danish thrones, and in 1397, at Kalmar, he was solemnly crowned king over the three countries, which entered into a union "never to be dissolved."

Reigns of the Kings of Norway

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<th>Reign Dates</th>
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1307-1814.—The history of Norway from 1307 down to the union with Sweden in 1814 falls naturally into four divisions. First, in 1450, the triple bond gave place to a union in which Norway became more firmly joined to Denmark. Next, in 1536, as the result of the Reformation, Norway sank almost to the level of a province. After 1660 she gained something in status from the establishment of autocracy in Denmark, and at the close of the period she became a constitutionally footing and approximate equality with Sweden. But for the convulsions to which some of these changes gave rise, Norway possesses during this period but little history of her own, and she sank from her former position as a considerable and independent nation. The kings dwelt outside her borders, her fleet and army decayed, and her language gradually gave place to Danish. Germans plundered her coasts and monopolized her commerce, and after 1450 Danes began to appropriate the higher posts in her administration. When in 1448 Karl Knutsson was chosen king by the Swedes, and Christian of Oldenburg by the Danes, it was by force that Norway fell to the latter. On the 24th of November 1449 the Norwegians protested against Christian's assumption of sovereignty over them, and after separation from the Swedes. Next year, however, the Swedes assented to the separation. Christian I. (1450-1481) gave estates and offices in Norway to his Danish subjects and raised money by pawning her ancient possessions, the Orkneys and Shetland islands, to the king of Scotland. His son Hans (1482-1513) purchased the obedience of the Norwegian nobles by concessions to their power. The imposing union continued in name, but the weakness of the nation and its government was strikingly illustrated when the Germans in Bergen besieged a monastery in which their enemy Olaf Nilsson, a high official, had taken refuge.

After the downfall of Christian II. (1513-1524) the position of Norway in relation to Denmark was changed for the worse. She was ruled for a century and a quarter by Danish officials; the churches and monasteries of Norway were sacked by Danes, and Danes were installed as pastors under the Lutheran system, which the Norwegians were compelled to accept in 1536. Soon Norway was drawn into the so-called Seventy Years' War of the North (1563-70). However, the power of the Hanse League in Bergen was broken. The rule of the Oldenburg dynasty proved neglectful rather than tyrannical, and under it the mass of the peasants was not flagrantly oppressed. Christian IV. (1588-1649), who founded Christiania, may almost be said to have discovered Norway anew. He reformed its government and strove to develop its resources, but his policy involved Norway in the loss of the provinces of Jemland and Herjedalen, which were ceded to the Swedes by the peace of Brünnich (1645). The Danish war of revenge against Carl X. of Sweden resulted in further territorial loss by Norway. By the peace of Roskilde (1658) she was compelled to renounce the counties of Trondhjem and Baahus, and although the former was restored by the peace of Copenhagen, two years later, her population fell below half a million. The Swedes had now acquired the rich provinces in the south and south-west of the Scandinavian peninsula, and their ambition to extend their frontiers to the North Sea became more pronounced and more possible of accomplishment. From the middle of the 17th century, however, the Dutch and English made their influence felt, and the political future of Norway could no longer be regarded as a purely Scandinavian affair. The establishment of hereditary autocracy in Denmark by Frederick III. in 1660 conferred many benefits upon Norway. Personal liberty perhaps suffered, but the Norwegian peasant remained a freeman while his counterpart in Denmark was a serf. Norwegian law was revised and codified under Christian V. (1670-1699), who was well served by the Norwegians in his attempt to regain the lost provinces.

Under the sons of these monarchs, Frederick IV. and Carl XII., Norway was once more compelled to pay for Danish aggression. Her shipping was destroyed, and in 1716, when driven from continental Europe, the Swedish hosts fell upon her. Two years later, however, the death of Carl XII. at the border fortress of Frederikshald averted the danger. During this war Peter Tordenskjold, the greatest among a long series of Norwegian heroes who served in the Danish fleet, won undying fame. Before the close of the 18th century something had been done towards dispelling the intellectual darkness. Holberg, though he flourished outside Norway, was at least born there, and by awakening the tide of German influence he did more than any Norwegian literature possible. At the close of the century Hans Nielsen Haugen, the Wesley of Norway, appeared, while the growth of the timber trade with England gave rise to a great increase in wealth and population. In a century and a half the number of the Norwegian people was doubled, so that by 1814 Norway comprised some 900,000 souls. In 1788 the oppressive law that grain should be imported into Norway only from Denmark was repealed, and thanks to Danish policy Norway actually drew financial profit from the wars of the French Revolution.

The Norwegian national movement was to render a decade at the beginning of the 19th century more memorable in Norwegian history than any century which had passed since the Calmar Union. In 1800 the Danish government committed the Norwegians to the second Armed Neutrality, and therefore to a share in the battle of Copenhagen, by which it was broken up. It was not until 1807, however, that Norway was fully involved in the Napoleonic wars. Then, after the bombardment of Copenhagen, she was compelled by Danish policy to embrace the cause of Napoleon against both England and Sweden. Commerce was annihilated, and the supply of food failed. The national distress brought into the forefront of politics national leaders, among whom Count Hermann Jasper von Wedel-Jarlsberg was the most conspicuous. As yet, however, patriotism went no further than a demand for an administration distinct from that of Denmark, which was conceded in 1807, and for a university nearer home than Copenhagen. In 1811 the government assented to the foundation of the university of Christiania. (W. F. R.) 1814-1907.—After a union of nearly 400 years between Norway and Denmark, the Danish king, Frederick VI., without consulting the Norwegians, ceded Norway to Sweden by the treaty of Kiel (January 14, 1814). Some time previously Sweden had joined the allies in their struggle against Napoleon, while Denmark had, unwisely, sided with the French. In 1813 the Swedish crown prince, Bernadotte, afterwards King Carl XIV., proceeded to Germany and took command of one of the armies of the allies. After the power of Napoleon had been broken at

1 In 1810 he was elected heir to the Swedish throne, in succession to the childless king Carl XIII., who died in 1818.
the battle of Leipzig, he advanced against Denmark, and King Frederick soon saw himself compelled to accede to the cession of Norway, which had long been the aspiration of the Swedes, especially after the loss of Finland in 1809. In the treaty of Kiel Frederick VI. absolved the Norwegians from their oath of allegiance, and called upon them to become the loyal subjects of the Swedish king. But the Norwegians, who had not been consulted in the matter, refused to acknowledge the treaty, declaring that, while the Danish king might renounce his right to the Norwegian crown, it was contrary to international law to dispose of an entire kingdom without the consent of its people.

A meeting of delegates was convened at Eidsvold, not far from the Norwegian capital, where, on the 17th of May 1814, a constitution, framed upon the constitutions of America, of France (1791), and of Spain (1812), was adopted. Among its most important features are that the Storting, or National Assembly, is a single-chamber institution, and that the king is not given an absolute veto, or the right to dissolve the Storting. The Danish governor of Norway, Prince Christian Frederick, was unanimously elected king. Soon afterwards the Swedish crown prince, invaded Norway. The hostilities lasted only a fortnight, when Bernadotte opened negotiations with the Norwegians. A convention was held at Moss, where it was proposed that the Norwegians should accept the Swedish king as their sovereign, on the condition that their constitution of the 17th of May should remain intact, except with such alterations as the union might render necessary. An extraordinary Storting was then summoned at Christiania, and on the 4th of November 1814 Norway was declared to be "a free, independent, and indivisible kingdom, united with Sweden under one king." A month previously Prince Christian Frederick had laid down his crown and left the country.

The union was more fully defined by the "Act of Union," which was accepted by the national assemblies of both countries in the following year. In the preamble to the act it is clearly stated that the union between the two peoples was accomplished "not by force of arms, but by free conviction," and the Swedish foreign minister declared to the European Powers, on behalf of Sweden, that the treaty of Kiel had been abandoned, and that it was not to this treaty, but to the confidence of the Norwegian people, that the latter owed the union with Norway. The constitution framed at Eidsvold was retained, and formed the Grundloven, or fundamental law of the kingdom. The union thus concluded between the two countries was really an offensive and defensive alliance under a common king, each country retaining its own government, parliament, army, navy and customs.

In Sweden the people received only an imperfect and erroneous insight into the nature of the union, and for a long time believed it to be an achievement of the Swedish arms. They had hoped to make Norway a province of Sweden, and now they had entered into a union in which both countries were equally independent. During the first fifteen years the king was represented in Norway by a Swedish viceroy, while the government was, of course, composed only of Norwegians. Count Wedel Jarlsberg was the first to be entrusted with the important office of head of the Norwegian government, while several of Prince Christian Frederick's councillors of state were retained, or replaced by others holding their political views. The Swedish Count von Essen was appointed the first viceroy of Norway, and was succeeded two years afterwards by his countryman Count von Münner, over both of whom Count Wedel exercised considerable influence.

During the first years of the union the country suffered from poverty and depression of trade, and the finances were in a deplorable condition. The first Storting was chiefly occupied with financial and other practical measures. In order to improve the finances of the country a bank of Norway was founded, and the army was reduced to one half. The paid-up capital of the bank was procured by an extraordinary tax, and this, together with the growing discontent among the peasantry, brought about a rising in Hedenmarken, the object of which was to dissolve the Storting and to obtain a reduction in the taxation. The rising, however, soon subsided, and the bountiful harvest of 1819 brought more prosperous times to the peasantry. Meanwhile, however, the financial position of the country had nearly endangered its independence. The settlement with Denmark with regard to Norway's share of the national debt common to both, assumed threatening proportions. In the interest of Denmark, the allied powers asked for a speedy settlement, and in order to escape their collective intervention, the Norwegian government was on the point of dissolving itself. The union of Sweden and Norway, on the death (February 5, 1818) of the old king Carl XIII., accepted England's mediation, and was enabled in September 1819 to conclude a convention with Denmark, according to which Norway was held liable for only 3,000,000 specie dollars (nearly $700,000). But the Norwegians considered that this was still too much, and the attitude of the Storting in 1821 nearly occasioned a fresh interference of the powers. The Storting, however, yielded at last, and agreed to raise a loan and pay the amount stipulated in the convention, but the king's council had his doubts as to whether the Norwegians really intended to fulfil their obligations. As his relations with the Storting had already become strained, and as he was occupied at that time with plans, which it is now known meant nothing less than a coup d'état in connexion with the revision of the Norwegian constitution, he decided to adopt military preparations, and in July 1821 he collected a force of 3000 Swedish and 3000 Norwegian troops in the neighbourhood of Christiania, ostensibly for the mere purpose of holding some manoeuvres. In a circular note (June 1) to the European powers, signed by the Swedish foreign minister, Engström—but it is not difficult to recognize the hand of the king as the real author—the minister complained bitterly of the treatment the king had met with at the hands of the Storting, and represented the Norwegians in anything but a favourable light to the powers, the intention being to obtain their sympathy for any attempt that might be made to revise the Norwegian constitution. About this time another important question had to be settled by the Storting. The Stortings of 1815 and 1816 had already passed a bill for the abolition of nobility, but the king had on both occasions refused his sanction. The Norwegians maintained that the king's few counts and barons still to be found in Norway were all Danish and of very recent origin, while the really true and ancient nobility of the country were the Norwegian peasants, descendants of the old jarls and chieftains. According to the constitution, any bill which has been passed by three successively elected Stortings, elections being held every third year, becomes law without the king's sanction. When the third reading of the bill came on, the king did everything in his power to obstruct it, but in spite of his opposition the bill was eventually carried and became law.

In 1822 Count Wedel Jarlsberg retired from the government. He had become unpopular through his financial policy, and was also at issue with the king on vital matters. In 1821 he had been impeached before the Rigsråd, the supreme court of the realm, for having caused the state considerable losses. Jonas Collett (1772-1851) was appointed as his successor to the post of minister of finance. The king had by this time apparently abandoned his plan of a coup d'état, lor in the following August he submitted to the Storting several proposals for fundamental changes in the constitution, all of which aimed at removing all that was in variance with a more direct and personal form of government. The changes, in fact, were the same as he had suggested in his circular note to the Powers, and which he knew would be hailed with approval by his Swedish subjects. When the Storting met again in 1824 the royal proposals for the constitutional changes came on for discussion. The Storting unanimously rejected not only the king's proposals, but also several others by private members for changes in the constitution. The king submitted his proposals again in the following session of the Storting, and again later on, but they were always unanimously rejected. In 1830 they were discussed for the last time, with the same result.
The king's insistence was viewed by the people as a sign of absolutist tendencies, and naturally excited fresh alarm. In the eyes of the people the members of the opposition in the Storting were the true champions of the rights and the independence which they had gained in 1814.

For several years the Norwegians had been celebrating the 17th of May as their day of independence, it being the anniversary of the adoption of the constitution of 1814; but as the tension between the Norwegians and the king increased, the latter began to look upon the celebration in the light of a demonstration directed against himself, and what Collett, minister of finance, was impeached before the supreme court of the realm for having made certain payments without the sanction of the Storting, he also considered this as an attack upon his royal prerogatives. His irritation knew no bounds, and although Collett was acquitted by the supreme court, the king, in order to express his irritation with the Storting and the action they had taken against one of his ministers, dissolved the national assembly with every sign of displeasure. The Swedish vicerey at the time, Count Sandels, had tried to convince him that his prejudice against the celebration could not be justified, but he wished to retain the Storting, and the king had made no objection to the celebration. In 1827 it was, however, celebrated in a very marked manner, and later in the same year there was a demonstration against a foolish political play called The Union, and this being privately reported to the king in as bad a light as possible, he thought that Count Sandels, who had not considered it worth while to report the occurrence, was not fitted for his post, and had him replaced by Count Beltzar Bojilas Platen (1766-1829), an upright but narrow-minded statesman. Count Platen's first act was to issue a proclamation warning the people against celebrating the day of independence; and in April 1828 the king, against the advice of his ministers, summoned an extraordinary Storting, his intention being to wrest from the Storting the supremacy it had gained in 1827. He also intended to take steps to prevent the celebration of the 17th of May, and assembled a force of 2000 Norwegian soldiers in the neighbourhood of the capital. The king arrived in Christiania soon after the opening of the extraordinary Storting. He did not succeed, however, in his attempt to make any constitutional changes, but the Storting met the king's wishes with regard to the celebration of the 17th of May by deciding not to continue the celebration, and the people all over the country quietly acquiesced. The following year trouble broke out again. The students had decided to celebrate the 17th of May with a festive gathering, which, however, passed off quietly. But large masses of the people paraded the streets, singing and shouting, and gathered finally in the market-place. There was a little rioting, and the police and the military eventually dispersed the people and drove them to their homes with sword and musket. This episode has become known as the "battle of the market-place," and did much to increase the general ill-feeling against Count Platen. His health eventually broke down from disappointment and vexation at the indignities and abuse heaped upon him. He died in Christiania at the end of the year, and his post remained vacant for several years, the presidency of the Norwegian government in the meantime being taken by Collett, his oldest member.

The by the Storting and in Europe became completely changed, and the lessons' derived from that great movement reached also to Norway. Nov. 1835 the constitution had paved the way to become the ruling element in political life, were also beginning to distinguish themselves in the national assembly, where they now had taken up an independent position against the representatives of the official classes, who in 1814 and afterwards had played the leading and most influential part in politics. This party was now under the leadership of the able and gifted Ole Ueland, who remained a member of every Storting from 1833 to 1869. The Storting of 1833 was the first of the so-called "peasant Storthings." Hitherto the peasantry had never been represented by more than twenty members, but the elections in 1833 brought their number up to forty-five, nearly half of the total representation. The attention of this new party was especially directed to the finances of the country, in the administration of which they demanded the strictest economy. They often went too far in their zeal, and thereby incurred considerable ridicule.

About this time the peasant party found a champion in the youthful poet Henrik Wergeland, who soon became one of the leaders of the "Young Norway" party. He was a romanticist, and played a most important part in the history of the national independence of Norway and of her full equality with Sweden in the union. A strong opposition to Wergeland and the peasant party was formed by the upper classes under the leadership of another rising poet and writer, Johan Sebastian Welhaven, and other talented men, who wished to retain the literary and linguistic relationship with Denmark, while Wergeland and his party wished to make the separation from Denmark as complete as possible, and in every way to encourage the growth of the national characteristics and to foster the popular. But it was a stormy time, and many of his friends who had just been isolated. He died in 1845, and his opponents became now the leaders in the field of literature, and carried on the work of national reconstruction in a more restrained and quiet manner. The peasant party still continued to exist, but restricted itself principally to the assertion of local interests and the maintenance of strict economy in finance.

The violent agitation that began in 1830 died away. The tension between the king and the legislature, however, still continued, and reached its height during the session of 1836, when all the royal proposals for changes in the constitution were laid aside, without even passing through committee, and when various other steps towards upholding the independence of the country were taken. The king, in his displeasure, decided to dissolve the Storting; but before it dispersed it proceeded to impeach Liøvenakjold, one of the ministers, before the supreme court of the realm, for having advised the king to dissolve the Storting. He was eventually sentenced to pay a fine of 10,000 kroner (about £550), but he retained his post. Collett, another minister who had greatly displeased the king by his conduct, was dismissed; but unity in the government was brought about by the appointment of Count Wedel Jarlsberg as vicecy of Norway. From this time the relations between the king and the Norwegian people began to improve, whereas in Sweden he was, in his later years, not a little disliked.

The question of the national flag was not yet settled. Towards the close of the session an address to the king was agreed to, in which the Storting urged that steps should be taken to place Norway in political respects upon an equal footing with Sweden, especially in the conduct of diplomatic affairs with foreign countries. The same address contained a petition for the use of the national or merchant flag in all waters. According to the constitution, Norway was to have her own merchant flag, and in 1821 the Storting had passed a resolution that the flag should be scarlet, divided into four by a blue cross with white and red edges, and bearing the king's monogram. In 1834 the king, however, refused his sanction to the resolution, but gave permission to use the flag in waters nearer home; but beyond Cape Finisterre the naval flag, which was really the Swedish flag, with a white cross on a red ground in the upper square, must be carried. In reply to the Storting's address the king in 1838 conceded the right to all merchant ships to carry the national flag in all waters. This was hailed with great rejoicings all over the country; but the question of the national flag for general use had yet to be settled. With regard to the question raised in the address of the Storting about the conduct of
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diplomatic affairs, and other matters concerning the equality of Norway in the union, the king in 1839 appointed a committee of four Norwegians and four Swedes, who were to consider and report upon the questions thus raised.

During the sitting of this first "Union Committee" its powers were extended to consider a comprehensive revision of the Act of Union, with the limitation that the fundamental conditions of the union must in no way be interfered with. But before the committee had finished their report the king died (March 8th 1844), and was succeeded by his son Oscar I. According to the constitution the Norwegian kings must be crowned in Throndhjem cathedral, but the bishop of Throndhjem was in doubt whether the queen, who was a Roman Catholic, could be crowned, and the king decided to forego the coronation both of himself and his queen. The new king soon showed his desire to meet the wishes of the Norwegian people. Thus he decided that in all documents concerning the internal government of the country Norway should stand first where reference was made to the king as sovereign of the two kingdoms. After having received the report of the committee concerning the flag question he resolved (June 20th 1844) that the red Norwegian flag, with each quadrant in the national flag as the national flag as the flag, with the mark of union in the upper corner; and it was also decided that the merchant flag of the two kingdoms should bear the same mark of union, and that only ships sailing under these flags could claim the protection of the state.

The financial and material condition of the country had now considerably improved, and King Oscar's reign was marked by the carrying out of important legislative work and reforms, especially in local government. New roads were planned and built all over the country, the first railway was built, steamship routes along the coast were established, lighthouses were erected and trade and shipping made great progress. The king's reign was not disturbed by any serious conflicts between the two countries. No change took place in the ministry under the presidency of the viceroy Lövenskiöld upon King Oscar's accession to the throne, but on the death or retirement of some of its members the vacant places were filled by younger and talented men, among whom was Fredrik Stang, who in 1845 took over the newly established ministry of the interior. During the Storstjæl-Holstein rebellion (1849-1850) and the Crimean War, King Oscar succeeded in maintaining the neutrality of Norway and Sweden, by which Norwegian shipping especially benefited. The abolition of the English navigation acts in 1850 was of great importance to Norway, and opened up a great future for its merchant fleet.

In 1826 a treaty had been concluded with Russia, by which the frontier between that country and the adjoining strip of Norwegian territory in the Polar region was definitely delimited; but in spite of this treaty Russia in 1831 demanded that the Russian Lapps on the Norwegian frontier should have the right to fish on the Norwegian coast, and have a portion of the coast on the Varanger fjord allotted to them to settle upon. The Norwegian government refused to accede to the Russian demands, and serious complications might have ensued if the attention of Russia had not been turned in another direction. While his father had looked to Russia for support, King Oscar was more inclined to secure western powers as his allies, and during the Crimean War he concluded a treaty with England and France, according to which these countries promised their assistance in the event of any fresh attempts at encroachment on Norwegian or Swedish territory by Russia. In consequence of this treaty the relations between Norway and Sweden and Russia became somewhat strained; but after the peace of Paris in 1856, and the accession of Alexander II., whose government was in favour of a peaceful policy, the Russian ambassador at Stockholm succeeded in bringing about more friendly relations.

Owing to the king's ill-health, his son, the crown prince Carl, was appointed regent in 1857, and two years later, when King Oscar died, he succeeded to the thrones of the two countries as

Carl XV. He was a gifted, genial and noble personality, and desired to inaugurate his reign by giving the Norwegians a proof of his willingness to acknowledge the claims of Norway, but he did not live to see his wishes in this respect carried out. According to the constitution, the king had the power to appoint a viceroy for Norway, who might be either a Norwegian or Swede. Since 1829 no Swede had held the post, and since 1859 no appointment of a viceroy had been made. But the paragraph in the constitution still existed, and the Norwegians naturally wished to have this stone in the new constitution, and for the abolition of the office of viceroy was laid before the Storting in 1859, and passed by it. The king, whose sympathies on this question were known, had been appealed to, and had privately promised that he would sanction the proposed change in the constitution; but as soon as the resolution of the Storting became known in Sweden, a violent outcry arose both in the Swedish press and the Swedish estates. Under the pressure that was brought to bear upon the king in Sweden, he eventually refused to sanction the resolution of the Storting; but he added that he shared the views of his Norwegian councillors, and would, when "the convenient moment" came, himself propose the abolition of the office of viceroy.

In the following year the Swedish government again pressed the demands of the Swedish estates for a revision of the Act of Union, which this time included the establishment of a union or common parliament for the two countries, on the basis that, according to the population, there should be two Swedish members to every Norwegian. The proposal was sent to the Norwegian government, which did not seem at all disposed to entertain it; but some dissensions arose with regard to the form in which its reply was to be laid before the king. The more obstinate members of the ministry resigned, and others, of a more pliable nature, were appointed under the presidency of Fredrik Stang, who had already been minister of the interior from 1845 to 1856. The reconstructed government was, however, in accord with the retiring one, that no proposal for the revision of the Act of Union could then be entertained. The king, however, advocated the desirability of a revision, but insisted that this would have to be based upon the full equality of both countries. In 1853 the Storting assembled in the act of 1815. The Storting assembled in the act of 1815, and the Constitution of Norway.

The committee, the second time that such a committee had been called upon to consider this vexatious question. It was not until 1867 that its report was made public, but it could not come on for discussion in the Storting till it met again in 1871. During this period the differences between the two countries were somewhat thrust into the background by the Danish complications in 1853-1864, which threatened to draw the two kingdoms into war. King Carl was himself in favour of a defensive alliance with Denmark, but the Norwegian Storting would not consent to this if an alliance could also be effected with at least one of the western powers.

In 1869 the Storting passed a resolution by which its sessions were made annual instead of triennial according to the constitution of 1814. The first important question which the first yearly Storting which met in 1871 had to consider was once more the proposed revision of the Act of Union. The Norwegians had persistently maintained that in any discussion on this question the basis for the negotiations should be (1) the full equality of the two kingdoms, and (2) no extension of the bonds of the union beyond the line originally defined in the act of 1815. Hence the draft of the new act contained terms in which the supremacy of Sweden was presupposed and which introduced important extensions of the bonds of the union; and, strangely enough, the report of the Union committee was adopted by the new Stang ministry, and even supported by some of the most influential newspapers under the plausible garb of "Scandinavianism." In these circumstances the "lawyers' party," under the leadership of Johan Sverdrup, who was to play such a prominent part in Norwegian politics, and the "peasant party," led by Sören...
Jaabek, a gifted peasant proprietor, who was also destined to become a prominent figure in the political history of the country, formed an alliance with the object of guarding against any encroachment upon the liberty and independence which were held all over the country by the constitution of 1814. This was the foundation of the great national party, which became known as the "Venstre" (the left), and which before long became powerful enough to exert the most decisive influence upon the political affairs of the country. When, therefore, the proposed revision of the Act of Union eventually came before the Storting in 1871, it was rejected by an overwhelming majority. The position which the government had taken up on this question helped to open the eyes of the Norwegians to some defects in the constitution, which has proved an obstacle in the development and strengthening of the parliamentary system.

In 1872 a private bill came before the Storting, proposing that the ministers should be admitted to the Storting and take part in its proceedings. After a number of stormy debates, the bill was successfully carried under the leadership of Johan Sverdrup by a large majority, but the government, evidently jealous of the growing powers and influence of the new liberal party in the Storting, advised the king to refuse his sanction, although the liberal party itself had several times in the preceding half-century voted in favor of admitting the ministers to the Storting. At that time, however, the opposition had looked with suspicion on the presence of the ministers in the national assembly, lest their superior skill in debate and political experience should turn the scale too readily in favour of government measures. Now, on the contrary, the opposition had gained more experience and had confidence in its own strength, and no doubt found that the legislative work could better be carried on if the ministers were present to explain and defend their views; but the government saw in the proposed reform the threat of another victory of full parliamentary government, by which the ministry could not remain in office unless supported by a majority in the Storting. Before the Storting separated the liberals carried a vote of censure against the government; but the king declared that the ministers enjoyed his confidence and took no further notice of the vote. Two of the ministers, who had advised the ratification of the bill, resigned, however, and a third minister, who had been in the government since 1846, resigned also, and retired from public life, foreseeing the storm that was brewing on the political horizon. Numerous public meetings were held in support of the proposed reform, and among the speakers was Johan Sverdrup, now the acknowledged leader of the liberal party, who was hailed with great enthusiasm as the champion of the proposed reform.

This was the political situation when King Carl died (18th September 1872). He was succeeded by his brother, who ascended the throne as Oscar II. In the following year he gave his sanction to the bill for the abolition of the office of viceroy, which the Storting had again passed, and the president of the ministry was afterwards recognized as the prime minister and head of the government in Christiania. Fredrik Stang, who was the president of the ministry at the time, was the first to fill this office. In the same year Norway celebrated its existence for a thousand years as a kingdom, with great festivities.

In 1874 the government, in order to show the people that they too some extent were willing to meet their wishes with regard to the great question before the country, laid before the Storting a royal proposition for the admission of the ministers to the national assembly. But this was to be accompanied by certain other constitutional changes, such as giving the king the right of dissolving the Storting at his pleasure, and providing fixed pensions for ex-ministers, which was regarded as a guarantee against the majority of the assembly misusing its new power. The bill which the government brought in was unanimously rejected by the Storting, the conservatives also voting against it, as they considered the guarantees insufficient. The same year, and again in 1877, the Storting passed the bill, but in a somewhat different form from that of 1872. On both occasions the king refused his sanction.

The Storting then resorted to the procedure provided by the constitution to carry out the people's will. In 1880 the bill was passed for the third time, and on this occasion by the overwhelming majority of 93 out of 113. Three Stortings after three successive elections had now carried the bill, and it was generally expected that the king and his government would at length comply with the wishes of the people, but the king on this occasion also refused his sanction, declaring at the same time that his right to the absolute veto was "above all doubt." Johan Sverdrup, the leader of the liberal party and president of the Storting, brought the question to a prompt issue by proposing to the Storting that the bill, which had been passed three times, should be declared to be the law of the land without the king's sanction. This proposal was carried by a large majority on the 9th of June 1880, but the king and his ministers in reply declared that they would not recognize the validity of the resolution.

From this moment the struggle 'may be said to have centred itself upon the existence or non-existence of an absolute veto on the part of the crown. The king requested the faculty of law at the Christiania university to give its opinion on the question at issue, and with one dissentient the learned doctors upheld the king's right to the absolute veto in questions concerning amendments of the constitution, although they could not find that it was expressly stated in the fundamental law of the country. The ministry also advised the king to claim a veto in questions of supply, which still further increased the ill-feeling in the country against the government, and the conflict in consequence grew more and more violent.

In the midst of the struggle between the king and the Storting, the prime minister, Fredrik Stang, resigned, and Christian August Selmer (1816-1889) became his successor; and this, together with the appointment of another member to the ministry, K. H. Schweigaard, plainly indicated that the conflict with the Storting was to be continued. In June 1882 the king arrived in Christiania to dissolve the Storting, and on this occasion delivered a speech from the throne, in which he openly censured the representatives of the people for their attitude in legislative work and on the question of the absolute veto, the speech creating considerable surprise among the people. Schweigaard and Bjørnstjerne Bjørnson, the popular poet and dramatist, called upon the people to support the Storting in upholding the resolution of the 9th of June, and to rouse themselves to a sense of their political rights. The elections resulted in a great victory for the liberal party, which returned stronger than ever to the Storting, numbering 83 and the conservatives only 31. The ministry, however, showed no sign of yielding, and, when the new Storting met in February 1883, the Odeshøg (the lower division of the national assembly) decided upon having the question finally settled by impeaching the whole of the ministry before the Rigsråd or the supreme court of the realm. The jurisdiction of the Rigsråd is limited to the trial of offences against the state, and there is no appeal against its decisions. The charges against the ministers were for having acted contrary to the interests of the country by advising the king to refuse his sanction—first, to the amendment of the law for admitting the ministers to the Storting; secondly, to a bill involving a question of supply; and thirdly, to a bill by which the Storting could appoint additional directors on the state railways.

The trial of the eleven ministers of the Selmer cabinet began in May 1883 and lasted over ten months. In the end the Rigsråd sentenced the prime minister and seven of his ministers to be deprived of their offices, while three, who had either recommended the king to sanction the bill for admitting the ministers to the Storting, or had
entered the cabinet at a later date, were heavily fined. The excitement in the country rose to feverish anxiety. Rumours of all kinds were afoot, and it was generally believed that the king would attempt a coup d'état. Fortunately the king after some hesitation issued (11th March 1884) an order in council announcing that the judicial and legislative business should not be carried into effect, and Selmer was then called upon to resign his position as prime minister. King Oscar, however, in his declaration upheld the constitutional prerogative of the crown, which he maintained, was not impaired by the judgment of the Rigsdag. The following month the king, regardless of the large liberal majority in the Storting, asked Schweigaard, one of the late ministers, whose punishment consisted in a fine, to form a ministry, and the so-called "April ministry" was then appointed, but sent in its resignation in the following month. Professor Broch, a former minister, next failed to form a ministry, and the king was at last compelled to appoint a ministry in accordance with the majority in the Storting. In June 1884 Johan Sverdrup was asked to form one. He selected for his ministers leading men on the liberal side in the Storting, and the first liberal ministry that Norway had was at length appointed. The Storting, in order to satisfy the king, passed a new resolution admitting the ministers to the national assembly, and this received formal sanction.

The following years a series of important reforms was carried through. Thus in 1887 the jury system in criminal matters was introduced into the country after violent opposition from the conservatives. A bill intended to give parishioners greater influence in church matters, and introduced by Jakob Sverdrup, the minister of education, and a nephew of the prime minister, met, however, with strong opposition, and was eventually rejected by the Storting, the result being a break-up of the ministry and a disorganization of the liberal party. In June 1889 the Sverdrup ministry resigned, and a conservative one was formed by Emil Stang, the leader of the conservatives in the Storting, and during the next two years the Storting passed various useful measures; but the ministry was eventually wrecked on the rock of the great national question which about this time came to the front—that of Norway's share in the transaction of diplomatic affairs. At the time of the union in 1814 nothing had been settled as to how these were to be conducted, but in 1835 a resolution was issued, that when the Swedish foreign minister was transacting diplomatic matters with the king which concerned both countries, or Norway only, the Norwegian minister of state in attendance upon the king at Stockholm should be present. This arrangement did not always prove satisfactory to the Norwegians, especially as the Swedish foreign minister could not be held responsible to the Norwegian government or parliament.

By a change in the Swedish constitution in 1885 the ministerial council, in which diplomatic matters are discussed, came to consist of the Swedish foreign minister and two other members of the cabinet on behalf of Sweden, and of the Norwegian minister at Stockholm on behalf of Norway. The king, wishing to remedy this disparity, proposed that the council on diplomatic questions should be enlarged by an additional paragraph in the Act of Union. The representatives of the Norwegian government in Stockholm proposed that three members of the cabinet of each country should constitute the ministerial council. To this the Swedish government was willing to agree, but on the assumption that the minister of foreign affairs should continue to be a Swede as before, and this the Norwegians, of course, would not accept. At the king's instigation the negotiations with the Swedish government were resumed at the beginning of 1891, but the Swedish Riksdag rejected the proposals, while the Norwegian Storting insisted upon "Norway's right, as an independent kingdom, to full equality in the union, and therewith her right to watch over her foreign affairs in a constitutional manner." The Stang ministry then resigned, and a liberal ministry, with Steen, the recognized leader of the liberal party after Sverdrup's withdrawal from politics, as prime minister, was appointed.

The new ministry had placed the question of a separate minister of foreign affairs for Norway prominently in their programme, but little progress was made during the next few years. 

The crisis of 1902-1903.

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The Norwegian claim.
government was prepared to agree to the establishment of separate consuls. This came as a surprise to the Norwegians in view of the fact that the basis for the establishment of separate consuls had already been agreed upon and confirmed by the king in December 1903. According to Boström's proposals the Norwegian consuls were to be placed under the control of the Swedish foreign minister, who was to have the power to remove any Norwegian consul. The Norwegians felt it would be beneath the dignity of a self-governing country to agree to the Swedish proposals, and that these new demands were nothing less than a breach of faith with regard to the terms of agreement arrived at two years before by both governments and signed by the king. The Norwegian government would have been perfectly justified if, after this, they had withdrawn from the negotiations, but they did not wish to jeopardize the opportunity of arriving at a friendly settlement, and Hagerup, the Norwegian prime minister, proceeded to Stockholm to confer with Boström; but no satisfactory agreement could be arrived at. There was therefore nothing left but for the Norwegians to take matters into their own hands.

On the 9th of February 1905 Hagerup announced to the Norwegian government that the negotiations had fallen through, and on the 17th the Storting decided unanimously to refer the matter to a special committee. Owing to some difference of opinion between the members of his ministry, Hagerup resigned on the 1st of March and was succeeded by Christian Michelsen, who formed a ministry composed of members of both political parties. The special committee decided that a bill should be immediately submitted to the Storting for the establishment of a Norwegian consular service and that the measure should come into force not later than the 1st of April 1906. An attempt was made by the Swedish crown prince, acting as Prince Regent 4th, to enter into negotiations with the Norwegian government, but the proposals were not favourably received in Norway. In April 1905 Boström resigned, which was considered to be a move on the part of Sweden to facilitate negotiations with Norway. The bill for the establishment of Norwegian consuls was passed by the Storting without a dissentient voice on the 23rd of May, and it was generally expected that the king, who again had assumed the reins of government, would sanction the bill, but on the 27th of May, in spite of the earnest entreaties of his Norwegian ministers, the king formally informed the Norwegian Ministry that he could not accept their resignation. They, however, declined to withdraw it. A few days afterwards the Norwegian government informed the Storting of the king's refusal, whereupon the assembly unanimously agreed to refer the matter to the special committee. On the 7th of June the Storting met to hear the final decision of the government. Michelsen, the prime minister, informed the Storting that all the members of the government had resigned in consequence of the king's refusal to sanction the consular law, that the king had declined to accept the resignation, and that, as an alternative government could not be formed, the union with Sweden, based upon a king in common, was consequently dissolved. The president of the Storting submitted a resolution that the resigning ministry should be authorized to exercise the authority vested in the king in accordance with the constitution of the country. The resolution was unanimously adopted.

King Oscar, on receiving the news of the action of the Norwegian Storting, sent a telegraphic protest to the Norwegian prime minister and to the president of the Storting. The Swedish government immediately decided to summon an extraordinary session of the Swedish parliament for the 20th of June, when a special committee was appointed to consider what steps should be taken by Sweden. On the 25th of July the report of the committee was laid before the Riksdag, in which it was stated that Sweden could have no objection to enter into negotiations about the severance of the union, but that a vote to that effect had been given by a newly-elected Storting or by a national vote in the form of a referendum by the Norwegian people. The proposal was unanimously adopted by the Swedish Riksdag on the 27th of July, and on the following day the Norwegian Storting decided that a general plebiscite should be taken on the 13th of August, when 368,211 voted in favour of the dissolution and only 184 against it. It was thereupon agreed that representatives of Norway and of Sweden should meet at Karlstad in Sweden on the 31st of August to discuss and arrange for the severance of the union. The negotiations lasted till the 23rd of September, though more than once they were on the point of being broken off. The agreement stipulated a neutral zone on both sides of the southern border between the two countries, and the Norwegians undertaking to dismantle some fortifications within that zone. The agreement was to remain in force for ten years, and could be renewed for a similar period, unless one of the countries gave notice to the contrary. The Karlstad agreement was ratified by the Norwegian Storting on the 9th of October and by the Swedish Riksdag on the 16th of the same month. On the 27th of October King Oscar issued a proclamation to the Norwegian Storting, in which he relinquished the crown of Norway. The Norwegian government was led by Bostrom; but the Norwegian people decided to negotiate with Prince Charles of Denmark and to arrange for a national vote as to whether or not the country would approve of his election for the Norwegian throne. The plebiscite resulted in 259,563 votes for his election and 60,264 against. On the 18th of November the Storting unanimously elected Prince Charles as king of Norway, he taking the name of Haakon VII. On the 25th of November the king and his consort, Queen Maud, the youngest daughter of Edward VII of England, entered the Norwegian capital. Their coronation took place in the Trondhjem cathedral on the following day.

In 1907 parliamentary suffrage was granted to women with the same limitation as in the municipal suffrage granted to them in 1901, viz., to all unmarried women over 25 years, who pay taxes on an income of 300 kroner (about £16) in the country districts and on 400 kroner (about £22) in the towns, as well as to all married women, whose husbands pay taxes on similar incomes. Norway was thus the first sovereign country in Europe where the parliamentary vote was granted to women. (H. L. B.)

**Norwegian Literature**

Early Norse literature is inextricably bound up with Icelandic literature. Iceland was colonized from Norway in the 9th century, and the colonists were drawn chiefly from the upper and cultivated classes. They took with them their poetry and literary traditions. Old Norse literature is therefore dealt with under Iceland (q.v.). (See also Edda, Saga, Runes.)

The modern literature of Norway bears something of the same relation to that of Denmark that American literature bears to English. In each case the development and separation of a dependency have produced a desire on the part of persons speaking the mother-tongue for a literature that shall express the local emotions and conditions of the new nation. Two notable events led to the foundation of a separate Norwegian literature: the one was the creation of the university of Christiania in 1811, and the other was the separation of Norway from Denmark in 1814. Before this time Norwegian writers had been content, as a rule, to publish their works at Copenhagen. The first name on the annals of Danish literature, Peder Clausen, is that of a Norwegian; and if all Norse writers were removed from that roll, the list would be poorer by some of its most illustrious names, by Holberg, Tullin, Wessel, Trischen, Steffens and Hauch.

The first book printed in Norway was an almanac, brought out in Christiania in 1643 by a wandering printer named Tyge Nielsen, who brought his types from Copenhagen. But the first press set up definitely in Norway was that of Valentin Kuhn, brought over from Germany in 1650 by the theologian Christian Stephens Mag (1580–1678) to help in the circulation of his numerous tracts. Bang's Christianae Studijs Befrielsse (1651), is the first book published in Norway. Christen Jensen (d. 1653)
Magnus Barfods Sønn (Magnus Barefoot's Son) and a lyrical drama, Fjeldensyret (The Adventure in the Mountains) (1888). He became judge of the supreme court of the diocese of Christiania. The third member of the Trefoil, Mauritz Kristoffer Hansen (1794–1842), was a schoolmaster. His novels, of which Olar of Bretagne (1819) was the earliest, were much esteemed in their day, and after his death were collected and edited (8 vols., 1855–1858), with a memoir by Schwab. Hansen's Poems, printed at Christiania in 1816, were among the earliest publications of a liberated Norway, but were preceded by a volume of Smaadige (Short Poems) by all three poets, edited by Schwab. These works, with contributions of genuine genius in themselves, did much by their industry and patriotism to form a basis for Norwegian literature.

The creator of Norwegian literature, however, was the poet Henrik Arnold Wergeland (1808–1845) (q.v.), a man of great genius and enthusiasm, who contrived within the limits of a life as short as Byron's to concentrate the labours of a dozen ordinary men of letters. He held views in most respects similar to those pronounced by Rousseau and Shelley. His obscurity and extravagance stood in the way of his teaching, and all his poetry—by St. Sylvester Sivertsen (1809–1847), a journalist of talent whose verses were collected in 1848, and Christian Monsen (1841–1852), author of Tidsnormerene (The Norns of the Age) (1835) and other verses.

Andreas Munch (1811–1884) took no part in the feud between Wergeland and Welhaven, but addicted himself to the study of Danish models independently of either. He published a series of poems and dramas, one of which latter, Kong Sverres Ungdom (1837), attracted some notice. His popularity commenced with the appearance of this Poetical Novel as a Sáliiter, and was reached by his epic called Kong- dotternes Brudesløft (The Bridal Journey of the King's Daughter) (1861). Two of his historical dramas have enjoyed a popularity greatly exceeding their merit; these are Solomon de Caus (1854) and Lord William Russell (1857).

A group of minor poetical writers may now be considered. Magnus Brostrup Landstad (1802–1880) was born on Maassø, an island in the vicinity of the North Cape, and, therefore, in higher latitudes than any other man of letters. He was a hymn-writer of merit, and he was the first to collect, in 1853, the norske Folkeviser or Norwegian folk-songs. Landstad was ordered by the government to prepare an official national hymn-book, which was brought out in 1861. Peter Andreas Jensen (1812–1867) published the collected volumes of his poetry in 1836, 1845, 1855 and 1861, and two dramas which he also wrote. His Poems, in Erindringer (A Souvenir), in 1857, Aasmund Olafsen Vinje (1818–1870) was a peasant of remarkable talent, who was the principal leader of the movement known as "svartkrov," an effort to distinguish Norwegian from Danish literature by the adoption of a peasant dialect, or rather a new language arbitrarily formed on a collision of the various dialects. Vinje wrote a volume of lyrics, which he published in 1864, and a narrative poem, Storregut (Big Lad) (1866), entirely in this fictitious language, and he even went so far as to issue in it a newspaper, Dålen (The Dalesman), which appeared from 1858 to Vinje's death in 1870. In these efforts he was supported by Tidsskriftet for Norske Litteratur, a journal founded and edited by the author of an historical tragedy, Jon Arason (1867); several novels: Fra Bygdom (1865); Torgim (1872); Fra Danskedsiden (1871); and an essay, "Ole Vestiary" (The Southern West of the Moon) (1879); besides a powerful but morbid drama in the ordinary language of Norway, En Kvindeksjøme (A Woman's Fate) (1879). In 1882 he left Norway for America, and in 1885, and his last works, among which is an essay in 1885 what is perhaps the best of his books, The Saga of the Prairie. Superior to all the preceding in the quality of his lyrical writing was the bishop of Christiansand, Jürgen Moe (1813–1882). He is,
The political crisis of 1884–1885, which produced so remarkable an effect on the material and social life of Norway, was not without its influence upon literature. There had followed, to the great generation of the 'sixties, led by Ibsen and Bjørnson, a race of entirely prosaic writers, of no great note, and no extraordinary promise. The movement which began in 1885 brought back the fine masters of a previous imaginative age, silenced the problem-setters, and encouraged a whole generation of new men, realists of a healthier sort. In 1885 the field was still held by the three main names of modern Norwegian literature—Ibsen, Bjørnson and Lie. Henrik Ibsen proceeded deliberately with his labours, and his name at the same time grew in reputation and influence. The advance of Bjørnson was not so regular, because it was disturbed by political issues. Moreover, his early peasant tales were later, after having suffered great neglect, grew to be a force, and Bjørnson's example has done much to revive an interest in the art of verse in Norway. Jonas Lie, the most popular novelist of Norway, continued to publish his pure, fresh and eminently characteristic stories. His style, colloquial almost to a fault, has neither the charm of Bjørnson nor the art of some of the latest generation. Ibsen, Bjørnson and Lie continued, however, to be the three representative authors of their country. Kristian Elster (1841–1881) showed great talent in his pessimistic novels Tora Trondal (1879) and Dangerous People (1881). His artistic legacy, together with Asbjornsen's, overflowed into the fields of fine arts. Asbjornsen (1847–1905), wife of the Danish novelist, Erik Skram. Her novels are destitute of literary beauty, but excellent in their local colour, dealing with life in Bergen and the west coast. But the most extravagant product of the prosaic period was Hans Jæger (b. 1854), a sailor by profession, who left the sea, obtained some instruction and embarked on literature. Jæger accepted the naturalistic formulas wholesale, and told Zola himself in the harshness of his pictures of life. Several of Jæger's books, and in particular his novel Morbid Love (1893), were immediately suppressed, and can with great difficulty be referred to. Knud Hamsun (b. 1860) has been noted for his egotism, and for the bitterness of his attacks upon his fellow-writers and the great names of literature. Hamsun is seen at his best in the powerful romance called Hunger (1888). A writer of a much more pleasing, and in its quiet way of a much more refined manner, is Hans Anrud (b. 1863). His humour, applied to the observation of the Oland peasants—Anrud himself comes from the Gulbrandsdal—is exquisite; he is by far the most amusing of recent Norwegian writers, a race whose fault it is that they are too serious. His story, Here Our Lord Made Hole at Asmund Bergemoll's (1887), is a little masterpiece. Peter Egge (b. 1869), a young novelist and playwright from Trondheim, came to the front with careful studies of types of Norwegian temperament. In his Jacob and Christopher (1900) Egge also proved himself a successful writer of comedy. Gunnar Heiberg (b. 1857), although older than most of the young generation, has but lately come into prominence. His poetical drama, The Balcony, made a sensation in 1894, but ten years earlier his comedy of Aunt Ulrica should have awakened anticipation. He was more ready (1889) to make a declaration of great promise were removed in the very heyday of success, Gabriel Finne (1866–1890) and Sighjør Obstfelder (1866–1900). The last mentioned, in The Red Drops and The Cross, published in 1897, gave promise of something new in Norwegian literature. Obstfelder, who died in a hospital in Copenhagen in August 1900, left an important book in MS., A Priest's Diary (1901).

Verse was banished from Norwegian literature, during the years that immediately preceded 1885. The credit of restoring it belongs to Sigurd Bödtker, who wrote an extremely naturalistic piece called Love, in the manner of Heine. The earliest real poet of the new generation is, however, Niels Collet-Melbye (b. 1864), who published a little volume of Poems in 1887. Arne Dybfast (1868–1892), a young anarchist who committed suicide, was a decadent egotist of the most pronounced type, but a poet of unquestionable talent, and the writer of a remarkably...
melodious prose. In 1851 was printed in a magazine Vilhelm Krag’s (b. 1871) very remarkable poem called Fandango, and shortly afterwards a collection of his lyrics. Vogt and V. Krag continued to be the leading lyrical writers of the period, and although they had many imitators, they cannot be said to have found any rivals. Vilhelm Krag turned to prose fiction, and his novels Isaac Seekhansen (1900) and Isaac Kopengetal (1903) are excellent studies of Westland life. More distinguished as a novelist, however, is his brother, Thomas P. Krag (b. 1868), who published a series of romantic novels, of which Ada Wilde (1897) is the most powerful. His short stories are full of delicate charm. Hans E. Kinck (b. 1865) is an accomplished writer of short stories from peasant life, written in dialect. Bernt Lie (b. 1868) is the author of popular works of fiction, mainly for the young. Sven Nilssen (b. 1864) is the author of a very successful novel, The Barque Franciska (1901). With him may be mentioned the popular dramatist and memoir-writer, John Paulsen (b. 1853), author of The Widow’s Son. Johan Bojer (b. 1872) has written satirical romances, of which the most powerful is The Power of Faith (1903). Jakob Hilditch (b. 1864) has written many stories and sketches of a purely national kind, and is the anonymous author of a most diverting parody of banal provincial journalism, Travnisktopsten (1900–1901).

The leading critics are Carl Nerup (b. 1864) and Hjalmar Christensen (b. 1860), each of whom has published collections of essays dealing with the aspects of recent Norwegian literature. The death of the leading bibliographer and lexicographer of Norwegian literature, Jakob Bjorvatn, (b. 1840) inflicted a blow upon the literary history of his country; his Dictionary of Norwegian Authors (1883–1900)—left for completion by Halfdan Koht—is one of the most elaborate works of its kind ever undertaken. Among recent historians of Norway much activity has been shown by Ernst Sars (b. 1835) and Yngvar Nielsen (b. 1843). The great historian of northern jurisprudence was L. M. B. Aubert (1838–1869), and in this connexion T. H. Aschehoug (b. 1822) must also be mentioned. The leading philosopher of Norway in those years was the Hegelian Marcus Jakob Monrad (b. 1816), whose Aesthetics of 1889 is his masterpiece.

The close of 1899 and the beginning of 1900 were occupied by a discussion, in which every Norwegian author took part, as to the adoption of the landsmaal, or composite dialect of the peasants, in place of the rigsmaal or common Norwegian. Political prejudice greatly bittered the controversy, but the proposition that the landsmaal, which dates from the exerions of Ivar Aasen (q.v.) in 1859, shouldoust the language in which all the classics of Norway are written, was supported by many of the most prominent authors and writer in the country, particularly by Bjørnson and Sophus Bugge (b. 1833). On the other side, Arne Garborg was almost the only name which carried any literary weight. The maal had no doubt enriched the literary tongue of the country with many valuable words and turns of expression, but there the advantage of it ends, and it is difficult to feel the slightest sympathy with a movement in favour of suppressing the language in which every one has hitherto expressed himself, in order to adopt an artificial dialect which exists mainly on paper, and which he declares to be the native speech of any one body of persons throughout the whole of Norway.

AUTHORITIES.—La Norvège littéraire, by Paul Botten-Hansen (1824–1886), is an admirable piece of bibliography, but comes down no farther than 1866. Jens Brage Halvorsen (1845-1900) left his admirable and exhaustive Norsk Forfatter-Lexicon, 1841–1880 (Norwegian Dictionary of Authors) incomplete; but the work was continued by Halfdan Koht. See also Henrik Jæger, Illustreret norsk litteraturhistorie (Christiansia, 1892–1905); to which an appendix State Tidsskr 1800–1905 was added by Carl Nerup in 1905; P. H. Schweitzer, Geschichte der skandinavischen Literatur (Leipzig, 1889); F. W. Horn, History of the Literature of the Scandinavian North (Engl. trans. Chicago, 1884); Edmund Gosse, Northern Studies (2nd ed., 1882).

NORWEGIAN SEA, the sea enclosed between Norway, the Shetland and Faeroe Islands, Iceland, Greenland, Spitsbergen and Bear Island. Its basin is bounded on the E. by the Spitsbergen platform, the continental shelf of the Barents Sea and the Norwegian coast; on the S. and S.W. by the North Sea, the Wyville-Thompson ridge, the Faeroe-Iceland ridge and the Iceland-Greenland ridge; on the W. by the coast of Greenland and on the N., so far as is known, by a ridge extending from Greenland to Spitsbergen. The Norwegian Sea is thus placed between the basins of the Atlantic on the one side and of the Arctic Ocean on the other: the mean depth of the submarine ridge separating it from the former being about 300 fathoms, and from the latter probably about 400 fathoms. The basin itself consists of a series of deeps, separated from one another by transverse ridges. Nansen and Hjelland-Hansen give the following results of measurements of the area:

<table>
<thead>
<tr>
<th>Area of surface</th>
<th>Water area at 100 metres</th>
<th>Water area at 200 metres</th>
<th>Water area at 300 metres</th>
<th>Water area at 400 metres</th>
<th>Mean depth</th>
</tr>
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<tbody>
<tr>
<td>2,58 million sq. km.</td>
<td>1,765,650 sq. km.</td>
<td>1,650,000 sq. km.</td>
<td>1,050,000 sq. km.</td>
<td>700,000 sq. km.</td>
<td>1,600 metres.</td>
</tr>
</tbody>
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The Norwegian Sea forms the meeting-place of waters coming from the Antarctic and Arctic oceans, and it also receives coastal waters from the North Sea and connecting areas, and from the Barents Sea. As communication with other basins is cut off comparatively near the surface, the inflow and outflow of waters must take place entirely in the upper strata, and the isolated water in the deep basin has typical physical characters of its own.

The distribution and circulation of these waters are of great complexity, and have formed the subject of study by oceanographers since the region was first opened up by the Norwegian North Atlantic Expedition, 1876–1878. Much fresh light has been thrown on the subject by the work of the International Council for the study of the sea, and more particularly by the Norwegian investigators Nansen and Hjelland-Hansen, whose report on Norwegian Fishery and Marine Investigations (vol. ii. No. 2. 1909) contains a complete survey of present knowledge.

NORWICH, GEORGE GORING, EARL OF (1583–1663), English soldier, was the son of George Goring of Hurstprey and Ovingdean, Sussex, and of Anne Denny, sister of Edward Denny, earl of Norwich. He was knighted in 1608, and became a favourite at court, benefiting largely from monopilies granted by Charles I. He became Baron Goring in 1628, and privy councillor in 1639. When the troubles between Charles and his parliament became acute Goring devoted his fortune freely to the royal cause, and the king in November 1644 renewed for him the title of earl of Norwich which had become extinct after his uncle’s death. He went with the queen to Holland in 1642 to raise money for the king, and in the autumn of the next year he was seeking arms for the enemy from Mazzar in Paris. His proceedings were soon revealed to the parliament in January 1644 by an intercepted letter to Henrietta Maria. He was consequently impeached of high treason, and prudently remained abroad until 1647 when he received a pass from the parliament under a pretex of seeking reconciliation. Thus he was able to take a prominent part in the Second Civil War of 1648 (see GREAT REBELLION). He commanded the Kentish levies, which Fairfax dispersed at Maidstone and elsewhere, and was forced to surrender unconditionally at Colchester. He was condemned to exile in November 1648 by a vote of the House of Commons, but the next year was granted his life. He lived at Brentford on the 6th of March 1663. By his wife Mary Nevill (d. 1648), daughter of the 6th Lord Abergavenny, he had four daughters and two sons: George, Lord Goring (q.v.); and Charles, who fought...
NORWICH, in the Civil War, succeeded his father in the earldom, and died without heirs in March 1671.

NORWICH, a city and one of the county-seats of New London county, Connecticut, U.S.A., in the township of Norwich, at the point where the Yantic (which expands here in "The Cove") and Shetucket rivers join and form the Thames. Pop. (1900) of the township, 24,657, which included that of the city (17,251, including 4,597 foreign-born); (1910) of the city, 20,367, and of the township, 28,219. The Congregational Church of the Inhabitants of Norwich is served by the New York, New Haven & Hartford and the Central Vermont railways, by steamers from New York and New London, and by interurban electric lines connecting with Willimantic, New London and other neighbouring places. The city is at the head of navigation on the Thames river, whose channel is 100-200 ft. wide and 14 ft. deep. The residential and older portion of the city is built on the rising ground between the valleys of the two streams; along their banks lies the business district. In Sachem Street is the grave of Uncas (d. c. 1682), a Mohegan Indian chief and friend of the early settlers; the corner-stone of the granite monument over the grave was laid by President Andrew Jackson in 1833. North-east of the Roman Catholic Cemetery, in the extreme eastern part of the city, is a monument to Mantonome, a sachem of the Narragansett tribe of Indians, who was put to death here. Among the principal buildings and institutions are the Congregational Church, organized in 1660; the Norwich Free Academy (1836) and its Slater Memorial Hall, in which are the Peck Library and an Art Museum, and the Converse Art Annex and Art Collection; the Otis Public Library (1848); the William Backus Hospital for the Inhabitants of Norwich and a state armory. In the 18th century, and early in the 19th, Norwich had a lucrative trade with the Atlantic ports and the West Indies, but later manufacturing became the most important industry; the manufactures include textiles, cutlery, firearms, paper, electrical supplies, printing presses, &c. In 1905 the factory products were valued at $6,032,391. With the city's growth in manufacturing there has been a large increase in the foreign element in the population. The municipality owns and operates the waterworks, and gas and electric-lighting plants.

Norwich was settled in 1659 by colonists from Saybrook under the leadership of Captain John Mason (1600–1672), who had crushed the power of the Pequot Indians in Connecticut in 1637, and the Rev. James Fitch (1622-1702), who became a missionary to the Mohegans. The tract was purchased from the Mohegan chiefs, Uncas, Owaneco and Attawahoon, and the settlement was called Mohegan until 1662, when the present name was adopted. During and preceding the War of Independence the citizens of Norwich were ardent Whigs; various members of the well-known Huntington family being among their leaders. In December 1776, in reply to a message from Boston, a town-meeting forbade the use of tea, wines, liquors and foreign manufactures; in 1770 all citizens were forbidden to hold intercourse with a schoolmaster who had continued to drink tea, and in 1776 a town-meeting directed the town clerk to proceed with his duties without reference to the Stamp Act. Norwich was chartered as a city in 1784. Among the early settlers in Ohio many were inhabitants of Norwich. Benedict Arnold was a native of Norwich; Mrs Lydia H. Sigourney was born here in a house still standing; Donald G. Mitchell ("Ik Marvel") was also born here; and Norwich was the birthplace of Alfred Buckingham (1804-1879), war governor of Connecticut.

See F. M. Caulkins, *History of Norwich* (Hartford, 1866).

NORWICH, a city and county of a city, municipal, county and parliamentary borough, and the county town of Norfolk, England; 114 m. N.E. by N. from London. Pop. (1901), 111,793. It is served by the Great Eastern railway and also by the Midland and Great Northern joint line. The Great Eastern company owns the Thorpe and Victoria stations, and the joint line the City station. The city lies in the valley of the Wensum, which joins the Yare immediately below. The ancient city lay in a deep bend of the Wensum, and the walls (1294-1299) with their many towers and gateway houses, of which fragments only remain, were 4 m. in circuit. These narrow limits, however, were long ago outgrown, for Evelyn writes in 1671 that "the suburbs are large, the prospects sweet, with other amenities, not omitting the flower gardens, in which all the inhabitants excel." The castle, standing high upon a steep mound, is still partly surrounded by earthworks and a ditch spanned by a very early bridge. Only the early Norman square keep remains, with four tiers of arcading without, and an ornate doorway into the great tower. The building long served as a prison, but, on the erection of a new and without the city, was acquired in 1884 by the corporation and in 1894 adapted as a museum and art gallery.

The cathedral church of the Holy Trinity lies between the castle and the river, on low ground. In 1503 the seat of the East Anglian bishopric was removed by Bishop Herbert de Loozing or Lorrainne from Thetford to Norwich, where in 1095 he laid the foundation of the cathedral and dedicated it in 1101, establishing at the same time a Benedictine monastery. As completed by his successor before the middle of the 12th century the cathedral in style was purely Norman; and it still retains its original Norman plan to a great degree. Changes and additions, however, were made from time to time—the Early English lady chapel (demolished about 1580) belonging to the middle of the 15th century; the Perpendicular spire, erected after the collapse of two previous spires of wood, to the 15th; the west window and porch and the lierne stone vaulting of the nave, with its elaborate 328 bosses, to the 15th; and to the 16th the vaulting of the transepts and Bishop Nix's chantry, whilst the fine cloisters, 175 ft. square, 12 ft. wide, with 45 windows, in style mainly Decorated, were begun in 1297 and completed till 1340. The following are the dimensions in feet of the cathedral: total length, 497; length of nave, 204; length of transepts, 178; breadth of nave and aisles, 72; total height of spire, 315 (in England exceeded by Salisbury only); height of tower, 149½; height of nave, 60½; height of choir, 83½. The chief entrance on the west is a Perpendicular archway, above which is an immense window filled with poor modern stained glass. The nave within is grand and imposing, of great length, divided by fourteen semi-circular arches whose massive piers are in two instances ornamented with spiral mouldings. The triforium is composed of similar arches. The side aisles are low, their vaultings plain. The choir, extending westward some way beyond the crossing, is of unusual length, and terminates in an apse. The oak stalls and misericores are very richly carved work of the 15th century. A curious quatrefoil, opening on the north side of the presbytery, beneath the confessio or relic chapel, deserves mention. There is a monumental effigy of Bishop Goldwell (c. 1499), and another of Bishop Bathurst (1537) by Sir P. Chantrey. Major Sir William Boleyn, great-grandfather of Queen Elizabeth, is buried on the south side of the presbytery, in the midst of which...
stood the tomb of Bishop Herbert, the founder. Of three circular apsidal chapels two remain; and in one—the Jesus chapel—the ancient colouring has been renewed. Two richly sculptured gateways lead to the cathedral—the Ethelbert gate (1420) and the Ethelbert gate (c. 1300). The bishop's palace and the deanery are buildings of high antiquity, but both have undergone many alterations. The latter has a well-restored chapter house. A beautiful Early Decorated twin in the palace garden, known as "Bishop Salmon's gateway," is supposed to have been the porch to the great hall (c. 1312). The diocese covers nearly all Norfolk, the greater part of Suffolk, and a small part of Cambridgeshire.

Of the remarkable number of churches, over forty in all, St Peter Mancroft is by many esteemed the finest parish church in England. Measuring 212 by 70 ft., it has a richly ornamented tower and flèche, 148 ft. high, with a beautiful peal of twelve bells, a long, light clerestory of thirty-four windows, a fine carved oak roof, a remarkable font cover, and the tomb of Sir Thomas Browne (d. 1682). The majority of the Norwich churches are of Perpendicular flint work, mostly of the 15th century. St Andrew, St Stephen, St Michael Coslany, with the fine Perpendicular Thorpe chapel, St John Maddermarket, St Lawrence, St Giles, with a tower 126 ft. high, St Gregory, St Helen, St Wthin, and St Michael at Plea (so called from the archdeacon's court held here) are also noticeable. The Roman Catholic church of St John the Baptist, begun in 1884 from designs by Sir G. G. Scott, occupies a commanding position outside St Giles's gate. At Carrow, E. of the city, there remain the hall, a decorated doorway, and other fragments of a Benedictine nunnery.

The grammar school is a Decorated edifice, formerly a chapel of St John, of c. 1316, with a "carnary" or crypt below. Among its scholars were Sir Edward Coke, Lord Nelson, Rajo Brooke and George Borrow, the traveller and author, in whose work *Lavengro* (chap. xiv.) occurs a noteworthy description of Norwich. St Andrew's Hall (124 by 64 ft.) is the seven-bayed nave of the Black Friars’ church, rebuilt with the aid of the Epehrings between 1440 and 1470. It is a splendid specimen of Perpendicular work, with its twenty-eight clerestory windows and chestnut hammer-beam roof, and has served since the Reforma- tion as a public hall, in which from 1824 have been held the triennial musical festivals. It was restored in 1863. The guildhall, on the site of an earlier tolbooth, is a fine flint Perpendicular structure of 1408–1413; the mayor's council-chamber, with furniture of the time of Henry VIII., is an interesting specimen of a court of justice of that period. The city regalia, kept here, include several objects of historical interest, amongst them a sword of a Spanish admiral captured by Nelson, with his auto-graph letter to him. The city has a curious figure formerly used in the procession of the mayor elect through the city. Other public buildings include a shire hall, within the castle precincts, corn exchange, agricultural hall, volunteer drill hall, barracks and gable on Mousehold Heath, the Norwich and Norfolk Library, rebuilt in 1900 after a fire, and a theatre. Educational establishments, besides the grammar school, include the Norwich and Ely Diocesan Training College, and the Municipal Technical Institute. The museum in the castle contains collections of British birds, insects, fossils, antiquities, and MSS. and early books. The chief charitable institutions are the Norwich and Norwich Hospital, lunatic asylum, blind asylum and schools. Jenny Lind Infirmary for children, a soldiers' and sailors' institute, St Giles's or old men's hospital (an ancient foundation), and Doughty's Hospital (1867).

The principal industries include foundries and engineering works, iron and wire fence works, brewing, brick works, chemical works, tanneries, and the production of mustard, starch, and crêpe, gauze and lace; and there are large boot and shoe factories. The great cattle market lies below the castle. The municipal, county, and parliamentary boroughs are coextensive. The parliamentary borough returns two members. The city is governed by a lord mayor (this title having been conferred in 1910), 16 aldermen and 48 councillors. Area, 7905 acres.

**History.**—There is no conclusive evidence that Norwich (Northwic, Norvijc) was an important settlement before the coming of the Angles. Caistor-by-Norwich, 4 m. S. of Norwich, is on the site of what was probably a Romano-British country town. A few Roman remains have been discovered in Norwich, itself, but not enough to indicate any real occupation or habitation. According to tradition Uffa made a fortification here about 579, but its history as a royal borough cannot be traced before the reign of Æthelstan (924–940), when it possessed a mint. After being destroyed by the Danes Norwich enjoyed a period of prosperity under Danish influence and was one of the largest boroughs in the kingdom at the Conquest. Ralph de Guader, earl of East Anglia under William I., formed the nucleus of a French borough with different customs from the English, and after his forfeiture, which involved the ruin of many of the old burgesses, a masonry castle was built and the centre ofburghal life gradually transferred to the new community west of it. By 1158, when Henry II. granted the burgesses a charter confirming their previous liberties, the two boroughs seem to have amalgamated. A fuller charter given by Richard I. in 1194 and confirmed by later sovereigns made Norwich a city enjoying the same liberties as London. From Henry IV. the citizens obtained a charter (1402), making their city a county with a mayor and two sheriffs instead of four bailiffs, and Henry V. added twenty-four aldermen and sixty common councilmen (1418). The cathedral precinct became parcel of the city at the Dissolution and in 1556 the neighbouring hamlets were incorporated in the county of Norwich. The charter of Charles II. (1663) remained in force until 1835 when one sheriff was abolished and the number of aldermen, common councilmen and wards diminished. Since 1208 Norwich has been represented in parliament by two members. Two annual fairs, existing before 1332, were formally granted to the city in 1482. One was then held in Lent, the other began on the feast of the Commemoration of St Paul (the 30th of June). These have been succeeded by the Maunday Thursday horse and cattle fair, and the pleasure fairs of Easter and Christmas. The market, which must have existed before the Conquest, was held daily in the 13th century, when divers enclosures staffed by royal licence. Edward III. made Norwich a staple town, and the importance of its trade in wool and worsted dates from his reign.

See *Victoria County History, Norfolk; W. Hudson, Records of the City of Norwich* (1906).

**NORWICH,** a village and the county-seat of Chenango county, New York, U.S.A., on the Chenango river, 42 m. N.E. of Binghamton. Pop. (1910 census), 7422. It is served by the Delaware, Lackawanna & Western and the New York, Ontario & Western railways. The village has three parks, two schools, a public school and a grammar school. The Chenango Valley Memorial Library and the Chenango Valley Home for Aged Women. Norwich is in a dairying and farming region, where hops especially are grown; and there are bluestone quarries in the vicinity. There are a variety of manufactures, and the New York, Ontario & Western has repair shops and division headquarters here. The first settlement was made in 1792, and the village was incorporated in 1857.

**NORWOOD,** a southern district of London, England, partly in Surrey and partly in the county of London (metropolitan borough of Lambeth). The district is hilly and well wooded, hence the name. It is divided into Upper Norwood, and South Norwood, all consisting principally of villa residences and detached houses inhabited by the better classes. Among numerous institutions are almshouses for the poor of St Saviour's, Southwark, opened at South Norwood in 1863, a Jewish convalescent home in 1869, and the Royal Normal College and Academy of Music for the Blind at Upper Norwood in 1872. At Gipsy Hill, Upper Norwood, lived Margaret Finch, queen of the Gypsies, who died in 1749 at the age of 105, and was buried in the churchyard at Beckenham.

Norwich—Ohio, a township in Norfolk county, Massachusetts, about 1 m. S.W. of Boston. Pop. (1900) 5840 (1497 foreign-born); (1910) 8014; area about 10 sq. m. Norwich is served
by the New York, New Haven & Hartford railroad. The township is traversed by the Neponset river. It has the Morrill Memorial Library (12,000 volumes in 1900). Norwood's manufactures include printing-ink and glue factories, tanneries, an iron foundry, and the printing-presses and binderies of J. S. Cushing Co., H. M. Plipton & Co., and the Norwood Press Co. Originally the South or Second Precinct of Dedham, Norwood was incorporated as a township (with the addition of a part of Walpole) under its present name in 1872.

See D. Hamilton Hurd, History of Norfolk County, Massachusetts (Philadelphia, 1864).

Norwood, a city of Hamilton county, Ohio, U.S.A., adjoining Cincinnati on the N. E. Pop. (1900), 6480 (718 foreign-born); (1910) 16,185. It is served by the Baltimore & Ohio South Western and the Cincinnati, Lebanon and Northern railways, and by interurban electric railways. Norwood has various manufactures, but as one of the hill suburbs of Cincinnati it is primarily a place of residence. It has a Carnegie library (a branch of the public library of Cincinnati) and a Catholic maternity hospital. Norwood, originally called Sharpshurg, was settled about 1798, laid out as a town in 1873, incorporated as a village in 1888, and charted as a city in 1903.

Norzagaray, a town of the province of Bulacan, Luzon, Philippine Islands, on the Quingua river, about 25 m. N. by E. of Manila. Pop. (1903), 5131. The inhabitants are engaged chiefly in the cultivation of rice and Indian corn, and in lumbering; good timber grows on the neighbouring mountains, and some iron and gold have been found in this region. Near the town there is a sulphur spring. The language is Tagalog.

Nosairis also known as Ansary, sometimes Ansarray, the people who inhabit the mountainous country of N. Syria, which is bounded on the S. by the north end of the Lebanon at the Naher el-Kbr (Eleutherus), on the N. by Mt Casius, Antioch, and the Naher el-Asi (Orontes). Various settlements of them are found also in Antioch itself and in Tarsus, Adana, and a few other places, while in harvest time they come down as far as the Bis'a (Buka'a). From the time of Strabo until about two centuries ago, the country was famed for its wine, but now more for its tobacco (especially at Latakia). The total number of Nosairi inhabiting this country is variously estimated at from 120,000 to 150,000.

The origin of the name Nosairi is uncertain. Among the more probable explanations is that the name is derived from that of Mahomed ibn Nuqar, who was an Isma'ilite follower of the eleventh imam of the Shiites at the end of the 9th century. This view has been accepted by Nosairi writers, but they transfer Ibn Nuqar to the 7th century and make him the son of the vizier of Mouawiy L, while another tradition (cf. Abulfeda, Geog. vol. ii. p. 11, No. 7) identifies him with Nuqar, a freeman of the city of Basra. The truth of the first is, however, noteworthy that Pliny (Hist. nat. vi. 61) gives the name Nosairi to the inhabitants of this district.

In this part of Syria paganism remained even up to the middle ages (cf. Archives de l'Orient Latin, vol. ii. 2, p. 375), and there is a complete absence of churches of the 4th to the 7th centuries in these mountains. In the 7th century the Arabs invaded Syria, but do not seem to have got into these mountains. At the end of the 10th century, however, the Isma'ili propaganda won some success among the people. Their strongholds were taken by Raymond in 1099, and later Tancred secured the very summits. In 1127-1140 the Assassins (q.v.), gained possession of their chief towns, but Saladin recovered them in 1188. In 1137 the sultan Bilbar endeavoured to convert them to orthodox Islam, and built many mosques, but Ibn Battuta (g. 177) says they did not use them. A fatwa of Ibn Taimiyya (d. 1327) of this time shows that the Nosairis were regarded with fear and hatred by the orthodox. For the next 500 years they were given over to their own internal disputes, until they came under the power of Ibrahim Pasha in 1852. At the present time they are under the direct administration of the Turks.

Religion of the Nosairis seems to have been almost the same in the first years of the 5th century A.D. (11th century A.D.) as it is to-day, judging by the references in the sacred books of the Druses. As set forth in their own sacred book, the Ma'vat, it seems to be a syncretism of Isma'ilite doctrines and the ancient heathenism of Harran. The ages of the world are seven in number, each of these having its own manifestation of deity. But the manifestation of the 7th age is not a Mahdi who is yet to come, but the historical person 'Ali ibn abu Talib. This is stated in the crudest form in Sura 11 of the Ma'vat: "I testify that there is no god but 'Ali ibn abu Talib." 'Ali is also called the Ma'vat ("Idea", cf. the Logos of the New Testament), hence the Nosairis are also called the Ma'awalya. 'Ali created Mahomet, who is known as the Iam ("Name"), and a trinity is formed by the addition of Salman ul-Farisi, who is the Bâb ("Door"), through whom the propaganda is made, and through whom one comes to God. A mysterious symbol much used in their ceremonies of initiation consists of the three letters 'Aim, Mîm, Sîn, these being the initials of 'Ali, Mahomet and Salman. Of these three, however, 'Ali is the supreme. In Sura 6 of the Ma'vat the Nosairi says: "I make for the Door, I prostrate myself before the Name, I worship the Idea." Each of the seven manifestations of God in the ages of the world has been opposed by an adversary.

The Nosairis are divided into four sects. (1) The Haidaris (from the name haidari, "lion," given to 'Ali on account of his valour) are the most advanced. (2) The Shamallis or Shamais preserves many traces of the old nature-worship. 'Ali (i.e. the supreme god) is the heaven, Mahomet is the sun, Salaman the moon. (3) On the other hand the Kalazis, so named from a sheik Mohammed Ibn Kalazi (cf. E. Salisbury in the Journal of the American Oriental Society, xvi. 237), or Qimarais, hold that the supreme god ("Ali) is the moon, not the sun. Their poetry addressed to the moon is translated by C. Huart in the Journal asiatique, ser. vii. vol. xiv. pp. 190 ff. (4) The Ghailbis are worshippers of the air, for God is invisible. In this they come nearer to the ordinary Isma'ilite doctrine. Religion is restricted among the Nosairis to the initiated, who must be adults over fifteen years of age and of Nosairi parentage. The initiator, who must not be a relative, becomes a spiritual father, and the relation cannot be broken except by his consent. The initiation consists of three stages. In the first the novice is received and told to meditate on the three mystic letters; in the second, after a period of forty days, he is taught the titles of the 16 suras of the Ma'vat; in the third, after seven or nine months (intended to correspond with the ordinary period of gestation), he is taught Suras 5, 6 and 9, learns the meaning of the three mystic letters and goes through a further period of instruction from his initiator. The initiated are divided into two classes, the sheiks, who are recruited from the families of sheiks only, and the ordinary members.

The public buildings and the private houses, especially those in the suburbs, are unusually good.


Nosari, or Navsari, a town in India, in the state of Baroda, on the left bank of the Purna river, 147 m. by rail N. of Bombay. Pop. (1901), 21,451. It is an ancient place, known to Ptolemy as Nasaria. It was one of the earliest settlements of the Parsees in Gujarat, after their abandonment from Persia in the 12th century. It is still the home of their nobods, or sacerdotal class, and contains their most venerated "fire temple." Many small industries are carried on, including the weaving of the kusti, or sacred thread of the Parsees. There is also considerable trade both rail and by river, for the river is navigable. The public buildings and the private houses, especially those in the suburbs, are unusually good.
NOSE (O.Eng. nos, cf. Dutch neus, Swed. nos, snout; the connexion with O.Eng. nase is obscure, cf. Ger. Nase, Lat. nasus, nostrils, nasus, nose, Fr. nez), the organ of the sense of smell (q.v.) in man and other animals (see Olfactory System). The projecting feature above the mouth, to which the word is usually restricted in man, is, in the case of the lower animals, called snout or muzzle, or, if much prolonged, proboscis or trunk. “Nostril,” the external opening into the nose, is from O.Eng. noster (“nose”); in modern English it is regarded as obsolete.

NOSOLOGY (Gr. νόσος, disease, and λέγος, science), that branch of medical science which deals with the classification of diseases; the term is applied also to a collection of diseases, and to the special character of a particular disease and the different opinions concerning it.

NOSSA, a town of Germany, in the kingdom of Saxony, pleasantly situated on the Freiberger Mulde, 51 m. S.E. from Leipzig by the railway to Dresden via Döbeln, and at the junction of a line to Moldau. Pop. (1903), 4879. It possesses an ancient castle crowning a height above the river, and has extensive manufactures of boots and shoes, leather and paper. In the immediate vicinity are the ruins of the Cistercian monastery of Altenzella, or Altzella, founded in 1145, and a noted school of philosophy during the 13th-15th centuries. In the chapel, which was built in 1347 and restored in 1577, lie the remains of ten margraves of Meissen, members of the family of Wettin. The foundation was secularized in 1544. The valuable annals, Chronicon vetere Cellense majus and Chronicon minus, giving a history of Saxony during the 13th and 14th centuries, were removed to the university library of Leipzig in 1544. They are printed in Band xvi. of the Monumenta Germaniae historica. scriptores (1859).

See E. Beyer, Das Cisterciensitift und Kloster Alt-Cella (Dresden, 1855).

NOSSI-BE, properly Nösy-bé, i.e., “Great island,” an island about 8 m. off the N.W. coast of Madagascar, in 13° 23′ S., 48° 15′ E. It is 14 m. long by 10 broad, and has an area of 130 sq. m. Nossi-bé is volcanic, the N. and S. parts of older, the central part of more modern date. Besides a number of true volcanic craters (Lökobé, the highest point, is 1486 ft. above the sea) there are numerous crater-lakes level with the ground (see Nature, March 1877, p. 477). The climate is similar to that of Mbayote (see Comoro Islands), and the neighbouring islet of Nossi-komba, about 2000 ft. above the sea, serves for a sanatorium. Pop. (1902), 9291. Hellville, the chief town (so called after De Heil, governor of Réunion at the time of the French annexation), is a port of call for the Messageries Maritimes and a centre for the coasting trade along the western shores of Madagascar. There is excellent anchorage, and a pier 800 ft. long. The soil is very fertile, and there are forests of palms and bamboos. The chief products are coffee, sesame, the sugar-cane, cocoa, vanilla and tobacco. There are numerous sugar factories and rum distilleries.

In 1837 Tsiamékko, chieftainess of one of the numerous divisions of the western Malagasy known under the common name of Sakalava, was expelled by the Hova and fled to Nossi-bé and Nossi-komba. Failing assistance from the imam of Muscat, she accepted French protection in 1840, ceding such rights as she possessed on the N.W. coast of the mainland. The French took possession in 1841, and in 1849 an unsuccessful attempt was made to expel them. The administration was entrusted to a subordinate of the governor of Mayotte until 1866, when Nossi-bé was placed under the administration of Madagascar (q.v.).

NOSTALGIA (Gr. νόστος, return home, and ἀλγός, grief), home-sickness, the desire when away to return home, amounting sometimes to a form of melancholia.

NOSTRADAMUS (1503-1566), the assumed name of Michel de Nortredame, a French astrologer, of Jewish origin, who was born in 1523 in Paris. He was educated at Perigueux on the 13th of December 1503. After studying humanity and philosophy at Avignon, he took the degree of doctor of medicine at Montpellier in 1529. He settled at Agen, and in 1544 established himself at Salon near Aix in Provence. Both at Aix and at Lyons he acquired great distinction by his labours during outbreaks of the plague. In 1555 he published at Lyons a book of rhymed prophecies under the title of Centuries, which secured him the notice of Catherine de’ Medici; and in 1558 he published an enlarged edition with a dedication to the king. The seeming fulfilment of some of his predictions increased his influence, and Charles IX. named him physician in ordinary. He died on the 2nd of July 1566.

The Centuries of Nostredamus have been frequently reprinted, and have been the subject of many commentaries. In 1568 they were condemned by the papal court, being supposed to contain a prediction of the fall of the papacy. Nostradamus was the author of a number of smaller treatises. See Bureest, Nostredamus (Paris, 1840).

NOSTRUM (neuter of Lat. noster, our), the name given to preparations of which the ingredients are not made publicly known, a patent or “quack” medicine; it is taken from the label (“of our own make”) formerly attached to such medicines.

NOTARY, or Notary Public. In Roman law the notarius was originally a slave or freedman who took notes (notae) of judicial proceedings in shorthand. The modern notary corresponds rather to the tabellio or tabularius than to the notarius. In canon law it was a maxim that his evidence was worth that of two unskilled witnesses.

The office of notary in England is a very ancient one. It is mentioned in the Statute of Provisors, 25 Edward III. stat. 4. The English notary is an ecclesiastical officer, nominated, since the Peterpence Dispensations Act 1533-1534, by the archbishop of Canterbury through the master of the faculties (now the judge of the provincial courts of Canterbury and York), in order to secure evidence as to the attestation of important documents. All registrars of ecclesiastical courts must be notaries. A notary’s duties, however, are mainly secular. “The general functions of a notary consist in receiving all acts and contracts which must or are wished to be clothed with an authentic form; in conferring on such documents the required authenticity; in establishing their date; in preserving originals or minutes of them which, when prepared in the style and with the seal of the notary, obtain the name of original acts; and in giving authentic copies of such acts” (Brooke, On the Office of a Notary, chap. iii.). The act of a notary in authenticating or certifying a document is technically called a “notarial act.” In most countries the notarial act is received in evidence as a semi-judicial matter, and the certificate of a notary is probative of the facts certified. But English law does not recognize the notarial act to this extent. An English court will, in certain cases, take judicial notice of the seal of a notary, but not that the facts that he has certified are true, except in the case of a bill of exchange protested abroad.

The most important part of an English notary’s duty is the noting and protest of foreign bills of exchange in case of non-acceptance or non-payment. This must be done by a notary in order that the holder may recover. He also prepares ship protests and protests relating to mercantile matters, and authenticates and certifies copies of documents and attests instruments to be sent abroad. The office of notary is now usually held by a solicitor. In London he must be free of the Scriveners’ Company.

In Scotland, before the reign of James III., papal and imperial notaries practised until the 29th of November 1460, when an act was passed declaring that notaries should be made by the king. It would appear, however, that for some time afterwards there were in Scotland clerical and legal notaries—the instruments taken by the latter bearing faith in civil matters. In 1551 an act was passed directing sheriffs to bring or send both kinds of notaries to the lords of session to be examined; and in a statute, passed in 1555, it was ordained that no notary, “by whatsoever power he be created,” should use the office “except he first present himself to the said lords, showing his creation, and be admitted by them thereto.” It does not appear that this statute was made with the object of making notaries in the court of session; but in 1561 it was by law declared that no person should take on him the office, under the pain of death, unless created by the sovereign’s
special letters, and thereafter examined and admitted by the lords of session. Since then the Court of Session has in Scotland exercised exclusive authority on the admission of notaries in all legal matters, spiritual and temporal. The position of notaries in Scotland is somewhat higher than it is in England.

In the United States, notaries are appointed by the governors of the states, and their authority to act is limited to the state to which they are appointed. They are state officers, and their duties are bound in a certain amount fixed by the government, as well as by affidavits and depositions; all such documents which are intended to be used in the federal courts must have the notarial seal affixed. They also protest bills of exchange, and in some states they have the powers of a justice of the peace.

In France, notaries receive all acts and contracts to which the parties thereto must give or desire to give the authenticity attached to the acts of a public authority; they certify the date, preserve the originals and give copies or duplicates. Notaries are nominated by the president of the republic on the recommendation of the keeper of the seals. They cannot act as notaries or practise as advocates, or hold any magisterial office, nor must they engage in business. Notaries are divided into three classes: those of towns which have a court of appeal; those of towns which have a court of first instance; those of the other towns and communes. The first and second classes can practise wherever the jurisdiction of their courts extends; the third class only in their canton. They must obtain the sanction of the minister of justice should they desire to change from one district to another. They must serve an apprenticeship of six years (with exceptions) to a notary of the class to which they desire to belong. Every notary must have a certain amount fixed by the government as security for the due discharge of his duties. Since 1896 the remuneration of the more important classes of notaries has been regulated by law. Each district has a chamber of notaries, which exercises disciplinary powers over its members.

In Germany, notaries are appointed by the president of the courts of law and the minister of justice in their respective states; they carry on their profession for their own benefit, and do not, except in Württemberg, receive any fixed salary, but take fees from the parties they represent. They may not refuse their services, save on good and sufficient ground. In some German states, notably Saxe-Weimar and Hesse-Darmstadt, there are no notaries. In Württemberg, Baden, Bavaria, Alsace-Lorraine, Rhenish Prussia and Austria, they form a distinct class, while in the other German states they generally combine the notarial office with that of advocate. There is no code of rules for the whole empire, the new Bürgerliches Gesetzbuch leaving it to each state to frame its own regulations.

NOTE (Lat. nota, mark, sign, from nascere, to know), a mark, particularly a sign by which a musical sound (also called a note) is indicated in writing (see also note). It is also applied to an abstract or memorandum of documents, speeches, &c. This appears to have been first in legal use, especially in the processes of the transfer of land by fine and recovery (see Fine). Further extensions of this meaning are to an explanation, comment or addition, added in the margin or at the foot of the page to a passage in a book, &c., or to a communication in writing shorter or less formal than a letter.

The ordinary distinction between note and letter is reversed in diplomacy. Diplomatic notes are written communications exchanged between diplomatic agents or between them and the ministers of foreign affairs of the government to which they are accredited; they differ from ordinary letters in having a more formal character and in dealing with matters of more immediate and definite importance: e.g. the notification of adhesion to a treaty, of the re-establishment of diplomatic relations after a war, &c. Sometimes, by agreement, a mere exchange of notes has the force of a convention. Collective notes are those signed by the representatives of several powers acting in concert. Sometimes identical notes are substituted for collective, i.e. notes identical as to form and substance, but signed and delivered separately by the representatives of the several powers. Thus in 1822, at the congress of Verona, in order to overcome the objection of Great Britain to any interference of the European concert in Spain, identical notes were presented to the Spanish government instead of a collective note. Circular notes are those addressed by one power to the other powers generally, e.g. that addressed by Thiers (November 9, 1870), on the proposed armistice, to the representatives of the great powers accredited to the government of national defence. Confidential notes are directed to inspiring confidence by giving an explicit account of the intentions of the plenipotentiaries and their governments. Such a note was sent, for instance, by the plenipotentiaries of the allied powers at the conference of Poree, on the 8th of December 1828, to Capo d'Istria, the Greek president, to instruct him confidentially as to the results of their deliberations. The so-called notes verbales are unsigned, and are merely of the nature of memoranda (of conversations, &c.). Notes ad referendum are addressed by diplomatic agents to their own governments asking for fresh powers to deal with points not covered by their instructions, which they have had to "refer." Diplomatic notes are usually written in the third person; but this rule has not always been observed (see P. Pradier-Fodere, Cours de droit diplomatique, Paris, 1899; vol. ii. p. 524).

For notes of hand or promissory notes see Negotiable Instruments and Bill of Exchange, and for notes passing as currency see Banks and Banking, Bank-Note and Post.

NOTHOMB, JEAN BAPTISTE, BARON (1805-1881), Belgian statesman and diplomat, was born at Messancy in Luxemburg on the 3rd of July 1805. He was educated at the Atheneaum of Bruxelles and the University of Liége, and was called to the bar when the revolution of August broke out, but was nominated a member of the commission appointed to draw up the constitution. He was a member of the national congress, and became secretary-general of the ministry of foreign affairs under Surlet de Chokier. He supported the candidature of the duke of Nemours, and joined in the proposal to offer the crown to Prince Leopold of Saxe-Coburg, being one of the delegates sent to London. When the Eighteen Articles were replaced by the Twenty-four less favourable to Belgium, he insisted on the necessity of compliance, and in 1839 he faced violent opposition to support the territorial cessions in Limburg and Luxemburg, which had remained an open question so long as Holland refused to acknowledge the Twenty-four Articles. His Essais historique et politique sur la révolution belge (1838) won for him the praise of Palmerston and the cross of the Legion of Honour from Louis Philippe. In 1837 he became minister of public works, and to him was largely due the rapid development of the Belgian railway system, and the increase in the mining industry. In 1840 he was sent as Belgian envoy to the Germanic Confederation, and in 1848 was nommed ambassador of the Leubeu notes, he organized the new cabinet, reserving for himself the portfolio of minister of the interior. In 1845 he was defeated, and retired from parliametary life, but he held a number of diplomatic appointments before his death at Berlin on the 6th of September 1881.

See T. Juste, Souvenirs du baron Notthomb (Brussels, 1882).

NOTICE, a term primarily meaning knowledge (Lat. notitia), as in "judicial notice"; thence it comes to signify the means of bringing to knowledge, as in "notice to quit"; at last it may be used even for the actual writing by which notice is given. The most important legal uses of the word are judicial notice and the equitable doctrine of notice. Judicial notice is the recognition by courts of justice of certain facts or events without proof. Thus in England the courts take judicial notice of the existence of states and sovereigns recognized by the sovereign of England, of the dates of the calendar, the date and place of the sitting of the legislature, &c. The equitable doctrine of notice is that a person who purchases an estate, although for valuable consideration, after notice of a prior equitable right, will not be enabled by getting in the legal estate to defeat that right. On the other hand, a purchaser for valuable consideration without notice of an adverse title is not protected in his enjoyment of the property. Other common uses of the word are notice to quit, i.e. a notice required to be given by landlord to tenant, or by tenant to landlord in order to terminate a tenancy
NOTKER—NOTTINGHAM, EARLS OF

(see LANDLORD AND TENANT); notice of dishonour, i.e. a notice that a bill of exchange has been dishonoured; notice of action, i.e. a notice to a person of an action intended to be brought against him, which is required by statute to be given in certain cases; notice of trial, i.e. the notice given by a plaintiff to a defendant that he intends to bring on the cause for trial; notice in lieu of personal service of a writ, i.e. by advertisement or otherwise; notice given by one party in an action to the other, at a trial, respecting the possession or power; notice to treat, given under the Land Clauses Acts by public bodies having compulsory powers of purchasing land as a preliminary step to putting their powers in force. Notice may be either express or constructive. The latter is where knowledge of a fact is presumed from the circumstances of the case, e.g. notice to a solicitor is usually constructive notice to the client. Notice in some cases may be either oral or written. It is usually advisable to give written notice even where oral evidence is sufficient in law, as in the case of notice to quit. The American use of notice is practically the same as in England.

NOTNER, a name of frequent occurrence in the ecclesiastical history of the middle ages. NOTKER BALBULUS (c. 840–912) was a native of northern Switzerland, and for many years magister in the school of St Gall. He compiled a martyrology and other works, but is famous for his services to church music and for the "sequences" of which he was the composer. He was canonized in 1513. His life is in the Bohllandist Acta Sanctorum, April 6th. NOTKER LARBE (d. June 29th, 1022) was also an instructor at St Gall. His numerous translations, including those of the Old Testament Psalms, the categories of Aristotle, the De natura rerum of Martianus Capella, and the De consolatione of Boethius, into Old High German, may possibly have been the work of his pupils. They possess considerable philological interest, and have been edited by E. G. Graff (Berlin, 1837–1847), and by P. Piper under the title Notker et dea Schriften (1883–1884).


NOTO, a city of Sicily, in the province of Syracuse, and 20 m. S.W. of it by rail, 520 ft. above sea-level. Pop. (1901) 22,564. The present town, rebuilt after the earthquake of 1693, has some fine buildings of the early 18th century. The older town lies 5 m. direct to the north (1378 ft.). It was the ancient Noto, a city of Sicel origin, left to Hiero II. by the Romans by the treaty of 263 B.C. and mentioned by Cicero as a foedere civitas (Verr. v. 51. 133), and by Pliny as Latinae conditionis (H.N. iii. 8. 14). The remains of this city are almost entirely hidden beneath the ruins of the medieval town, except three chambers cut in the rock, one of which is shown, by an inscription in the library at Noto, to have belonged to the gymnasium, while the other two were heroi, or shrines of heroes. But explorations have brought to light four cemeteries of the third Sicel period, and one of the Greek period, of the 3rd and 2nd centuries B.C. There are also catacombs of the Christian period and some Byzantine tombs. See P. Orsi in Notizie degli scavi, 1897, 69–90. Four miles to the S. of Noto, on the left bank of the Tellaro (Helorus) (E. Pais, Ataka, Pisa, 1891, p. 75 seq.) stands a stone column about 35 ft. in height, which is believed to be a memorial of the surrender of Niças. This is uncertain; but, in any case, in the 3rd century B.C. a tomb was excavated in the temple in which it stood and, destroying apparently a pre-existing tomb. The later builders of the town added to the temple of the small town of Heloros, 750 yds. to the S.E., some remains of which have been discovered. It was a small advanced post of Syracuse, belonging probably to the 6th century B.C. See P. Orsi in Notizie degli scavi, 1899, 241.

NOTT, ELPHIALET (1773–1866), American divine, was born on the 25th of June 1773 at Ashford, Connecticut. He was left an orphan without resources, but graduated in 1795 at Brown University. In 1804 he became president of Union College, Schenectady, New York, a position which he held till his death on the 29th of January 1866. He found the college financially embarrassed, but succeeded in placing it on a sound footing. He was also known as the inventor of the first stove for anthracite coal. His publications include sermons, Counsels to Young Men (1610), and Lectures on Temperance (1647). Life by C. van Santvoort (ed. Taylor Lewis, 1876).

NOTT, SIR WILLIAM (1782–1845), English general, was the second son of Charles Nott, a Herefordshire farmer, who in 1794 became an inmate of St. Carmarthen. William Nott was indifferently educated, but he succeeded in obtaining a cadetship in the Indian army and proceeded to India in 1800. In 1825 he was promoted to the command of his regiment of native infantry; and in 1838, on the outbreak of the first Afghan war, he was appointed to the command of a brigade. From April to October 1839 he was in command of the troops left at Quetta, where he rendered valuable service. In November 1840 he captured Khelat, and in the following year compelled Akbar Khan and other tribal chiefs to submit to the British. On receiving the news of the raising of the Afghans at Kabul in November 1841, Nott took energetic measures. On the 23rd of December the British envoy, Sir William Hay Macnaghten, was murdered at Kabul; and in February 1842 the weak and incompetent commander-in-chief, General Elphinstone, sent orders that Kandahar was to be evacuated. Nott at once decided to disobey, on the supposition that Elphinstone was not a free agent at Kabul; and as soon as he heard the news of the massacre in the Khyber Pass, he urged the government at Calcutta to maintain the garrison of Kandahar with a view to avenging the massacre and the outrages which had been committed. Nott having been given a severe defeat on the enemy near Kandahar, and in May drove them with heavy loss out of the Baba Wall Pass. In July he received orders from Lord Ellenborough, the governor-general of India, to evacuate Afghanistan, with permission to retire by Kabul. Nott arranged with Sir George Pollock, now commander-in-chief, to join him at Kabul. On the 3oth of August he routed the Afghans at Ghazni, and on the 6th of September occupied the fortress, from which he carried away, by the governor-general's express instructions, the gates of the temple of Somnath; on the 17th he joined Pollock at Kabul. The combined army recrossed the Sutlej in December. Nott's services were most warmly commended; he was immediately appointed resident at Lucknow, was presented with a sword of honour, and was made a G.C.B. In 1843 he returned to England, where the directors of the East India Company voted him a pension of £1000 per annum. He died at Carmarthen on the 1st of January 1845.


NOTTINGHAM, EARLS OF. The English title of earl of Nottingham has been held by different families, notably by the Mowbrays (1377 to 1475; merged in the Norfolk title from 1397), the Howards (1596–1681), and the Finches (1685; since 1720 united with that of Winchilsea). For the Howard line see the separate article below. Here only the ancestors of the Finch line are dealt with.

HENAGE FINCH (1621–1682), first earl of Nottingham in the Finch line, lord chancellor of England, was descended from an old family (see FINCH, FINCH-HATTON), many of whose members had attained to high legal eminence, and was the eldest son of Sir Heneage Finch, recorder of London, by his first wife Frances, daughter of Sir Edmund Bell of Beaupré Hall, Norfolk. In the register of Oxford university he is entered as born in Kent on the 23rd of December 1621, and probably his native place was Eastwell in that county. He was educated at Westminster and at Christ Church, Oxford, where he remained till he became a member of the Inner Temple in 1638. He was called to the bar in 1645, and soon obtained a lucrative practice. He was a member of the convention parliament of April 1660, and shortly afterwards was appointed solicitor-general, being created a baronet the day after he was knighted. In May of the following year he was chosen to represent the university of
draw your forces round about you like a mighty prince to defend you. Truly, Madam, if you do so, there is no cause for fear."

On the approach of the Armada on the 6th of July 1588, Howard describes thus the disposal of his forces: "I have divided myself here into three parts, and yet we lie within sight of one another, so as if any of us do discover the Spanish fleet we give notice thereof presently the one to the other and thereupon repair and assemble together. I myself do lie in the middle of the channel with the greatest force. Sir Francis Drake hath 20 ships and 4 or 5 pinnaces which lie beyond Ushant and Mr Hawkins with as many more lie towards Scilly." He directed the various engagements (see ARMADA), and stayed himself to conduct the attack on the "San Lorenzo," stranded off Calais, arriving in consequence at the great fight off Gravelines some time after the engagement had begun. His tactics have been criticized both by contemporary and by later authorities, but his position was a perilous one, exposed to an overwhelming force of the enemy, and rendered still more difficult by the queen's untimely economy, Howard himself contributing largely to the naval expenses and to the relief of the numerous seamen poisoned by bad food and landed at Margate. "It were too pitiful to have men starve after such a service." Instead of risking all in a pitched battle with the enemy, a course which probably appealed more to his dashing subordinates, he resolved to pursue the less heroic method of "plucking their feathers little by little," and his prudence, while justified by the result, was served by pursuing the last attack and the forts destroyed; the naval prizes, however, but for this diversion would have been more numerous. The council of war then refusing to countenance any further attempts on land, Howard and Essex returned with the expedition to England. On the 22nd of October 1596 Howard was created earl of Nottingham.

In February 1598, on a scare of an intended invasion, he was ordered to take measures for the defence of the country, and again in 1599, when he was appointed "Lord Lieut.-general of the Tower," and, by the same grant, was also greatly praised by so good a judge as Raleigh. Shortly afterwards, under Howard's directions, a "Relation of Proceedings" was drawn up (now printed in the Navy Records Society Publications, i. 1-18).

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NOTTINGHAM

a staunch Protestant,¹ was commissioner in Surrey for inquiring after recusants,² and in the diocese of Winchester for hearing ecclesiastical causes; he sat on the government commission for discovering and expelling Roman Catholic priests, and was mentioned in 1602 from Douay as one of the three enemies most feared by the recusants.

He served on the commission on the navy in 1618 and of the abuses then exposed, Lord Nottingham, though no blame was attached to himself, being now an old man over eighty years of age, vacated his office of lord high admiral, receiving the sum of £3000 with a pension of £1000, and being granted a special precedence, limited to his person, as earl of Nottingham of the earlier Mowbray creation, and still keeping the lord-lieutenancy of Surrey. He died at Haling House, near Croydon, on the 14th of December 1624, and was buried at Reigate, a monument being afterwards placed to his memory in St Margaret's church at Westminster. He was a striking and almost heroic figure in the Elizabethan annals, an unworthy leader of such men as Drake, Hawkins and Raleigh, the defender of his country at a time of imminent peril, and by his splendid character and services he was placed beyond the reach of the intrigues and jealousies which troubled the reputation of many of his contemporaries and above even the suspicion of ill-doing.

Lord Nottingham married (1), in July 1563, Catherine, daughter of Henry Carey, 1st Lord Hunsdon, cousin to the queen, by whom he had, besides three daughters, two sons—William, who died in his father's lifetime, and Charles (1575-1642), who succeeded as second earl of Nottingham; and (2), Margaret, daughter of James Stuart, earl of Murray, by whom he had two sons, the youngest of whom, on the death of his half-brother without male issue, succeeded as third earl of Nottingham; on his dying childless in April 1681 the earldom became extinct, the barony of Evingham passing to the descendants of the first earl of Nottingham's younger brother, Sir William Howard, from whom the fourth earl of Evingham (creation of 1837) and 14th baron Howard of Evingham (b. 1866), who succeeded in 1868, was descended.

NOTTINGHAM, a city and county of a city, municipal, county and parliamentary borough, and county town of Nottinghamshire, England. Pop. (1901) 230,743. It stands on the left (north) bank of the Trent and its tributary the Leen. It is 125 m. N.N.W. from London by the Midland railway, and is also served by the Great Central and Great Northern railways. Water communications are afforded by the Grantham canal eastward, by the Nottingham and Erewash canals westward, communicating with the Cromford canal in Derbyshire, and by the Trent. The plan of the town is irregular, and the main thoroughfares are generally modern in appearance, many of the old narrow streets having been wholly altered or renewed. About the centre of the town is an open market-place some 52 acres in area, said to be the largest of its kind in England. Nottingham Castle occupies a fine site to the S., on an abrupt rocky hill. The ancient remains are not large, including only a restored Norman gateway and fragments of the fortifications. In 1878 the site was acquired on lease by the corporation, and the building was opened as the Nottingham and Midland Counties Art Museum. The church of St Mary is a fine Perpendicular cruciform structure, with a central tower and a four-light east window in the main's church. But there are traces of an earlier building at St Nicholas' church, near the castle, is a plain building of brick dating from 1676. There are several handsome modern churches, among which is the Roman Catholic cathedral of St Barnabas, from the designs of A. W. Pugin, erected in 1842-1844. There are a large number of Nonconformist places of worship. The principal secular buildings are the guildhall and city sessions court (1887), the shire hall, the Albert Hall and the Exchange; there are two principal theatres, the Theatre Royal and the Empire Theatre. Among educational establishments the principal is University College, for which a fine range of buildings was opened in 1881, containing the free municipal library and the museum of natural history. The free grammar school, founded in 1537, for some time in disuse, was revived in 1807, and on its removal in 1868 to new buildings, became known as the High School. There are also the Nottingham High School for girls; the blue-coat school, founded in 1723; the People's College, founded in 1846; two technical schools; the Congregational Institute; and the Nottingham school of art, for which a fine building was erected in 1865 in the Italian style. The Midland Baptist college was transferred from Chilwell to Nottingham in 1882.

The General Hospital was founded in 1781, and there are the Nottingham and Midland eye infirmary, the county asylum and the Midland institution for the blind. The Arboretum and the Forest are the principal public pleasure-grounds; the county cricket club plays matches on the Trent Bridge ground, and there is a racecourse at Colwick, E. of the city. To the N.W., but within the city boundaries, are the industrial districts of Radford and Basford, beyond which lies Bulwell, with collieries, limestone quarries and earthenware manufactures. Bestwood Park, in the vicinity, contained a hunting lodge of Henry I., being included in Sherwood Forest. To the N., Sherwood is a growing residential district; another extends towards Gedling on the E. Southward, across the Trent, West Bridgford is another large residential suburb. To the W. is Lenton, and Beeston has become a populous suburb mainly owing to the establishment of large cycle and motor works.

Nottingham itself became an important seat of the stocking trade in the latter part of the 18th century. It was here that Richard Arkwright in 1769 erected his first spinning frame, and here also James Hargreaves had the year previously removed with his spinning Jenny after his machine had been destroyed by a mob at Blackburn. Nottingham has devoted itself chiefly to cotton, silk and merino hosiery. Up to 1815 point lace was also an important manufacture. In 1808 and 1809 John Heathcoat obtained patents for machines for making bobbin net, which inaugurated a new era in the lace manufacture. The industries also include bleaching, the dyeing, spinning and twisting of silk, the spinning of cotton and woollen yarn, tanning, engineering and brewing, while cycle works and tobacco factories are important, and the industries have the advantage of the close proximity of coal-mines. Besides the general market there is a large cattle market.

Nottingham received its style of a city and county of a city by letters patent of the 7th of August 1897. The parliamentary borough returns three members to parliament, being divided into W., E. and S. divisions. The city is governed by a mayor, 16 aldermen and 48 councillors. Area, 10,933 acres.

The advantageous position of Nottingham (Snootsgam, Nottingham) on the Trent, where it was crossed by an ancient highway, accounts for its origin, whether in Roman or Saxon times. The Saxon form of the name is taken to refer to the caves, anciently used as dwelling-places, which were hollowed out of the soft sandstone. Examples of these occur in the Castle rock, in the Rock Holes W. of the castle, in the suburb of Sneinton and elsewhere. It was chosen by the Danes for their winter quarters in 868, and constituted one of their five burhs. In 922 it was secured and fortified by Edward the Elder, who in 924 built a second "thor" opposite the first and connected with it by a bridge over the river. Æthelstan, the successor of Edward the Elder, established there a royal mint. In 1013 the town submitted to Sweyn. William I. erected a castle, and mention of a new borough occurs in Domesday Book, and this seems to be the first evidence of the existence of the "French borough" which grew up in Nottingham under the Normans, and was distinguished from the English borough by the different customs which prevailed in it. Parliaments were held at Nottingham in 1334, 1337 and 1357, and it was the scene of the conference of the judges with Richard II. in August 1387. Several important persons have been imprisoned in the castle, among others David II. of Scotland. Edward IV. assembled his troops at Nottingham in 1461; and it was the headquarters of Richard III. before the battle of Bosworth in 1485. In 1642 Charles I. finally broke with

¹ See esp. his letter to Walsingham, Naval Record Soc. Pub. l. 65.
the Parliament by setting up his standard at Nottingham, and during the ensuing Civil War the castle was held by each of the two parties more than once. In 1644 it was dismantled by Cromwell’s orders.

Henry I. granted the first extant charter, which confirmed to the burgesses the liberties they had under Henry I., referred to a market on Saturdays, and forbade the working of dyed cloth, except in Nottingham, within ten leagues of the borough. This was confirmed by John, who also granted a gild-merchant, Henry III. allowed the burgesses to hold the town in free-farm, and Edward I. granted them a mayor and two bailiffs, one to be chosen from each borough. Henry VI. confirmed all preceding privileges, first incorporated the mayor and burgesses, and granted that the town, except the castle and the gaol, should be a county of itself. 2 700 serfs were the two bailiffs. This charter remained, except for temporary surrenders under Charles II. and James II., the governing charter of the corporation until the Municipal Act of 1835.

Nottingham returned two members to parliament from 1295 until 1885, when the number was increased to three. Edward I. granted eight days’ fair in September and a fifteen-days’ fair in November, the last altered by Richard II. to a five-days’ fair in February. Two other fairs were granted by Anne; one large fair, Goose Fair, is still held. This begins on the first Thursday in October and lasts for five days. The market where it is held on Saturdays is held by prescriptive right. Besides the Reform riots of 1831, Nottingham witnessed in 1811 the Luddite disturbances. In 1870 Nottingham was made the seat of a suffragan bishop of the diocese of Lincoln, but as it is now in the diocese of Southwell there is no suffragan bishop.

Nottinghamshire, or Notts, an inland county of England, bounded N.W. by Yorkshire, W. by Derbyshire, S. by Leicestershire and E. and N.E. by Lincolnshire. The area is 5434 sq. m. The N. is included in the great plain of York, and in the extreme N. there is some extent of marshes. The valley of the large Trent, with turns of several miles, is in the S.W. The S.W. between Nottingham and Warsop, the undulations swell into considerable elevations, reaching near Mansfield a height over 600 ft. This district includes the ancient Sherwood Forest (g.v.). Some portions of it are still retained in their original condition, and there are many very old oaks, especially in the portion known as the Dukeries (g.v.). The county generally is finely wooded, although in the E. of the valley of the Soar there is a considerable stretch of wolds. The principal rivers are the Trent, the Erewash, the Soar and the Idle. The Trent, which enters the county near Thoresby on the S.W., where it receives the Erewash from S. and the Soar from the S., flows N.E. past Nottingham and Newark, where it takes a more northerly direction, forming the N. part of the E. boundary of the county till it reaches the Isle of Axholm (Lincolnshire). The Soar forms for a short distance the boundary with Leicestershire, and the Erewash the boundary with Derbyshire. The Idle, which is formed of several streams in Sherwood Forest, flows N. to Batnwy, and then turns E. to the Trent.

Geology.—All formations, from Lower and Middle Coal Measures, overlap unconformably by Permian, to Lower Lias, crop out successively eastward across the county, with a general but slight dip away from the Pennine uplift. The strike of the Carboniferous rocks veers from S. to E. in the S.; that of younger formations is generally parallel. S.W. The Coal Measures, about 3000 ft. thick, continue the Derbyshire Coalfield. A boring at Ruddington proved the lowest measures, underlain by Millstone Grit. Lower and Middle Measures below the important Top Hard Coal, with the Kilburn, Mid Main, Deep Hard and Soft Coals, crop out in the south and along the Erewash Valley; higher strata farther N. All these consist of shale, clay and little sandstone. They contain Carbonicola acuta, C. robusta and Petracolus theodorri, and in the Hard Coal, series of opercula showing essentially non-marine conditions. But several thin marine beds occur. The highest measures, divisible into red Etruria Marls, Newcastle Sandstone, and a red on We-Rode, with a series of coal-free levels, in the Hard Coal, are in the south. A thin basalt breccia, a sandy or marly group, the Magnesian Limestone with Productus horridus and Schizodus obscurus (granular dolomite typically, its uplands and generally in fair condition); the magnesian sandstones of Mansfield and Worksop; red gypseous Middle Marls, an Upper Limestone, and Upper Red Marls, collectively 550 ft. thick in the north of Nottinghamshire, terminate a Permian outcrop continuous from Durham, but isolated by a fault at Northumbria. At the lowest divisions persist so far. The more extensive Trias overlies successively Lower Coal measures, magnesian limestones, and limestone. Its lower sandstones (Bunter, 600 ft. thick, consisting of Lower Red Sandstone with breccias, and Pebble Beds; Keuper Marl at 200 ft. thick, a very sandy red-brown sandstone, glomeratic at the base and containing the fish Semionotus) form an undulating wooded district. Higher red and pale green Keuper Marl, with subordinate sandstones and gypsum, makes a large agricultural extent on the E. The Trent valley below the so-called White Lias, mostly gypseous magnesian sandstones, Black Rhaetic shales succeed with Pteria (Asciola) conoita, Protocardium rhathicum and bone-beds, below light-coloured marls and argillaceous shales. At Worksop, where it joins the Trent and the S.E., one containing Carboniferous and some extraneous boulders probably came with the Pennine ice from the N.W. The upper part, now both high and full, with talk and flint, belongs to the Chalky Boulder Clay of the North Sea ice. Glacial gravel caps the higher ground of the Triassic sandstones. Church Hole, one of the Magnesian Limestone caves of Creswell Crags, yielded remains of cave-lion, bear, mammoth, rhinoceros, &c. Older river-gravels flank the pasture land of the Trent alluvium.

Climate and Agriculture.—As the higher districts of Derbyshire and Yorkshire attract the rain clouds, the climate of Nottinghamshire varies considerably with its southward extent. The mean temperature at Bawtry is 52°.7 in. and at Nottingham 62°3 in. On this account crops ripen nearly as early as in the S. counties. The soil of about 10,300 ft. in area is the chief county, and contains a large part of the Fladen. It is generally over 5 ft. thick, where it inclines to stoniness, and the valley of the Trent, where there is a rich vegetable mould on a stratum of sand or gravel. The land along the banks of the Trent is equally suitable for crops and pasture. The heather and barley industries are old establishments in the county, under 300 acres. Most of the immediate occupants are tenants-at-will. Roughly four-fifths of the total area is under cultivation. A great many farmers, for want of land or capital, raise tobacco, sand and cotton. A large number of hands are employed in machinery works, and the cycle and motor industry of Beeston is important. The manufacture of tobacco and cigars is considerable at Nottingham and Hucknall Torkard.

Communications.—The main line of the Midland railway touches the S.W. border of the county, with an alternative route through the county, and branches thence N. through Hucknall and Mansfield to Worksop, to Newark and Lincoln, from Mansfield to Southwell and Newark, &c. The main line of the Great Eastern railway serves Newark and Retford, with a branch to Nottingham and local lines in that vicinity. A branch of the Great Central railway, entering the county at Ashford in the Forest (1906), and the main line of the Loughborough, Derbyshire and East Coast railway, enters the county on the W. from Chesterfield, and crosses the Dukeries by Olterton to Dukeries Junction (G.N.R.) and Lincoln. The Sheffield-Grimby line of the Great Central crosses the N. of the county by Worksop and Retford. The Trent is navigable throughout the county, and the Idle between Bawtry and the Trent. The principal canals centre upon Nottingham.

Population and Administration.—The area of the ancient county is 530,756 acres, with a population in 1901 of 514,578. The area of the administrative county is 540,123. The county contains the city and county and municipal borough of Nottingham (pop. 239,743), and the municipal boroughs of Retford or East Retford (12,340), Mansfield (21,443) and Newark (14,092). The urban districts are Arnold (8757), Beeston (8060), Carlton (10,641), Eastwood (4813), Hucknall Torkard (15,250), Hucknall under Huthwaite (4076), Kirkby in Ashfield (16,318), Mansfield West Bridgford (4873), Retford (4378), Sinfin (4893), Southwell (5718), West Bridgford (18,001), Worksop (16,112). For parliamentary purposes the ancient county is divided into four divisions (Bassetlaw, Newark, Rushcliffe and Mansfield), each returning one member; and the parliamentary borough of Nottingham returns one member for each of its three divisions. There are one court of quarter sessions and seven petty sessional divisions. The boroughs of Newark and Nottingham have separate commissions of the peace, also separate courts of quarter sessions;
that of East Retford has a separate commission of the peace. The total number of civil parishes is 266. The ancient county contains 231 ecclesiastical parishes and districts, wholly or in part; it is situated principally in the diocese of Southwell and partly in the diocese of York.

The 17th-century settlers in the district which is now Nottinghamshire were an Anglian tribe who, not later than the 5th century, advanced from Lincolnshire along the Fosseway, and, pushing their way up the Trent valley, settled in the fertile districts of the S. and E., the whole W. region from Nottingham to within a short distance of Southwell being then occupied by the vast forest of Sherwood. At the end of the 6th century Nottinghamshire already existed as organized territory, though its W. limit probably extended no farther than the Saxons relics discovered at Oxton and Tuxford. Nottingham after the Conquest became one of the first Danish boroughs. On the break-up of Mercia under Hardicanute, Nottinghamshire was included in the earldom of the Middle English, but in 1049 it again became part of Leofric's earldom of Mercia, and descended to Edwin and Morkere. The first mention of the shire of Nottingham occurs in 1016, when it was harried by Canute. The boundaries have remained practically unaltered since the time of the Domesday Survey, and the eight Domesday wapentakes were unchanged in 1610; in 1719 they had been reduced to six, their present number, Oswaldbeck being absorbed in Bassetlaw, of which it formed a part. The most interesting historic figure in the district is Edward I., who was born at Newark in 1284. Nottinghamshire was originally included in the diocese and province of York, and in 1091 formed an archdeaconry comprising the deaneries of Nottingham, Newark, Bingham and Retford. By act of parliament of 1836 the county was transferred to the diocese of Lincoln and province of Canterbury, with the additional deanery of Southwell. In 1878 the deaneries of Mansfield, South Bingham, West Bingham, Collingham, Tuxford and Worksop were created, and in 1884 most of the county was transferred to the newly-created diocese of Southwell, the deaneries being unchanged. The deaneries of Bawtry, Bulwell, Ollerton, East Newark and Norwell were created in 1888. Until 1568 Nottinghamshire was united with Derbyshire under one sheriff, the courts and tourns being held at Nottingham until the reign of Henry III, when with the assizes for both counties they were removed to Derby. In the time of Edward I. the assizes were again held at Nottingham, where they are held at the present day. The Peveril Court, founded before 1113 for the recovery of small debts, had jurisdiction over 127 towns in Nottinghamshire, and was held at Nottingham until 1321, in 1356 at Algarthorpe and in 1700 at Lenton, being finally abolished in 1540.

The political history of Nottinghamshire centres round the town and castle of Nottingham, which was seized by Robert of Gloucester on behalf of Maud in 1140, captured by John in 1191; surrendered to Henry III. by the rebellious barons in 1264; formed an important station of Edward III. in the Scottish wars; and in 1397 was the scene of a council where three of the lords appellant were appealed of treason. In the Wars of the Roses the county was a whole favoured the Yorkist cause, Nottingham being one of the most useful stations of Edward IV. In the Civil War of the 17th century most of the city and county was in support of the Royalist cause, though the castle was garrisoned for the parliament, and in 1651 was ordered to be demolished.

Among the earliest industries of Nottinghamshire were the melting and woolen industries, which flourished in Norman times. The latter declined in the 16th, and was succeeded by the hosiery manufacture which sprang up after the invention of the stocking-loom in 1580. The earliest evidence of the working of the Nottinghamshire coalfield is in 1590, when Queen Eleanor was unable to remain in this county on account of the scarcity of coal (see Nottingham, 1890). The earliest other industry was heard of in Nottinghamshire in the 17th century, but in 1620 the justices of the peace for the shire report that there is no fear of scarcity of corn, as the counties which send up the Trent for coal bring corn in exchange, and in 1883 thirty-nine collieries were at work in the county. Hops were formerly extensively grown, and Worksop was famous for its liquorice. Numerous cotton-mills were erected in Nottinghamshire in the 18th century, and there were silk-mills at Nottingham. The manufacture of tambour lace existed in Nottinghamshire in the 18th century, and was facilitated in the 19th century by the cheapness of machine-made net. From 1205 the county and town of Nottingham each returned two members to parliament. In 1572 East Retford was represented by two members, and in 1672 Newark—upon-Trent also. Under the Reform Act of 1832 the county returned four members in two divisions. By the act of 1885 it returned four members in four divisions; Newark and East Retford were disfranchised, and Nottingham returned three members in three divisions.

Antiquities.—At the dissolution of the monasteries there were no relics, and no objects of devotion, of which Nottinghamshire was. The only important monastic remains, however, are the priory at Newark, but the building is partly transformed into a mansion which was formerly the residence of Lord Byron (see Hucknall Torkard). There are also traces of monastic ruins at Beavuale, Mattersey, Radford and Thurgarton. The finest parish church in the county is that of Newark. The churches of St Mary, Nottingham, and of Southwell were collegiate churches; Southwell, now a cathedral, is a splendid building, principally Norman. The churches of Balderton, Bawtry, Hoveringham, Mansfield and Worksop are also partly Norman, and those of Coddington, Hawton and Upton St Peter near Southwell, Early English. None of the old castles, the principal remains are those at Newark, but there are several interesting old mansions, as at Kingshaugh, Scruby, Shelford and Southwell. Wollaton Hall, near Nottingham, is a fine old building (c.1580). The finest residences of more modern date are Welbeck and others in the Dukeries (q.v.).


NOUMENON (Gr. θυμήμα, a thing known, from νοέμαι, a philosophical term put into currency by Kant and not much used except in definite reference to his doctrine. In the Kantian system the term "noûmena" means things-in-themselves as opposed to "phenomena" or things as they appear to us. According to Kant the human mind is such that it can never penetrate by its speculative powers to things-in-themselves, but can only know phenomena. Thus we have the odd position that noûmena, or the contents of the intelligible world, are just things to which thought can never penetrate. The term, however, is a relic of the Kantian mental development. In his fully mature or critical position he held that the noûmenal world was inaccessible to the speculative reason, and yet that we are not altogether excluded from it, since the practical reason, i.e. our capacity for acting as moral agents, assures us of the existence of a noûmenal world wherein freedom, God and immortality have a real place. The relation of noûmena to phenomena in the Kantian system is a most difficult one; and, in view of the fact that the acute intellects of Europe have been engaged vainly for more than a century in reconciling the various passages on the subject, the safest conclusion is that they are irreconcilable. The course adopted by Kant's immediate successors in German idealism was to reject the whole conception of noûmena, for the reason that what is essentially unknowable has no existence for our intelligence. Kant, however, protested
strongly against this development when it was propounded by Fichte, and held that he had precluded it by his "refutation of idealism": he stood unshakably to the belief in an absolutely real world behind phenomena. Kant's position may be illogical as he himself stated it; but it is the expression of a sound principle: we must connect it with his general tendency to recognize the dynamic side of things. He saw, what so many of his successors failed to see, that the world as we know it is an expression of power; and he could not imagine whence the power could come if not from a world beyond phenomena. (See Kant; Phenomena.)

NOVALICHES, MANUEL PAVIA Y LACY, 1st MARQUIS DE (1814-1866), Spanish marquis, was born at Granada on the 6th of July 1814. He was the son of Colonel Pavia, and after a few years at the Jesuit school of Valencia he entered the Royal Artillery Academy at Segovia. In 1833 he became a lieutenant in the guards of Queen Isabella II., and during the Carlist War from 1833 to 1840 he became general of division in the latter year at the early age of twenty-six. The Moderate party made him war minister in 1847, and sent him to Catalonia, where his efforts to put down a Carlist rising were not attended with success. He had been a senator in 1845, and marquis in 1848. He was sent out to Manila in 1852 as captain-general of the Philippine Islands. In April 1854 he crushed with much sternness a formidable insurrection and carried out many useful reforms. On his return to Spain he married the countess of Pini-Franch, a daughter of the Duke of Cadiz. He landed the next year in Madrid and in January 1855. The Restoration made the marquis de Novaliches a senator, and the new king gave him the Golden Fleece. He died in Madrid on the 22d of October 1866.

NOVALIS, the pseudonym of FRIEDRICH LEOPOLD, FREIHERR VON HARDENBERG (1772-1801), German poet and novelist. The name was taken, according to family records, from an ancestral estate. He was born on the 2nd of May 1772 on his father's estate at Oberwiederstedt in Prussian Saxony. His parents were members of the Moravian (Herrnhuter) sect, and the strict religious training of his youth is largely reflected in his literary works. From his boyhood he was devoted to politics and the liberal studies of philosophy, to the university of Jena, where he was befriended by Schiller. He next studied law at Leipzig, where he formed a friendship with Friedrich Schlegel, and finally at Wittenberg, where, in 1794, he took his degree. His father's cousin, the Prussian minister Hardenberg, now offered him a government post at Berlin; but the father feared the influence upon his son of the loose-living statesman, and sent him to learn the practical duties of his profession under the Kreissamtmann (district administrator) of Tennstedt near Langensalza. In the following year he was appointed director of the Tennstedt grammar school in Weissenfels, of which his father was director. His grief at the death in 1797 of Sophie von Kühn, to whom he had become betrothed in Tennstedt, found expression in the beautiful Hymnen an die Nacht (first published in the Athenäum, 1800). A few months later he entered the Mining Academy of Freiberg in Saxony to study geology under Professor Abraham Gottlob Werner (1750-1817), whom in the fragment Die Lehrbue in Sais he immortalized as the "Meister." Here he again became engaged to be married, and the next two years were fruitful in practical Judentum. In the autumn of 1799 he read at Jena to the admiring circle of young romantic poets his Geistliche Lieder. Several of these, such as "Wenn alle untreu werden," "Wenn ich ihn nur habe," "Unter tausend frohen Stunden," still retain, as church hymns, great popularity. In 1800 he was appointed Amtshauptmann (local magistrate) in Thuringia, and was preparing to marry and settle, when pulmonary consumption rapidly set in, of which he died at Weissenfels on the 25th of March 1801.

His works were issued in two volumes by his friends Ludwig Tieck and Friedrich Schlegel (2 vols. 1802; a third volume was added in 1840). There are found among the part fragments, of which Heinrich von Ofterdingen is a unfinished preparatory sketch. It was undertaken at the instance of Tieck, and reflects the ideas and tendencies of the older Romantic School, of which Hardenberg was a leading member. Heinrich von Ofterdingen's search for the mysterious "blue flower" is an allegory of the poet's life set in a romantic medieval world. Novalis, however, did not succeed in blending his mystical and philosophical conceptions into a harmonious whole. The "fragments" contain idealistic though paradoxical views on philosophy, art, natural science, mathematics, &c.

There are editions of his collected works by C. Meissner and B. Wille (1898), by E. Heillberg (5 vols., 1901), and by J. Minor (4 vols., 1907), Heinrich von Ofterdingen was published separately by J. Schmidt in 1876. Novalis's Correspondence was edited by J. M. Reihl in 1860. See R. Haym, Die romantische Schule (Berlin, 1870; A. Schubart, Novalis' Leben, Dichten und Denken (1887); C. Busse, Novalis' Lyrik (1898); J. Bing, Friedrich von Hardenberg (Hamburg, 1890), E. Heillberg, Friedrich von Hardenberg (Berlin, 1901). Carlyle's fine essay on Novalis (1829) is well known.

NOVARA, a town and episcopal see, of Piedmont, Italy, capital of the province of Novara, 31 m. by rail W. of Milan, 538 ft. above sea-level. Pop. (1905) 96,632, of whom 48,604 (commune). Railways diverge hence to Varallo Sesia, Orta, Arona (for Domodossola), Busto Arsizio, Milan, Vigevano and Vercelli. Previous to 1839 Novara was still surrounded by its old Spanish ramparts, but it is now an open, modern-looking town. Part of the old citadel is used as a prison. The cathedral dates from the 4th century (?), but, with the exception of the octagonal dome-roofed baptistery belonging to the first part of the 10th century, and separated from the west end by an atrium) was rebuilt between 1860 and 1870 after designs by Antonelli; the church of S. Gaudenzio, dedicated to Bishop Gaudentius (d. 417), who is buried under the high altar, rebuilt by Pellegrino Tibaldi about 1570, has a baroque campanile and a dome 396 ft. high, the latter added by Antonelli in 1875-1878; and San Pietro del Rosario is the church in which the papal anathema was pronounced against the followers of Fra Dolcino. The two first contain pictures by Gaudenzio Ferrari. The city also contains handsome market-buildings erected in 1817-1842, a large hospital dating from the 9th century and a courthouse constructed in 1346. The town has also a museum of Roman antiquities. In the canton are a wind-wheel, which is turned by wind or water, for spinning silk; there are also iron-works and foundries, cotton mills, rice-husking mills, organ factories, dye-works and printing works.

Novara, the ancient Novaria, according to Pliny a place of Celtic origin, according to Cato (but wrongly) of Ligurian origin, was a municipal city, and lay on the road between Vercellae and Mediolanum. Its rectangular plan may well be a survival of Roman days. Dismantled in 306 by Maximus for siding with his brother Constantine, it was restored by Justinius, but was afterwards ravaged by Radagaisus (409) and Attila (453). A dukedom of Novara was constituted by the Lombards, a countship by Charlemagne. In 1110 the city was taken and burned by the emperor Henry V. Before the close of the 12th century it accepted the protection of Milan, and thus passed into the hands, first, of the Visconti, and, secondly, of the Sforzas. In 1566 the city, which had long before been ceded by Maria Visconti to Amadeus VIII. of Savoy, was occupied by the Savoy troops. At the peace of Utrecht it passed to the house of Austria with the duchy of Milan; but, having been occupied by Charles Emmanuel of Savoy in 1734, it was granted to him in the following year. Under the French it was the chief town of the department of Agogna. Restored to Savoy in 1814, it was in 1821 the scene of the defeat of the Piedmontese by the Austrians, and in 1849 of the more disastrous battle which led to the abdication
NOVA SCOTIA

Charles Albert and an Austrian occupation of the city. The painter Gaudenzianni Ferrari was a native of Novara; and so was Peter Lombard.

NOVA SCOTIA, a province of the Dominion of Canada, lying between 43° 25' and 47° N. and 60° 25' W. and 66° 25' W., and composed of the peninsula provinces and the adjoining lands. Along the N.E. Cape line abound.s in the mainland by the Strait of Canos. The extreme length from S.W. to N.E. is 374 m. (N.S. 268, C.B. 196); breadth 60 to 100 m.; area 21,428 sq. m. The isthmus of Chignecto, 11½ m. wide, connects it with the province of New Brunswick.

Physical Features.—Nova Scotia is intersected by chains of hills. The Cobequid Mountains, stretching from E. to W. and terminating in Cape Chignecto, form the chief ridge. Several of the elevations are as high as 1100 ft., and are cultivable almost to their summits. Lying along each side of the range are two extensive tracts of arable land. A ridge of precipices runs for 130 m. along the Bay of Fundy from Brier Island at the farthest extremity of Digby Neck and culminates in Caper Split and Blomidon. Here and there rocks, from 200 to 600 ft. in height and covered with stunted firs, overhang the coasts. Beyond them lies the garden of Nova Scotia, the valley of the Annapolis. The Atlantic coast from Cape Canso to Cape Sable is high and bold, containing many excellent harbours, of which Halifax (Chebucto Bay) is the chief. The N. shore is, as a rule, low, with hills not exceeding 300 ft. In its harbours the Atlantic Ocean, the most constant is Pictou. Of the inlets the nearest to the interior is Minas Basin, the eastern arm of the Bay of Fundy; it penetrates some 60 m. inland, and terminates in Cobequid Bay, where the tides rise sometimes as high as 53 ft., while on the opposite coast, in Halifax Harbour, the spring tides scarcely exceed 7 or 8 ft. The height of the Fundy tides has, however, been oftentimes exaggerated, the average being 42-3 ft. Many islands occur along the coast, particularly on the S.E.; of these the most celebrated is Sable Island (q.v.). The rivers are, with few exceptions, navigable for coasting vessels for from 2 to 20 m. The principal are the Annapolis, Avon, Shubenacadie, the East, Middle and West rivers of Pictou, the Musquodoboit and the Lahave. The largest of the fresh-water lakes is Lake Rossignol, situated in Queen's county, and more than 20 m. long. Ship Harbour Lake, 15 m. in length, and Grand Lake are in Halifax county.

Geology.—The Lower Cambrian formation forms an almost continuous belt along the Atlantic coast, varying in width from 10 to 75 m. and covering an area estimated at 800 sq. m. It is interrupted by the trap beds of the Cape Breton and Canso series, S.W. of the province as far as Halifax, and cropping out in detached areas as far as Cape Canso. This part of the province is rugged and stony, the surface being covered with large boulders. Another belt extends a Carboniferous area, including two large and productive coal-fields in Cumberland and Pictou counties, and continued in the coal-fields of Cape Breton. On the S. coast of the Bay of Fundy, and at Minas Basin and Channel, the Triassic Red Sandstone formation predominates, more or less protected by a narrow rim of trap rock, culminating at its E. end in the basaltic promontory of Blomidon (Blow-me-down). The Cobequid Mountains are composed of slates, quartzites and intrusive rocks (apparently Siluro-Cambrian). At the junctions, near Cape Chignecto, occurs a splendid exposure, rich in curious minerals and fossils, and very celebrated among geologists.

Climate.—The climate of Nova Scotia is cooler and less temperate than that of New Brunswick, and more equable than that of the inland provinces, though not so dry. Spring and winter begin about a fortnight later than in Ontario. Dense fogs often drift in from the Atlantic, but are not considered unhealthy.

Most of the principal birds of North America are to be found, and the game of the country includes moose, caribou, duck, teal, goose, wren, pheasant, snipe, plover, &c. The game laws are strict and well enforced. The chief wild animals are bears, foxes and wildcats. Wolves, once numerous, are now extinct. The natural flora does not differ greatly from that of the New England states, though it lacks the lower, or trailing arbutus (Epigaea repens), grows extensively, and has long been the provincial emblem.

Population.—The population increases slowly, having risen only from 400,572 in 1881 to 450,574 in 1901, an average of 21-8 to the square mile (total area, 21,428 sq. m.). The rural population is grouped along the river valleys, and the natural increase is normal, but there is a large emigration to the manufacturing cities of the E. states and to the Canadian N.W. The great mass of the people are of British descent, but in parts of Cape Breton are found descendants of the early French settlers; in Lunenburg and the S.E. is a large German colony; near Halifax are a number of negroes from the West Indies, and scattered throughout the province are a few Micmac Indians, who now confine themselves chiefly to the making of baskets and trinkets; though they carry on a certain amount of mixed farming. Few are of absolutely pure Indian blood. The settlers of English and Scotch descent are about equal in numbers, but the latter have been more prominent in the development of the province. The Irish are found chiefly in Halifax and in the mining towns of Cape Breton. Roman Catholics, Presbyterians and Baptists predominate, though the Church of England is strong in Halifax, and still retains a certain social prestige.

Administration.—The executive authority is in the hands of a lieutenant-governor appointed for five years by the federal government, and of a council appointed from and responsible to the local legislature. This consists of a lower house of assembly, and of a legislative council of twenty life members, which the assembly has frequently, but in vain, endeavoured to abolish. The municipal system was introduced subsequent to federation, and is modelled on that of Ontario.

The revenue is chiefly made up of the Dominion subsidy (see Ontario), and of royalties on mining concessions, chiefly those on coal. Owing to the great increase of mining in Cape Breton, the latter revenue is larger in proportion than those of the mainland.

Education.—Primary education is free and compulsory; secondary education is also free but optional. In each county one high school is raised to the rank of an academy, free to all qualified students in the county, and receives an additional grant. Roman Catholics have not the right of separate schools, as in Ontario, but in Halifax and other districts where that church is strong, a compromise has been arranged. Thus the two Roman Catholic colleges, St Francis Xavier (English) at Antigonish, and St Anne (French) at Church Point (see Catholic Church), and the convent (nuns) of St Anne, constitute the public school system. There are also many private schools, chiefly for girls, and under denominational control. But while primary and secondary education is widespread and of good quality, higher education has suffered from denominational bickerings, and the universities are still too many and too small. They are: King's College, Windsor (Anglican), founded in 1790; Acadia University, Wolfville (Baptist, 1839); St Francis Xavier, Antigonish (Roman Catholic, 1866); and Dalhousie University, Halifax (Undenominational), established by charter in 1812, reorganized in 1865, the largest and the most efficient, possessing faculties of arts, science, law, engineering and medicine, a botanical garden, a large library, a school of agriculture and of horticulture at Truro, and has voted $100,000 for a College of Technology at Halifax.

Fisheries.—The fisheries of Nova Scotia are the most important in Canada, and the value of their products ($7,841,502 in 1904) is about one-third that of the whole Dominion. Lobsters, cod and mackerel constitute the bulk of the catch. Many boats are also fitted out in Lunenburg, Digby, Yarmouth and other ports for the Grand Banks of Newfoundland. A bounty is paid by the Dominion government, and attempts are being made to introduce more scientific methods among the fishermen. The vessels are manned by over 25,000 men, and many more are employed in the lobster canneries and kindred industries. Trout and salmon abound in the inland lakes and streams.

Lumbering was long the chief industry of the province, and is still very important, though the percentage of forest left uncult is only about 30%. The network of small lakes and rivers enables the timber to be brought down to the ports, where the lumbering is now reported. The chief export is that of spruce deals, almost entirely from Halifax. The manufacture of wood-pulp for paper is also carried on.

Bituminous coal is mined in various parts of Cape Breton (q.v.) and in the counties of Cumberland and Pictou. The seams dip at a low angle, and are of great thickness, especially in Pictou county. The total product exceeded 60,000,000 tons in 1904, and the coal is chiefly used in the manufacture of cement in the United States. Other
important centres are Springhill, Acadia Mines, Stellarton and Glace Bay (C.B.). It is shipped as far west as Montreal, and to the New England states. Iron is largely produced, chiefly in the vicinity of the Cumberland and Pictou coal-fields. The deposits include magnetite, red haematite, specular, limonite and carbonates ores. Blast furnaces are in operation, especially at New Glasgow, Sydney and North Sydney, though most of the ore used at Sydney is imported from Newfoundland. The quarries of easily worked limestone, the product of which is used as a "flux" in the blast furnaces, add to the value of the iron deposits. Gold occurs in workable quantities in the quartz all along the Atlantic coast, and several small but successful mining enterprises are in operation, yielding about $500,000 annually. Large deposits of gypsum occur, especially at Windsor in Hills county. Manganese and copper are also worked on a small scale.

**Agriculture.**—The attention paid to lumbering, fishing and shipping, and the subsequent emigration westwards have lessened the importance of this industry. Mixed farming is however largely carried on, and of late years dairy farming has been greatly extended and improved, and much butter and cheese is exported to England. Both the Dominion and the provincial governments have endeavoured to introduce scientific methods. Nova Scotia ranks second to Ontario in its production of apples and peaches. The centre of this industry is the valley of the Annapolis, where, it is said, one "may ride for fifty miles under apple-blossoms." At the head of the Bay of Fundy and on Minas Basin the low-lying meadows produce splendid crops of hay. Owing to high Fundy tides, the air in the neighbourhood is constantly in motion, the result being a cool temperature, even in the height of summer, which is well fitted for stock-raising.

**Roads and Railroads.**—Road-making machines are employed for the improvement of the ordinary highways, and steel bridges are replacing the wooden structures; but the roads in the country districts still leave much to be desired. The Intercolonal railway, owned and worked by the Dominion government, is the chief means of communication with the other provinces, and for the carriage of local traffic. Besides the main line from Halifax to Amherst, a branch runs from Truro to Sydney, and another from Oxford Junction to Pictou and Stellarton. The Canadian Pacific railway has running rights over it from St John (N.B.) to Halifax; on its completion, similar rights will be granted from Moncton to Halifax to the Grand Trunk Pacific. The Dominion Atlantic railway extends from Windsor Junction, near Halifax, to Yarmouth; the Nova Scotia Central railway from Lunenburg to Middleton on the Dominion Atlantic railway. A line along the Atlantic coast connects Halifax and Yarmouth, whence a daily line of steamers sails for Boston. Other lines connect Halifax with a number of the S.W. coast and inland towns, and a line has been projected from New Glasgow to Guysborough and the coast. Several smaller lines are owned by the various coal-mining companies. Telegraph and telephone lines extend all over the province, and there are two cable stations—one at Canso and the other at Sydney. The Marconi Company has stations for wireless telegraphy at Halifax, Cape Sable, Sable Island and Glace Bay.

**History.**—Nova Scotia may well have been the Markland of early Norse and Icelandic voyages, and Cape Breton was visited by the Cabots in 1497-1498, but not till 1604 was any attempt at permanent colonization made by Europeans. In that year an expedition was headed by a Frenchman, Pierre de Guaust, Sieur de Monts (1560-1630), who had received from Henry IV. full powers to explore and take possession of all lands in North America lying between the 40th and 46th parallels of north latitude. De Monts and his friend de Poutrincourt (d. 1615), endeavoured to form settlements at Port Royal (now Annapolis), St Croix (in New Brunswick) and elsewhere, but quarrels broke out with the Jesuits, and in 1613 the English colonists of Virginia made a descent upon them, claimed the territory in right of the discovery by the Cabots, and expelled the greater part of the inhabitants. In 1621 Sir William Alexander obtained from James I. a grant of the whole peninsula, which was named in the patent, Nova Scotia, instead of Acadia, the old name given to the colony by the French. During the reign of Charles I. the still existing order of Baronets of Nova Scotia was instituted, and their patents ratified in parliament. The treaty of St Germain-en-Laye (1632) confirmed France in the possession of Acadia, Cape Breton and New France; but fierce feuds broke out among the French settlers, and in 1654 a force sent out by Cromwell took possession of the country, but by the treaty of Breda (1667) it was restored to France by Charles II. Continual
fighting went on between the French and the British colonists of New England, the Indians taking part, usually on the side of the French; in 1710 the province was finally captured by Great Britain and ceded to her in 1713 by the treaty of Utrecht, under the Faubourg d'Acadie or Nova Scotia," the French retaining the boundaries of the district ceded; the English claim comprised the present Nova Scotia, Prince Edward Island, most of New Brunswick and the Gaspé peninsula, while the French restricted it to the S. half of what is now Nova Scotia. In 1749 Halifax was founded as a counterpart to Louisbourg in Cape Breton, and over 4000 colonists sent out, but the French opposed the new settlers. In 1755 about 6000 French were suddenly seized by Governor Charles Laurence (d. 1760) and hurried into exile. After a short suffering the prisoner was sent back, while others settled in Cape Breton, or in distant Louisiana. By the treaty of Paris in 1763, France resigned all claim to the country. In 1769 Prince Edward Island (formerly Isle St Jean) was made a separate government. Meanwhile, immigration from the New England colonies had filled the fertile meadows left vacant by the Acadians. A later influx of American Loyalists led in 1784 to the erection of New Brunswick into a separate colony. In the same year, Cape Breton was also separated from Nova Scotia but reunited in 1820.

During the wars of the American and French revolutions in 1775-1783, the Acadians were expelled. Hitherto, in June 1813, came the "Shannon" with her prize the "Chesapeake," captured off Boston harbour. Meanwhile, between 1784 and 1828, a large Scottish emigration, chiefly from the Highlands, had settled in the counties around Pictou, and the lumbering industry rose to great proportions. Agriculture was for some time neglected, but in 1818 the letters of "Agricult" (John Young, 1773-1837) gave it an impetus. Representative institutions had been granted as early as 1758, but power long rested mainly in the hands of a Council of Twelve, comprising the chief justice, the Anglican bishop and other high officials. On the 25th of July, 1848, the provincial government was won by the legislative assembly, led by Joseph Howe. In these political struggles, education was often the battle-ground, the fight ending in 1864 in the establishment of free primary and secondary schools by Dr (afterwards Sir Charles) Tupper, and the reorganization on an undenominational basis of Dalhousie University (see HALIFAX). In 1867 the province entered the new Dominion of Canada. For some years afterwards an agitation in favour of recall was maintained, but gradually died away. Since then its history is a record of uneventful progress.

**NOVATIANUS.** Roman presbyter, and one of the earliest antipopes, founder of the sect of the Novatians or Novatians, who was born about the beginning of the 3rd century. By the authority of Philostorgius (H.E. viii. 15) he has been called a native of Phrygia, but perhaps the historian merely intended to indicate the persistence of Novatianism in Phrygia at the time when he wrote. Little is known of his life, and that only from his opponents. His conversion is said to have taken place after an intense mental struggle; he was baptized by sprinkling, and without episcopal confirmation, when in hourly expectation of death; and on his recovery his Christianity retained all the gloomy character of its earliest stages. He was ordained at Rome by Fabian, or perhaps by an elder bishop; and during the Decian persecution he maintained the view which excluded from ecclesiastical communion all those (lapsi) who after baptism had sacrificed to idols—a view which had frequently found expression, and had caused the schism of Hippolytus. Bishop Fabian suffered martyrdom in January 250, and, when Cornelius was elected his successor in March or April 251, Novatian objected on account of his known laxity on the above-mentioned point of discipline, and allowed himself to be consecrated bishop by the minority who shared his views. He and his followers were, however, suffered by the synod held at Rome in October of the same year. He was excommunicated (1) on 25th March; (2) at the Easter meeting; (3) after the death of Valerian. After his death the Novatians spread rapidly over the empire; they called themselves καθαροί, or Puritans, and rebaptized their converts from the Catholic view. The eighth canon of the council of Nice provides in a liberal spirit for the readmission of the clergy of the καθαροί to the Catholic Church, and the sect finally disappeared some two centuries after its origin. Novatian has sometimes been confounded with his contemporary Novatus, a Carthaginian presbyter, who held similar views.

Novatian was the first Roman Christian who wrote to any considerable extent in Latin. Of his numerous writings three are extant: (1) a letter written in the name of the Roman clergy to Cyprian in 250; (2) a treatise in thirty-one chapters, De trinitate; (3) a letter written at the request of the Roman laity, De cibis judaicus. They are well-arranged compositions, written in an elegant and vigorous style. The best editions are by Welchem (Oxford, 1724) and by Jackson (London, 1728); they are translated in vol. ii. of Cyprian's works in the Ante-Nicene Theol. Libr. (Edinburgh, 1869). The Novatian controversy can be advantageously studied in the Epistula of Cyprian.

**NOVATION,** a legal term derived from the Roman law in which new was substituted for any kind—substitution of a new debtor (expressio or delegatio), of a new creditor (cessio nominum vel actionum), or of a new contract. In English law the term (though it occurs as early as Bracton) is scarcely naturalized, the substitution of a new debtor or creditor being generally called an assignment, and of a new contract a merger. It is doubtful, however, whether merger applies except where the substituted contract is one of a higher nature, as where a contract under seal supersedes a simple contract. Where one contract is replaced by another, it is of course necessary that the new contract should be supported by a new consideration, or a new contract, founded upon sufficient consideration (see CONTRACT). The extinction of the previous contract is sufficient consideration. The question whether there is a novation most frequently arises in the course of dealing between a customer and a new partnership, and on the assignment of the business of a life assurance company with reference to the assent of the policyholders to the transfer of their policies. The points on which novation turns are whether the new firm or company has assumed the liability of the old, and whether the creditor has consented to accept the liability of the new debtors and discharge the old. The question is one of fact and condition. See especially Life Assurance Companies Act 1872, §§ 7, 8, where the word "novations" occurs in the marginal note to the section, and so has quasi-statutory sanction. Scots law seems to be more stringent than English law in the application of the doctrine of novation, and to need stronger evidence of the creditor’s consent to the transfer of liability. In American law, as in English, the term is something of a novelty, except in Louisiana, where much of the civil law is retained.

**NOVAYA ZEMLYA** (Nova Zemlica, "new land"), an Arctic island off the coast of European Russia, to which it belongs, shaped like a crescent, consisting of two large islands separated by a strait, the Matotchkin Shar. It lies between 70° 31' and 77° 6' N., and between 5° 35' and 60° 2' E. It forms an elongated crescent, being nearly 600 m. long with a width of 30 to 90 m., and an area of about 36,000 sq. m. It separates the Barents Sea on the W. from the Kara Sea on the E. With Vyaghch Island, between it and the mainland, Novaya Zemlya forms a continuation of the Pa-Khay hills. Vyaghch is separated by it from the Kara Strait, 30 m. wide, and from the continent by the Yugor or Ugrin Strait, only 7 m. across. On the E. coast of Novaya Zemlya, especially between the Matotchkin Shar, 70° 31' and 75° N., there are a number of fjord-like inlets—such as Chekina, Rasmyslov and Medzhiviby bays. The greater part of the W. coast is fretted into bays and promontories, and a large number of islets lie off it. At the S. extremity there are a number of fjords and the wide bay of Sakhanka. Then
farther N. is the Kostin Shar, a strait separating Mekhu-sharsky Island from the coast, and having at its N. entrance South Goose Cape, which forms the S. extremity of Goose Land (Gusinaya Zemlya) in 72° N. Next follows Moller Bay, between Goose Land and Cape Britvin, with several minor bays affording anchorages. On the W. coast of the N. island are Krestovaya, Mashighin and Nordenskjold bays, and to the N. are several groups of islands—Gorbovyi, Pankratiev, the Gulf Stream Islands and the Orange Islands. Off the E. coast that called Xamoa, N. of which another supposed point in Arctic waters may be mentioned. Little is known of the interior of Novaya Zemlya. It is mountainous throughout. Transverse chains are thrown off from the main chain, and are separated by deep narrow valleys, some of which are watered by streams of considerable size, which, at the spring thaw, bring down a remarkable bulk of detritus. The general slope of the land is steeper on the E. than on the W., and at the N. and S. extremities there is a descent to a comparatively low plateau. In the S. this plateau is broken by several parallel ridges, with level valleys between them, dotted with numerous small lakes. On either side of the Matochkin Shar the hills reach 4000 ft. and upwards. The more elevated region is covered with snow-fields which feed glaciers in some cases, while the N. seems to be covered with a great ice-sheet. Geology.—The geological structure of the central region is of the most varied description. The primary rocks which appear at M. Solovetsky Island are gneiss, quartziferous schists, gneisses containing sulphide of iron, with subordinate layers of tale or mica slate, and thinner beds of fossiliferous limestone, Silurian or Devonian. More recent clay-slates and marls belonging to the middle Jurassic are found both on the eastern coast and with the quartz-sandstone. About 74° N. the clays of the E. coast are composed of grey sandstone, while in 76° Barents's Islands, and possibly a much greater part of the whole coast, the rocks are composed of sandstones, siltstones, and thin deposits have not been discovered on Novaya Zemlya. During the Glacial period its glaciers were much larger than at present, whilst, during a later portion of the Quaternary period (to judge by the moraines and the corries) the fit has been 500 ft. below the present level. As the whole of the arctic coast of Russia, was submerged for several hundred feet. At present it appears to partake of the movement of upheaval common to the whole of N. Russia.

Climate.—Novaya Zemlya is colder than Spitsbergen (which lies more to the N.) as in some degree it shares in the continental conditions of northern Russia and Siberia. The middle and northern parts of the W. coast are not so cold as the E. On the W. coast the temperature appears to decrease S. of the Matochkin Shar, being reduced by a cold current from the Kara Sea through Kara Strait. On the other hand, the climate of the northern part of the W. coast is moderated by the presence of the warm waters from the W. influence there are years when the islands can be circumnavigated without difficulty. In the Matochkin Shar region the snow-line is estimated at about 1800 to 2000 ft. Glaciers are rare S. of 72° N. and in many respects these glaciers are exceptional even in Greenland. Elsewhere even the leached lichens are precocious, though the leached lichens flourish. Of Phanerogams, only the Diapensia lapponica is common south of Novaya Zemlya, and among the flowering plants, the isolated C IPCCAIARIA, &c., and, where a layer of thinner clay has been deposited in sheltered places, the surface is covered with saxifrages, &c.; and a carpet of mosses allows the arctic willow (Salix polaris) to develop. Where a thin sheet of humus, fertilized by lemmings, has accumulated, a flowering plants appear, but even so, its brilliant flowers spring direct from the soil, concealing the developed leaflets, while in the temperate regions, plants occur with leaflets thrown out in a thin and 10 to 12 ft. long. This applies only to the better-known neighbourhoods of Matochkin Shar and Kostin Shar. N. of 74° N. very few flowering plants have been found on Novaya Zemlya and Vaygach numbers about two hundred species. As to the genetic connexions of the Novaya Zemlya flora, it appears, according to M. Kjellman's researches, to belong to the Asiatic race of plants. The interior of Novaya Zemlya shows hardly a trace of animal life, save here and there a vagrant bird, a few lemmings, an ice-fox, a brown or white bear, and at times immigrant gulls, Eskimos, and the like. Of birds are abundant, and probably by. birds, which come from the S. for the breeding season, and at certain parts of the sea-coast the rocks are covered with millions of guillemots, which return every year. The sea is inhabited by varieties of seal and fish, and every summer on the valleys and lakes of the south. Whales, walruses, various seals and dolphins are frequently met with. Only two species of fish are of any importance—the goleecy (Salmo Alpinus) in the fresh-water rivers and creeks, and the cod. The numbers of sea mammals and birds attracted Russian hunters, and even in the 16th century they had extended their nets (stano- mishchka) to the extreme N. of the Island. Many of them wintered for

years on Novaya Zemlya without great loss from scurry. Owing to the ice in the White Sea Russian hunters found Novaya Zemlya less easy of access than did the Norwegians. But about 1877 systematic and scientific researches were made by the Zoological Station in Saint Petersburg, and several families of Samoyedes being established at stations on the W. coast of the S. island, the chief of which is Karmakuly on Moller Bay, where there is a church. Novaya Zemlya is included in the Russian Province of Noravetskaya.

History.—Novaya Zemlya seems to have been known to Novgorod hunters in the 11th century; but its geographical discovery dates from the great movement for the discovery of the N. passage. In 1553 Sir Hugh Willoughby sighted what was probably Goose Land; Richard Chancellor penetrated into the White Sea. In 1556 Stephen Borough reached the S. extremity of the island, being the first western European to do so. William Barents trenched the island (1544) at Sukhoy Nos (73° 40'), and followed the coast N. to the Orange Islands and S. to the Kostin Shar. Rumours of silver ore having been found induced the Russian government to send out expeditions during the second half of the 18th century. In 1760 Savva Lobshkin cruised along the E. coast, spent two winters there, and in the next year, after having reached Cape Begehrte (Begaunte), returned along the W. coast, thus accomplishing the first circumnavigation; but the valuable records of his voyage have been lost. In 1768 the Russian Lieutenant Rozmyslov reached Goose Land and penetrated into the Kara Sea by the Matochkin Shar, where he spent the winter; in the following year he pursued the exploration of the Kara Sea, but was compelled to return to his ship. In the year 1771 the whole of the coast of the island is due to the expeditions (1821-1824) of Count Feodor Petrovich Litke (1797-1882), after whom part of the N. island is named Litke Land. Nearly all the W. coast as far as Cape Nassau, as well as Matochkin Shar, was mapped, and valuable scientific information obtained. In 1832 Lieutenant Pakhtusov mapped the E. coast as far as Matochkin Shar; and in 1835 Pakhtusov and Tsivolka his pilot, or commander of his second ship, mapped the coast as far as 74° 24'. The next expedition was that of the naturalist Karl von Baer in 1838. A new and scientific exploration began in 1868, while Norwegian seal-hunters brought in valuable geographical information. In 1870 the Norwegian Captain Johannesen penetrated as far as 79° E., in 76° 13' N., and afterwards accomplished the second circumnavigation of Novaya Zemlya. These explorations led the way for the famous voyages of Baron Nordenskjold (1875-1878), which included investigations in Novaya Zemlya. In 1877 the Russian Lieutenant, Tyaghin, attempted to cross the S. island, and in 1878 M. Grinevetsky succeeded in doing so. Among later expeditions may be mentioned those of C. Nossov (1879), and A. Millen, T. N. Golovin, and M. Vajnberg (1892) with the S. island, H. J. Pearson (1895 and 1897), Lieutenant Borchgrevink (1899 and 1900) and O. Ekstrom (1900 and 1903).

See accounts of the expeditions above mentioned, and especially, among earlier works, K. E. von Baer, Expedition a Novaia Zemli a et Lapponie (St Petersburg, 1838, &c.); and among later works H. J. Pearson, Beyond Petropoli Eastward, with botanical and geological appendices by H. W. Feildén (London, 1896); also J. Sporer, Novaia Zemlya (Gotha, 1867); A. P. Engelhardt, A Russian Province of the North (Archangel, of which the author was governor), translated by H. Cooke (London, 1899).

**NOVEL**

*from novelis, diminutive of Lat. novus, new; through the Italian *novella*, the name given in literature to a study of a single problem, or founded on an observation of contemporary or distant life, in which the characters, the incidents and the intrigue are imaginary, and, therefore, "new" to the reader, but are founded on lines running parallel with those of actual history.*

1. With the word *novel* is identified a certain adherence to the normal conditions of experience. A novel is a sustained story which is, indeed, not historically true, but might very easily be so. It is essentially a modern form of literature—that is to say, it makes its appearance when the energy of a people has considerably subsided or has taken purely civic forms, and is to contemplate and to criticize pictures drawn from conventional manners. The novel has been made the vehicle for satire, for instruction, for political or religious exhortation, for technical
information; but these are side issues. The plain and direct purpose of the novel is to amuse by a succession of scenes painted from nature, and by a thread of emotional narrative.

It was not until the 18th century that it began to be a prominent factor in literary life, and not until the 19th that it took a place in it which was absolutely predominant. The novel requires, from those who are content to be only fairly proficient in it, less intellectual apparatus than any other species of writing. This does not militate against the fact that the greatest novelists, always a small class, produce work which is as admirable in its art as the finest poetry. But the novel adapts itself to a far larger range of readers, and covers so vast a ground in the imitation of life, that it is the unique branch of literature which may be cultivated without any real distinction or skill, and yet for the moment may exercise a powerful purpose.

2. Classical Antiquity.—The place held by the novel in antiquity offers interesting analogies with its position in modern times. It was Voltaire, in his Pyrrhonisme de l'histoire, who set the fashion of calling the Cyropaedia a novel, but it is probable that Xenophon, in composing this great work on the education of Cyrus, had a purpose that was didactic and historical rather than narrative, and that its present-day vogue began in Alexandrian times, when social life was so far settled in tradition that the pleasure of reflecting on reality had definitely set in. In the 2nd century B.C. a certain Aristides wrote, in six books, the Milesiaka, which was probably the beginning of the modern novel. These Tales of Miletus, the town in which Aristides lived, are lost, but from existing imitations of them in Greek and Latin we can gather that they consisted of humorous and sarcastic episodes of contemporary life. There seems to be good evidence that the bulk of these novelettes, and the tales which followed them, dealt mainly with the adventures of lovers. In the 2nd century A.D. Lucian preserved for us invaluable pictures of the life in which he moved: his Licius or the Ass and his True History are fantastic and extraordinary fictions in which the nature of the novel is not unfrequently approached. But a Syrian Christian, Heliodorus, bishop of Tricca in the 4th century, may claim to have come much closer to it in his Aethiopica, which has the unique merit of being a perfectly pure love story, in which the marvellous is not absolutely banished, but in which on the whole the solid structure of experience is preserved. In the 6th century, as is supposed, a Greek who is called Longus (or Apion), but of whose life nothing is known, wrote the voluptuous pastoral story of Daphnis and Chloe, which is so far superior to all other remnants of Greek fiction which have come down to us, and which is the only one of them which can strictly be called a novel. In Latin literature, the Golden Ass of Apuleius is manifestly a translation of a lost Greek book, to which Lucian also was indebted. It is probable that in the great age of Roman literature prose fiction was cultivated, but we should be limited to pure conjecture as to its scope, if we did not possess a fragment of a work which is absolutely invaluable to the comparative student of literature. If the Satyricon of Petronius was not an isolated phenomenon—and it is highly improbable that this was the case—then the Romans of the Neronian epoch understood to the full the secret of how to produce in prose a satirical, not to say cynical, study of manners in fiction. The Satyricon is not less skilfully managed than such later novels as Glirias or Peregrine Pickle, and it is of the same class. From the extent of the principal episode which has been preserved, it is supposed that this novel was not a short tale of intrigue, but was a sustained record, drawn up with careful and lengthy observation of manners, for the single purpose of entertainment. Unfortunately, this extraordinary work remains not merely solitary in its class, but itself a fragment. In early Christian times, such books as The Shepherd of Hermes, and the productions of Palladius and of Synesius, indistinctly testified to a certain appetite for prose fiction.

3. Italian.—It was in northern Italy that the novel of modern Europe (both the literary type and the name) came into existence. A collection of tales, called Il Novellino or Cento novelle antiche (although only 66 of the 100 survive), was composed at the end of the 13th century, and started this class of literature in Europe. These anonymous stories are of extraordinary diversity, chivalrous, mythological, moral and scandalous. The medieval view of women and priests and peasants is found in its full development, and there is something of the realistic reflection of customs which was to flourish later in a whole class of fiction. The earliest Italian novelist whose name is connected with his writings is Francesco da Barberino (1264-1348), whose Documenti d'Amor were first published in 1640. He was followed by the celebrated Giovanni Boccaccio, who wrote his Filocolo about 1330 and then produced some nine years later. Of his other works the most eminent was Filostrato (1335-1350), a Florentine. Sacchetti's Trecento novelle, which remained in MS. until the 18th century (1724), are ironical and realistic studies of the life around him in Tuscany. To Giovanni Fiorentino is attributed a collection of 10 tales, called Il Pecerone, printed first in 1558, but written in 1536. Shakespeare is indebted to one of these stories for the plot of The Merchant of Venice.

A great name in the evolution of European fiction is that of Tommaso Guidato, called Masuccio (1415?-1477); he was a native of Salerno, and was the first of the south Italian novelists. Moreover, it is significant of the universal character of the novel that many of the finest are wholly his own. His Novellino, printed at Naples in 1476, is divided into five books, each containing ten stories. These deal satirically with the three favourite subjects of the age—namely, jealous husbands, unfaithful wives and debauched priests. He was followed in this, as well as in his vivacity, by Antonio Cornazzano (1437-1506?), an inhabitant of Piacenza, who wrote Italian with much greater purity than Masuccio, but less vigour. His stories were frequently reprinted, under the title of Proverbi. Of the novels of Giovanni Brevio (1467-1508) only five have been preserved, but these are of unusual merit. We then reach Matteo Bandello (1480-1560), long the most famous of all the Italian novelists, whose Novelle, first issued in 1554, were eagerly read in all parts of Europe; they are 214 in number. After Bandello the decline of the Italian novella is evident. Francesco Maria Molza (1480-1544), whose stories appeared in 1547, was a rival to Bandello, and has been preferred to him by several modern critics. The Ragionamenti d'Amor (1538) of Agnolo Firenzoula (1493-1543) was the work of a poet writing in richly embroidered prose. After Firenzoula the great school of Italian story-tellers declined. There was no more novel writing, of any importance in Italy until the close of the 16th century, when an admiring study of German literature produced the romances of Alessandro Verri (1741-1816) and Ugo Foscolo (1778-1827). The first Italian novelist of merit in recent times, however, is Alessandro Manzoni (1785-1873), whose I Promessi Sposi (1825) enjoyed an unbounded popularity. Manzoni had a troop of imitators, but no rivals. In the fourth quarter of the 19th century Italy produced some very brilliant and original novelists, in particular Giovanni Verga (b. 1840), Matilda Serao (b. 1856) and Gabriele d'Annunzio (b. 1863).

France.—In the 14th century, when Italy was already proceeding in a modern direction, France was satisfied with ancient tales of Fierabras or Les Quatre fils d'Aymon, which were nothing but epics told in rambling prose. It was not until about 1450 that the anonymous Quinze joutes du mariage showed the French to be influenced by the Italian development of the novelette of manners. The author of this extraordinary work was perhaps Antoine de la Salle who seems certainly to have written the whole of the Cent nouvelles nouvelles, imitated from Boccaccio and Sacchetti. This bud of realistic fiction, however, was immediately nip ped by the renaissance of chivalry, of Spanish extraction, which were only destroyed by the vogue of Don Quixote. The translation of Montalvo's celebrated Amadis de Gaule enjoyed at this time an extraordinary popularity.

The habit of telling tales freely in prose was not, however, formed in France until after 1500. Bonaventure Despréz (d. 1544) was the author of the Cymbalum mundi, and of Nouvelles récréations, mordant satires and gay stories. Probably to this age also belongs the semi-fabulous Séraude de Vervielle, who is supposed to be the author of a collection of facetious
anecdotes and conversations, Le Moyen de Porsien. These, and other experiments in fiction, led us up to Rabelais, whose magnificent genius adopted as its mode of address the chain of burlesque prose narratives which we possess in Gargantua and Pantagruel, recording the family history of a race of giant kings, but his influence on the novel is insignificant. It was half a century later that, in the romantic pastoral of Astarte, published in 1610, France may be said to have achieved her first attempt at a novel. This famous book was written by Honoré d'Urfé; in spite of its absurdities it is full of talent, and succeeds, for the first time in the history of French narrative, in depicting interior life. D'Urfé was followed, with less originality, by Marin Le Roy de Gomberville (1600-1674), who was the author of a Mexican romance, Pôlexandre, and by Gombauld (1570-1666), the author of Endymion (1624). These were fictions of interminable adventures, broken by an infinite number of episodes; they seem tedious enough to us nowadays, but with their refinement of language, and their elevation of sentiment, they fascinated readers like Madame de Sévigné. To Gomberville, who has been called the Alexandre Dumas of the 17th century, succeeded Mîlle de Scudéry, who preserved the romantic form of the novel, but filled it up with modern and familiar figures disguised under the ancient nomenclature. Her huge romans à clefs, tiresome as they are, form the necessary stepping-stone between Astarte, in which the novel was first conceived, and La Princesse de Clèves, where at last it found perfect expression. Meanwhile, the elephantine heroic romances were ridiculed by Charles Sorel in his Francion (1622) and Le Berger extemporâng (1628). Later examples of a realistic reaction against the pompous beauty of Gomberville and Scudéry were the Roman comique (1651) of Scarron and Le Roman bourgeois (1666) of Furetière. All these, however, were mere preparations. The earliest novelist of France is Marquerite de la Vergne, comtesse de La Fayette (1644-1639), and the earliest genuine French novels were her Princesse de Montpensier (1662), and her far more important Princesse de Clèves (1678). Madame de La Fayette was the first writer of prose narrative in Europe who portrayed, as closely as nature as she could, the actual manner and conversations of well-bred people. To show that she was capable of writing in the old style, she published, with the help of Segrais, in 1670, a Lydie, which is in the Spanish manner affected by M. d'Urfé. This was followed, in the same year, by the beautiful romance of La Princesse de Clèves, which was appreciated. Meanwhile La Fontaine, in 1660, published a fine romance of Psyché, partly in verse, and Fénelon, in 1699, his celebrated Téléméaque. The influence of La Bruyère on the novelists, although he wrote no novels, must not be overlooked. But the Princesse de Clèves remained the solitary novel of moral analysis when its author died and the 17th century closed. The successes of Alain René Lesage seemed to be wholly reactionary. His realistic novels, Gil Blas and Le Diable boiteux, depended upon their comic force, their picturesque vivacity, rather than upon the sober study of average human character. But Marivaux (1688-1763) took up the psychological novel again, and produced in Marianne (1731) and Le Paysan parvenu (1735) analytical studies of Parisian manners and character which were wholly modern in form. If Marianne was deliberate, the exquisite Mannon Lescat (1731), by the Abbé Prévost d'Exiles (1697-1763), was almost an accident; but, between these, these simultaneous works started the French novel of the analysis of emotion. The brilliant stories of Voltaire, which began with Zadig and included Candide, hardly belonged to this category; they are rather satires and divertissements, in which class must also be placed the fashionable boudoir novels of Crétillon fils, La Morlière and others. But the English taste, exemplified mainly by Richardson, Sterne and Fielding, prevailed, and its effect was seen again in the imperfect novels of Diderot and Rousseau. The Nouvelle Héloïse and the Émile of the latter are not skilfully constructed as stories, but they mark the starting-point of the novel which aims at familiarising the public mind with great ideas in an attractively Romantic form. The moral purpose is evidently in the famous Paul et Virginie of Bernardin de St Pierre. It was long didactically present in Mme de Staël's Delphine (1802) and Corinne (1807), where the misinterpreted woman of genius, so often depicted since, is first introduced to French novel-readers. It was not, however, until about 1830 that the novel began to be one of the main channels of imaginative writing in France, and the development of this kind of fiction was one of the main features of the Romantic revival. Stendhal showed that, without any of the charms of style, and relying exclusively upon minute psychological observation, the record of a human life could be made enthralling interesting. Alexandre Dumas, under the direct influence of Stendhal and Scott, who were the models of the Dumas family, finally laid down its laws and settled its borders. Certain dates, however, must be recorded in the briefest record of the evolution of the French novel, and 1836 is one of these; in that year Gustave Flaubert published Madame Bovary, a work in which the rival realistic and Romantic tendencies are combined with a mastery that had not been approached and has not since been equalled. Another is 1871, when Zola began to roll out the enormous canvas of Les Rougon-Macquart. Yet another is 1880, when Boule de Suif first revealed in Maupassant a novelist whose creations were not mere topical imaginations and, but absolutely convincing and logical.
the reign of the heroic romances in France, their vogue violently affected the English book-market. The huge stories of Calpenède and Gomberg were imported, and translated and imitated to the exclusion of every other. It is true of prose fiction, between 1645 and 1650. The long-winded books of Mdlle de Scudéry, especially Cassandra and The Great Cyrus, were read so universally in England as to leave their stamp on the national manners. Of original English romances, written in competition with the French masterpieces of tenderness and chivalry, the Parthenissa of Lord Orrery (1654) is the best known. The first definite stand against these Gallicized romances was made by two dramatists, Aphaara Behn and William Congreve. Congreve's Incognita (1692) is remarkable for its light raillery and humour, and perhaps deserves as well as any a 17th-century denomination to be called the earliest novel in English. The stories of Mrs Behn have the merit of a romantic simplicity of narrative, but they are dull and devoid of art. But the novel still lingered, unwilling to make its appearance in England, and its place was taken during the age of Anne by the labours of the essayists. So rich is the character painting, so lively the touches of social colour in the Spectator and Taller, that these periodicals have, by enthusiastic critics, been styled brilliant examples of prose fiction. But it is obvious that in the delightful essays of Addison and Steele there was no attempt made at construction, that the sustained evolution of characters was not essayed, and that even in the studies of Mr Bickerstaff's Club anything like a plot was studiously avoided. Yet these are all essential characteristics of the novel, and until they make their appearance in English literature we must not say that the secret has been discovered. Very near to the mystery, if he did not quite grasp it, was Daniel Defoe, who introduced into his narrative a minute and rude system of realistic observation, by way of giving an impression of truth to it. This exactitude he combined with a survival of the old picareseque method, the result being those strange and entertaining pieces (1725) which still make him to come to positive success in the immortal narrative of Robinson Crusoe, in which the fascination of the desolate island was first worked up in English.

6. Not even yet had the English novel been invented. It came into the world in 1740 from the unconscious hands of Samuel Richardson (1689-1761), who had hit upon the notion that morality might be helped and young persons of inexperience protected by the preparation of a set of letters exchanged between imaginary persons. The result was Pamela: or Virtue Rewarded, a book which is in every strict sense the earliest English novel. It has even a claim to be considered the earliest European novel, of the modern kind, for the assumption of French criticism that Richardson borrowed his ideas and his characters from Marianne of Marivaux is not supported by evidence. There is no reason to suppose that Richardson met with the name of Marivaux earlier than 1749. At all events, it would seem to be certain that, whether in France or England, the fourth decade of the 18th century saw the spontaneous conception of this "new species of writing." The name of the heroine of Richardson's book was Miss Pamela Andrews, and the second English novel was Fielding's Joseph Andrews (1742), which started as a mere burlesque of Pamela, but proceeded upon admirably original lines of its own, in a study of the humours and manners of contemporary country life. Fielding rejected the epistolary artifice of Richardson, and told his story in a straightforward narrative, broken indeed by arguments and ejaculations which bound the new novel to the old essay of the Spectator type. The creative force of Fielding filled the pages of this book with a crowd of vividly-presented characters, and this marked a step in advance, for Richardson's practice was to concentrate minute attention upon only one character at a time, and that even in the next important fiction came, in the shape of the long-drawn tragedy of Clarissa (1748). But a third great novelist was now at work; in 1748 appeared the Redderick Random of Smollett, and here we have neither the sculptural manner of Richardson nor the busy world of Fielding's realism, but a comic impression founded on an artful employment of emphasis and exaggeration.

Smollett gives us neither breathing statues nor a crowd of men and women, but a gallery of "freaks," arranged with great art, indeed, but exhibited in such a way as to expose not their likeness but their unlikeliness to the commuter of rock of humanity. It is very important to notice this curious divergence between the three great writers, because they exemplified the three classes into which almost all subsequent novels can with more or less ease be divided. The next move was made by Fielding, who in 1749 published his Tom Jones. Starting with the pungent horror of hypocrisy ever before him, Fielding constructs a fragment of the world in which men and women are seen, without exaggeration, pitying their daily trades under the eye of an impartial observer who can penetrate to their secret motives. This was a great advance, and a still greater one was the sustained skill with which the author conducted the plot, the interwoven series of the actions of his characters. He may almost be said that until the publication of Tom Jones no novel with a real plot had been conceived in England. The rivalry of the great novelists of this time was of signal help to them, and there can be no question that the astounding richness of Tom Jones stirred Smollett to the exercise of increased energy in Peregrine Pickle (1751), a coarse and savage book, illuminated by brilliant flashes of humour. A better, because a tenderer and truer study of life was Amelia, which Fielding published in the same year; yet most readers have come to regard this book as an appendix to the two novels which I have already noted. The ideal of life depicted in it was quieter and sadder, it was perhaps for that very reason more in harmony with the facts of life. Now Richardson, who had long been silent, reasserted his mastery of epistolary analysis in the huge History of Sir Charles Grandison (1753), in which, as its admirers claimed, "all the recesses of the human heart are explored and its whole texture unfolded." Richardson had scarcely been affected by the experiments of his contemporaries, of the very nature of which he had to be ignorant, and the result is that in his third and last novel he devoted entirely to qualities which he had already developed, and made nothing to the discoveries of others.

7. With this book, the first great group of English novels comes to a close, and we may observe that in these eight stories everything is to be found, in germ if not in full evolution, which was during the next century and a half to make the abundant out-put of the English novel prominent. New forms, above all new subjects, were to present themselves to the imagination of capable British novelists, but the starting-point of every experiment was to be discovered in the ripest work of Richardson, Fielding and Smollett. Their influence was manifest in the writings of the second school of English novels, in whose pages, however, several interesting varieties of subject and treatment were discovered. The Tristram Shandy (1759-1760) of Sterne, is the most masterly example in English of a humour which goes direct to paths for its most "sentimental" effects, and of the kind of loosely-strung, reflective fiction which is hardly a narrative at all. Neither Tristram Shandy nor A Sentimental Journey (1768) can properly be included among novels. In Rasselas (1759) Dr Johnson showed that the new kind of writing could be used to give entertainment to a sermon and in this he was to have a multitude of followers. In Chrysal (1760) Charles Johnstone (d. 1806) showed that the picareseque romance could still exist, tinctured by the newly-found art of the novelist. In The Castle of Otranto (1764) Horace Walpole adapted the methods of the novelist to a pseudo-historical theme of horror and romance, and prophesied of Walter Scott. In The Vicar of Wakefield (1760) Goldsmith was indebted to most of his immediate predecessors, but fused their qualities in an amalgam of gentle wit and delicate sweetness and conversational brevity which has made his one loosely-constructed novel a foremost classic of our writings of the second school of English novels. But the Pamela from The Vicar of Wakefield, English novel-writing was born, grew into full maturity, and adopted its adult and final forms.

8. During the remainder of the 18th century, little or nothing was done to extend the range of prose fiction in England; but one or two of those departments of novel-writing which had already
been invented were developed and adapted to changing taste. In particular, the rapid increase of reticence and refinement in conversation made such a novel in letters as Smollett’s *Humphrey Cliker* (1771) repulsively coarse to women of delicacy, who were charmed on the other hand with the * Evelina of Frances Burney* (1778). These two typical books are composed on the same plan, yet essentially a whole age lies between the former and the latter. What has been called “the novel of the tea-table” began to exist, and the 19th century was about to close in mediocrity, when its credit was partly restored by a development of Horace Walpole’s romance of terror in the vigorous and sensational narratives of Anne Radcliffe (1764–1823), whose *Mysteries of Udolpho* appeared in 1794. The same year saw the publication of *Caleb Williams*, in which William Godwin (1756–1836) evolved a tragic theory of politics. A finer study than either of the works just mentioned, although not truly a novel, was the gorgeous and sinister *Vathek* (1786) of William Beckford, an oriental tale of horror. In all these books there existed an element of grotesque mingled with romantic colour, which announced the coming revival.

9. The two schools here indicated, and they may be roughly defined as the school of the Tea-Table and the school of the Skeleton-in-the-Cupboard, did not, however, betray their real significance until the second decade of the 19th century, when after several unimportant efforts, they developed into the novel of psychological satire and the romance of historical imagination. Two writers, the greatest who had yet attempted to address English readers through prose fiction, almost simultaneously came forward as the protagonists in these two spheres of work. Jane Austen published *Sense and Sensibility* in 1811, Walter Scott’s *Waverley* in 1814. These were epoch-making dates; in each case a new era opened for the countless readers of novels. The first-named writer, all exactitude, conscience and literary art, worked away at her “little bit (two inches wide) of ivory”; the other, with bold and flowing brush, covered vast spaces with his stimulating and noble compositions. It is, however, to be noted that the isolation in which we now regard these great writers—a solitude à deux only broken in measure by the presence of Miss Maria Edgeworth—is an optical delusion due to the veils of distance. The bookshops from 1810 to 1820 and onwards were thronged and glutted with novels, many of them infinitely more successful, as far as sales were concerned, than the most popular of Miss Austen’s works. The novels of Miss Austen were written between 1776 and 1810, although published from 1811 to 1818; those of Sir Walter Scott date from 1814 (*Waverley*) to 1829 (*Anne of Geierstein*). Practically speaking, no additions were made to the formula of the social novel or of the historical romance, to the study of national manners, that is to say, from the satirical or from the picturesque point of view, until a quarter of a century later.

10. The next artist in prose fiction whose force of invention was sufficient to start the novel on wholly fresh tracks was born forty years later than Scott. This was Charles Dickens, whose *Pickwick Papers* (1836) marks another epoch in novel writing. His career of prodigal production ceased abruptly in 1870, by which time it had long been obvious that he was the pioneer of a great and diverse school of novelists, all born within the second decade of the century. Of these Thackeray was not really made obvious until *Vanity Fair* (1847), nor Charlotte Brontë till *Jane Eyre* (1847), nor Miss Gaskell till *Mary Barton* (1848), nor George Elliot till *Adam Bede* (1859). The most noticeable point on which the five illustrious novelists of the Early Victorian age resembled one another and differed from all their predecessors, was the sociological or even humanitarian character of their writings. All of them had projects of moral or social reform close at heart, all desired to mend the existing scheme of things. In several of them, particularly in Dickens and Miss Brontë, the element of insubordination is extremely marked; it is present in them all; and a determination not to be content to see life beautifully, though coloured, glasses, or to be content with a sarcastic travesty of it, but to realize in detail its elements of pain and injustice. The novel, which had already learned to compete with all the amusing sections of literature, became the successful rival of the serious ones also. The task of the novelist was, therefore, so far as the indication of the scope of his particular kind of art is concerned, now complete. The names of Anthony Trollope, Charles Kingsley, Charles Reade, George Meredith, Thomas Hardy and Robert Louis Stevenson represent, in their least challenged form, different movements in novel-writing during the second half of the 19th century; we must be content here to refer for particulars concerning them to the separate biographical articles.

11. Spain.—Prose narrative in Spain practically begins in the 15th century with chronicles and romances of chivalry, tempered occasionally and faintly by some knowledge of what had been attempted in Italy by Boccaccio. The Spanish version of *Amadés de Gaula*, in which the romance of knight errantry culminated, belongs to 1508; the lost original is supposed to have been Portuguese. This was the only book of its class which is saved from the burning in *Don Quixote*; it was followed by *Palmerin of England*. These interminable books, and a hundred worse than they, occupied the leisure of 16th-century readers of both sexes. Without approaching the form of novels, they prepared the ground for novel-reading. The exploration of America led to the composition of monstrous tales of the New World, which generally took the form of continuations of *Amadés*. A new thing was begun in 1554, when the anonymous picarose romance of *Lazarillo de Torre* started the story of fantastic modern adventure; this highly entertaining book has been called the 16th-century *Pickwick*, and Mr Fitzmaurice-Kelly remarks that it “fixed for ever the type of the comic prose epic.” The pastoral romance, in the hands of Jorge de Montemor (d. 1561), who wrote an insipid *Diana* which was popular for a while throughout Europe, took readers a step backward, away from the ultimate path of the novel. It is of interest to us, however, to note that it was in one of these “vain imaginings,” in his pastoral romance of *Gatamea*, that Cervantes approached the field of fiction, in 1585. Few of his peculiar merits are to be found in this early work; he turned for the present to the composition of plays. It was not until 1604 that he returned to prose fiction by printing his immortal *Don Quixote*, which made an epoch in the history of the novel. This book was originally intended to ridicule the already fading passion for the romances of chivalry, but it proceeded much further than that, and there is hardly any branch of fiction which may not be traced back to the splendid initiation of some chapter of *Don Quixote*. In 1613 Cervantes published his twelve *Exemplary Novels*; these are not so well known as the great romance, and they owed not a little of their form to Italian sources, but they are very brilliant. One of the best anonymous Spanish stories of the period, *The Mock Aunt*, is a type of excellent satirical narrative of the sarcastic class; this is now commonly attributed to Cervantes himself. No other novelist of Spain has moulded the thought of Europe, but the heroic romance which occupied so much of the attention of France in the 17th century was invented by a little-known Spanish soldier, Pérez de Hita, who, about 1600, wrote fantastic stories about Granada and the Moors. The farcical romance of *Fray Jeronimo de Campas*, 1758, by J. F. de Isla (1703-1718), competed in popularity with *Gil Bias*. Speaking broadly, however, Spain made no appreciable progress in novel-writing from the days of Cervantes to those of Walter Scott, when the *Waverley Novels* began to find such artless imitators as Martinez de la Rosa and Zorrilla. But the first original novelist of Spain was Cecilia Böhl de Faber (Fernán Caballero) (1706-1877), whose *La Gaviota*, 1848, a study of life in an Andalusian village, was the earliest Spanish novel, in the modern sense. She was followed by Valera (1824-1904), by Alarcón (1833-1891), by Pereda (b. 1834), by Perez Galdós (b. 1845) and by Palacio Valdés (b. 1853), in whom the tendencies of recent European fiction have been competently illustrated without any striking originality.

12. Germany.—The cultivation of the novel in its proper sense began late in Germany. It is usual to consider that H. J. von Grimmelshausen (1627-1675) is the earliest German novelist;
his very romantic, Abenteuerliche Simplicissimus-Simplicissimus, was printed at Mönypelard in 1690. This is an account of the adventures of a simple-minded fellow during the Thirty Years' War, and is a chain of episodes, brilliantly recorded, but hardly a novel. Early in the 18th century, an extraordinary number of imitations of Defoe's great romance were published in Germany, and these are known to scholars as the Robinsonaden. Later on, Wieland imitated Don Quixote, but the earliest German novel which possesses original value is the celebrated work of Goethe, The Sorrows of Young Werther (1774). The still more celebrated Wilhelm Meister did not appear until 1796. A third novel, Elective Affinities, was published by Goethe in 1809. Meanwhile, a very characteristic group of picturesque stories had been issued by Johann Paul Richter (Jean Paul) (1763-1825), destined to have a wide influence upon romantic literature throughout Europe. Purely romantic were the stories of Tieck, of Brentano, of Arnim, of Fouqué, of Kleist, of Immermann. The German novelists of this period wrote like poets, deprived of the discipline of verse. In later times novels of high merit have been written by Gustav Freytag, Willhald Alexis (1809-1885), called the German Walter Scott, Laube, Fontane, Eilers, Jeremias Gotthelf, Berthold Auerbach, Spielhagen, Heyse and many others, but the 19th century produced no German novelist of commanding originality.

13. Russia.—In Russia alone, among the countries of central and eastern Europe, the novel has developed with a radical originality. Until the second quarter of the 19th century the prose fiction of Russia was confined to imitators of Sir Walter Scott, but about the year 1834 Gogol (1809-1852) began to revolt against the historico-romantic school and to produce stories in which an almost savage realism was curiously blended with the Slavonic dreaminess and melancholy. Since then the Russian novel has consistently been the novel of resignation and pity, but wholly divorced from sentimentality. Gogol was succeeded by Goncharov, Tourgeniev, Dostoevski, Pesmenski (1820-1881) and Tolstoi, forming the most consistent and, doubtless, the most powerful school of novelists which Europe saw in the 19th century. The influence of these writers on the rest of the world was immense, and even in England, where it was least acutely felt, it was significant. That the Russians have indicated the path to new fields in 1860 and 1870, the Adolphs, the Wielands, the nursery tales, which outward province of novel-writing is abundantly manifest.

14. Oriental.—In a primitive form, the novel has long been cultivated in Asia. It was introduced into China, but whence it is unknown, in the 13th century, and Le Kuan-chung was the first Chinese novelist. The productions of this writer and of his followers are tales of bloody warfare, or record the adventures of travellers. The novel called The Twice-Flowering Plum-Tree, belonging to the 16th (or 17th) century, is a typical example of the moral Chinese novel, written with a virtuous purpose. Professor Giles holds that the novel of China reached its highest point of development in The Dream of the Red Chamber, an anonymous story of the end of the 17th century; this is a panorama of Chinese social life, "worked out with a completeness worthy of Fielding." Prose began to be met with in the literature of Japan early in the 10th century. But the inventor of the Japanese novel was a woman of genius, Murasaki no Shikibu, whose Genji Monogatari has been compared to the writings of Richardson; it was finished in 1004 and may, therefore, be considered the oldest novel in the world. This book, which is one of the great classics of Japan, was widely imitated. After the classic period of novel-writing took a long neglected in Japan, but the humors of 17th-century life were successfully translated into popular fiction by Saikaku (1614-1669), and later by Jisho and Kicski, who collaborated in a great number of remarkable stories.

See Dunlop, The History of Fiction (1816); Borroneto, Catalogo de novellieri italiani (1805); Em. Gebhart, Contours du moyen âge (1860); F. and D. F. Sonnenfels, Romanzi e Novellisti della 8th Century (1871); Bever and Sansot-Orlando, Oeuvres galantes des novellieri italiani (1903); Rivadeneyra, Biblioteca de autores españoles (1868-1880); Gosse, A Century of French Romance (1900-1902); G. Pellissier, Le Mouvement littéraire au XIXe siècle (1889); Zola, Les Romanciers naturalistes (1880); Le Roman experimental (1879); Brucieire, Le Roman naturaliste (1883); W. Raleigh, The English Novel (1894); V. Chavouin, Les Romanciers grecs et latins (1862); Fancan, Le Tombeau des romanciers (1862).

NOVELDA, a town of E. Spain, in the province of Alicante; on the right bank of the river Vinalopó, and on the railway from Madrid to Alicante. Pop. (1900) 11,388. The country around is flat and fertile, producing much wine, dates, oranges, oil, saffron and wine. There are rather considerable manufactories of alcohol, chocolate and soap. The women make fine lace. In the neighbouring village of Salinitas de Elda there are warm sulphur and saline baths.

NOVELLI, ERMETE (1851—1919), Italian actor and playwright, was born in Lucca on the 3rd of March 1851, the son of a prompter. He made his first appearance in 1866, and played character and leading comedy parts in the best companies between 1871 and 1884. By 1885 he had his own company, and made a great success in Paris in 1888 and 1902. He established the Fitzwilliam Museum, and innumerable great compositions...
beginning of winter; the sacred banquet called opulum \textit{Jove}s took place on the 13th. It is said that the senate intended to rename the month in honour of Tiberius—his birthday occurring on the 16th, but the emperor declined, saying, "What will you do, Conspect Fathers, if you have \textit{thirteen Caesars}?" The Anglo-Saxon names for November were \textit{Windmonath}, "wind-month" and \textit{Blodmonath} "blood-month." In the calendar of the first French republic November reappeared partly as Brumaire and partly as Frimaire. The principal November festivals in the calendar of the Roman Church are: All Saints' Day on the 1st, All Souls' on the 2nd, St Martin's on the 11th, the Presentation of the Virgin on the 21st, St Cecilia's on the 22nd, St Catherine's on the 25th and St Andrew's on the 30th. In 1755 he was invited by Garrick to London, where he remained two years. Between 1758 and 1760 he produced several ballets at Lyons, and published his \textit{Le"tres sur la danse et les ballets}. From this period may be dated the revolution in the art of the ballet for which Novelle was responsible. (See \textit{Pantomime} and \textit{Ballet}).

He was next engaged by the duke of Württemburg, and afterwards by the empress Maria Theresa, until, in 1775, he was appointed, at the request of Queen Marie Antoinette, \textit{maître des ballets} of the Paris Opera.

This period of his life is usually described as one of poverty. He died at St Germain on the 10th of November 1830.

Novelle's friends included Voltaire, Frederick the Great and David Garrick (who called him "the Shakespeare of the dance"). The ballets of which he was most proud were his \textit{Haute de Vénus}, \textit{Le Ballet des Quatorze Ménages}, \textit{Le Ballet de Jalousie}. Besides the letters, Novelle wrote \textit{Observations sur la construction d'une nouvelle salle de l'Opéra} (1761); \textit{Le"tres sur Garrick écrits à Voltaire} (1801); and \textit{Let"tres sur les fêtes publiques} (1801).

NOVGOROD, a government of N.W. Russia, bounded W. and N. by the governments of St Petersburg and Olonets, S.E. by Volodga, Yaroslav and Tver, and S.W. by Pskov, stretching from S.W. to N.E. 450 m. Area, 42,233 sq. m. Pop. (1906) 1,555,700. The S. is occupied by the Valdai plateau, in which are the highest elevations of middle Russia (600 to over 1000 ft.), as well as the sources of nearly all the great rivers of the country. The plateau is deeply furrowed by valleys with abrupt slopes, and descends rapidly towards the basin of Lake Ilm in the W. (only 60 ft. above the sea-level). The climate of this region of N.W. Russia. This tract is dotted over with innumerable sheets of water, of which Byelo-ozero (White Lake) and Vozhe are the largest of over 3000. Immense marshes, overgrown with thin forests of birch and elm, occupy more than one-seventh of the entire area of the government; several of them have an area of 300 to 450 sq. m. each. They admit of being crossed only when frozen. Six centuries ago they were even less accessible, but the slow upheaval of N.W. Russia, going on at the rate of 3 or more feet per century, has exercised a powerful influence on the drainage. Of late years artificial drainage has been carried out on a large scale. The forests still occupy 55% of the total area of the government.

Geologically, Novgorod exhibits in the W. vast beds of Devonian limestones and sandstones; these are elsewhere overlaid with Carboniferous limestone, dolomite, sandstones and marls. Devonian rivers have cut their way through these strata. Staraya Russa (S. of Lake Ilmen), and contains iron-ores, while the more recent formation has coal strata of inferior quality. The whole is covered with a thick sheet of boulder-clay, on the外包成在以里侧在水底的末期的N. European ice-sheet of the Glacial period. Numerous remains of the neolithic Stone Age are found, especially round the extinct lakes. The Baltic and Caspian Sea basins are the ends of the Moraines, which are still in evidence in the Batyn and Volkhov rivers, and the Volkhov and Vyatka canals, while the Alexander-von-Württemberg canal connects the tributaries of the White Sea with those of the Baltic. The chief river is the Volkhov, which flows from Lake Ilmen into Lake Ladoga.

Other navigable rivers are the Syas, also flowing into Lake Ladoga, and the Sheksna and the Mologa, tributaries of the Volga. The Msta and the Lovat are the principal streams in the basin of Lake Ilmen. All boats from the Volga to St Petersburg pass through this government.

The yearly average temperature at Novgorod is only 40° Fahr. (14.5° in January, 62.5° in July). The severe climate, the marshy or stony soil, and the want of grazing grounds render agriculture unprofitable, though it is carried on everywhere. The yield of rye or other cereals is insufficient for the wants of the inhabitants. Fireclay, coal and turf are extracted in commercial quantities. Building, smith-work, fishing, shipbuilding, distilleries, glass and match factories, sawmills and a variety of domestic industries give occupation to about 40,000 families. Hunting is still profitable. But most of the inhabitants are dependent on the river-boat traffic; and nearly one-fourth of the able-bodied males are annually driven to other parts of Russia in search of work. The Novgorod carpenters and masons have long been renowned. Trade is chiefly in grain and timber, and in manufactures and grocery wares from St Petersburg. The fairs are numerous, and several of them (Kirillo-Belozersky monastery, Stariy Russ and Novgorod) are of considerable repute.

The inhabitants are almost exclusively Great-Russians, but they are discriminated by some historians from the Great-Russians of the basin of the Oka, as showing remote affinities with the Little-Russians. They belong mostly (96% ?) to the Orthodox Greek Church, but there are many Nonconformists. There are 10,000 Karelians and 5000 Chudes, with some Jews and some Germans. Novgorod is well provided with educational institutions, and primary education is widely diffused in the villages. (P. A. K.; J. T. B.).

NOVGOROD (formerly known as Veliky-Novgorod, Great Novgorod), a town of Russia, capital of the government of the same name, and the seat of an archbishop of the Orthodox Greek Church, situated 119 m. by rail S. of St Petersburg, on the low flat banks of the Volkhov, 2 m. below the point where it issues from Lake Ilmen. Pop. (1900) 26,972. The present town is but a poor survival of the wealthy city of medieval times. It consists of a Kremlin (old fortress), and of the city, which stands on both banks of the river, connected by a handsome stone bridge. The Kremlin was much enlarged in 1044, and again in 1116. Its two principal palisades, were begun in 1225, and much extended in 1490. Formerly a great number of churches and shops, with wide squares, stood within the enclosure. Its historical monuments include the cathedral of St Sophia, built in 1045-1052 by architects from Constantinople to take the place of the original wooden structure (?), destroyed by fire in that year. Some minor changes were made in 1688 and 1692, but otherwise (notwithstanding several fires) the building remained unaltered until its restoration in 1839-1900. It contains many highly-prized relics, including bronze doors of the 12th century, one brought reputedly from Sigtuna, the ancient capital of Sweden. Another ancient building in the Kremlin is the Yaroslav Tower, in the square where the Novgorod vjecke (common council) used to meet; it still bears the name of "the court of Yaroslav"; and was the chancellery of the secretaries of the vjecke. Other remarkable monuments of ancient Russian architecture are the church of St. Nicholas erected in 1135, the Smanski cathedral of the 14th century, and churches of the 14th and 15th centuries. Within the town itself there are four monasteries and convents, two of them dating from the 11th and two from the 12th century; and the large number in the immediate neighbourhood shows the great extent which the city formerly had. A monument to commemorate the thousandth anniversary of the foundation of Russia (the calling in of the Varangians by Novgorod in 862) was erected in 1862. Another monument commemorates the repulse of the Napoleonic invasion of 1812.

The date at which the Slavs first erected forts on the Volkhov (where it leaves Lake Ilmen and where it flows into Lake Ladoga) is unknown. That situated on a low terrace close by Lake Ilmen was soon abandoned, and Novgorod or "New-town"
with the aid of the Lithuanians. But in 1456 the great prince of Moscow succeeded in imposing a heavy tribute. Ivan III. of Moscow took possession of the colonies in the northern Dvina and the Perm regions, and began two bloody wars, during which Novgorod fought for its liberty under the leadership of Martha Boretskaya, the mayor. In 1475-1478 Ivan III. entered Novgorod, abolished its charters, and carried away 1000 of the wealthier families, substituting for them families from Moscow; the old free city then recognized his sovereignty. A century later Ivan IV. (the Terrible) abolished the last vestiges of the independence of the city. Having learned that a party favourable to Lithuania had been organized in Novgorod, he took the field in 1570, and entered the city (much weakened by the recent pestilences) without opposition. His followers killed the heads of the monasteries, the wealthier of the merchants and clergy, and burned and pillaged the city and villages. No fewer than 15,000 men, women and children were massacred at Novgorod alone (60,000 according to some authorities). A famine ensued, and the district of Novgorod fell into utter desolation. Thousands of families were transported to Moscow, Nizhni-Novgorod, and other towns of the principality of Moscow. In the 16th century the 17th century the foundation of St Petersburg ultimately destroyed its trade. Its position, however, on the water highway from the Volga to St Petersburg and on the trunk road from Moscow to the capital, still gave it some commercial importance; but even this was destroyed by the opening of the Vishera canal, connecting the Msta with the Volkov below the city, and by the construction of the railway from St Petersburg to Moscow, which passes 46 m. to the east of Novgorod. 

Ivan III. (P. A. K.; J. T. Be), Novibazar, Nov-Bazar, or Novibazar (ancient Russia, Rascia, or Rashka, Turkish Yenipazar, i.e. "New Market"), a sanjak of European Turkey, in the vilayet of Kossa. Pop. (1905) about 175,000. Novibazar is a mountainous region, watered by the Lim, which flows north into Bosnia, and by some small tributaries of the Servian Ibar. About three-fourths of the inhabitants are Christian Serbs, and the remainder are chiefly Moslem Albanians, with a few gipsies, Turkish officials and about 3000 Austro-Hungarian soldiers. The local trade is mainly agricultural. The sanjak is of great strategic importance, for it is the N.W. part of the Turkish empire, on the direct route between Bosnia and Salonica, and forms a wedge of Turkish territory between Servia and Montenegro. The union of these powers, combined with the annexation of Novibazar, would have imposed the extension of Austrian influence towards Salonica. But by the treaty of Berlin (1878) Austria-Hungary was empowered to garrison the towns of Byelopolye, Priyepolye, Plevye and other strategic points within the sanjak, although the entire civil administration remained in Turkish hands. This decision was enforced in 1879. The chief approaches from Servia and Montenegro have also been strongly fortified by the Turks.

Novibaz, the capital of the sanjak, is a town of about 12,000 inhabitants, on the site of the ancient Servian city of Rascia. Near it there are Roman baths, and the old church of St Peter and St Paul, the metropolitan church of the bishopric of Rascia, in which Stephen Nemanya, king of Servia, passed from the Roman to the Greek Church in 1143.

Novice (through French from Lat. noviceus or novitius, one who has newly arrived, novus, new), a person who joins a religious order on probation. He or she is subject to the authority of the Ordinary, or bishop, and obeys his rules. At the end of the "novitiate," which must last at least one year, the novice is free to leave without taking the vows, and the order is free to refuse to allow him or her to take them. The word was early used of a beginner in any art or science, hence an inexperienced person.

Novi Ligure, a town of Piedmont, Italy, in the province of Alessandria, from which it is 14 m. S.E. by rail, situated among wooded hills, 626 ft. above sea-level. Pop. (1901) 17,868. It was the scene of a victory by the Austrians and Russians under
NOVO-BAYAZET—NOWGONG

Suworov over the French in 1790. It is now an important railway junction, the main lines from Turin and Milan to Genoa converging here. Cotton, silk, coal briquettes, &c., are also manufactured here.

NOVO-BAYAZET, a town of Russian Transcaucasia, in the government of Erivan, 35 m. N.E. of the town of Erivan, and 4 m. W. of Gok-chai Lake, 5970 ft. above the sea. Pop. 5807 in 1897, mainly Armenians. An Armenian village which stood here was destroyed by Nadir Shah of Persia in 1736, and it was not till the Turkish War of 1828–29 that the site was again occupied by Armenian refugees from the Turkish town of Bayazet or Bayadiz.

NOVOCRHERKASK, a town of Russia, capital of the Don Cossacks territory, situated on a hill 400 ft. above the plain, at the confluence of the Don with the Aksai, 45 m. from the Sea of Azov, and 32 m. by rail N.E. from Rostov. Pop. (1897) 52,005.

It was founded in 1805, when the inhabitants of the Cherkassk stolitsa (now Old Cherkerk) were compelled to leave their abodes on the Don by account of the frequent inundations. The town is an archiepiscopal see of the Orthodox Greek Church, and possesses a cathedral (1904), a museum, the palace of the ataman (chief) of the Cossacks, and monuments to M. I. Platov (a Cossack chief) and T. Yermak (1604), the conqueror of West Siberia. Wide suburbs extend to the S.W., and the right bank of the Aksai is dotted with the villas of the Cossack officials. Manufactures make slow progress. An active trade is carried on in corn, wine and timber (exports), and manufactures and grocery wares (imports).

NOVOGONG, a town of Russia, usually known under the name of Krylov, in the government of Kherson, at the confluence of the Tyasmin with the Dnieper, 17 m. W.N.W. of Kremenchug. Its fort was erected by the Poles in 1615. The inhabitants carry on a lively trade in timber, grain and cattle, and have a few flourmills and candle-works. Pop. (1897) 11,214. (2) A first-class fortress of Russian Poland (called Modlin till 1831), at the confluence of the Narev (Bug) with the Vistula, 23 m. by rail N.W. of Warsaw. Modlin was first fortified under the Napoleonic régime in 1807, and in the wars of 1813 and 1830–31 underwent several sieges. Since that time the Russians have made many additions to the works, and the place now forms, with Warsaw, Ivangorod and Brest-Litovsk, the so-called Polish Quadrilateral. The strength of Novo-georgievsk lies mainly in the new circle of eight powerful forts, erected at a mean distance of 10 m. from the enceinte.

The importance of the fortress lies in the fact that it prevents Warsaw from being turned by a force on the lower Vistula and commands the railway between Danzig and Warsaw.

NOVOMOSKOVSK, a town in Russia, in the government of Ekaterinoslav, 16 m. N.E. of the town of Ekaterinoslav. Including several villages which have been incorporated with it, it extends for nearly 7 m. along the right bank of the Samara, a tributary of the Dnieper. In the 17th century the site was occupied by several villages of Zaporogian Cossacks, known under the name of Samarchik. In 1687 Prince Golitsin founded here the Ust-Samara fort, which was destroyed after the treaty of the Pruth (1711), but rebuilt in 1736, and the settlement of Novoselitsy established. The inhabitants of Novomoskovsk, who numbered 23,831 in 1900, are chiefly engaged in agriculture, though some are employed in tanneries, and there is a trade in horses, cattle, tallow, skins, tar and pitch. In the immediate neighbourhood is the Samarsko-Nikolayevsky monastery, which is visited by many pilgrims.

NOVORADOMSK, or Radomsko, a town of Russian Poland, in the government of Piotrków, 28 m. by rail S.S.W. of the town of Piotrków. It has factories for bentwood furniture, woollens and cloth, tanneries, ironworks and sawmills, and is the centre of a very active trade. Pop. (1900) 14,646, many being Jews.

NOVOROBYSKV, a seaport town of S. Russia, in the Chernomorsk or Black Sea territory, on a bay of the same name (also named Tames), on the N.E. coast of the Black Sea. Pop. (1900) 40,384.

The bay, nearly 3 m. wide at its entrance on the E., and 5 m. deep from E. to W., is exposed to the N.E. wind (bora), which sweeps down from the Caucasus Mountains with great violence. There is an artificial harbour (1853) protected by a mole. Novorossiysk is connected by a branch railway to Tikhoryetskaya (169 m.) with the main Caucasian line, which crosses the Volga near Tsaritsyn, and has become an important centre for the export of corn, and since the petroleum wells of Grouzy in northern Caucasus were tapped it has become a great depot for the export of petroleum. Cement is manufactured. Large grain elevators have been erected, and a commercial town has grown up. Besides cereals, which amount to 65% of the whole, the exports consist of petroleum and petroleum waste, oilcake, linters, timber, bran, millet seed, wool, potash, zinc ore and liquorice, the total annual value ranging between 32 and 34 millions sterling. The imports are small. Some 1500 acres in the vicinity of the town are planted with vines. Novorossiysk has belonged to Russia since 1829.

NOWELL, ALEXANDER (c. 1507—1602), dean of St. Paul's, London, was the eldest son of John Nowell of Read Hall, Whalley, Lancashire, by his second wife Elizabeth Kay of Rochdale.

He was educated at Middleton, Lancashire, and at Brasenose College, Oxford, where he is said to have shared rooms with John Foxe the martyrlogist. He was elected fellow of Brasenose in 1526. In 1543 he was appointed master of Westminster school, and in December 1551 prebendar of Westminster.

He was elected in September 1553 member of parliament for Loce in Cornwall in Queen Mary's first parliament, but in October 1553 a committee of the house reported that, having paraphrased the 6th chapter of Jeremiah to a seat in convocation, he could not sit in the House of Commons. He was also deprived of his prebend, probably as being a married man, before May 1554, and sought refuge at Strassburg and Frankfurt, where he developed puritan and almost presbyterian views. He submitted, however, to the Elizabethan settlement of religion, and was rewarded with the archdeaconry of Middlesex, a canonry at Canterbury and in 1560 with the deanship of St Paul's. His sermons occasionally created some stir, and on one occasion Elizabeth interrupted his sermon, telling him to stick to his text and cease slinging the crucifix. He held the deanship of St Paul's for forty-two years, surviving until the 11th of February 1602.

Nowell is believed to have composed the Catechism inserted before the Order of Confirmation in the Prayer Book of 1540, which was supplemented in 1604 and is still in use; but the evidence is not conclusive. Early in Elizabeth's reign, however, he wrote a larger catechism, to serve as a statement of Protestant principles; it was printed in 1570, and in the same year appeared his "middle" catechism, designed it would seem for the instruction of "simple curates." Nowell also published a free school at Middleton and made other contributions for educational purposes. He was twice married, but left no children.


NOWGONG, a town of India, headquarters of the Bundelkhand agency and a military cantonment, in the native state of Chhatarpur, on the border of the British district of Jhansi. Pop. (1901) 4430. It has accommodation for a force of about 3500. The college for the education of the sons of chiefs in Central India, opened here in 1872, was abolished in 1898, owing to the small attendance.

NOWGONG, a town and district of British India, in the Brahmputtra valley division of eastern Bengal and Assam. The town is situated on the Kalang river. Pop. (1901) 4430. The district of Nowgong has an area of 3843 sq. m. It consists of a wide plain overgrown with jungle and canebreaks, intersected by numerous tributaries of the Brahmaputra, and dotted with lenticular marshes. The Mikir hills cover an area of about 63 m. by 35 in the S. of the district; the highest peak is about 3500 ft. The slopes are very steep, and are covered with dense forest.
The Kamakhya hills near the bank of the Brahmaputra, are about 1,500 ft. high. On the summit of the highest peak is a celebrated temple of Kamakhya, the local goddess of love, where three annual festivals are held. The staple crop is rice. Tea cultivation and manufacture are carried on by European capital and under European supervision, though the soil and climate are not so favourable as in Upper Assam. The population in 1901 was 261,150, showing a decrease of 24.8% in the decade, due to the extreme unhealthiness of the climate. In the previous ten years the number of deaths recorded from fever and kalu assa has increased by 33.824. The section of the Assam-Bengal rail road, from Gauhati to the hills passes through part of the district, but not very near Nowgong town; and feeder roads to the estates lead from the main road that runs parallel to the Kalan river.

See *Newsgong District Gazetteer* (Calcutta, 1905).

**Nowshea** or Naushahra, a town and cantonment in Peshawar district of the North-West Frontier Province of India, situated on the right bank of the Kabul river 27 m. E. of Peshawar. Pop. (1901) 9518. It is the headquarters of a brigade of the Frontier Force. On it one of the branches of the railway intersects, and also the junction for the frontier railway that runs to the station of Mardan and continues to Dargai and Malakand on the route to Chitral.

**Noy, William** (1577–1634), English jurist, was born on the family estate of Pendrea in Buryan, Cornwall, in 1577, his father belonging to a family whose pedigree is included in the visitation of Cornwall in 1620. He went to Exeter College, Oxford, but left without taking a degree. He entered Lincoln’s Inn in 1594. From 1603 until his death he was elected, with one exception, to each parliament, sitting invariably for a constituency of his native county. For several years his sympathies were in antagonism to the court party. Every commission that was appointed numbered Noy among its members, and even those who were opposed to him in politics acknowledged his learning. A few years before his death he was drawn over to the side of the court, and in October 1631 he was created attorney-general, but was never knighted. It was through his advice that the impost of ship-money was levied. Noy had long suffered from stone, and died in great agony on the 9th of August 1634; two days later he was buried at New Brentford church.

**Noyon**, a city of N. France, in the department of Oise, 67 m. N.N.E. of Paris by the railway to Brussels. Pop. (1906) 5968. Noyon is built on the foot and on the slopes of a hill, and traversed by a small stream, the Verse, which joins the Oise 1 m. farther down. The old cathedral of Notre-Dame, constructed on the site of a church burned in 1131, is a fine example of the transition from Romanesque to Gothic architecture. In plan it is a Latin cross, with a total length from E. to W. of about 340 ft.; the height of the nave vaulting is 75 ft. The west front has a porch, added in the 14th century, and two unfinished towers; their upper portions dating from the 13th century; its decorations have been greatly mutilated. The nave consists of eleven bays, including those of the W. front, which, in the interior, forms a kind of transept. In the windows of the aisles, the arches of the triforium, and the windows of the clerestory the round type is maintained; but double pointed arches appear in the lower gallery; and the vaults of the roof, originally six-ribbed, were rebuilt after a fire in 1293 in the prevailing Pointed style. The transepts have apsidal terminations, and in the S. aisle in the 15th and the 16th, one of the latter (15th) is especially rich in decorations. The flying buttresses of the building were restored in the 19th century in the style of the 12th century. From the N.W. corner of the nave runs the western gallery of a fine cloister erected in 1292; and next to the cloister is the chapter-house of the same date, with its entrance adorned with statues of the bishops and other sculpture. The bishops’ tombs within the cathedral were destroyed during the Revolution. The chapel of the bishops' palace is an example of the Early Pointed style; the canons' library was built of wood early in the 16th century; and the town-hall (Gothic and Renaissance) dates from 1485-1523. Among the town manuscripts is the Red Book or communal charter of Noyon. Remains of the Roman walls may be traced. There is a statue to Jacques Sarrazin, the painter (1692-1660), a native of the town. Noyon has good trade in grain and live-stock, and contains chemical and artificial manure works, tanneries and ironfoundies and carries on sawmilling and sugar manufacture.

Noyon, the ancient Noviomagus Vermondauorum, was chosen by St. Peter of the Walloon Beghins as the site of their first monastery, and about 530 St. Medard, bishop of the district of Vermandois, transferred his see thither from St. Quentin. The episcopate of St. Eligius towards the middle of the 7th century, the burial of Chilperic I., the coronation of Pippin the Short in 752, and on the same occasion the coronation of his infant son Carolomn with the title of king of Noyon, the coronation of Charlemagne in 768 and the election of Hugh Capet in 987, the plunder of the town by the Normans in 859 are the chief events in the history of Noyon down to the 10th century. Fill the Revolution the bishops-the cathedral was never a diocesan see—ceded its temporalities to the state, and the town, the church and the bishopric were merged in the Republic. At the beginning of the 17th century Noyon was made a commune and was granted a communal charter through the favour of its bishops. The extent of the bishopric was considerably curtailed towards the middle of the 12th century by the breaking off of the diocese of Tournai. Noyon was ravaged by the English and the Burgundians during the Hundred Years' War. In 1516 a truce was signed there by Francis I. and Charles V. The city was captured by the Spaniards in 1552, and afterwards by the Leaguers, who were expelled in 1594 by Henry IV. John Calvin was born at Noyon in 1543.


**Nouzu, Michitsura, Marquess** (1840–1908), Japanese field-marshall, was born in Satsuma. He fought against the Satsuma rebels in 1877, became a general in 1894 and led the Hiroshima division at the battle of Pyongyang (1894). He succeeded Yamagata in the command-in-chief of the Manchurian army, and fought in that capacity throughout the China-Japan War, being raised to the rank of viscount (1895). He commanded the fourth army in the Russo-Japanese War, and received a marquisate at its close.

**Nubar Pasha** (1829–1899), Egyptian statesman, was born at Smyrna in January 1825, the son of an Armenian merchant named Mogherditch, who had married a relative of Boghos Bey, an influential minister of Mehemet Ali. Boghos had promised to interest himself in the future of his young relative, and at his suggestion he was sent first to Vevey, and then to Toulouse, to be educated by the Jesuits, from whom he acquired a very perfect knowledge of French, and perhaps that singular suppleness and subtlety of character by which he was mainly distinguished. Before he was eighteen he went to Egypt, and after some eighteen months' training as secretary to Boghos, who was then minister of both commerce and foreign affairs, he was made second secretary to Mehemet Ali. In 1845 he became first secretary to Ibrahim Pasha, the heir apparent, and accompanied him on a special mission to Europe. Abbas Pasha, who succeeded Ibrahim in 1848, maintained Nubar in the same capacity, and sent him in 1850 to London as his representative to resist the pretensions of the sultan, who was seeking to evade the conditions of the treaty under which Egypt was secured to the family of Mehemet Ali. Here he was so completely successful that he was made a bey; he was also made Minister of the Interior in 1852, and remained there until the death of Abbas in July 1854. The new viceroy, Said, at once dismissed him from office, but two years afterwards appointed him his chief secretary, and later gave him charge of the important transport service through Egypt to India. Here Nubar was mainly instrumental in the completion of railway communication between Cairo and Suez, and exhibited strong organising ability combined with readiness of resource. After a second time falling a victim to Said's caprice and being dismissed, he was again sent to Vienna, and returned as
principal secretary to Said, a position he held till Said's death in January 1863.

On the accession of Ismail Pasha, Nubar Bey was in the prime of life. He was already on friendly terms with him; he even claimed to have saved his life—at all events, it was a coincidence that the two had together refused to travel by the train the accident to which caused the death (on the 14th of May 1838) of the prince Ahmed, who would otherwise have succeeded Said. Ismail, himself of more capable man than his immediate pre-
decessors, at once recognized the ability of Nubar, and charged him with a mission to Constantinople, not only to notify his accession, but to smooth the way for the many ambitious projects he already entertained, notably the completion of the Suez Canal, the change in title to that of khedive and the change in the order of succession. In the first of these he was completely successful; the sultan, believing as little as every one else that the canal was anything more than a dream, gave his consent at a price the moderation of which he must afterwards have regretted. The gratified Ismail created Nubar a pasha, and the sultan himself, persuaded to visit Cairo, confirmed the title so rarely accorded to a Christian.

Half the work was, however, yet to be done, and Nubar was sent to Paris to complete the arrangements, and to settle the differences between Egypt and the Canal Company. In what he used to call "an expensive moment of enthusiasm," he left these differences to the arbitration of the emperor Napoleon III. and cost Egypt four millions sterling. On his return he was

made Egypt's first minister of public works, and was distinguished for the energy which he threw into the creation of a new department; but in 1866 he was made minister of foreign affairs, and at once went on a special mission to Constantinople, where he succeeded in the other two projects that had been left in abeyance since his last visit. In June 1867 Ismail was declared khedive of Egypt, with succession in favour of his eldest son. Nubar now had a harder task to undertake than ever before. The antiquated system of "capitations" which had existed in the Ottoman empire since the 15th century had grown in Egypt to be a practical creation of seventeen imperia in imperio: seventeen consulates of seventeen different powers administered seventeen different codes in courts before which alone their subjects were amenable. A plaintiff could only sue a Frenchman in the French court, with appeal to Aix; an Italian in the Italian court, with appeal to Ancona; a Russian in the Russian court, with appeal to Moscow. Nubar's bold design, for which alone he deserves the credit, was to induce these seventeen powers to consent to abandon their jurisdiction in civil actions, to substitute mixed International Courts and a uniform code binding on all. That in spite of the jealousies of all the powers, in spite of the opposition of the Porte, he should have succeeded, places him at once in the first rank of statesmen of his period. Nubar made no attempt to get rid of the criminal jurisdiction exercised by the consular representatives of the foreign powers—such a proposal would have had, at that time, no chance of success.

The extravagant administration of Ismail, for which perhaps Nubar can hardly be held wholly responsible, had brought Egypt to the verge of bankruptcy, and Ismail's disregard of the judgments of the Court at last compelled Great Britain and France to interfere. Under pressure, Ismail, who began to regret the establishment of the International Courts, assented to a mixed ministry under Nubar, with Rivers Wilson as minister of finance and de Blignières as minister of public works. Nubar, finding himself supported by both Great Britain and France, tried to reduce Ismail to the position of a constitutional monarch, and Ismail, with an astuteness worthy of a better cause, took advantage of a somewhat injudicious disbandment of certain regiments to incite a military rising against the ministry. The governments of Great Britain and France, instead of supporting the ministry against the khedive, weakly consented to Nubar's dismissal; but when Nubar had retired, Rivers Wilson and de Blignières they realized that the situation was a critical one, and they succeeded in obtaining from the sultan the deposition of Ismail and the substi-
tution of his son Tewfik as khedive (1879). Nubar remained out of office until 1884.

In the interval Great Britain had intervened in Egypt—the battle of Tel-el-Kebir had been fought, Arabi had been banished, and Sir Evelyn Baring (afterwards earl of Cromer) had succeeded Sir Edward Malet. The British government, under the advice of Baring, insisted on the evacuation of the Sudan, and Sheriff having resigned office, the more pliant Nubar was induced to become premier, and to carry out a policy of which he openly disapproved, but which he considered Egypt was forced to accept under British dictation. At this period he used to say, "I am not here to govern Egypt, but to administer the British government of Egypt. I am simply the greaser of the official wheels." It might have been well if Nubar had confined himself to this modest programme, but it was perhaps hardly to be expected of a man of his ability and restless energy. It must be admitted, however, that the characters of Nubar and Lord Cromer were not formed to run in harness, and it was with no surprise that the public learnt in June 1888 that he had been relieved of office, though his dismissal was the direct act of the khedive Tewfik, who did not on this occasion seek the advice of the British agent. Riaz Pasha, who succeeded him, was, with one interval of eight months, prime minister until April 1894, when Nubar returned to office. By that time Lord Cromer had more completely grasped the reins of administration as well as of government, and Nubar had realized more clearly the rôle which an Egyptian minister was called on to play; Lord Cromer was the real ruler of Egypt, and the death of Tewfik in 1890 had necessitated a more open exercise of British authority. In November 1895 Nubar completed his fifty years of service, and, accepting a pension, retired from office. He lived little more than three years longer, spending his time between Cairo and Paris, where he died in January 1899 at the age of seventy-four.

NUBIA, a region of north-east Africa, bounded N. by Egypt, E. and W. by the Red Sea and the Libyan Desert respectively, and extending S. indefinitely to about the latitude of Khartum. It may be taken to include the Nile valley from Assuan near the First Cataract southwards to the confluence of the White and Blue Niles, stretching in this direction for about 500 m. between 16° and 24° N. Nubia, however, has no strictly defined limits, and is little more than a geographical expression. The term appears to have been unknown to the ancients, by whom everything south of Egypt was vaguely called Ethiopia, the land of the dark races. It is first associated historically, not with any definite geographical region, but with the Nobatae, a negro people removed by Dioscurid from Kharga oasis to the Nile valley above Egypt (Dodecaschoenus), whence the turbulent Blemmyes had recently been driven eastwards. From Sth, the Arabic form of the name of this people, comes the modern Nubia, a term about the precise meaning of which no two writers are in accord. Within the limits indicated the country consists mainly of sandy desert and rugged and arid steppes and plateaus through which the Nile forces its way to Upper Egypt. In this section of the river there occurs a continuous series of slight falls and rapids, including all the historical "six cataracts," beginning below Khartum and terminating at Philae. Between those places the river makes a great S-shaped bend, the region west of the Nile within the lower bend being called the Bayuda Desert, and that east of the Nile the Nubian Desert. The two districts roughly correspond to the conventional divisions of Upper and Lower Nubia respectively. Except along the narrow valley of the Nile only the southernmost portion of Nubia contains arable land. The greater part is within the almost rainless zone. An aridiferous district lies between the Nile and the Red Sea, in 25° N. Politically the whole of Nubia is now included either in Egypt or the Anglo-Egyptian Sudan, and has no administrative existence.

Ethnology.—As an ethnical expression the term Nubia or Nubian has little value. Rejected by the presumed descend-
slaves drawn by Arab dealers from the Nuba negroes of Kordofan, who appear to constitute the original stock of the Nubian races (but see HAMITIC RACES). On the other hand, the name has never included all the inhabitants of Nubia. Peoples of three distinct stocks inhabit the country—the comparatively recent Semitic Arab intruders, mainly in Upper Nubia, the Beja (? Hamitic) family of tribes (the Ababda, Basharin, Hadendoa, Beni-Amer, &c.), everywhere between the Nile and the Red Sea; and the Nubians (Nuba or Barabira) of the Low Nubia, where they now also seem to predominate. Nubia is attached to the banks of the Nile, from Assuan southwards to Dongola. Ethnologically these modern Nubians are a very mixed people, but their affiliation to negroes or negroids, which is based on physical and linguistic grounds, is confirmed by what is known of the history of the Nilotic peoples.

The first inhabitants of the region beyond Egypt appear to have been the Uaua, whose name occurs in an inscription on a tomb at Memphis of the Vth Dynasty, and again constantly in subsequent inscriptions down to the time of the Ptolemies, as the chief negro race to the south of Syene. (For the history of the country during this period see ETHIOPIA.) It thus appears that throughout the historic period down to the arrival of the Romans the Nile-country above Egypt was occupied by a negro people. Egyptian monuments are found as far south as Mount Barkal (Napata), but no Egyptian settlements beyond Syene. Hence these Uaua negroes probably remained unaffected, or very slightly affected, by foreign elements until about the 3rd century A.D. Their domain then began to be encroached upon from the east by the Blemmyes, who have been identified with the present Beja of the Nubian desert. It was owing to their incessant raids that the Romans withdrew the Roman garrisons above the cataracts, and called in the warlike Nubate to protect the Egyptian frontier from their attacks. These negro Nubate, originally from Kordofan, as is now evident, had advanced to the Great Oasis (Kharga) in Upper Egypt, whence they passed into the Nile valley between the cataracts. Here they absorbed the older Gua of kindred stock, and ultimately came to terms with the Blemmyes. The two races even began intermingling, and, making common cause against the Romans, were defeated by Maximinus in 457.

The Blemmyes remaining pagan after the Nubas had embraced Christianity (6th century) were soon after driven from the Nile valley eastwards to the kindred Megabares, Memmons and other negroes, who, with the Troglydates, had from time immemorial held the whole steppe region between the Nile and the Red Sea from Azum to Egypt. Here their most collective name was Bugaitae (Bovraerbal), as appears from the Axumite inscription, whence the forms Buja, Beja, which occur in the oldest Arab records, and by which they are still known.

In the 7th century the Arabs who had conquered Egypt penetrated into Lower Nubia, where the two Jawabareh and Al-Gharbiya tribes became powerful, and amalgamated with the Nubas of that district. Their further progress south was barred by the Christian kings of Dongola (682) until the 14th century, when the Arabs became masters of the whole region. Still later another element was added to the population in the introduction by the Turkish masters of Egypt of a number of Bosnians. These Bosnians (Kahaj as they called themselves) settled in the country and intermarried with the Arabs and Nubians, their descendants still holding lands between Assuan and Derr. Hence it is that the Nubians of this district, fairest of all the races, still claim Arab or Osmani (Bosnian) descent.

Nevertheless, the Nubian type of negro is essentially negro, being characterized by a very dark complexion, varying from a mahogany brown and deep bronze to an almost black shade, with tumid lips, large black animated eyes, doli-chephalic head (index 73, 72), hair often woolly or strongly frizzled, and scant beard worn under the chin like the figures of the fugitives (Uaua?) in the battle-pieces sculptured on the walls of the Egyptian temples. At the same time the nose is much larger and the azygomatic arches less prominent than in the full-blooded negro. The Nilotic Nubians are on the whole a strong muscular people, essentially agricultural, more warlike and energetic than the Egyptians. Many find employment as artisans, small dealers, porters and soldiers in Egypt, where they are usually noted for their honesty, and frank and cheerful temperament. Since the overthrow of the native Christian states all have become Mahomedans, but not of a fanatical type. Although a native of Dongola, the maliki, Mahommed Ahmed, found his chief support, not among his countrymen, but among the more recently converted Kordofan negroes and Arabs and Beja. (For ethnology see also HAMITIC RACES, BEJA, ABABA, BISHARIN, HADENDOA, &c.).

Language.—Little is known of the language of the ancient Nubians or of its connexion, if any, with the language, known as Meroitic, of the old Nubian negroes. The cartouches and hieroglyphs and inscriptions in Meroitic belong mostly to the first six centuries A.D.; the existing Nubian MSS. are medieval and are written chiefly in Greek letters, and in form and character resemble Coptic. They are, with one exception, written on parchment and contain lives of saints, &c., the exception being a legal document. The most noteworthy of these MSS. was found near Edfu, in Upper Egypt, early in the 19th century and purchased for the British Museum in 1808. Etym-chius, pamphlet, (second cataract.) Here the natives are called Sadooki, in contradistinction to the northern Matoke.

III. SOUTHERN: Dongola, throughout the province of Dongola from the second cataract to J, Délia near Meroé, on the northern frontier of the Arab district of Dar Shagia. By Iofa, Mahas, or the Arab name Bannid, Biscaini Barisc (in the language of the poor,) or, collectively with the Keno, Ohkhirin, Banni, "language of slaves."

The northern and southern varieties are closely related to each other in the following characteristics, which show more marked affinities with the Kordofan Nuba, possibly because the Sadooki people are later arrivals from Kordofan. For topography, &c., and archaeology, see SUDAN § Anglo-Egyptian and Egypt. Authorities.—C. R. Lepage, Nubische Grammatik (Berlin, 1880), and Briefe aus Aegypten, Athiopien, &c. (Berlin, 1852); D. R. Maclever, Aretka (Oxford, 1909); Nubian Texts, edited by E. A. Wallis Budge (British Museum, 1900); F. Li Griffith, "Some old Nubian Christian Texts" in Journal of Theological Studies (July, 1909); E. A. Wallis Budge, The Egyptian Sudan (London, 1907); G. E. Ward, Our Sudan, its Pyramids and Progress (London, 1905); E. Engelbrechter, Zwei Reisen im Nubien (Vienna, 1889); L. Reinisch, Die Nuba-Sprache (Vienna, 1879); Memori of the Société kshéviélale de Géographie, Cairo; J. L. Burckhardt, Travels in Nubia, &c. (London); C. A. Bell, "Visit to some parts of Ethiopia" (London, 1822); E. F. Gau, Nubische Denkmäler (Stuttgart, 1821). Consult also the bibliography under SUDAN.

NUBLE, a province of central Chile, bounded N. by Linares, E. by the Argentine Republic, S. by Concepción and W. by Concepción and Maule. Area, 3407 sq. m.; pop. (1856) 152,935. The province lies partly in the great central valley of Chile, noted for its fine climate and fertility, and partly on the western slopes of the Andes. The Itata river, which forms the southern boundary, and its principal tributary, the Nuble, form the drainage system of the province. Agriculture and grazing are the principal industries. Wheat is largely produced, and there are vineyards in some localities. Stock-raising is pursued chiefly in the east, where the pastures are rich and the water

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NUBLE
supply unfalling. The state railway from Santiago to the southern provinces passes through Nuble, from N.N.E. to S.S.W., and sends off a branch from Bulnes W. to Jan Tomé on the Bay of Concepción. The capital is Chillán, and the only other important town is Bulnes, a railway junction and active commercial centre. The hot baths of Chillán, in the eastern part of the province on the slope of the volcano of that name, about 7000 ft. above sea level, are very popular in Chile.

**NUCERIA ALFATERNA—NUISANCE**

The chief products being sugar, barley, Indian corn and wheat. Rum is a by-product of the sugar industry, and the "mescal" is distilled from the agave. The gathering and preparation of "little" fibres from the agave and yucca forms another important industry, the fibre being sent to Tampico for export. Stock-raising receives considerable attention; there are about a score of large cattle ranges, and there is a considerable export of live cattle to Texas and to various Mexican states. Considerable progress has been made in manufacturing industries, and there are a large number of sugar-mills, cotton factories, woolen mills, smelting works and iron and steel works. The state is well served with railways, the capital, Monterrey, being one of the most important railway centres of Mexico. Though a Mexican National line crosses the northern half of the state and has constructed a branch from Monterrey to Matamoros, and a Belgian line (F. C. de Monterrey al Golfo Mexicano) runs from Tampico N.N.W. to Monterrey, and thence westward to Treviño (formerly Venadito) in Coahulla, a station on the Mexican International. The other principal towns are: Linares, or San Felipe de Linares (pop. 20,560 in 1900), 112 m. by rail S.E. of the capital in a rich agricultural region; Lampaos, or Lampazos de Naranjo (1790), 96 m. by rail N.W. of the capital; Cadereyta Jiménez, or Nuestra Señora de Guadalupe, and Durango, the last in the extreme southern part of the state.

**NUGENT, ROBERT NUGENT, EARL (1702–1788)**, Irish politician and poet, son of Michael Nugent, was born in Carlowtown, Co. Westmeath. He was tersely described by Richard Glover as "a jovial and voluptuous Irishman who had left popery for the Protestant religion, money and widows." His change of religion took place at a very early period in life; he married in 1736 Anna (d. 1756), daughter of James Craggs, the secretary of state, a lady who had already been twice given in marriage. His wife's property comprised the borough of Mawes in Cornwall, and Nugent sat for that constituency from 1741 to 1754, after which date he represented Bristol until 1774, when he returned to St Mawes. He was a lord of the treasury from 1754 to 1759 and president of the board of trade from 1766 to 1768. He married in 1757 Elizabeth, dowager-countess of Berkeley, who brought him a large fortune. His support of the ministry was so useful that he was created in 1707 Viscount Clare, and in 1776 Earl Nugent, both Irish peerages. He died on the 15th of October 1788. Lord Nugent was the author of some poems, several of which are preserved in the second volume of Dodson's Collections (1748). The epigram descended by special remainder to the earl's son-in-law, George Nugent Temple Grenville, marquess of Buckingham, and so to his successors, the dukes of Buckingham and Chandos.

**NUISANCE** (through Fr. *nuiscence*, *nuisance*, from Lat. *nocere*, to hurt), that which gives offence or causes annoyance, trouble or injury. In English law nuisance is either public or private. A public or common nuisance is defined by Sir J. F. Stephen as "an act not warranted by law, or an omission to discharge a local duty, which act or omission obstructs or causes inconvenience or damage to the public in the exercise of rights common to all His Majesty's subjects." (Digest of the Criminal Law, p. 120). A common nuisance is punishable as a misdemeanour at common law, where no special provision is made by statute. In modern times many of the old common law nuisances have been the subject of legislation. It is no defence for a master or employer that a nuisance is caused by the acts of his servants, if such acts are within the scope of their employment, even though such acts are done without his knowledge and contrary to his orders. Nor is it a defence that the nuisance has been in existence for a great length of time, for no lapse of time will legitimate a public nuisance.

A private nuisance is an act or omission which causes inconvenience or damage to a private person, and is left to be remedied by action. There must be some sensible diminution of these rights affecting the value or convenience of the property. "The real question in all the cases is the question of fact, whether the annoyance is such as materially to interfere with the ordinary comfort of human existence." (Lord Romilly in *Crump v.*
nullification required a practice as follows. A state aggrieved by a law of the Federal congress might, in constituent convention, suspend the operation of the objectionable law, and report its action to the other states. If three-fourths of them should decide that the law in question was not unconstitutional, then in effect it became ratified (see United States Constitution, art. v.). The dissatisfied state must then submit or must draw out of the union by the act of secession (see secession, and Confederate States). This theory of the right of nullification was considered by those who held it to be in accord with the principles laid down in the Constitution. It must be distinguished from secession, which was considered a sovereign right, one above the Constitution; yet nullification presumed the submission to the Constitution.

The earliest assertions of the doctrine of nullification are found in the Kentucky and Virginia Resolutions of 1798-1799, written respectively by Thomas Jefferson and James Madison in protest against the Alien and Sedition Acts of Congress. Nullification was first practised in 1830 by Pennsylvania, the governor ordering out the state troops to resist the execution of a decree of a Federal court. In the New England states, 1800-1815, the United States laws relating to embargo, non-intercourse and army enlistments were nullified by state action. In 1832 and 1835, South Carolina likewise nullified the execution of Federal laws and court decrees relating to the Indians within her borders and in Alabama, 1832-1835, there was a similar nullification. The only example of nullification in which theory and practice coincided was the nullification in 1832 by South Carolina of the Federal tariff laws. In this case the state upon the theory outlined above which was perfected by Calhoun. In the last decade before the Civil War fourteenth of the Northern states in the so-called Personal Liberty laws nullified the Federal statutes relating to slaves and slavery by making it a crime for their citizens to obey these laws and by setting them aside by setting them aside. Since the Reconstruction the Southern states have in practice effected a nullification of the Fourteenth and Fifteenth Amendments to the Constitution providing for negro suffrage.

See John C. Calhoun, Works, vols. i. and vi. (New York, 1853-1855); D. F. Houston, Critical Study of Nullification in South Carolina (New York, 1807); C. W. Loring, Nullification and Secession (New York, 1893); E. P. Powell, Nullification and Secession in the United States (New York, 1897); and U. B. Phillips, Georgia and States Rights (Washington, 1902).

NUMANTIA, an ancient hill fortress in northern Spain, in the province of Soria (Old Castile), overlooking the valley of the River Tormes. It was built by the town of Soria, on the upper Donava. Here on a small isolated high plateau in the middle of the valley, was the stronghold which played the principal part in a famous struggle between the conquering Romans and the native Spaniards during the years 154-133 B.C. Numantia was especially concerned in the latter part of this war from 144 onwards. It was several times unsuccessfully besieged. Once the Roman general Hostilius Mancinus with his whole army was compelled to surrender (137). Finally, Scipio Aemilianus, Rome’s first and only general in that age, with some 60,000 men drew round the town 6 m. of continuous entrenchments with seven camps at intervals. After 15 months (134-133) he reduced by hunger the 6000-8000 Numantine soldiers, much as Caesar afterwards reduced Alesia in Gaul. The result was regarded as a glorious victory, and in Roman literature the fall of Numantia was placed beside the fall of Carthage (149 B.C.). In truth, the maintenance in effective condition of so large a Roman force in so remote and difficult a region was in itself a real achievement and such as at that time no one but Scipio could have performed. He redeemed by organized strategy the vacillations and follies of statesmen who had sat at home and sent out inadequate expeditions or incompetent commanders. The site was, under the Roman Empire, occupied by a Roman town called Numantia, and the Itinerary tells of a Roman road which ran past it. It is to-day a “Monumento Nacional” of Spain, and has yielded remarkable discoveries to the skilful excavations of Dr Schulten.
NUMA POMPILIUS—NUMBER

(1905-1910), who has traced the Celtiberian town, the lines of Scipio and several other Roman camps dating from the Numantine Wars.

(F. J. H.)

NUMA POMPILIUS, second legendary king of Rome (715-672 B.C.), was a Sabine, a native of Cures, and his wife was the daughter of Titus Tatius, the Sabine colleague of Romulus. He was elected by the Roman people at the close of a year's interregnum, during which the sovereignty had been exercised by the members of the senate in rotation. Nearly all the early religious institutions of Rome were attributed to him. He set up the worship of Terminus (the god of landmarks), appointed the festival of Fides (Faith), built the temple of Janus, reorganized the calendar and fixed days of business and holiday. He instituted the flamen (sacred priest) of Jupiter, Mars and Quirinus; the virgins of Vesta, to keep the sacred fire burning on the hearth of the city; the Salii, to guard the shield that fell from heaven; the pontifices and augurs, to arrange the rites and interpret the will of the gods; he also divided the handicraftsmen into nine guilds. He derived his inspiration from his wife, the nymph Egeria, whom he used to meet by night in her sacred grove. After a long and peaceful reign, during which the gates of Janus were closed, Numa died and was succeeded by the warlike Tullus Hostilius. Livy (xl. 29) tells a curious story of two stone chests, bearing inscriptions in Greek and Latin, which were found at the foot of the Janiculum (781 B.C.), containing the laws of the ages 2, 4 and 6. The first when opened was found to be empty, but the second contained fourteen books relating to philosophy and pontifical law, which were publicly burned as tending to undermine the established religion.

No single legislator can really be considered responsible for all the institutions ascribed to Numa; they are essentially Italian, and older than Rome itself. Even Roman tradition itself wavers; e.g. the fetiales are variously attributed to Tullus Hostilius and Ancus Marcius. The supposed law-books, which were to all appearance new when discovered, were certainly false.

See Livy i. 18-21; Plutarch, Numa; Dion. Halic. ii. 58-76; Cicero, De republica, ii. 13-15. For criticism: Schwiep, Römische Geschichte, bk. xii.; Sir G. Cornwall Lewis, Credibility of early Roman History, ch. xii.; W. Ihne, Hist. of Rome, i. E. Pais, Storia di Roma, i. (1896), where Numa is identified with Titus Tatius and made out to be a river god, Numinis, closely connected with Aeneas; J. B. Carter, The Religion of Numa (1906); O. Gilbert, Geschichte und Topographie der Stadt Rom im Altertum (1883-1885), and Rome: Ancient History.

NUMBER1 (through Fr. nombre, from Lat. numerus; from a root seen in Gr. προβος to distribute), a word generally expressive of quantity, the fundamental meaning of which leads on to some of the most difficult problems of higher mathematics.

1. The most elementary process of thought involves a distinction within an identity—the A and the not-A within the sphere throughout which these terms are intelligible. Again A may be a generic quality found in different modes Aa, Ab, Ac, &c.; for instance, colour in the modes, red, green, blue and so on. Thus the notions of ‘one,’ ‘two,’ and the vague ‘many’ are fundamentally put, and must have impressed themselves on the human mind at a very early period: evidence of this is found in the grammatical distinction of singular, dual and plural which occurs in ancient languages of widely different races. A more definite idea of number seems to have been gradually acquired by realizing the equivalence, as regards plurality, of different concrete groups, such as the fingers of the right hand and those of the left. This led to the invention of a set of names which in the first instance did not suggest a numerical system, but denoted certain recognized forms of plurality, just as blue, red, green, &c., denote recognized forms of color. Eventually the conception of a series of natural numbers became sufficiently clear to lead to a systematic terminology, and the science of arithmetic was thus rendered possible. But it is only in quite recent times that the notion of number has been submitted to a searching critical analysis: it is, in fact, one of the most characteristic results of modern mathematical research that the term number has been made at once more precise and more extensive.

2. Aggregates (also called manifolds or sets).—Let us assume the possibility of constructing or contemplating a permanent system of the aggregate of all things, as is done in the treatment of the system of all the planets and stars. (1) the system includes all objects to which a certain definite quality belongs; (2) no object without that quality belongs to the system; (3) each object of the system is permanently recognizable as the same thing, and as distinct from all other objects of the system. Such a collection is called an aggregate: the separate objects belonging to it are called its elements. An aggregate may consist of a single element. It is further assumed that we can select, by a definite process, one or more elements of any aggregate A at pleasure: these form another aggregate B. If any element of A remains unselected, B is said to be a part of A (in symbols, B⊂A). If not, B is identical with A. Every element of A is a part of B. If B⊂A and C⊂B, then C⊂A.

When a correspondence can be established between two aggregates A and B in such a way that to every element of A corresponds one and only one element of B, and conversely, A and B are said to be equivalent, or to have the same power (or potency); in symbols, A∞B. If A∞B and B∞C, then A∞C. It is possible for an aggregate to be equivalent to a part of itself: the aggregate is then said to be finite. As an example, the aggregates 2, 4, 6, 8, 10, &c., 1, 2, 3, 4, 5, 6, 7, &c., are equivalent, but the first is only a part of the second.

3. Order.—Suppose that any two elements a, b of an aggregate A are taken there can be established, by a definite criterion, one or other of two alternative relations, symbolized by a<a or a>b, subject to the following conditions:—(1) If a<b, then b>a, and if a<b, then b>a; (2) If a>b and b>c, then a>c. In this case the criterion is said to arrange the aggregate in order. An aggregate which can be arranged in order may be called ordinal. An ordinal aggregate may, in general, by an alternative criterion, be arranged in order in a variety of ways. According as a<b or a>b we shall speak of a as anterior or posterior to b. These terms are chosen merely for convenience, and must not be taken to imply any meaning except what is involved in the definitions of the signs > and < for the particular criterion in question. The consideration of a successor of events in time will help to show that the assumptions made are not self-contradictory. An aggregate arranged in order by a definite criterion will be called an ordered aggregate. Let a, b be two elements of an aggregate (or ordinal aggregate), and suppose a<b. All the elements c (if any) such that a<c<b are said to fall within the interval (a, b). If an element b, posterior to a, can be found so that no element falls within the interval (a, b), then a is said to be isolated from all subsequent elements, and b is said to be the element next after a. So if b<a, and no element falls within the interval (b', a), then a is isolated from all preceding elements, and b' is the element next before a. As will be seen presently, for any assigned element a, either, neither, or both of these cases may occur.

An aggregate A is said to be well-ordered (or normally ordered) when, in addition to being ordered, it has the following properties: (1) A has a first or lowest element a which is anterior to all the rest; (2) if b is any part of A, then A has a first element. It follows from this that every part of a well-ordered aggregate is itself well-ordered. A well-ordered aggregate may or may not have a last element.

Two ordered aggregates A, B are said to be similar (A~B) when a one-one correspondence can be set up between their elements in such a way that if b, b' are the elements of B which correspond to any two elements a, a' of A, then b>b' or b'<b' according as we can make the even number 2n correspond to the odd number 2n−1 and conversely.

Similar ordered aggregates are said to have the same order-type. Any definite order-type is said to be the ordinal number of every aggregate arranged according to that type. This somewhat vague definition will become clearer as we proceed.

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1 See also Numeral.
4. The Natural Scale.—Let $a$ be any element of a well-ordered aggregate $A$. Then all the elements posterior to $a$ form an aggregate $a'$, which is a part of $A$ and, by definition, has a first element $a'$. This element $a'$ is different from $a$, and immediately succeeds it in the order of $A$. (It may happen, of course, that $a'$ does not exist; in this case $a$ is the last element of $A$.) Thus in a well-ordered aggregate every element except the last (if there be a last element) is succeeded by a definite next element. The ingenuity of man has developed a symbolism by means of which every symbol is associated with a definite next succeeding symbol, and in this we have a set of visible or audible signs $1, 2, 3, \&c.$ (or their verbal equivalents), representing an aggregate in which (1) there is a definite order, (2) there is a first term, (3) each term has one next following, and consequently there is no last term. Counting a set of objects means associating them in order with the first and subsequent members of this conventional aggregate. The process of counting may lead to three different results: (1) the set of objects may be finite in number, so that they are associated with a part of the conventional aggregate which has a last term; (2) the set of objects may have the same power as the conventional aggregate; (3) the set of objects may have a higher power than the conventional aggregate. Examples of (2) and (3) will be found further on. The order-type of $1, 2, 3, \&c.$ is called an ordinal number, and the first is the first and simplest member of a set of transfinite ordinal numbers to be considered later on. Any finite number such as $3$ is used ordinarily as representing the order-type of $1, 2, 3$ or any similar aggregate, and cardinally as representing the power of $1, 2, 3$ or any equivalent aggregate. For reasons that will appear, $\omega$ is only used in an ordinal sense. The aggregate $1, 2, 3, \&c.$, in any of its written or spoken forms, may be called the natural scale, and denoted by $N$. It has already been shown that $N$ is infinite: this appears in a more elementary way from the fact that $(1, 2, 3, 4, \ldots) \equiv (2, 3, 4, 5, \ldots)$, where each element of $N$ is in one-to-one correspond with the next following. Any aggregate which is equivalent to the natural scale or a part thereof is said to be countable.

5. Arithmetical Operations.—When the natural scale $N$ has once been obtained it is comparatively easy, although it requires a long process of induction, to define the arithmetical operations of addition, multiplication and involution, as applied to natural numbers. It can be proved that these operations are free from ambiguity and obey certain formal laws of commutation, &c., which will not be discussed here. Each of the three direct operations leads to an inverse problem which can be solved if except under certain implied conditions. Let $a$, $b$ denote any two assigned natural numbers: then it is required to find natural numbers, $x, y, z$ such that

$$a + b = x, \quad a = by, \quad a = b$$

respectively. The solutions, when they exist, are perfectly definite, and may be denoted by $a - b, a/b$ and $a^{\&c.}$; but they are only possible in the first case when $a > b$, in the second when $a$ is a multiple of $b$, and in the third when $a$ is a perfect $b$th power. It is found to be possible, by the construction of certain elements, called respectively negative, fractional and irrational numbers, and zero, to remove all these restrictions.

6. There are certain properties, common to the aggregates with which we have next to deal, analogous to those possessed by the natural scale, and consequently justifying us in applying the term number to any one of their elements. They are stated here, once for all, to avoid repetition; the verification, in each case, will be, for the most part, left to the reader. Each of the aggregates in question ($A$, suppose) is an ordered aggregate. If $a, b$ are any two elements of $A$, they may be combined by two different operations, denoted by $a + b$ and $a \times b$, so as to produce two definite elements of $A$ represented by $a + b$ and $a \times b$ (or $ab$); these operations obey the formal laws satisfied by those of addition and multiplication. The aggregate $A$ contains one (and only one) element $i$, such that if $a$ is any element of $A$ ($i$ included), then $a + i = a$, and $ai = a$. Thus $A$ contains the elements $i, i + i, i + i + i, \&c.$, or, as we may write them, $i, 2i, 3i, \ldots$ such that $m + n = (m + n)i$ and $m \times n = mn i$; also $i < 2i < 3i \ldots$. We may express this by saying that $A$ contains an image of the natural scale. The element denoted by $i$ may be called the ground element of $A$.

7. Negative Numbers.—Let any two natural numbers $a, b$ be selected in a definite order $a, b$ (to be distinguished from $b, a$, in which the order is reversed). In this way we obtain from $N$ an aggregate of symbols ($a, b$) which we shall call couples, or more precisely, if necessary, polar couples. This new aggregate may be arranged in order by means of the following rules:

Two couples ($a, b$), ($a', b'$) are said to be equal if $a + b' = a' + b$. In other words ($a, b$), ($a', b'$) are then taken to be equivalent symbols for the same thing.

If $a + b' > a' + b$, we write $(a, b) > (a', b')$; and if $a + b' < a' + b$, we write $(a, b) < (a', b')$.

The rules for the addition and multiplication of couples are:

$$(a, b) + (a', b') = (a + a', b + b')$$

$$(a, b) \times (a', b') = (aa' + bb', ab' + ba').$$

The aggregate thus defined will be denoted by $N$; it may be called the scale of relative integers.

If $\iota$ denotes $(2, 1)$ or any equivalent couple, $(a, b) + \iota = (a + 2, b + 1) > (a, b)$ and $(a, b) \times \iota = (2a + b, a + 2b) = (a, b)$. Hence $\iota$ is the ground element of $N$. By definition, $2_1 = 1 + \iota = (5, 1)$ and hence by induction $mn = (m + 1, 1)$, where $m$ is any natural integer. Conversely every couple $(a, b)$ in which $a > b$ can be expressed by the symbol $(a - b)\iota$, in the same way, every couple $(a, b)$ in which $b > a$ can be expressed in the form $(b - a)\iota$, where $\iota = (1, 2)$.

It follows as a formal consequence of the definitions that

$$i + i = (1, 1) = (a + 1, 1) = (a, b)$$

$$i \times i = (1, 1) = (a, b)$$

hence $i + \iota = \omega$, and we can represent $N$ by the scheme

$$3i, 2i, 1i, 0i, 2i, 3i \ldots$$

in which each element is obtained from the next before it by the addition of $i$. With this notation the rules of operation may be written $(m, n$, denoting natural numbers$)$

$$mm + mn = (m + 1)n$$

$$mm + mn' = (m + 1)n'$$

$$mn + mn' = (m + 1)n$$

$$mn \times mn' = mn' - mn$$

with the special rules for zero, that if $a$ is any element of $N$,

$$a + 0 = a, \quad a \times 0 = 0.$$

To each element, $a$, of $N$ corresponds a definite element $\alpha'$ such that $a + \alpha' = 0$; if $a = 0$, then $\alpha' = 0$, but in every other case $a, a'$ are different and may be denoted by $m, m'$. The natural number $m$ is called the absolute value of $m$ and $m'$.

9. If $a, b$ are any two elements of $N$, the equation $x + y = a$ is satisfied by putting $x = a + b$. Thus the symbol $a + b$ is always interpretable as $a + b$, and we may say that within $N$ subtraction is always possible; it is easily proved to be also free from ambiguity. On the other hand, $a/b$ is intelligible only if the absolute value of $a$ is a multiple of the absolute value of $b$.

The aggregate $N$ has no first element and no last element. At the same time it is countable, as we see, for instance, by associating the elements $o, a, b'$ with the natural numbers $1, 2a, 2b - 1$ respectively, thus—

$$(N) \quad 1, 2, 3, 4, 5, 6, \ldots$$

$$(\bar{N}) \quad o, 1, 2, 3, 4, 3, 1, \ldots$$

It is usual to write $a + o$ (or simply $a$) for $ao$ and $-a$ for $oa'$; that this should be possible without leading to confusion or ambiguity is certainly remarkable.

10. Fractional Numbers.—We will now derive from $N$ a different aggregate of couples $[a, b]$ subject to the following rules:

The symbols $[a, b], [a', b']$, are equivalent if $ab' = a'b$. According as $ab'$ is greater or less than $a'b$ we regard $[a, b]$ as being greater or less than $[a', b']$. The formulae for addition and multiplication are

$$[a, b] + [a', b'] = [ab + a'b', bb']$$

$$[a, b] \times [a', b'] = [aa', bb']$$

All the couples $[a, b]$ are equivalent to $[1, 1]$, and if we denote
In the same way, if \( o \) denotes the zero element of \( R \), and \( \xi \) any other element, the symbol \( o/\xi \) is indeterminate, and \( o/\xi = \xi/0 \) inadmissible, because, by the formal rules of operation, \( \xi/\xi + \xi = \xi/0 \), which conflicts with the definition of the ground element \( v \).

It is usual to write \( +m_n/n \) (or simply \( m_n/n \)) for \( m_n/nu \), and \( -m_n/n \) for \( m_n/nv \).

Each of these elements is said to have the absolute value \( mn/\nu \).

The criterion for arranging the elements of \( R \) in order of magnitude is that, if \( \xi, \eta \) are any two elements of it, \( \xi/\eta \) when \( \xi/\eta \) is positive; that is to say, when it can be expressed in the form \( \eta \).

15. The aggregate \( R \) is very important, because it is the simplest type of a field of rationality, or corpus. An algebraic corpus is an aggregate, such that its elements are representable by symbols \( a, b, \ldots \), which can be combined according to the laws of ordinary algebra; every algebraic expression obtained by combining a finite number of symbols, by means of a finite chain of rational operations, being capable of interpretation as representing a definite element of the aggregate, with the single exception that division by zero is inadmissible. Since, by the laws of algebra, \( a=a-0 \), and \( a=a/1 \), every algebraic field contains \( R \), or, more properly, an aggregate which is an image of \( R \) in the "real" rational numbers. Let a denote any element of \( R \); then \( a \) and all lesser elements form an aggregate, the remaining elements form another aggregate \( A', \) which we shall call complementary to \( A \), and we may write \( R=A+A' \).

Now the essence of this separation of \( R \) into the parts \( A \) and \( A' \) may be expressed without any reference to \( a \) as follows:

I. The aggregates \( A, A' \) are complementary; that is, their elements, taken together, make up the whole of \( R \).

II. Every element of \( A \) is less than every element of \( A' \).

III. The aggregate \( A' \) has no least element. (This condition is artificial, but saves a distinction of cases in what follows.)

Every separation \( R=A+A' \) which satisfies these conditions is called a cut (or section), and we may denote it by \( (A, A') \). We have seen that every rational number \( a \) can be associated with a cut. Conversely, every cut \( (A, A') \) in which \( A \) has a last element \( a \) is perfectly definite, and specifies a without ambiguity. But there are other cuts in which \( A \) has no last element. For instance, all the elements \( a \) of \( R \) such that either \( a<0 \), or else \( a>0 \) and \( a' \) form an aggregate \( A \), while those for which \( a<0 \), and \( a'>0 \), form the complementary aggregate \( A' \). This separation is a cut in which \( A \) has no last element; because if \( p/q \) is any positive element of \( A \), the element \( (p+q)(p+q) \) exceeds \( p/q \), and also belongs to \( A \). Every cut of this kind is said to define an irrational number. The justification of this is contained in the following propositions:

(1) A cut is a definite concept, and the assemblage of cuts is an aggregate according to definition; the generic quality of the aggregate being the separation of \( R \) into two complementary parts, without altering the order of its elements.

(2) The aggregate of cuts may be arranged in order by the rule that \((A, A') < (B, B') \) if \( A \) is a part of \( B \).

(3) This criterion of arrangement preserves the order of magnitude of all rational numbers.

(4) Cuts may be combined according to the laws of algebra, and, when the cuts so combined are all rational, the results are in agreement with those derived from the rational theory.

As a partial illustration of proposition (4) let \((A', A) \), \((B', B) \) be any two cuts, and let \( C \) be the aggregate whose elements are obtained by forming all the values of \( A'+B' \) and \( a'+a \) of \( a \) and \( b \), and \( b' \) is any element of \( B' \). Then if \( C \) is the complement of \( C \), it can be proved that \( C, C' \) is a cut; this is said to be the sum of \( (A', A') \) and \( (B', B') \). The difference, product and quotient of two cuts may be defined in a similar way. If it is assumed that the cuts are chosen above for purposes of illustration, we shall have \( B'=C, C' \) where \( C' \) comprises all the numbers \( a'b' \) obtained by multiplying any two elements, \( a', b' \) which are rational and positive, and such that \( a'+b' \) is positive. Since \( a'-b' > a' - b' > 0 \), it follows that \( a'b' \) is positive and greater than \( 2 \); it can be proved conversely that every rational number which is greater than \( 2 \) can be expressed in the form \( a'b' \). Hence \( =2 \), so that the cut \( B \) actually gives a real arithmetical meaning to the positive root of the equation \( x^2-2 \); in other words we
may say that it defines the irrational number $\sqrt{2}$. The theory of cuts, in fact, provides a logical basis for the treatment of all finite numerical irrationalities, and enables us to justify all arithmetical operations involving the use of such quantities.

17. Since the aggregate of cuts (of course say) has an order of magnitude, we may construct cuts in this aggregate. Thus if $a$ is any element of $\mathcal{A}$, and $\mathcal{A}$ is the aggregate which consists of a and all anterior elements of $\mathcal{A}$, we may write $\mathcal{A} = \mathcal{A} + a'$, and $(\mathcal{A}, \mathcal{A}')$ is a cut in which $\mathcal{A}$ has a last element a. It is a remarkable fact that no other kind of cut in $\mathcal{A}$ is possible; in other words, every conceivable cut in $\mathcal{A}$ is defined by one of its own elements. This is expressed by saying that $\mathcal{A}$ is a continuous aggregate, and $\mathcal{A}$ itself is referred to as the numerical continuum of real numbers. The property of continuity must be carefully distinguished from that of close order ($\mathcal{A}$ a); a continuous aggregate is necessarily in close order, but the converse is not always true. The aggregate $\mathcal{A}$ is not countable.

18. Another way of treating irrationalals is by means of sequences. A sequence is an unlimited succession of rational numbers

$$a_1, a_2, a_3, \ldots, a_n, a_{n+1}, \ldots$$

(in order-type $\omega$) the elements of which can be assigned by a definite rule, such that when any rational number $e$, however small, has been fixed, it is possible to find an integer $m$, so that for all positive integral values of $n$ the absolute value of $(a_{m+n} - a_n)$ is less than $e$. Under these conditions the sequence may be taken to represent a definite number, which is, in fact, the limit of $a_n$ when $m$ increases without limit. Every rational number $a$ can be expressed as a sequence in the form $(a, a, a, \ldots)$, but this is only one of an infinite variety of such representations.

$$1 = (\{9, 99, 999, \ldots\}) = \left(\frac{1}{9} \cdot \frac{3}{9} \cdot \frac{7}{9} \cdot \frac{11}{9} \cdots \right)$$

and so on. The essential thing is that we have a mode of representation which can be applied to rational and irrational numbers alike, and provides a very convenient symbolism to express the results of arithmetical operations. Thus the rules for the sum and product of two sequences are given by the formulæ

\[
\begin{align*}
(a_1, a_2, a_3, \ldots) + (b_1, b_2, b_3, \ldots) &= (a_1 + b_1, a_2 + b_2, a_3 + b_3, \ldots) \\
(a_1, a_2, a_3, \ldots) \times (b_1, b_2, b_3, \ldots) &= (a_1 b_1, a_2 b_2, a_3 b_3, \ldots)
\end{align*}
\]

from which the rules for subtraction and division may be at once inferred. It has been proved that the method of sequences is ultimately equivalent to that of cuts. The advantage of the former lies in its convenient notation, that of the latter in giving a clear definition of an irrational number without having recourse to the notion of a limit.

19. Complex Numbers.—If a is an assigned number, rational or irrational, and $m$ a natural number, it can be proved that there is a real number satisfying the equation $x^n = a$, except when $m$ is even and $a$ is negative; in this case the equation is not satisfied by any real number whatever. To remove the difficulty we construct an aggregate of polar couples $(x, y)$, where $x, y$ are any two real numbers, and define the addition and multiplication of such couples by the rules

$$[(x_1, y_1) + (x_2, y_2)] = (x_1 + x_2, y_1 + y_2)$$

$$[(x_1, y_1) \times (x_2, y_2)] = (x_1 x_2 - y_1 y_2, x_1 y_2 + y_1 x_2)$$

We also agree that $(x, y) \leq (x', y')$ if $x < x'$ or if $x = x'$ and $y \leq y'$. It follows that the aggregate has the ground element $[1, 0]$, of which we may denote by $e$; and that, if we write $\tau$ for the element $[0, 1]$, $\tau^2 = [-1, 0] = -\tau$.

Whenver $m, n$ are rational, $[m, n] = \omega m + \pi n$, and we are thus justified in writing, if we like, $x + \tau y$ for $(x, y)$ in all circumstances. A further simplification is gained by writing $x$ instead of $x \tau$, and regarding $\tau$ as a symbol which is such that $\tau^2 = -1$, but in other respects obeys the ordinary laws of operation. It is usual to write $i$ instead of $\tau$; we thus have an aggregate $\mathcal{S}$ of complex numbers $x + \tau y$. In this aggregate, which includes the real continuum as part of itself, not only the four rational operations (excluding division by $0$, the zero element), but also the extraction of roots, may be effected without any restriction. Moreover (as first proved by Gauss and Cauchy), if $a_0, a_1, \ldots, a_n$ are any assigned real or complex numbers, the equation

$$a_0 \tau^n + a_1 \tau^{n-1} + \cdots + a_{n-1} \tau + a_n = 0,$$

is always satisfied by precisely $n$ real or complex values of $\tau$, with a proper convention as to multiple roots. Thus any algebraic function of any finite number of elements of $\mathcal{S}$ is also contained in $\mathcal{S}$, which is, in this sense, a closed arithmetical field, just as $\mathcal{A}$ is when we restrict ourselves to rational operations. The power of $\mathcal{S}$ is the same as that of $\mathcal{A}$.

20. Transfinite Numbers.—The theory of these numbers is quite recent, and mainly due to G. Cantor. The simplest of them, $\omega$, has been already defined ($\S$ 4) as the order-type of the natural scale. Now there is no logical difficulty in constructing a scheme

$$\mathcal{U}_1, \mathcal{U}_2, \mathcal{U}_3, \ldots | \mathcal{V}_1,$$

indicating a well-ordered aggregate of type $\omega$ immediately followed by a distinct element $\mathcal{V}_1$; for example, we may think of all positive odd integers arranged in ascending order of magnitude and then think of the even number $2$. A scheme of this kind is said to be of order-type $(\omega + 1)$; and it will be convenient to speak of $(\omega + 1)$ as the index of the scheme. Similarly we may form arrangements corresponding to the indices

$$\omega + 2, \omega + 3, \ldots, \omega + n,$$

where $n$ is any positive integer. The scheme

$$\mathcal{U}_1, \mathcal{U}_2, \mathcal{U}_3, \ldots | \mathcal{V}_1, \mathcal{V}_2, \mathcal{V}_3, \ldots$$

is associated with $\omega + \omega = 2 \omega$;

$$\mathcal{U}_1, \mathcal{U}_2, \mathcal{U}_3, \ldots | \mathcal{V}_1, \mathcal{V}_2, \mathcal{V}_3, \ldots | \mathcal{W}_1, \mathcal{W}_2, \mathcal{W}_3, \ldots$$

with $\omega \omega$ or $\omega^2$; and so on. Thus we may construct arrangements of aggregates corresponding to any index of the form

$$\phi(\omega) = \omega a^2 + b \omega = a \omega^2 + b \omega = a \omega^2 + b \omega + c \omega^2 + \cdots,$$

where $n, a, b, c, \ldots$ are all positive integers.

We are thus led to the construction of a scheme of symbols—

$$I. \quad 2, 3, \ldots | \mathcal{V}_1,$$

$$\mathcal{U}_1, \mathcal{U}_2, \mathcal{U}_3, \ldots | \mathcal{V}_1, \mathcal{V}_2, \mathcal{V}_3, \ldots | \mathcal{W}_1, \mathcal{W}_2, \mathcal{W}_3, \ldots$$

The symbols $\phi(\omega)$ form a countable aggregate; so that we may, if we like (and in various ways), arrange the rows of block (II) in a scheme of type $\mathcal{A}$ we thus have each element a succeeded in its row by $(a + 1)$, and the row containing $\phi(\omega)$ succeeded by a definite next row. The same process may be applied to $(\mathcal{U}_I)$, and we can form additional blocks (IV.), (V.), &c., with first elements $\omega(\omega), \omega(\omega^2), \omega(\omega^3)$ &c. All the symbols in which $\omega$ occurs are called transfinite ordinal numbers.

21. The index of a finite set is a definite integer however the set may be arranged; we may take this index as also denoting the power of the set, and call it the number of things in the set. But the index of an infinite ordinable set depends upon the way in which its elements are arranged; for instance, ind. $(1, 2, 3, \ldots) = \omega$, but ind. $(1, 3, 5, \ldots) = 2 \omega$. Or, to take another example, the scheme—

$$3, 5, \ldots | 2(2n-1)$$

where each row is supposed to follow the one above it, gives a permutation of $(1, 2, 3, \ldots)$, by which its index is changed from $\omega$ to $\omega^2$. It has been proved that there is a permutation of the natural scale, of which the index is $\phi(\omega)$, any assigned element of (II); and that, if the index of any ordered aggregate is $\phi(\omega)$, the aggregate is countable. Thus the power of all aggregates which can be associated with indices of the class (II) is the same as that of the natural scale; this power may be denoted by $\alpha$. Since $\alpha$ is associated with all aggregates of a
22. There are aggregates which have a power greater than \( a \); for instance, the arithmetical continuum of positive real numbers, the power of which is denoted by \( c \). Another one is the aggregate of all those order-types which (like those in II. above) are the indices of aggregates of power \( a \). The power of this aggregate is denoted by \( c \). According to Cantor's theory it is the transfinite cardinal number \( \aleph \) of a transfinite set, and to \( a \), which for the sake of uniformity is denoted by \( \aleph_a \). It has been conjectured that \( \aleph_0 = c \), but this has neither been verified nor disproved. The discussion of the aleph-numbers is still in a controversial stage (November 1907) and the points in debate cannot be entered upon here.

23. Transfinite numbers, both ordinal and cardinal, may be combined by operations which are so far analogous to those of ordinary arithmetic that is it convenient to denote them by the same symbols. But the laws of operation are not entirely the same, for instance, the principle of commutativity: the first has been explained, the second is the index of the scheme (\( a_1a_2 \cdots a_n \) . . . | \( a_2a_1 \cdots \) ) or any similar arrangement. Again if \( n \) is any positive integer, \( na = a + a + \cdots + a \). It should also be observed that according to Cantor's principles of construction every ordinal number is succeeded by a definite next one; but that there are definite ordinal numbers (e.g. \( \omega^\omega \)) which have no ordinal immediately preceding them.

24. Theory of Numbers.—The theory of numbers is that branch of mathematics which deals with the properties of the natural numbers. As Dirichlet observed long ago, the whole of the subject would be coextensive with mathematical analysis in general; but it is convenient to restrict it to certain fields where the appropriateness of the above definition is fairly obvious. Even so, the domain of the subject is becoming more and more comprehensive, as the methods of analysis become more systematic and more exact.

25. The first noteworthy classification of the natural numbers is into those which are prime and those which are composite. A prime number is one which is not exactly divisible by any number except itself and 1; all others are composite. The number of primes is infinite (Eucl. Elem. ix. 20), and consequently, if \( n \) is an assigned number however large, there is an infinite number (\( a \)) of primes greater than \( n \).

26. If \( m \) and \( n \) are any two numbers, and \( m = n \), we can always find a definite chain of positive integers (\( q_1, r_1 \) ) , (\( q_2, r_2 \) ) , . . . , (\( q_n, r_n \) ) , such that

\[
m = q_1 + r_1, \quad n = q_2 + r_2, \quad a = q_3 + r_3, \quad &c.
\]

27. The process by which they are calculated will be treated in detail. Since there is only a finite number of positive integers less than \( n \), the process must terminate with two equalities of the form

\[
r_k = xq_k + r_{k+1}, \quad r_{k+1} = q_{k+2}r_k.
\]

28. Thus we infer successively that \( r_k \) is a divisor of \( r_{k+1}, r_{k+2}, . . . , r_l \) and finally of \( m \) and \( n \). Also \( r_k \) is the greatest common factor of \( m, n \) : because any common factor must divide \( n, r_l \) and so on down to \( r_1 \); and the highest factor of \( r_1 \) is itself. It will be convenient to write \( r_k = d(v, m, n) \). If \( r_1 = 1 \), the numbers \( m, n \) are said to be prime to each other, or co-primes.

The fundamental theorem of resiliation is of the greatest importance; with the help of it we can prove three other fundamental propositions, namely:

(1) If \( m, n \) are any two natural numbers, we can always find two natural numbers \( x, y \) such that

\[
d(v, m, n) = xn - ym.
\]

(2) If \( m, n \) are prime to each other, and \( p \) is a prime factor of \( mn \), then \( p \) must be a factor of either \( m \) or \( n \). (Every number may be uniquely expressed as a product of prime factors.)

29. The representation of any number \( n \) as the product of powers of different primes, the divisors of \( n \) are the terms of the product

\[
(1 + p_1 + p_1^2 + \cdots + p_1^g) (1 + p_2 + p_2^2 + \cdots + p_2^h) \cdots (1 + p_r + p_r^2 + \cdots + p_r^t) (1 + t_1 + t_1^2 + \cdots + t_1^s) \cdots (1 + t_l + t_l^2 + \cdots + t_l^s).
\]

(3) \( 1 + p_1 + p_1^2 + \cdots + p_1^g \) gives the representation of any number \( n \) as the product of powers of different primes, the divisors of \( n \) are the terms of the product

\[
(1 + p_1 + p_1^2 + \cdots + p_1^g)(1 + p_2 + p_2^2 + \cdots + p_2^h) \cdots (1 + p_r + p_r^2 + \cdots + p_r^t)(1 + t_1 + t_1^2 + \cdots + t_1^s) \cdots (1 + t_l + t_l^2 + \cdots + t_l^s).
\]

26. Totients. —By the totient of \( n \), which is denoted, after Euler, by \( \phi(n) \), we mean the number of integers prime to \( n \), and not exceeding \( n \). If \( n = p^a \), the numbers not exceeding \( n \) and not prime to it are

\[
p, 2p, \ldots (p-1), p^a - 1, \ldots, 2p^a - 1, \ldots, p^a - 1.
\]

(4) If \( n = m^a \), then \( p \) is prime to \( m \) if and only if \( m \) is prime to \( x \) for every integer \( x \) for which \( x^a \equiv 1 \pmod{m} \).

For example, \( \phi(15) = 8 \), since 8 is the number of numbers less than 15 and not prime to it that are divisible by 15. And if \( n = 4 \), then \( \phi(4) = 2 \), since only 2 is not prime to 4.

27. Residues and congruences. —It will now be convenient to introduce for the term number the symbol \( \equiv \). For instance, \( 2 \equiv 1 \pmod{1} \) and \( 4 \equiv 2 \pmod{2} \), where the product applies to all the different prime factors of \( n \). If \( a, b, \cdots, c \) are the different divisors of \( n \), then

\[
\phi(d_1) + \phi(d_2) + \cdots + \phi(d_n) = n.
\]

For example, \( \phi(15) = 8 = \phi(3) + \phi(5) \).

28. Theorem of Fermat and Wilson. —Let \( r_1, \ldots, r_s \) where \( i \equiv \phi(m) \) be a complete set of residues prime to the modulus.

Then if \( x \) is any number prime to \( m \), the residues \( r_1x, r_2x, \ldots, r sx \) also form a complete set of residues prime to the modulus.

Thus the theory of congruences is very nearly, but not quite, similar to that of algebraic equations. With respect to a given modulus \( m \) the scale of relative integers may be distributed into classes. For a given \( m \), the numbers \( 1, 2, \ldots, m \) form a system of congruence classes, and the definition is made, to a modulus \( m \) divisors and residues.

29. Fermat's Theorem. —Fermat's theorem states that if \( p \) is a prime number, then \( p \) is prime to \( m \) if and only if \( m \) is prime to \( p \).

Consequently the generalization of Fermat's theorem is that if \( p \) is a prime number, then \( p \) is prime to \( m \) if and only if \( m \) is prime to \( p \).

Thus the theory of congruences is very nearly, but not quite, similar to that of algebraic equations. With respect to a given modulus \( m \) the scale of relative integers may be distributed into classes. For a given \( m \), the numbers \( 1, 2, \ldots, m \) form a system of congruence classes, and the definition is made, to a modulus \( m \) divisors and residues.
In order that the congruence $x^2 \equiv a \pmod{m}$ may have a solution it is necessary and sufficient that a $b$ be a residue of each distinct prime factor of $m$. If these conditions are all satisfied, and $m = 2^n p_1^{e_1} \cdots$, where $p_1, p_2, \ldots$ are odd primes, then $b$ is in every case $1$, the number of incongruent solutions of the given congruence is $2^1, 2^{2t_1}$, or $2^{2t_2}$, according as $a < 2$, $a = 2$, or $a > 2$ respectively. The actual solutions are best found by a process of exhaustion. It should be observed that $(\frac{b}{m}) = 1$ is a necessary but not a sufficient condition for the possibility of the congruence.

32. Quadratic forms.—It will be observed that the solution of the linear congruence leads to all the representations of $b$ in the form $a + x + y$, where $x, y$ are integers. Many of the earliest researches in the theory of numbers deal with particular cases of the problem. Even for $b = 1$ or $b = 2$, it is required to find all the integers $x, y$ (if there be any) which satisfy the equation $x^2 + y^2 \equiv b \pmod{m}$. FERMAT, for instance, discovered that every positive prime of the form $4n+1$ is uniquely expressible as the sum of two squares. There is a corresponding arithmetical theorem for forms of any degree and any number of variables; only those of linear forms and binary quadratics are in any sense complete, as the difficulty of the problem increases very rapidly with the increase of the degree of the form considered or of the number of variables contained in it.

The form $ax^2 + by^2 + cz^2$ will be denoted by $(a, b, c)$ $(x, y, z)$ or more simply by $(a, b, c)$ when there is no need of specifying the variables. If $k$ is the greatest common factor of $a, b, c$, we may write $(a, b, c) = k' (a', b', c')$ where $(a', b', c')$ is a primitive form, that is, one for which $d = (a', b', c') = 1$. The other form is then said to be derived from $(a', b', c')$ and to have a divisor $k$. For the present we shall concern ourselves only with the primitive forms. The product of the two forms $D$ and $C$ is defined to be the product of the two linear factors. It will be observed that $D \equiv 1 \pmod{4}$ according as $b$ is even or odd; and that if $E$ is any odd square factor of $D$ there will be forms of determinant $D$ and degree 4.

If we write $x = x_1 + x_2$, $y = y_1 + y_2$, we have identically

$$
(a, b, c) (x, y, z) = (a', b', c') (x', y', z')
$$

where $a = a' a''$,

$$
b' = a a'' b' + a' a'' c' z^2,
$$

$$
c' = a a'' b' + a' a'' c' z^2
$$

Hence also

$$
D' = b'^2 a'^2 c'^2 (a-b') (a+c') = (a-b') D
$$

Supposing that $a, b, c$ are integers such that $a - b' = \alpha$, a number different from zero, we have $b' = b + \alpha c$ and $c' = b - \alpha c$.

33. Method of Reduction.—This differs according as $D$ is positive or negative, and will require some preliminary lemmas. Suppose that any complex quantity $z = x + y i$ is represented in the usual way by a point $(x, y)$ referred to rectangular axes. Then by plotting off all the points corresponding to $(a+b)/ (z^2 - b)$, we obtain a complete set of properly equivalent points. All these lie on the same side of the axis of $x$, and there is precisely one of them and no more which satisfies the conditions: (i) that it is not outside the area which is bounded by the lines $2x = \pm 1$; (ii) that it is not inside the segment $(a, b)$ of the line $2x = b$; (iii) that it is not on the line $2x = 1$, or on the arc of the circle $x^2 + y^2 \equiv 1$ intercepted by $2x = 1$ and $x = 0$. This point will be called the reduced point equivalent.

In the positive half-plane $(x > 0)$ the aggregate of all reduced points occupies the interior and half the boundary of an area which will be called the fundamental triangle, because the area equivalent to it, and finite, are all triangles bounded by circular arcs, and having angles $\pi/2, \pi/2, \pi$ and the fundamental triangle may be considered as a special case when one vertex goes to infinity. The aggregate of equivalent triangles forms a kind of mosaic which fills up the whole of the half-plane. It will be convenient to denote the fundamental triangle (with its half-boundary, for which $x < 0$) by $\mathcal{V}$; for which reason which will appear later, the set of equivalent triangles will be said to make up the modular dissection of the positive half-plane.
Now let $f = \varepsilon(a', b', c')$ be any definite form with $a'$ positive and determinant $-\Delta$. The root of $a'x^2 + b'x^2 + c' = 0$ which is represented by a point in the positive half-plane is

$$\omega = b' + \sqrt{\Delta},$$

and this is a reduced point if either

(i) $b' < 0$, $c' < 0$,

(ii) $b' = 0$, $a' < c'$,

(iii) $a' = c'$, $0 < b' < \Delta$.

Cases (ii) and (iii) only occur when the representative point is on the boundary of $V$. A form whose representative point is reduced is said to be a reduced form. It follows from the geometrical theory that every form is equivalent to a reduced form, and that there are as many distinct classes of positive forms of determinant $-\Delta$ as there are reduced forms. The total number of reduced forms is limited, because in case (i), we have $\Delta = 4ac - b'^2 \geq 3b'^2$, so that $b' < \frac{\sqrt{\Delta}}{3}$. Therefore, there are not many limited numbers of reduced forms, but they are not non-equivalent. In fact they arrange themselves, according to a law which is not very difficult to discover, in cycles or periods, each of which is associated with a particular class. The number of such classes is finite, and that for each class we can find a representative form by a finite process of calculation.

34. Problem of Representation.—It is required to find out whether a given number $m'$ can be represented by the given form $(a', b', c')$. One condition is clearly that the divisor of the form must be a factor of $m'$. Suppose this is the case; and let $(a', b', c')$ be the quotient of $m'$ and $(a', b', c')$ be the divisor in question. Then we have now to discover whether $m'$ can be represented by the primitive form $(a, b, c)$. First of all we will consider proper representations

$$m = m'(a', b', c'),$$

where $a, y$ are co-primes. Determine integers $\beta$ such that $\alpha - \beta y = 1$, and apply to $(a, b, c)$ the substitution

$$\begin{pmatrix} a \\ b \\ c \\ y \\ \gamma \end{pmatrix} \rightarrow \begin{pmatrix} a' \\ b' \\ c' \\ \gamma \end{pmatrix},$$

the new form will be

$$m'(a', b', c') = m'(a', b', c') = m,'$$

where $a', b', c$, and $\gamma$ are co-primes. In this case

$$\begin{pmatrix} a' \\ b' \\ c' \\ \gamma \end{pmatrix} \rightarrow \begin{pmatrix} \alpha \\ \beta y \end{pmatrix} \rightarrow \begin{pmatrix} a \\ b \\ c \\ y \\ \gamma \end{pmatrix} \rightarrow \begin{pmatrix} a' \\ b' \\ c' \\ \gamma \end{pmatrix},$$

the new form will be

$$m'(a', b', c') = m'(a', b', c') = m,'$$

This is called the Pellian equation, and it is represented by a point in the positive half-plane.

The form $(a, b, c)$ is said to be unimodular if it is equivalent to itself; in this case all its proper automorphs can be expressed in the form

$$(a' + \lambda b', b' + \lambda c', c'),$$

where $\lambda$ is an integer.

35. Automorphs, The Pellian Equation.—A primitive form $(a, b, c)$ is, by definition, equivalent to itself; but it may be so in more ways than one. In order that $(a, b, c)$ may be transformed into $(a', b', c')$ by the substitution

$$\begin{pmatrix} a \\ b \\ c \end{pmatrix} \rightarrow \begin{pmatrix} a' \\ b' \\ c' \end{pmatrix},$$

it is necessary and sufficient that

$$\begin{pmatrix} a \\ b \\ c \end{pmatrix} \rightarrow \begin{pmatrix} a + \lambda b \\ b + \lambda c \\ c + \lambda b \end{pmatrix},$$

the substitutions by which $(a, b, c)$ is transformed into itself are called its automorphs. In the case when $D = 0$ (mod 4) we have $I = 2I$, $u = 2U$, $D = 4N$, and (T, U) any even number.

This is usually called the Pellian equation, though it should properly be associated with Fermat, who first perceived its importance. The minimum solution can be found by converting $\sqrt{N}$ into a periodic continued fraction.

The form $(a, b, c)$ may be improperly equivalent to itself; in this case all its improper automorphs can be expressed in the form

$$(a' + \lambda b', b' + \lambda c', c'),$$

where $\lambda$ is an integer.

This is the Pellian equation, and it is represented by a point in the positive half-plane.

36. Characters of a form or class. General.—Let $(a, b, c)$ be any primitive form; we have seen above (§32) that if $a, b, c, \gamma$ are any integers

$$4(a' + \lambda b')^2 + (b' + \lambda c')^2 = (a' - \lambda b')^2,$$

where $b' = a0 + b + c0$ and $c0 = b + c0$. Now the expressions in brackets on the left hand may denote any two numbers, $m, n$ representable by the form $(a, b, c)$; the formula shows that $4mn$ is a residue of $D$, and hence $mn$ is a residue of every odd prime factor of $D$, and if $l$ is any such factor the symbols $\left[ \frac{m}{l} \right]$ and $\left[ \frac{n}{l} \right]$ will have the same value. Putting $(a, b, c) = 1$, this common value is denoted by $\left[ \frac{1}{l} \right]$ and called a quadratic character (or simply character) of $l$ with respect to $p$, $a, b, c, \gamma$.

In certain cases there are supplementary characters of the type

$$\left[ \frac{1}{l} \right]$$

and the characters $\left[ \frac{1}{l} \right]$ are discriminated according to the number or even power of $p$ is contained in $D$; but in every case there are certain combinations of characters (in number one-half of all possible combinations) which form the total characters of actually existing classes. Classes which have the same total character are said to belong to the same genus. Each genus of the same order contains the same number of classes. For any determinant $D$ we have a principal primitive class for which all the characters are $1$; this is represented by the principal form $(1, 1, -n)$ or $(1, -1, n)$ according as $D$ is of the form $4n, 4n + 1$. The corresponding genus is called the principal genus. Thus, when $D = 194$, it appears from the table above that in the primitive order there are two genera, each containing three classes; and the number of total characters is $3 + 1 = 4$.

37. Composition.—Considering $X, Y$ as given linear functions of $(x, y)$, $X', Y'$ defined by the equations

$$X = px + qx, Y = px' + qx'$$

and this is said to be a compound of the two forms $(a, b, c)$, $(a', b', c')$, the order of composition is indicated in the third. In order that two forms may admit of composition into a third, it is necessary and sufficient that their determinants be in the ratio of two squares. The most important case is that of two primitive forms $X, Y$; this can be composed into a form denoted by $XY$ which is also primitive and of the same determinant as $X$ or $Y$. If $A, B, C$ are the classes to which $X, Y$ respectively belong, then any form of $A$ composed with any form of $B$ gives rise to a form belonging to $C$. For this reason we write $C = AB$; $BA$, and the operation of multiplication or composition of classes. The principal class is usually denoted by $1$, because when compounded with any other class $A$ it gives this same class $A$.

The total number of primitive classes being finite, $h$, say, the series $A, A', A''$, etc. must be recurring, and there will be a least exponent $e$ such that $A^n = 1$. The period $n$ is a factor of $h$, so that every class satisfies $A^n = 1$. Composition is associative as well as commutative, that is to say, $(AB)C = A(BC)$; hence the symbols $A_1, A_2, \ldots$ for the different classes define an Abelian group (see Group). The order of $h$, which is representable by one or more base-classes $\beta_1, \beta_2, \ldots$, is such a way that each class $A$ is enumerated once and only once by putting

$$A = \beta_1^p \beta_2^p \ldots \beta_m^p,$$

with $m, \gamma$. This means that $m$ is a multiple of $n$, the corresponding index, and so on. The same thing may be said with regard
to the symbols for the classes contained in the principal genus, because two forms of that genus may be distinguished by one and the same number only if they have the same discriminant, and thus are identical. This follows from the fact that the principal genus may be considered as formed by a cyclic group whose generators are the classes $1, i, i'_2, \ldots$, hence the principal genus is regular, and in this case the discriminant is the only characteristic of the principal genus. Gauss proved, conversely, that every class in the principal genus may be expressed as the duplicate of a class. An ambiguous class satisfies $A^2 = 1$, that is, its duplicate is the principal class; and the numbers of the classes under consideration are obtained by multiplying the principal classes by $A$ for the whole composition-group, and $A^2B_2, A^2B_3, A^2B_4, \ldots$ (as above) $A^2 = 1$, if $x_2 = m$, $y_2 = n, z_2 = \xi, \zeta, \eta, \zeta'$; hence the number of ambiguous classes is $2^n$. As an example, when $D = -1460$, there are four ambiguous classes, represented by 

\[(1, 0, 355), (2, 2, 183), (5, 0, 73), (10, 10, 39)\]

hence the composition-group must be dihedral, and in fact, if we put $B_i, B_j$ for the classes represented by $(11, 6, 34)$ and $(2, 2, 185)$, we have $B_iB_j = B_jB_i = 1$ and the two primitive classes are given by $B_2B_3 \equiv 10\zeta, 10\xi \in 2$. In this case the determinant is regular and the classes in the principal genus are $1, B_i, B_i', B_i''$. 39. On account of its historical interest, we may briefly consider the form $x^2 + y^2 = m$. The problem of finding all the integer solutions of the equation $x^2 + y^2 = m$ is the only one that has been solved in a satisfactory manner up to the present time. There are only three cases, the most important of which is the case $m = 2$, or $x_1 = 1, y_1 = 1$ and $x_1 = 0, y_1 = 0$. For the case $m = 2$, the equation is of the form $x^2 + y^2 = 2$, and conversely two distinct representations $N = x^2 + y^2 = 2^2$ lead to the conclusion that $N$ is composite. This is a simple example of the application of the theory of forms to the difficult problem of deciding whether a given number is large prime or composite; an application first indicated by Gauss, though, in the present simple case, probably known to Fermat. 40. Bilinear Forms. A bilinear form is an expression of the type $\sum_{i, j} a_{ij}x_iy_j$ ($i = 1, 2, \ldots, m; j = 1, 2, \ldots, n$); the most important examples are those which arise from determinants, and of which the invariants of a form are its determinant $|a_{ij}|$ and the elementary factors thereof. Two bilinear forms are equivalent when each can be transformed into the other by linear integral substitutions $x = ax', y = by'$. Every bilinear form is equivalent to a reduced form $\sum_{i, j} (a_{ij})x_iy_j$, and $r = n$, unless $|a_{ij}| = 0$. In that case the form may be equivalent if it is necessary and sufficient that their invariants should be the same. Moreover, if $a - b$ and $c - d$, if the invariants of the forms $a + bc - b + ad$ are the same for all values of $\lambda$, we shall have $a + bc - b + ad$, and the transformation of one form to the other may be made by substituting, according to orders and genera, and proof that generic with specified characters exist; also the determination of all the rational transformations of a given form into itself. In connexion with a definite form there is the important question of the number of its equivalence classes, or the number of its proper automorphisms. Equivalent forms are of the same weight; this is defined to be the weight of their class. The weight of a genus or order is the sum of the weights of the classes contained in it; and expressions for the weight of a given genus have actually been obtained. For binary forms, the sum of the weights of all the genera coincides with the expression denoted by $H(\Delta)$ in § 39. The complete discussion of a form requires the consideration of $\sim 2n$ associated quadrics; one of these is the contravariant of the given form, each of the others contains more than $n$ variables. For certain quaternary and senary classes there are formulæ analogous to the formulæ for the genus of $\Delta = 23$. The results for $\Delta = 23$ are given in § 39 (see Smith, Proc. R.S. xvi, or Collected Papers, i, 510). Among the most interesting special applications of the theory are conferring upon the collection of all the modular forms with a given sum of squares. In order that a number may be expressible as the sum of two squares it is necessary and sufficient for it to be of the form $p^4q$, where $p$ has no square factor and no prime factor of the form $4k + 3$. A number is expressible as the sum of three squares if, and only if, it is of the form $m^2n^2 + 2m^2 + 3m^2$ (mod 8); when $m = 1$ and $m = 3$ (mod 8), all the squares are odd, and hence follows Fermat's theorem (that every number can be expressed as the sum of three triangular numbers one of which may be 0). Another famous theorem of Fermat's is that every number can be expressed as the sum of four squares; this was first proved by Jacobi, who also proved that the number of representations of a number $n$ does not increase if $n$ is odd, while if $n$ is even it is $24$ times the sum of the odd factors of $n$. Explicit and finite, though more complicated, formulæ have been obtained for the number of representations of a number $n$ as the sum of five, six, and eight squares. But whereas one can list the classes, the outstanding difficulties of this part of the subject may be mentioned the problem of finding all the integral (not merely rational) automorphs of a given form $F$. When $F$ is ternary, C. Hermite has shown that the solution depends on finding all the integral solutions of $F(x, y, z) = \pm 1$, where $F$ is the contravariant of $F$. Thanks to the researches of Gauss, Eisenstein, Smith, Hermite and others, we possess formulæ for the representation of a number by that of quadratics with four or more variables. Thus methods of reduction have been found both for definite and for indefinite forms; so that it would be possible to draw up a table of representations. If, however, the results were worth the labor, the important theorem is the solution of $ax^2 + by^2 + cz^2 + dw^2 = 0$; this is always possible if $-a, -b, -c, -d$ are quadratic residues of $a, b, c$ respectively, and the discriminant $abc$ can be calculated from it.
integers \(a + bi\), where \(a, b\) are ordinary integers, and, as usual, \(i^2 = -1\). In this theory there are four units \(\pm 1, \pm i\); the numbers \(a^2 + b^2\) are said to be associated; \(a + bi\) is the conjugate of \(a - bi\) and we write \(N(\frac{a + bi}{a - bi})\), the norm of \(a + bi\), its conjugate, and associated. The most fundamental proposition in the theory is that the process of residuation (§ 24) is applicable; namely, if \(m, n\) are any two complex integers and \(N(m) > N(n)\), we can always find integers \(a, b\) such that \(m = a + bi\) with \(N(a + bi) \leq N(n)\). This may be proved analytically, but is obvious if we mark complex integers by points in a plane. Hence immediately follow propositions about resolutions into prime factors, greatest common measure, &c., analogous to those in the ordinary theory; it will only be necessary to indicate special points of difference.

We have \(x = -(-1)^{p+1}\) so that \(2\) is associated with a square: a real prime subject to the residuation is seen to be of the form \(4n + 1\) breaks up into two prime conjugate factors, for example, \(5 = (1 - 2i)(1 + 2i)\). An integer is even, semi-even, or odd according as it is divisible by \((1 + i)^2, (1 + i)\) or prime to \((1 + i)\). Among four associated odd integers there is one and only one which is \(1\) (mod 2 - 2i); this is said to be primary; the conjugate of a primary number is primary, and the product of any number of primaries is primary. The conditions that \(a + bi\) may be primary are \(a = \pm 0\) (mod 2) or \(a + b = \pm 1\) (mod 4). Every complex integer can be uniquely expressed in the form \(a + bi = \frac{a}{2} + \frac{b}{2} \cdot (1 + i)\) where \(a, b\) are co-primes, we may take as representatives of these classes the residues \(x + yi\) where \(x = 0, 1, 2, \ldots, (\frac{p}{2}) - 1\); \(y = 0, 1, 2, \ldots, (\frac{p}{2}) - 1\); \(y = 0, 1, 2, \ldots, (\frac{p}{2}) - 1\); giving the \(p^2\) residues of the real number \(h\); while if \(a + bi\) is prime, \(1, 2, 3, \ldots, (\frac{p}{2} + 1)\) form a complete set of residues.

The number of residues of \(m\) that are prime to \(m\) is given by

\[
\phi(m) = N(m)(1 - \frac{1}{\alpha(p)})
\]

where the product extends to all prime factors of \(m\). As an analogue to Fermat's theorem we have, for any integer prime to the modulus, \(x^{\phi(m)} \equiv 1 \pmod{m}\), \(x^{N(p) - 1} \equiv 1 \pmod{p}\) according as \(m\) is composite or prime. There are \(\phi(N(p))\) primitive roots of the prime \(p\); a primitive root in the new theory for a real prime \(4n + 1\) is also a primitive root in the new theory for each prime factor of \((4n + 1)\), but if \(p = 4n - 1\) be a prime its primitive roots are necessarily composite.

If \(p\) is a quadratic residue of \(q\) or not; and that \(\left(\frac{p}{q}\right) = 1\) only if \(p\) is a biquadratic residue of \(q\). If \(p, q\) are primary primes, we have two laws of reciprocity, expressed by the equations

\[
\left(\frac{p}{q}\right) = \pm \left(\frac{p}{q}\right), \quad \left(\frac{q}{p}\right) = \pm \left(\frac{q}{p}\right)
\]

These must be added the supplementary formula

\[
\left(\frac{p}{q}\right) = \left(-1\right)^{N(q) - 1}, \quad \left(\frac{q}{p}\right) = \left(-1\right)^{N(p) - 1}
\]

\[
\left(\frac{a + bi}{c + di}\right) = \left(\frac{a}{c}\right) \left(\frac{b}{d}\right)
\]

The second published proof is that of Eisenstein, which is very beautiful and simple, but involves the theory of Linnicute functions.

42. Algebra of Complex Numbers—In Gauss'ssilent papers has been developed by Busche; this probably admits of simplification. Other demonstrations, for instance Jacobi's, depend on cyclotomy (see below).

43. Algebras to the complex numbers of the ordinary kind, the fields of ordinary algebra, especially in the case of a field of numbers. The field of Gaussian integers is an algebraic number field, and Gauss's algebra of complex numbers is an algebraic number field.

44. Gauss's Imaginary Unit—The first extension of Gauss's complex theory was made by E. E. Kummer, who considered complex numbers represented by rational integral functions of any number of units and used them in the theory of the complex theory and Gauss's as special cases. He was soon faced by the difficulty that, in some cases, the law that an integer can be uniquely expressed as the product of prime factors appeared to break down. To see how this happens take the equation \(\xi^4 + 1 = 0\), the roots of which are expressed as rational integral functions of 23rd roots of unity, and let \(\eta\) be either of the roots. If we define \(a + bi\) to be an integer, when \(a, b\) are natural numbers, the product of any number of such integers is uniquely expressible in the form \(an + bm\). Conversely every integer can be recovered as the product of a finite number of indecomposable complex integers \(a + bi\), that is, integers which cannot be further resolved into factors of the same type. But this resolution is not necessarily unique, since it may be possible to write the same integer in two different ways, as, for example, \(a + bi\) is transformable into a form indecomposable and essentially distinct. To see the way in which Kummer surmounted the difficulty consider the congruence

\[
\alpha + \beta + \gamma + \delta = \phi(p, \beta)
\]

where \(p\) is any prime, except 23. If \(-23\chi\) has two distinct roots \(u, \psi\) and \(\psi, \chi\) then \(\alpha + \beta + \gamma + \delta\) is an integer. The conditions that \(\alpha + \beta\) may be primary are \(u + \beta = \pm 0\) (mod 2) or \(u + \beta = \pm 1\) (mod 4). Every complex integer can be uniquely expressed in the form \(a + bi = \frac{a}{2} + \frac{b}{2} \cdot (1 + i)\) where \(a, b\) are co-primes, we may take as representatives of these classes the residues \(x + yi\) where \(x = 0, 1, 2, \ldots, (\frac{p}{2}) - 1\); \(y = 0, 1, 2, \ldots, (\frac{p}{2}) - 1\); \(y = 0, 1, 2, \ldots, (\frac{p}{2}) - 1\); giving the \(p^2\) residues of the real number \(h\); while if \(a + bi\) is prime, \(1, 2, 3, \ldots, (\frac{p}{2} + 1)\) form a complete set of residues.

The number of residues of \(m\) that are prime to \(m\) is given by

\[
\phi(m) = N(m)(1 - \frac{1}{\alpha(p)})
\]

where the product extends to all prime factors of \(m\). As an analogue to Fermat's theorem we have, for any integer prime to the modulus, \(x^{\phi(m)} \equiv 1 \pmod{m}\), \(x^{N(p) - 1} \equiv 1 \pmod{p}\) according as \(m\) is composite or prime. There are \(\phi(N(p))\) primitive roots of the prime \(p\); a primitive root in the new theory for a real prime \(4n + 1\) is also a primitive root in the new theory for each prime factor of \((4n + 1)\), but if \(p = 4n - 1\) be a prime its primitive roots are necessarily composite.

If \(p\) and \(q\) are any two odd primes, we shall define the symbols \(\left(\frac{p}{q}\right)\) and \(\left(\frac{q}{p}\right)\) by the congruences

\[
\left(\frac{p}{q}\right) = p^{N(q)/2}, \quad \left(\frac{q}{p}\right) = q^{N(p)/2}
\]

It being understood that the symbols stand for absolutely least residues. It follows that \(\left(\frac{p}{q}\right) = \left(\frac{q}{p}\right)\) only if \(p\) is a quadratic residue of \(q\). If \(p, q\) are primary primes, we have two laws of reciprocity, expressed by the equations

\[
\left(\frac{p}{q}\right) = \left(-1\right)^{N(q) - 1}, \quad \left(\frac{q}{p}\right) = \left(-1\right)^{N(p) - 1}
\]

These must be added the supplementary formula

\[
\left(\frac{p}{q}\right) = \left(-1\right)^{N(p) - 1}, \quad \left(\frac{p}{q}\right) = \left(-1\right)^{N(q) - 1}
\]

\[
\left(\frac{a + bi}{c + di}\right) = \left(\frac{a}{c}\right) \left(\frac{b}{d}\right)
\]

\[
\left(\frac{a + bi}{c + di}\right) = \left(\frac{a}{c}\right) \left(\frac{b}{d}\right)
\]

\[
\left(\frac{a + bi}{c + di}\right) = \left(\frac{a}{c}\right) \left(\frac{b}{d}\right)
\]

\[
\left(\frac{a + bi}{c + di}\right) = \left(\frac{a}{c}\right) \left(\frac{b}{d}\right)
\]

\[
\left(\frac{a + bi}{c + di}\right) = \left(\frac{a}{c}\right) \left(\frac{b}{d}\right)
\]
where \( h_1, h_2, \ldots, h_n \) are elements of \( N \) which may be called the \( \alpha \) or \( \alpha \) of \( H \). The conjugates of \( \alpha \) are \( \alpha \) and \( \alpha \), and \( a \) is a modulus (§ 44), and we may write \( \alpha = [a \omega_1, a \omega_2, \ldots, a \omega \] assuming that we have found one basis, we can construct any number of equivalent bases by means of equations such as \( \omega = \sum_{i=1}^{n} \omega_i \), where the integral coefficients \( c_i \) are such that the determinant \( \Delta \) is 1.

46. The extension of Kummer's results to algebraic numbers in general was independently made by J. W. R. Dedekind and Kronecker; their methods differ mainly in matters of notation and machinery, each having special advantages of its own for particular purposes. Dedekind introduced the concept of an \( \alpha \) ideal, which is defined by the following properties:

(i) An ideal \( \alpha \) is an aggregate of elements in \( \Omega \).

(ii) \( \alpha \) contains a zero element, and \( \alpha + \alpha \) is an element of \( \alpha \).

(iii) If \( \alpha \) is any element of \( \alpha \), and \( \alpha \) any element of \( \alpha \), then \( \alpha \) is also an element of \( \alpha \).

47. There is a theory of congruences with respect to an ideal modulus. Thus \( \alpha \equiv \beta (mod \alpha \) means that \( \alpha \) is an element of \( \alpha \). With respect to \( \alpha \), all the elements of \( \alpha \) may be arranged in a number of \( \alpha \) congruent classes. The number of these classes is called the \( \alpha \) of \( \alpha \), and written \( \alpha \). The \( \alpha \) of a prime ideal \( \alpha \) is the power of a real prime \( \beta \); if \( \alpha \equiv \beta (mod \alpha \), then \( \alpha \) is a principal ideal of \( \alpha \). Hilbert's \( \alpha \) of a \( \alpha \) is an ideal integer which takes the place of the resolution of an \( \alpha \) integer into its prime factors in the ordinary theory. It may happen that a particular \( \alpha \) does not have a unique \( \alpha \)-factorization; in this case every resolution of an \( \alpha \) ideal into factors corresponds to the resolution of an \( \alpha \) integer into actual integral factors, and the introduction of ideals is unnecessary. But in every other case the introduction of ideals or some equivalent notion is indispensable. When two ideals have been resolved into their prime factors, their greatest common measure and least common multiple are determined by the ordinary rules. Every ideal may be expressed (in an infinite number of ways) as the greatest common measure of two principal ideals.

48. Every element of \( \alpha \) which is not contained in any other ideal is called a prime ideal. If \( \alpha \) is a prime ideal of \( \alpha \), then \( \alpha \) is a principal ideal of \( \alpha \). For \( \alpha \) is a modulus, if \( \alpha \) is a principal ideal, then \( \alpha \equiv \beta (mod \alpha \), where \( \alpha \) is a modulus (§ 44), and we may write \( \alpha = [a \omega_1, a \omega_2, \ldots, a \omega \), assuming that we have found one basis, we can construct any number of equivalent bases by means of equations such as \( \omega = \sum_{i=1}^{n} \omega_i \), where the integral coefficients \( c_i \) are such that the determinant \( \Delta \) is 1.

49. For a quadratic field the equation is of the form \( \alpha^2 + \beta^2 = \gamma \), and the theory of this is complete; but except for certain special cubic corpuses little has been done towards solving the important problem of assigning an \( \alpha \) ideal to \( \alpha \) field, a system of units \( \alpha, \alpha, \ldots, \alpha \), where \( \alpha \) is a root of unity contained in \( \alpha \) and \( \alpha \) is a root of a certain polynomial. We can show that \( \alpha \) is a root of unity if and only if \( \alpha = \alpha^{-1} \). The norm of an \( \alpha \) is \( \alpha + \alpha \); and the determination of all the units contained in a given field is in fact the same as the solution of a Diophantine equation \( \alpha^2 = \alpha \).

50. The general theory of \( \alpha \) fields is known as the theory of ideals, and Dedekind's generalization of the corresponding one for quadratic fields, first obtained by Dirichlet. Let \( \alpha = \alpha \), where the sum extends to all ideals \( \alpha \) contained in \( \alpha \); this converges so long as the real quantity \( s \) is positive and greater than 1. Then \( \alpha \) being a certain quantity which can be calculated when a fundamental system of units is known, we shall have \( \alpha = \alpha \). The expression for \( \alpha \) is rather complicated, and very peculiar; it may be written in the form \( \alpha = \alpha \).

51. Normal Fields. The special properties of a particular field \( \alpha \) are closely connected with its relations to the conjugate fields \( \alpha \), \( \alpha \), \( \alpha \) normal. The most important case is when each of the conjugate fields is identical with \( \alpha \); the field is then said to be Galoisian or normal. The aggregate \( \{R, \alpha, \ldots, \alpha \} \) of all \( \alpha \) of \( \alpha \) is one of the special sense, "logarithms" of the fundamental units \( \alpha, \alpha, \ldots, \alpha \).

52. The discriminant \( \Delta \) enjoys some very remarkable properties. Its value is always different from \( \alpha \); there can be only a finite number of fields which have a given \( \alpha \); and the rational prime factors of \( \Delta \) are precisely those rational primes which, in \( \alpha \), are divisible by the square (or some higher power) of a prime ideal. Consequently, every rational prime not contained in \( \alpha \) is divisible, in \( \alpha \), by the square of a prime ideal which occurs only once. The presence of multiple prime factors in the discriminant was the principal difficulty in the way of extending Kummer's method to all fields, and was overcome by the introduction of the congruent modulus—for this is the common characteristic of Dedekind's and Kronecker's procedure.
The next proposition, which, in its natural order, is easily proved by the method of ideals, whereas Gauss had to employ the theory of ternary quadratics.

Every class of the principal genus is the square of a class.

An ambiguous ideal in \( \Omega \) is defined as one which is unaltered by the change of \( \nu m \) to \(-\nu m\) (that is, it is the same as its conjugate) and not divisible by any rational integer except \( \pm 1 \). The only ambiguous ideal in \( \mathbb{Q} \) is \( 1 \).

Putting \( \Delta = q_1^2 \cdot q_2 \cdot \ldots \cdot q_r \), and \( \Delta \) is positive; \( \pm 1 \) is the only number of ambiguous classes is equal to the number of genera.

54. Class-Number.—The number of ideal classes in the field \( \Omega(\nu/m) \) may be expressed in the following forms:

\[
\begin{align*}
(i) & \quad m < 0, \quad \lambda = -1 \pm m^{-1} \\
(ii) & \quad m > 0, \quad \lambda = -1 \pm m^{1/2}
\end{align*}
\]

In the first of these formulae \( \nu \) is the number of units contained in \( \Omega \); thus \( r = 6 \) for \( \Delta = -3 \), \( r = 4 \) for \( \Delta = -4 \), \( r = 2 \) in other cases. In the second formula, \( s \) is the fundamental unit, and the products are taken for all the numbers of the set \( (1,2,\ldots,\Delta) \) for which \( \frac{\lambda}{\nu} = -1 \).

55. Suppose that any ideal in \( \Omega \) is expressed in the form \( \langle a, b, c \rangle \), then any element of it is expressible as \( ax + by + cz \), where \( a, b, c \) are rational integers, and we shall have \( N(\langle x, y, z \rangle) = a^2 + b^2 + c^2 + \cdots \) in \( \Omega \), where \( N \) is the discriminant of \( \Omega \) in \( \mathbb{Q} \). The representation will be unique if \( a, b, c \) are not all zero; \( a, b, c \) are not all zero.

56. Complex Quadratic Forms.—Dirichlet, Smith, and others, have discussed forms \( (a, b, c) \) in which the coefficients are complex integers of the form \( m-ni \); and Hermite has considered bilinear forms \( ax+bz+by+cz+cy \), where \( x, y, z \) are the conjugates of \( x, y, z \).

In the general case, the number of ideals in \( \Omega \) as also the number of a set of quadratic forms; and it can be shown that all these forms have the same discriminant \( \Delta \).

Conversely, every class of forms of discriminant \( \Delta \) can be associated with a definite class of ideals in \( \Omega(\nu/m) \), where \( \Delta \) is an integer satisfying the condition \( \Delta = \pm 1, \ldots, \Delta \) as the case may be. Composition of forms exactly corresponds to the multiplication of ideals; hence the complete analogy between the two theories, so long as they are really in contact. There is a corresponding theory of finite forms in connection with a field of order \( n \): the forms are of the order \( n \), but are only very special forms of that order, because they are algebraically resolvable into the product of linear factors.
NUMBER

product of the contents of two forms is equal to the content of the product of the corresponding forms with the respective signs; let N be the product of m and n, and we have N(E) = N(m) if m is the content of F, and N(m) has the meaning already assigned to it. On the other hand, to a given ideal correspond an indefinite number of forms of which it is the content (§ 46, end) and we can find forms as \( x^k y^l \) of which any given ideal is the content. 

§38. Let \( \omega_1, \omega_2, \ldots, \omega_3 \) be a basis of \( n, \mu_1, \mu_2, \ldots, \mu_n \) a set of indeterminates; and 

\[
\varepsilon_{\omega_1, \omega_2, \ldots, \omega_3} \varepsilon_{\mu_1, \mu_2, \ldots, \mu_n} = a
\]

is called the fundamental form of \( \Omega \). It satisfies the equation \( N(\omega_\xi) = 0 \), or 

\[
F(x) = u_1 x^3 + u_2 x^2 + \ldots + u_3 = 0
\]

where \( u_1, u_2, \ldots, u_3 \) are rational polynomials in \( u_1, u_2, \ldots, u_3 \) with rational integral coefficients. This is called the fundamental equation.

Suppose now that \( p \) is a rational prime, and that \( p = 1 \bmod r \). Then there will be the different ideal prime factors of \( p \) if \( F(x) \) is the left-hand side of the fundamental equation there is an identical congruence

\[
F(x) = [P(x)]^2 [Q(x)]^2 R(x) = 0 \pmod{p}
\]

where \( P(x), Q(x), \) and \( R(x) \) are prime functions with respect to \( p \). The meaning of this is that if we expand the expression on the right-hand side of the congruence, the coefficient of every term \( x^m \), \( m \neq 0 \), will be congruent, \( \bmod p, \) to the corresponding coefficient in \( F(x) \). If \( p = 1 \bmod r \), \( F(x) \) is a primitive form of \( \Omega, \) \( Q(x) \) and \( R(x) \) can be found by taking the ideal prime factors of \( p \). For every prime \( p \), which is not a divisor of \( \Delta, a, b = c = -1 \) and \( F(x) \) is congruent to the product of a set of different prime forms in as many powers as there are different ideal prime factors of \( p \). In particular, if \( p = 1 \bmod \Omega, \) \( F(x) \) is a prime function \( \pmod{p} \) and conversely.

It generally happens that rational integral values \( a_1, a_2, \ldots, a_n \) can be found, such that \( x \) and \( y \) are the last term in the fundamental equation, then has a value which is prime to \( p \). Supposing that this condition is satisfied, let \( \phi(a_1, a_2, \ldots, a_n) \) and let \( \overline{\phi} \) be the result of putting \( x = a, y = a \) in \( F(x) \). Then the ideal \( \phi(x) \) is completely determined as the greatest common divisor of \( \phi \) and \( \overline{\phi} \); and similarly for the other prime factors of \( p \). There are, however, exceptional cases when the condition above stated is not satisfied.

59. Cyclotomicity. — It follows from de Moivre's theorem that the arithmetical solution of the equation \( x^n = 1 \) corresponds to the division of the circumference of a circle into \( n \) equal parts. The case when \( n \) is composite is easily made to depend on that where \( n \) is a power of a prime; if \( m \) is a power of \( 2 \), the solution is effected by a chain of quadratic equations, and it only remains to consider the case when \( m = a^2 \), a power of an odd prime. It will be convenient to write \( p(x) \) for \( m = a^2 \), \( x \) for \( p(x) \), the primitive roots of \( \phi \); and \( \phi(x) \) is a product of \( \phi \) for \( x \) and \( \overline{\phi} \). The primitive roots of this congruence \( x^m = 1 \) \( \pmod{m} \); let \( g \) be any one of these. Then if we put \( x^p = g \), we have all the roots of \( f(x) \) \( \pmod{n} \) in a definite cyclic order \( (r_0, r_1, \ldots, r_{m-1}) \); and the change of \( r \) into \( r^m \) produces a cyclic permutation of the roots. It follows from this that \( x \) is a primitive root of \( \phi \) with rational coefficients is equal to a rational number. Thus if we write \( l + a g + b g^2 + c g^3 = n \), we have, in virtue of \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), \( r^2 - r \), the sum of the first powers of all the roots of \( f(x) = 0 \), and this is a rational integer or zero. Since every cyclic polynomial is the sum of parts similar to \( S(r^2 - r), \) the theorem is proved. Now let \( g, f \) be any two conjugate factors of \( \mu \), so that \( \mu \) is a prime, and let 

\[
\varepsilon_{\omega_1, \omega_2, \ldots, \omega_3} \varepsilon_{\mu_1, \mu_2, \ldots, \mu_n} = a
\]

then the elementary symmetric functions \( \Sigma \phi, \Sigma \phi^2, \ldots, \) are cyclic functions of the roots of \( f(x) = 0 \) and therefore have rational values which can be calculated: consequently \( \mu_1, \mu_2, \ldots, \mu_n \) are the \( n \)-fold roots of this congruence.
numbers. He also succeeded in showing that in the field $R(e^{\pi i/p})$ the equation $x^2 - p^2 y^2 = m$ has no integral solutions whenever $m$ is not divisible by $p^2$. What is known as the "last" theorem of Fermat is his assertion that every integral solution of this equation in which $x$ and $y$ are not both divisible by any prime is given by the equation $x^2 = y^2 + m^n$. This theorem has no rational solutions, except the obvious ones for which $x = y = 0$. It would be sufficient to prove Fermat's theorem for all prime values of $m$; and whenever Kummer's theorem last quoted applies, Fermat's theorem will hold. Fermat's theorem is true for all values of $m$ such that $2^m < 101$, but no complete proof of it has yet been obtained.

Hilbert has considered the question of what he calls Kummer fields, which are obtained by taking $\sqrt{a}$, a primitive $p$th root of unity, and $\sqrt{a}$ any integer or any number in the field $R(\sqrt{a})$ which is not a perfect $n$th power in that field. The Kummer field is then the field obtained by adjoining all rational functions of $x$ and $\alpha$. Other fields that have been discussed more or less are general cubic fields, special bicuadratics, and some special biquadratic and a few Abelian fields not cyclic.

Among the applications of cyclotomy may be mentioned the proof which it affords of the theorem, first proved by Dirichlet, that if $m$, $n$ are any two rational integers prime to each other, the linear form $mx + n$ is capable of representing an infinite number of primes.

62. Gauss's Sums.—Let $m$ be any positive real integer; then

$$\sum_{x=0}^{m-1} e^{2\pi i x/m} = \begin{cases} 0 & \text{if } m = \text{odd} \\ 1 & \text{if } m = \text{even} \end{cases}$$

This remarkable formula, when $m$ is prime, contains results which were first obtained by Gauss, and hence known as Gauss's sums. The easiest method of proof is Kronecker's, which consists in finding the value of $\int e^{2\pi i x/m} dx$, which is $1$ when $m$ is prime and $0$ when $m$ is composite, and taking the appropriate contour. It will be noticed that one result of the formula is that the square of any integer can be expressed as a rational function of roots of unity.

The most important application of the formula is the deduction from it of the law of quadratic reciprocity for real primes: this was done by Gauss.

63. One example may be given of some remarkable formulae giving explicit solutions of representations of numbers by certain quadratic equations. Let $p$ be any odd prime of the form $4n+1$; then we shall have $p = m^2 + 2 = x^2 + y^2$, where $x$ is determined by the congruence $2x \equiv (\eta) \pmod{p}$, $x \equiv 3 \pmod{7}$. This formula was obtained by Eisenstein, who proved it by investigating properties of integers in the field generated by $\eta = 2^{1/2}$, which is a component of the field generated by $\eta = 2^{1/2}$.

The first formula of this kind was given by Gauss, and relates to the case $p = m^2 + 2 = x^2 + y^2$; he conceals its connexion with complex numbers. Probably there are many others which have not yet been stated.

64. Higher Congruences, Functional Moduli.—Suppose that $p$ is a real prime, and that $f(x)$, $g(x)$ are polynomials in $x$ with rational integral coefficients. The congruence $g(x) \equiv f(x) \pmod{p}$ is identical when each coefficient of $f$ is congruent, mod $p$, to the corresponding coefficient of $g$, with itself, under these circumstances, $f \equiv g \pmod{p}$ and to say that $f$, $g$ are equivalent, mod $p$. Every polynomial of degree $k$ is equivalent to another of equal or lower degree, which has any of its coefficients, negative, and each of them less than $p$. Such a polynomial, with unity for the coefficient of the highest power of $x$ contained in it, may be called a reduced polynomial with respect to $p$. There are, in all, $p^k$ reduced polynomials of degree $k$. A polynomial may or may not be equivalent to the product of two others of lower degree than itself; in the latter case it is said to be prime. In every case, $f$ being any polynomial, there is an equivalence $f - df_1 \cdots - f_k$ where $c$ is an integer and $f_1, \cdots, f_k$ are prime functions; this resolution is unique. Moreover, it follows from Fermat's theorem that $f(x) \equiv F(x)$, $f(x) \equiv F(x)$, and so on.

As in the case of equations, it may be proved that, when the modulus is prime, a congruence $f(x) \equiv 0 \pmod{p}$ cannot have more incongruent roots than the index of the highest power of $x$ in $f(x)$, and that if $x = y \pmod{p}$ is a solution, $f(x) = f(y) \pmod{p}$, where $f(y)$ is another polynomial in $y$ with coefficients congruent, mod $p$, to the corresponding coefficients of $f(x)$ and $f(y)$. The solutions of $f(x) \equiv 0 \pmod{p}$ are all the zeros of $f(x)$, hence the solutions of the congruence $f(x) \equiv 0 \pmod{p}$ have the same number of zeros as the polynomial $f(x)$ has, hence the number of its distinct zeros, and each of them less than $p$. Such a polynomial, with unity for the coefficient of the highest power of $x$ contained in it, may be called a reduced polynomial with respect to $p$. There are, in all, $p^k$ reduced polynomials of degree $k$. A polynomial may or may not be equivalent to the product of two others of lower degree than itself; in the latter case it is said to be prime. In every case, $f$ being any polynomial, there is an equivalence $f - df_1 \cdots - f_k$; each $c$ is an integer and $f_1, \cdots, f_k$ are prime functions; this resolution is unique. Moreover, it follows from Fermat's theorem that $f(x) \equiv F(x)$, $f(x) \equiv F(x)$, and so on.

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860
*+^

so that

we

I,

=v

shall

Fuchsian or automorphic function.
2
and may be expanded in the form

have

dn

-i-.

"' sn "'

g

It is

an analytical function

of

,

w,

0-o7

and, supposing for simplicity that ia

= 2 K,

TrO<a*

a>w0oo

the notation being that which
It is found that
ir..

2

is

a real negative quantity,

is

= 2:'K', a)=t'K'/K,
now usual for the elliptic

where

functions.

c\, Ci, &c., are rational integers.
69. Suppose, now, that a, b, c, d are rational integers, such that
Let (oa>+6)/
dv(a, 6, c, d) = I and ad bc = n, a positive integer.

(cia-\-d) =<*>';

_ 2 | _2!I*_

u'~ a, that
sjn (25

i)

=J(u)

J(oo')

there are integers

a,/3,

is

satisfied

if

7,8 such that ai

TM,

q"

1 1

then the equation

is, if

'+/3)

and only if
= 1, and

(87

=O.

we write^(w) = nll(i +"'), where the product extends to all prime
factors (p) of n, it is tound that the values of w fall into ^() equivalent sets, so that when w is given there are not more than <}/(n)
different values of J (&>')
Putting J(oi')=J', J(i>)=J, we have a
If

cos 2iir.

From

modular equation

u = o, we obtain

the last formula, by putting

/i(J',J)-o
with integral coefficients and of degree ^(n).
Similarly when dv(a, b, c, d) =T we have an equation /T (J J) =o of
order ^(n/r 2 ) hence the complete modular equation for transformations ofjjhe nth order is
symmetrical in

J, J',

,

sides in ascending powers of q, and
equating the coefficients of o", we arrive at a formula for the number
If 8 is any odd
of ways of expressing n as the sum of two squares.
divisor of , including I and n itself if n is odd, we find as the co-

and hence, by expanding both

~

the expansion of the left-hand side 4S(-i)* (a l)
on the right-hand side the coefficient enumerates all the solutions
= ( x) 2 -f- ( y) 2 taking account of the different signs (except for o2 )
and of the order in which the terms are written (except when x? =>*).
) =
Thus if n is an odd prime of the form 4^ 1, S(-i) 3t
2, and the
coefficient of g" is 8, which is right, because the one possible com2
2
2
2
2
2
6)
6) =(
position n =a +& may be written n =( a) +(
giving eight representations.
By methods of a similar character formulae can be found for the
number of representations of a number as the sum of 4, 6, 8 squares
The four-square theorem has been stated in 41 the
respectively.
eight-square theorem is that the number of representations of a
number as the sum of eight squares is sixteen times the sum of the
cubes of its factors, if the given number is odd, while for an even
number it is sixteen times the excess of the cubes of the even factors
above the cubes of the odd factors. The five-square and sevensquare theorems have not been derived from g-senes, but from the
general theory of quadratic forms.
68. Still more remarkable results are deducible from the theory of
the transformation of the theta functions. The elementary formulae
efficient of g" in

;

,

+

+(o)

,

;

the degree of which

Now

if

is

in F(J', J)

F(J'J)=H/r(J',J)=0,
*(), the sum of the divisors

of n.

= J. the result is a polynomial in J
G(J). To every linear factor of G corre-

we put

J'

which we may call
sponds a class of quadratic forms of determinant (if 4n) where
2
<4 and K is an integer or zero: conversely from every such form
we can derive a linear factor (J o) of G. Moreover, if with each form
we associate its weight ( 41) we find that with the notation of 39
2
the degree of G is precisely SH(4n
e n where
n = i when n
)
is a square, and is zero in other cases.
But this degree may be found
in another way as follows. A complete representative set of transformations of order n is given by u' = (au+b)/d, with ad = n,
hence
alone,
/c

ic

,

;

=0oo(w,)),

*""*,
e

=9m(u, w),

9oo(iU>-f-l)

g, _I)--,V=SS,,<,),

_ A = v ^3?

f

for J(u)

and J /^ii_l

their values in terms of

q, we find that the lowest term in the factor expressed above is either
2
2a
/i728, or a constant, according as a<d, a>d or
g~ /!7 2 8or g~
a = d. Hence if v is the order of G(J), so that its expansion in g
begins with a term in q-*' we must have
' <i

extending to all divisors of n which exceed V
the other vlue, we have

Comparing this with

ZH(4- K =
2

)

(, u )

10

a/

\co

and by substituting

,

as stated in

39.
70. Each of the singular moduli which are the roots of G(J)=O
corresponds to exactly one primitive class of definite quadratic forms,

and conversely.
Corresponding to every given negative determinant

where V
positive.
K as

i<<>
is to be taken in such a way that its real
part is
Taking the definition of K given in
67, and considering

a function of

a,

we

find

A

there

is

an irreducible equation <fr(j)=o, where j'=i728J, the coefficients
of which are rational integers, and the degree of which is k(
A).
The coefficient of the highest power of j is unity, so thatj is an arithmetical integer, and its conjugate values belong one to each primitive
determinant
A.
By adjoining the square roots of the
prime factors of A the function ^(j) may be resolved into the product

class of

many factors as there are genera of primitive classes, and the
degree of each factor is equal to the number of classes in each genus.
In particular, if ji, i, J(A+l)| is the only reduced form for the
determinant
A, the value of is a real negative rational cube. At
of as

For convenience let s (o))=er: then the substitutions (w,u+i) and
&T ) convert o into <7/(<7 I ) and (l a) respectively. Now if
(u,
/t

1

a,

/3,

7, 6 are

any

real integers

such that aS

/}y

= I,

the substitution

[w,(aa+f})/(yu+&)\ can be compounded of (u.co+l) and (u, u~');
the effect on a will be the same as if we apply a corresponding substitution
of [a, <7/(<r
But these are
1)| and [<r, I
v].
compounded
periodic and of order 3, 2 respectively] therefore we cannot get more
than six values of a, namely
;

a
,

,

l

I

a

I

I

,

and any symmetrical function of these will have the same value at
any two equivalent places in the modular dissection ( 33). Their

sum

is

constant, but the

sum

of their squares

form

may

be put into the

_;'

the same time

its

approximate value

is

exp

I

2ri

I

+744 =

m

eV
eV

A
where
is a
A, so that, approximately,
744
" ==m*+744
rational integer.
For instance
...=
884736743-9997775
3
96o +744 very nearly, and for the class (i, i, n) the exact value of
3
Four and only four other similar determinants are known
j is goo
to exist, namely
n,
19,
163, although thousands have
67,
been classified. According to Hermite the decimal part of e"V 163
begins with twelve nines; in this case Weber has shown that the
exact value ofj is -2 18 -3 3 -5 3 -23 3 -29 3
71. The f unction j(u) is the most fundamental of a set of quantities
called class-invariants. Let (a, b, c) be the representative of any class
of definite quadratic forms, and let a be the root of a&-\-bx-+-c = O
which has a positive imaginary part then F (a) is said to be a classe"V

.

.

;

invariant

hence (*
F. Klein writes

this

is

1

2

-j-ff (ff

i )

2

has the same value at equivalent places.

a transcendental function of u, which

a special case of a

if

F

("
\y

,

,)=F(a>) for

all

real

integers

true for j(a) whatever <a may
be, and it is for this reason that j is so fundamental. But, as will be
seen from the above examples, the value of j soon becomes so large
that its calculation is impracticable. Moreover, there is the difficulty of constructing the modular equation /i(J, J') =o (69), which

ft,

is

for (a, b, c)

y, 8

such that 08

0y

i.

This

is


NUMBER
has only been done in the cases when n =2, 3 (the latter by Smith in
For moderate values of A the difficulty can generally be removed
by constructing algebraic functions of j. Suppose we have an irreducible equation
m-l
xm
. .

+ClX

ng * we can

and

tf

in this

we put x = y = u, the
*-2tt -495tt

2

result

+2

4

If,

now, we write

we

shall

have
dji : dji : dji

where

810, 0oi,

We shall therefore have 72(201) =72(10)
=

3

.3 .5

=o,

1,

for all values of such that

7+7a-HSH3572So (mod

3).

I, o) the conditions are satisfied, and
so that 72(0 = 12; and since j(w) is
positive for a pure imaginary, 7 2 (iV2)=2O. The remaining case is
settled by putting

the same conditions as before.

One

solution

*

and hence w2 +3<o+4=o, so that 72 f
=-152
J
irrational invariants which have been used with
other
Besides 72,
effect are 73 =
(j-l^2&), the moduli K, K', their square and fourth
roots, the functions/, /i,/i defined by
(-1, 2, i, i)

-\l

ij(n<o)/j/(to)

where

ij(o>)

is

defined

CC

The corresponding
For deficiency

solving <t>(r) =
auxiliary
simple equation >l>(x, y) =o not exsuch that j, j are each rational

singular moduli are found
I we may find in a similar

functions x, y connected by
ceeding the fourth degree,
functions 'of x and y.

some
and

by

way two

Hurwitz has extended this field of research almost indefinitely,
not only by generalising the formulae for class-number sums, such
as that in 69, but also by bringing the modular-function theory into
connexion with that of algebraic correspondence and Abelian into indicate the
tegrals. A comparatively simple example may help
nature of these researches. From the formulae given at the beginning
of the corresponding
of
67, we can deduce, by actual multiplication

f

j y

(

67)

_
2

-T-

= i~T

f

j

)

jf

Cxdx = \-(

j y

we put x = -Jn(w).
Other functions occur in this theory analogous to ji(u), but such
that in the g-series which are the expansions of them the coefficients
and exponents depend on representations of numbers by quaternary
quadratic forms.
73. In the Berliner Sitzungsberichte for the period 1883-1890,
L. Kronecker published a very important series of articles on elliptic
functions, which contain many arithmetical results of extreme
elegance; some of these Kronecker had announced without proof
many years before. A few will be quoted here, without any attempt
at demonstration; but in order to understand them, it will be
necessary to bear in mind two definitions. The first relates to the

Legendre-Jacobi symbol (-J
while
(2| =o;

W =(\o/ W
)

(-

a

if

)

rt=i

L =0>

If a, b

have a common factor we put

odd and 6=2*c, where

is

The

.

.

c

is

we put

odd,

other definition relates to the classification of

D

is any number that can be
discriminants of quadratic forms. If
or I (mod. 4), and in every
such a discriminant, we must have
= DoQ2 where Q2 is a square factor of D, and
case we can write
Do satisfies one of the following conditions, in which P denotes a
product of different odd primes:
I (mod 4)
Do = P, with

D=o

D

,

P=
P= -I
P=;l

,

:

where we are to take A, fe = 1,2, 3,
except that, if D<o, the case

D>o, (2am+bn)T?n\J
2
2

T -DU

3.

=4.

The sum

...+.; m, n=o,

m =n =o

j,

2, ..

00

.

excluded, and that, it
where (T, U) is the least positive solution of
X applies to a system of representative
is

,,
primitive forms

prime to Q, and

for the determinant D, chosen so that o is
are each divisible by all the prime factors of Q.

(a, 6, c)
b, c

c);

,

or

and

D>o.

itions that
,

are convergent.
F(ry)=F(x)F(}>), and that the sums on both sides
quantity, it
By putting F(x) =X-I-P, where P is a real positive
can be deduced from the foregoing that, if Dj is net a square, and if

Di

is

T

*i,

=4P,

discriminant is uniquely expressible as the product of a fundamental
discriminant and a positive integral square.
Now let DI, D2 be any two discriminants, then DiD2 is also a dis2
where Do is fundacriminant, and we may put DiDj = D = DoQ
mental this being done, we shall have

series,

=9*00801910=

oo

(mod 4)
Do = 8P,
(mod 4).
Numbers such as Do are called fundamental discriminants; every

by

C. F. Klein and
72. Another powerful method, developed by
K. E. R. Fricke, proceeds by discussing the deficiency olfi(j,j')=o
considered as representing a curve. If this deficiency is zero, j and j'
may be expressed as rational functions of the same parameter, and
this replaces the modular equation in the most convenient manner.
For instance, when n = 7, we may put

o

:

V,

= i'fto)

D

<t>(r').

floi

which represents, in homogeneous co-ordinates, a quartic curve of
For this curve, or any equivalent algebraic figure,
deficiency 3.
ji(w), J2(to) and j(w) supply an independent set of Abelian integrals
of the first kind. If we put x =
y = V*'. it is found that

(?)
a, 0, y, S satisfying

+

:

provided that

=
Putting (a, 0, y, 5) (o, -I,
2w = i'V2. Now j(i) = 1728,

and the function

= 9j

connected by the relation

9<, are

so that the integrals which the algebraic theory gives in connexion
with x t +y t-i=o are directly identified with ji(w), jj(w), j(u),

is

3

the roots of which are 12, 20, -15, -15.
It remains to find the
values of to, to which they belong. Writing 72(10) = ^ j, it is found
that we may define 72 in such a way that 72(0)+!) = e~**V J7j(<o).
1
7i(-"~ ) =72(40), whence it is found that

is

In a similar .way

.

3

with

the representations

all

in

., ^ ., and then the
,.
equation *l/(x, x)=o defines a set of singular moduli, each one of which
a
certain value of to and all the quantities derived from
belongs to
it by the substitutions which leave x(w) unaltered.
As one of the simplest examples, let n=2, x i -J(<a)=y i-j (u')=o.
Then the equation connecting x, y in its complete form is of the ninth
degree in each variable; but it can be proved that it has a rational
factor, namely
.

extended over

+

the coefficients of which are rational functions ofj(u). If we apply
any modular substitution to'=S(to), this leaves the equation unaltered, and consequently only permutates the roots among themselves: thus if Xi(w) is any definite root we shall have Xi(w') =
*<(to), where i may or may not be equal to I.
The group of unitary
substitutions which leave all the roots unaltered is a factor of the
complete modular group. If we put y = x(nta), y will satisfy an equation similar to that which defines x, with j' written for i; hence, since
4 4' art* r*nnnr*t*tf*f\ Kw t-fitt wiii^*is^n t. f * *'\t\ * I-,,..-.. ....*![ I..,.,., ('(iirittnn
.

861

different

from

I,

H(D Q')H(D2Q )=Lt S
2

l

po

where the function

a, b, c

H (d) is defined as follows for any discriminant d

i,5. 9.

where

d>o

T+UVd

:


$h(d)$ meaning the number of primitive forms for the determinant $d$. This is a generalisation of a theorem due to Dirichlet.

There is another formula which, in a certain sense, is the generalisation of Gauss's sums (§ 62) in cyclotomy. Let $\chi(u, v)$ denote the function $\theta_1(u+v)+\theta_2(u\theta(v)$ and let $D_1$ be any two fundamental discriminants such that $D_1D_2$ is also fundamental and negative: then

$$\frac{\tau D_1}{2\pi \sqrt{D_1D_2}} \sum_{\sigma \in S} \left( \frac{D_1}{\sigma} \right) J_{\frac{\rho}{\sigma}}(1) \left( \frac{D_2}{\rho} \right) \sum_{m, n} g_1(m^2+n^2+cD_2),$$

where, on the left-hand side, we are to sum for $\sigma = 1, 2, 3, \ldots |D_1|$; and on the right we are to take a complete set of representatives $\rho = a_1+b_1\sqrt{D_2}, a_2+b_2\sqrt{D_2}$, and $m, n$, of all positive and negative integral values such that $m^2+n^2+cD_2$ is odd. The quantity $\tau$ is 2 if $D_1D_2<4, \tau = 3$ if $D_1D_2=4, \tau = 6$ if $D_1D_2=8$. From putting $D_1=1$, we obtain, after some easy transformations,

$$\sum_{\sigma = 1}^\infty \left( \frac{-4}{\sigma} \right) \sin 2\pi \frac{K}{\sigma} = \frac{\tau D_1}{2\pi \sqrt{D_1D_2}} \sum_{m, n} g_1(m^2+n^2+cD_2),$$

which holds for any fundamental discriminant $\sigma$. For instance, taking $\omega = i\sqrt{5}/K$, and $\Delta = 3$, we have $\theta_1(\omega) = 2\sqrt{5}/\pi$, and $\sum_{\sigma = 1}^\infty \left( \frac{-4}{\sigma} \right) \sin 2\pi \frac{K}{\sigma} = \frac{4\sqrt{5}}{3\pi}$; a verification afforded by making $a_k$ approach $\pi$, the value of $\pi$, in which case $\sigma$ vanishes, while the limit of $g_1(K)/3$ is $\frac{4\sqrt{5}}{3\pi}$, as it should be.

Several of Kronecker's formulae connect the solution of the Pellian equation with elliptic modular functions; one example may be given here. Let $D$ be a positive discriminant of the form $8n+5$, let $(\Gamma, U)$ be the least solution, and $\tau(D) = 3$. Then, if $D(\tau)$ is the number of primitive classes for the determinants $D(\tau) = D(\tau', \tau''),$ where the product on the right extends to a certain sixth part of the numbers $\Delta = 2K/\pi$, which are singular, and correspond to the field $\Omega/\Delta$, one finds that

$$\tau(D(\tau)) = \frac{4\Delta(\omega \tau)^2 + 1}{(2+15+3\sqrt{5})^2(\omega\tau)^2 + 1}$$

one root of which is given by $2\omega \tau = 1+\sqrt{5}$, and $\Delta + 5\sqrt{5}$ which is right, because in this case $D(D(\tau)) = 12$.

74. Frequency of Primes.—The distribution of primes in a finite interval $(a, b)$ is very irregular, if we change $a$ and keep $b$ constant. Thus if we put $n = a$, the numbers $\mu/2, \mu/3, \ldots, (\mu/\mu-1)$ are all composite, so that we can form a run of consecutive composite numbers as extensive as we please; on the other hand, there is possibly no limit to the number of cases in which $p$ and $p+2$ are both prime, and it is the first to examine the approximate formula for $F(x)$, the number of primes not exceeding $x$. He found by induction

$$F(x) = x + (2\log x - 1 - 0.8366)$$

which answers fairly well when $x$ lies between 10 and 1,000,000, but becomes more and more inaccurate as $x$ increases. Gauss found, by theoretical considerations (which, however, he does not explain), the approximate formula

$$F(x) \approx x + \frac{x}{2} \log x$$

(where, as in all that follows, $\log x$ is taken to the base $e$). This value is ultimately too large, but when $x$ exceeds a million it is nearer the truth than the value given by Legendre's formula.

By a singularly profound and original analysis, Riemann succeeded in finding a formula, of the same type as Gauss's, but more exact for very large values of $x$. In its complete form it is very complicated; but, by omitting terms which ultimately vanish (for sufficiently large values of $x$) in comparison with those retained, the formula reduces to

$$F(x) = A \sum_{m = 1}^{\infty} \frac{\mu(x)}{m^2} x^x \log x$$

where the sum extends to all positive integral values of $m$ which have no square factor, and $\mu$ is the number of different prime factors of $m$, with the convention that when $m = 1, (-1) = 1$. The symbol $A$ denotes a constant, namely

$$A = \frac{e^{\tau /2} \beta e^{-1} \log|-2\pi|}{25 \log 6^6}$$

and $L$ is used in the sense given above.

P. L. Tchebycheff obtained some remarkable results on the frequency of primes by an ingenious application of Stirling's theorem. One of these is that there will certainly be $(\alpha + 1)$ primes between $a$ and $b$, provided that

$$\alpha \geq \frac{5}{6} \log b - \sqrt{2} \log 6 \log b + \frac{5}{6} (4k + 25) - 26 \frac{25}{6}$$

where $R = \log h + \log 4 + \frac{1}{4} \log 5 - 15 \log 7 - 0 + 0.921292$. From this may be inferred the truth of Bertrand's conjecture that there is always at least one prime between $a$ and $(2a-2)$ if $a > 7$. Tchebycheff's results were generalized and made more precise by Sylvester.

The actual calculation of the number of primes in a given interval may be effected by a formula contrived by Pringsheim, Stern and by D., F. E. Meissel. The following table gives the values of $F(n)$ for various values of $n$, according to Meissel's determinations:

<table>
<thead>
<tr>
<th>$n$</th>
<th>$F(n)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>9952</td>
</tr>
<tr>
<td>50000</td>
<td>41538</td>
</tr>
<tr>
<td>100000</td>
<td>168373</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

Riemann's analysis mainly depends upon the properties of the function

$$f(n) = \sum_{\rho} \theta(u, v) \left( \frac{1}{\rho} \right)$$

considered as a function of the complex variable $z$. The above definition is only valid when the real part of $s$ exceeds 1; but it can be generalized by writing

$$2 \sin \pi \Gamma f(z) = \int_{-\infty}^{\infty} e^{-\pi x^2} dx$$

where the integral is taken from $x = +\infty$ along the axis of real quantities to $x = 0$, where $e$ is a very small positive quantity, then round a circle of radius $\epsilon$ and centre at the origin, and finally from $x = -\infty$ along the axis of real quantities. This function $f(z)$ is of great importance, and has been recently studied by von Mangoldt Landau and others.

Reference has already been made to the fact that if $n$, $m$ are coprime, the linear form $x + my$ includes an infinite number of primes.

Now let $\alpha$, $\beta$, $\gamma$ be any primitive quadratic form with a total generic character $C$; and let $x + my$ be a primitive linear form chosen so that all its values have the character $C$. Then it has been proved by Weber and Meyer that $n, m, c, C$ is capable of representing an infinity of primes of all the linear form $x + my$.

75. Arithmetical Functions.—This term is applied to symbols such as $f(x)$, $g(x)$, &c., which are functions of $x$ with $n$ by certain properties which make them suitable for metrical use. The function $f(x)$ was written by Euler, who investigated its properties, and by proving the formula

$$\sum_{n=1}^{\infty} \frac{f(n)}{n} = \log 2$$

where

$$\sum_{n=1}^{\infty} \frac{f(n)}{n} = \log 2$$

this is the simplest proof of the law of quadratic reciprocity depends upon the fact that $q$ are odd primes, and we put $p = 2n+1, q = 2n+1$.

$$\sum_{n=1}^{\infty} \frac{E(x)}{x} = \frac{x}{2}$$

the truth of which is obvious, if we rule a rectangle $\theta x^2q^2$ into unit squares, and draw its diagonal. This formula is Gauss's, but the geometrical proof is due to Eisenstein. Another useful formula is

$$\sum_{n=1}^{\infty} \frac{E(x)}{x} = E(nx) - E(x),$$

which is due to Hermite.

Various other arithmetical functions have been devised for particular purposes; two that deserve mention (both due to Kronecker) are the number of divisors (as in our case) which is odd or even, and $s x$, which means $s + x$. Note 1.

76. Transcendental Numbers.—It has been proved by Cantor that the aggregate of all algebraic numbers is countable. Hence immediately follows the proposition (first proved by Liouville) that there are numbers, both real and complex, which cannot be defined by any combination of a finite number of equations with rational integral coefficients. Such numbers are said to be transcendental. Hermite first completely proved the transcendental character of $e$, and Lindemann, by a similar method, proved the transcendence of $\pi$. Thus it is now finally established that the quotient of the circle is impossible, not only by rule and compass, but even with the help of any number of algebraic curves of any order when the coefficients in their equations are rational (see Hermite, C. R. Izvii., 1873; in Lindemann, Math. Ann. xx., 1882). Another number which is almost certainly transcendental is Euler's constant $C$. It may be convenient to give here the following numerical values:

- $\log 2 = 0.6931471803$
The Berlin, theory foregoing has 1801 (in 2'18284 peculiar well. Another 4 i) acknowledged solutions equalities, processes with the last of which is useful in calculating class-invariants.

77. Miscellaneous Investigations.—The foregoing articles (§§ 24-76) give an outline of what may be called the analytical theory of numbers, which is mainly the work of the 19th century, though many of the researches of Lagrange, Legendre and Gauss, as well as all those of Euler, fall within the 18th. But after all, the germ of this remarkable development is contained in what may be called the original Diophantine analysis, of which, beyond question, Fermat was the author. While the spirit of this method is still vigorous in Euler; but the appearance of Gauss’s *Disquisitiones arithmeticae* in 1801 transformed the whole subject, and gave it a new tendency which was strengthened by the discoveries of Cauchy, Jacobi, Eisenstein and Dirichlet. In recent times Édouard Lucas revived something of the old doctrine, and it can hardly be denied that the Diophantine method is the one that is really germane to the subject. Even the strange results obtained from elliptic and modular functions must somehow be capable of purely arithmetical proof without the use of theories final. Besides those who have announced various theorems which have not been proved or disproved, and made a beginning of theories which are still in a more or less rudimentary stage. As examples of the latter may be mentioned the partition of numbers (see Numbers, Partition or, below), and the resolution of large numbers into their prime factors.

The general problem of partitions is to find all the integral solutions of a set of linear equations \( \sum_{k=1}^{n} a_k x_k = m \), with integral coefficients, and fewer equations than there are variables. The solutions may be further restricted by other conditions—for instance, that all the variables are to be positive. This theory was begun by Euler: Sylvester gave lectures on the subject, of which some portions have been preserved; and various results of great generality have been discovered by P. A. MacMahon. The author last named has also considered Diophantine inequalities, a simple problem in which is "to enumerate all the solutions of \( \sum_{k=1}^{n} x_k = m \) in positive integers."

The resolution of a given large number into its prime factors is still a problem of great difficulty, and tentative methods have to be applied. But is good deal has been done by Schnolff, Lucas, Landau, and J. C. Cunningham and Lawrence to shorten the calculation, especially when the number is given, or can be reduced to, some particular form.

It is well known that Fermat led to the erroneous conjecture (he did not affirm it) that \( 2^{n} + 1 \) is a prime whenever \( n \) is a power of 2. The first case of failure is when \( n = 32; \) in fact \( 2^{32} + 1 = 429,496,729 \) (mod 429,496,729). Other known cases of failure are \( n = 2^{m}, \) with \( m = 6, 12, 23, 26 \) respectively; at the same time, Eisenstein asserted that he had proved that the formula \( 2^{2n} + 1 \) included an infinite number of primes. This proof is not extant; and no other has yet been supplied. Similar difficulties are encountered when we examine Mersenne's numbers, which are those of the form \( 2^{n} - 1, \) with \( p \) a prime; the known cases for which a Mersenne number is prime correspond to \( p = 2, 3, 5, 7, 13, 17, 19, 31, 61. \) A perfect number is one which, like \( 6 \) or \( 28, \) is the sum of its aliquot parts. Euclid proved that \( 2^{n-1} (2^{n} - 1) \) is perfect when \( 2^{n-1} - 1 \) is a prime: and it has been shown that this formula includes all perfect numbers which are even. It is not known whether any odd perfect numbers exist or not. Friendly numbers (numeri amicabiles) are pairs such as 220, 284, each of the sum of the aliquot parts of the other. No general rules for constructing them appear to be known, but several have been found, in a more or less methodical way.

78. In conclusion it may be remarked that the science of arithmetic (q.v.) has now reached a stage when all its definitions, processes and results are demonstrably independent of any theory of variable or measurable quantities such as those postulated in geometry and mathematical physics; even the notion of a limit may be dispensed with, although this idea, as well as that of a variable, is often convenient. For the application of arithmetic to geometry and analysis, see Function.


**NUMBERS, BOOK OF.** the fourth book of the Bible, which takes its title from the Latin equivalent of the Septuagint *Aπολογια*. While the English version follows the Septuagint directly in speaking of Genesis, Exodus, Leviticus and Deuteronomy, it follows the Vulgate in speaking of Numbers. Since this book describes the way in which an elaborate census of Israel was taken on two separate occasions, the first at Sinai after the beginning of the desert wanderings and the second just before the Israelites were to be settled on the plains of Moab, the title is quite appropriate. The name is also used in modern Hebrew Bibles from its fourth word *Bemiškhar* ("In the desert") is at least equally appropriate. The other title in use among the Jews, *Vayyidkaber* ("And he said "), is simply the first word of the book and has no reference to its contents.

Numbers is the first part of the second great division of the Hexateuch. In the first three books we are shown how God raised up for Himself a chosen people and how the descendants of Israel on entering at Sinai into a solemn league and covenant with God, as a separate nation, a peculiar people. In the last three books we are told what happened to Israel between the time it entered into this solemn covenant and its settlement in the Promised Land under the successor of Moses. Yet, though part of a larger whole, the book of Numbers has been so constructed by the Redactor as to form a self-contained division of that whole.

The truth of this statement is seen by comparing the first verse of the book with the last. The first is as evidently meant to serve as an introduction to the book as the last is to serve as a conclusion, and, if not always fulfilled, it would in fact, if this last verse is considered as one part of a wider whole, be almost a glimmering of the principle that the whole is much greater than the sum of its parts. It is noteworthy that the books of Hexateuchal criticism are gradually changing their character, as one after another of the main contentions of Biblical scholars regarding the date and authorship of the Hexateuch passes out of the list of debatable questions into that of acknowledged facts. No competent scholars now question the existence, hardly any one the relative dates, of J, E, and P. In Numbers one can tell almost at a glance which parts belong to P, the Priestly Code, and which to JE, the narrative resulting from the combination of the Judaic work of the Yahwist with the Ephraimitic work of the Elohist. The main difficulty in Numbers is to determine to which stratum of P certain sections should be assigned.

The first large section (i. - x. 10) is wholly P, and the last eleven chapters are also P with the exception of two or three paragraphs in chap. xxxii., while the intervening portion is mainly P with the inclusion of three important episodes and two or three others of less importance. The three main episodes are those of the twelve spies, the rebellion of Korah, Dathan and Abiram, and Balaam's mission to Balak. The last is the only one even of these three in which there is nothing belonging to P. Another passage which we may here mention is one where the elements of JE can be readily separated and assigned to their respective authors, viz. chaps. xi. and xii. It is generally agreed that to E belongs the passage describing the outpouring of the Spirit on Elidad and Medad and the remarkable prayer of Moses in xi. 29. Would God that all the Lord's people were prophets that the Lord
would put his Spirit upon them," a prayer that closely approaches the New Testament idea that all Christians are "priests unto God." As usual, the J and E elements possess such a vivid character as to render them familiar to ordinary readers. The legends in which this crisis is presented differ mainly in the proportions assigned to P are so detailed and uninteresting that they make no impression on a reader's memory, and P's diffuseness, always undue, reaches a climax in chap. vii., where the offerings presented by each tribe at the dedication of the Tabernacle are actually described in such full detail that six, in themselves extremely uninteresting, verses are repeated in identical terms no fewer than twelve times. Compare also the very similar repetitions and diffuseness in chap. xxix.

Perhaps, however, the most illuminating example of the difference in position as recorded in J or E and traditions as given by P is found in the very first passage that occurs after the first long section of P describing the order of march of the several tribes and the position of the ark in the very centre of the host, both when encamped and on the march. Notwithstanding all this, in x. 30 we find Moses entreating Hobab, the son of Reuel his father-in-law, to come along with the Israelites to be "eyes" unto them; and in x. 33 it is stated that the ark went before them to seek out a resting-place for them. Whether we ascribe this whole passage simply to JE or consider, as many scholars do, that the J and E traditions reflect this oracle to the time of antiquity, when these statements directly contradict P's elaborate scheme, according to which the people march, tribe by tribe, with the ark in the very centre of the square, and guided by the pillar of cloud by day and the pillar of fire by night. There can be equally little doubt that these statements are much more likely to be in accordance with fact than P's. The latter's elaborate plans go on the supposition that great masses of men, women and children could be moved about over the desert as easily as pawns on a chess-board; but even the greatest military leader the world has seen would have been unable to fix a battle-ground or to bring together the difficulties inevitable on a desert march; and the more carefully an intelligent reader has studied the details of P's plan, the more astonished will he be to read the statement in x. 33 as to the position of the ark, and to learn that Moses, instead of simply following the pillar of cloud, requests Hobab to determine the line of march and select the sites for encampment. No clearer proof could be desired of the utterly uncritical spirit of the age in which the Hexateuch got its present form than that this detailed account should be immediately followed by two short paragraphs which are both based on the same principle of the pillar of cloud and march so elaborately worked out in the preceding narrative.

The fact is that Numbers is the result of a long literary process of amalgamation both of traditions and of documents, a process that began in the closing decades of the 9th century B.C. and did not finally end till the 2nd century B.C., the earliest date being that of J, and the latest probably that of the various addenda to Balaam's prophecies, e.g. xxiii. 106, xxiv. 9b, xxiv. 18-24. Balaam's prayer in xxiii. 106 is not only metrically superfluous, but the personal, individual note in it is quite out of keeping with the rest of the poem, this poem, which is purely national. This addition may therefore have been originally the marginal note of a piou scribe which was afterwards transferred to the text. In xxiv. 24 Kittim is a name originally derived from Kittim, a city of Cyprus. The meaning of "Kittim" was then extended to include the inhabitants of all the islands and coast-lands of the Mediterranean. Hence it might mean not only Macedonia or Greece, but even Italy. In Dan. xi. 30 it is certainly applied to Rome, the Vulgate rendering it "Romam" there just as that version translates it here by "Italia." Hence Bezae, which would retain this reading of this A.D. 374. (Epiphanes) and even to the embassy of Popilius Laenas in 168 B.C. when that haughty Roman humiliated the Syrian king by drawing a circle round him with his cane, and daring him to step out of it till he had given him an answer.

The book falls naturally into three sections, chronologically arranged: (1) Chaps. i.-x. 16, Israel's twenty days' sojourn at Sinai during which a census of the people is taken and various laws are promulgated by Moses. (2) Chaps. xi.-xxiii., incidents that occurred on the way of leaving Horeb. These incidents seem to have been chosen for the purpose of casting light on the religious history and character of the people and showing how later generations explained the origin of various place names, e.g. the desert of Kadesh and Kadesh Barnea. The second narrative, of worship, cf. the worship of the brazen serpent, xxi. 4-11, which, as we learn from 2 Kings viii. 4, continued down to the time of Hezekiah. (3) Chaps. xxiii.-xxvii., Israel's sojourn in the plains of Moab, their march through there, and the taking of a second census, preliminary to the invasion of Canaan.

Two examples of the very miscellaneous contents of the book will suffice to show the extent to which it is composed of scraps from many sources. (A) We shall take first the account given in chaps. xvi. of the rebellion of Korah, Dathan and Abiram. There would be four independent narratives, J, E, and two very distinct strata of P, a deuteronomistic account and an earlier one, ii. 17-26, i.e. chap. ii. called by J itself "the book of the men of Reuben," and another account of Balaam, at the head of 250 Israelites rebelled against the religious authority of Moses and Aaron because of the privileges conferred on the Levites. Korah and his associates maintained that the other tribes, believing as they did, that Yahweh had given the Levites to approach Yahweh directly, without the mediation of any Levite, and offer sacrifices and even incense to Yahweh. Read together verses 12-16, 18, 19-24.

3. The third narrative is P, which relates how Korah at the head of 250 Levites protested against the priestly privileges of Aaron, claiming that all the Levites had as much right to sacrifice and offer incense to Yahweh as Aaron and his sons had. Read verses 8-11 and 16 and 17. In both P and P' the disputants are summoned from their tents and ordered to assemble before the Dwelling of Yahweh; and in both cases the same fate overtook the transgressors: fire from Yahweh consumed them and their families. The burden of P' is greater. (B) The story of Balaam as we have it in chaps. xxiii.-xxiv. is an amalgam of J and E with later additions; but xxxii. 6, 16 proves that Balaam was not unknown to P. According to E, Balaam sent certain Moabite princes all the way to Pethor on the Euphrates to ask Balaam to come and curse Israel. But Elomim came to Balaam by night and forbade him to go. So the princes returned disappointed. A second and still more influential embassy having been sent, Elomim again appeared by night, and this time permitted Balaam to go on condition that he said nothing but what Elomim bade him. His journey was uneventful, and he arrived at Zephathah. There he required a caravan well equipped with camels, the princes of Moab waited till Balaam was ready to accompany them. When Balaam reached the frontier of Moab Balak was waiting to welcome him, but Balaam refused to enter Moab, and Balak and his fellow-embassies were required to retire. With equal frankness Balaam replied that, though he had come now, he had no power to say anything but what Elomim bade him. He then, however, appeared to have been overheard, for a word was met by Elomim. Thereupon, instead of cursing the Israelites, Balaam blessed them. Though bitterly disappointed Balak still attempted to effect his purpose and took Balaam to the top of a mountain, but balancing the position, he discovered that the people that had come out up Egypt. Balaam protested that, though he were to receive a houseful of silver and gold, he could not see beyond the word of Yahweh, his God. Nevertheless his scruples were somehow overcome; and, "[translated by Jwsvhe] he
agreed to go. As the journey was not a long or dangerous one, the
servants of Balak returned at once to inform their master of their
success, leaving Balaam to follow at his own convenience. So
Balaam, still without consulting Yahweh, saddled his ass and set out
for Moab, attended only by two servants. The land through which
he had to pass, so far from being a desert, was a land of oil and wine;
and when Balaam was riding along a narrow path between two vine
yards, the anger of Yahweh would have slain him, had not his ass
served and saved him. That this episode belongs to J I no one need
ever forget, since the only parallel in Scripture to the speaking ass
is the serpent that spoke in Eden. Balaam, after being sternly
reprimanded, was allowed to proceed, but only on condition that
he would not pass beyond the word of Yahweh, and then boldly announced
the respective destinations of Israel and Moab, xxiv. 15-19.

As seven is the perfect number and as Balaam had ordered seven
altars to be built, the Redactor thought it would be well to have
seven Mehshilim or metrical oracles; and so he added other three
which are certainly not pertinent to the situation, as they allude not
merely to the Assyrian empire but to the Macedonian, and even,
as some maintain, to the Roman empire, cf. xxiv. 24.

The poetical quotations in Numbers are of the utmost im-
portance, not only as helping to determine the date of the book
but as indicating the value of poetry in its bearing on history. In
xxiv. 16 we have the Wentworth's translation of one of the
earliest poetry entitled "The Book of the Wars of Yahweh." It is
highly probable that Deborah's song was also originally in this book;
and when we compare the statement in that song as to Israel's
full fighting strength, viz. 40,000, men, with the statements in
the prose of Numbers as to 600,000 men and more, we at once
realise how much closer to actual facts we are brought by early
poetry than by the latter prose of writers like P. Perhaps it is in
ch. xxxi. that we have the clearest proof of the non-historical
character of the book. There we read that 12,000 Israelites,
who had once been a single man, dwelt over against the Midianite,
children included, and every Midianite woman that had known a man,
and took so much booty that there had to be special legislation as
to how it is to be divided. But if this were actual fact, how
could the Midianites have ever reappeared in history? And yet
in Gideon's time they were strong enough to oppress Israel.
From this chapter, unhistorical as it must be, we see how the
legislation of Israel, whatever its character or origin, was referred
back to Moses the great Law giver of Israel.

NUMBERS, PARTITION OF.

This mathematical subject, created by Euler, though relating essentially to positive integer numbers, has to be regarded as a portion of the theory of Numbers
(see Number). We consider in it a number as made up by the
addition of other numbers: thus the partitions of the successive
numbers 1, 2, 3, 4, 5, 6, &c., are as follows:

1; 2; 11;
3, 21, 111;
4, 211, 2111, 1111;
5, 41, 321, 221, 2111, 11111;
6, 51, 421, 411, 331, 3211, 321, 2211, 22111, 21111, 111111.

These are formed each from the preceding ones; thus, to form
the partitions of 6 we take first 6; secondly, 5 prefixed to each of
the partitions of 1 (that is, 51); thirdly, 4 prefixed to each of the
partitions of 2 (that is, 42, 411); fourthly, 3 prefixed to each of the
partitions of 3 (that is, 33, 321, 3111); fifthly, 2 prefixed,
ot to each of the partitions of 4, but only to those partitions
which begin with a number not exceeding 2 (that is, 222, 2211,
21111); and lastly, 1 prefixed to all the partitions of 5 which begin
with a number not exceeding 1 (that is, 111111); and so in
other cases.

The method gives all the partitions of a number, but we may
consider different classes of partitions: the partitions into a
given number of parts, or into not more than a given number
of parts; or the partitions into given parts, either with repeti-
tions or without repetitions, &c. It is possible, for any
particular class of partitions, to obtain methods more or less
easy for the formation of the partitions either of a given
number or of the successive numbers 1, 2, 3, &c. And of course in
any case, having obtained the partitions, we can count them
and so obtain the number of partitions.

Another method is by L. F. A. Arbogast's rule of the last and
the last but one; in fact, taking the value of a to be unity, and,
understanding this letter in each term, the rule gives:
\[ b_1, b_2, \ldots, b_n = \frac{1}{a} \left( a - 1 \right) \left( a - 2 \right) \ldots \left( a - n + 1 \right) \]
where \( b_1, b_2, \ldots, b_n \) are the number of partitions of \( n \) with
partitions of \( n \) with no part greater than \( k \) and in general we have the
theorem, the number of partitions of \( n \) into not more than \( k \) parts is equal to the number of partitions of \( n \) with no part
greater than \( k \).

We have for the number of partitions an analytical theory depend-
ing on generating functions; thus for the partitions of a number \( n \)
with the parts 1, 2, 3, 4, 5, &c., without repetitions, writing down the
product:
\[ (1 + x + x^2 + \ldots + x^a)' \times (1 + x^2 + x^4 + \ldots + x^{2a})' \times \ldots \]

it is clear that, if \( a, x, x_1, \ldots \) are terms of the series \( x, x^2, \ldots \)
for which \( a + b + \ldots = n \), then we have in the development of
the product the term \( x^a \) and hence that in the term \( N^n \) of the
product the coefficient \( N \) is equal to the number of partitions of \( n \), with
the parts 1, 2, 3, \ldots, without repetitions; or say that the product is
the generating function \( G \) for the number of such partitions.

And so in other cases we obtain a generating function.

Thus for the function
\[ \prod_{i=1}^{a} (1 + x^i)' \]
observing that any factor \( 1 - x^i \) is \( 1 + x^i + x^{2i} + \ldots \)
we see that in the term \( N^n \) of the development the coefficient \( N \)
is equal to the number of partitions of \( n \) into \( k \) parts, with the parts
1, 2, 3, \ldots, without repetitions.

And similarly, considering the function
\[ \prod_{i=1}^{a} (1 + x^i)' \]
where the only terms are those with an exponent \( \frac{1}{2}(nm+n) \), and for
each such pair of terms the coefficient is \((-1)^{n-1} \). The formula shows
that except for numbers of the form \( \frac{1}{2}(nm+n) \) the number
of partitions without repetitions into an odd number of parts is equal
to the number of partitions without repetitions into an even number
of parts.

Another method for the excepted numbers is to say that they differ
by unity. Thus for the number \( 11 \), which is not an excepted number,
the two sets of partitions are
11, 821, 731, 641, 632, 542, 101, 92, 83, 74, 65, 5321,

in each set.

We have
\[ 1 - x \cdot 1 + x \cdot 1 + x^2 \cdot 1 + x^3 \cdot 1 + x^4 \cdot 1 + \ldots = 1 \]
or, as this may be written,
\[ 1 + x \cdot 1 + x^2 \cdot 1 + x^3 \cdot 1 + x^4 \cdot 1 = 1 - x \cdot 1 + x^2 \cdot 1 + x^3 \cdot 1 + x^4 \cdot 1 \]
showing that a number \( n \) can always be made up, and in one way
only, with the parts 1, 2, 4, 8, \ldots. The product on the left-hand
side may be taken to \( k \) terms only, thus if \( k = 4 \), we have
\[ 1 + x \cdot 1 + x^2 \cdot 1 + x^3 \cdot 1 + x^4 \cdot 1 = 1 - x \cdot 1 + x^2 \cdot 1 + x^3 \cdot 1 + x^4 \cdot 1 \]

xix, 28
NUMENIUS—NUMERAL

that is, any number from 1 to 15 can be made up, and in one way only, with the parts 1, 2, 4, 8; and similarly any number from 1 to 25–1 can be made up, and in one way only, with the parts 1, 2, 4, 8, 16.

A like formula is

\[ \frac{1-x}{x-1} \cdot \frac{1-x^2}{x^2-1} = \frac{1-x^3}{x^3-1} \]

\[ \frac{1-x^4}{x^4-1} \cdot \frac{1-x^5}{x^5-1} = \frac{1-x^6}{x^6-1} \]

that is,

\[ x^1 + 1 \times x^2 + 2 \times x^3 + 3 \times x^4 + 4 \times x^5 + 5 \times x^6 \]

showing that any number from -40 to +40 can be made up, and that in one way only, with the parts 1, 3, 9, 27 taken positively or negatively; and so in general any number from \(-\frac{1}{3}(3^{10}-1)\) to \((3^{10}-1)\) can be made up, and that in one way only, with the parts 1, 3, 9, \ldots, \(3^n\) taken positively or negatively.

See further COMBINATORIAL ANALYSIS. (A. C.)

NUMENIUS, a Greek philosopher, of Apamea in Syria, Neo-
Pythagorean and forerunner of the Neo-Platonists, flourished
during the latter half of the 2nd century A.D. He seems to have
taken Pythagoras as his highest authority, while at the same
time he chiefly follows Plato. He calls the latter an “Articulating
Moses.” His chief divergence from Plato is the distinction
between the “first god” and the “deimurge.” This is probably
due to the influence of the Valentinian Gnostics and the Jewish-
Alexandrian philosophers (especially Philo and his theory of the
Logos). According to Proclus (Comment. in Timaeum, 93)
Numenius held that there was a kind of trinity of gods, the
members of which he designated as 

\[ \text{Kyovos, } \text{Aqmd, } \text{Thdinga} \]

(irairiros, fingers) of Platonists Graecae (ed. Ritter, Hist. Phil. Graece (ed. E. Wellman, 1898), § 624-7; T. Whittaker, The Neo-
Platonists (1901).

NUMERAL (from Lat. numerus, a number), a figure used to
represent a number. The use of visible signs to represent
numbers and aid reckoning is not only older than writing, but
older than the development of numerical language on the denary
system; we count by tens because our ancestors counted on the
classes of society. In the latter times of antiquity the finger
symbols were developed into a system capable of expressing
all numbers below 10,000. The left hand was held up flat with the
fingers together. The units from 1 to 9 were expressed by various positions of the third, fourth, and fifth
fingers alone, one or more of these being either closed on the palm or simply bent at the middle joint, according to the number meant. The thumb and index were thus left free to express the
tens by a variety of relative positions, e.g. for 30 their positions
were brought together and stretched forward; for 50 the thumb
was bent like the Greek ι and brought against the ball of the
index. The same set of signs if executed with the thumb and
index of the right hand meant hundreds instead of tens, and
the unit signs if performed on the right hand meant thousands.1

The fingers serve to express numbers, but to make a
permanent note of numbers some kind of mark or tally is needed.
A single stroke is the obvious representation of unity; higher
numbers are indicated by groups of strokes. But when the
strokes become many they are confusing, and so a new sign

must be introduced, perhaps for 5, at any rate for 10, 100, 1000,
and so forth. Intermediate numbers are expressed by the
addition of symbols, as in the Roman system ccxxxvi = 236.
This simplest way of writing numbers is well seen in the Baby-

donian inscriptions, where all numbers from 1 to 90 are got by
repetition of the vertical arrowhead ꞌ and a barbed sign ꞌ ꞌ 10. But the most interesting case is the Egyptian, because
from its hieratic form sprang the Phoenician numerals, and from
them in turn those of Palmyra and the Syrians, as illustrated in

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TABLE I. displaced the Heronian numbers, was to make the first nine
letters stand for the units and the rest for the tens and hundreds.

1 The system is described by Nicolus Rhaba of Smyrna (8th
century A.D.), ap. N. Causinus, De eloquentia sacra et humana
(Paris, 1636). The Venerable Bede gives essentially the same system,
and it long survived in the East; see especially Rödiger, “Über die
im Orient gebräuchliche Fingersprache, &c,” D.M.G. (1845), and
With the old Semitic alphabet of 22 letters this system broke down at $n = 400$, and the higher hundreds had to be got by juxtaposition; but when the Hebrew square character got the distinct final forms י, י, י', י' these served for the hundreds from 500 to 900. The Greeks with their larger alphabet required but three supplemental signs, which they got by keeping for this purpose two old Phoenician letters which were not used in writing ($F$ or $S = 1 = 6$, and $V = 22 = 90$), and by adding simplices for 900.1

Among the Greeks the first certain use of this system seems to be on coins of Ptolemy II. The first trace of it on Semitic ground is on Jewish coins of the Hasmonaeans. It is the foundation of gematria as we find it in Jewish book and in the apocalyptic number of the beast ($\text{aO} = 666$). But we do not know how old gematria is; the name is borrowed from the Greek.

The most familiar case of the use of letters as numerals is the Roman system. Here C is the original of centum and M of millie; but instead of these signs we find older forms, consisting of a circle divided vertically for 1000 and horizontally, for 100. We have, or in the cognate Etruscan system divided into quadrants, $\theta$, for 100. From the sign for 1000, still sometimes roughly shown in print as $\text{C}$, comes $\text{D}$, the half of the symbol for half the number; and the older forms of $\text{L}$, viz. 1, or 1, suggest that this also was once half of the hundred symbol. So V (Etruscan $\lambda$) is half of $\text{X}$, which itself is not a true Roman letter. The system, therefore, is hardly alphabetic in origin, though the idea has been thrown out that the signs for 10, 50, and 100 were originally the Greek $\text{X}$, $\psi$, $\phi$, which were not used in writing Latin.2

When high numbers had to be expressed systems such as we have described became very cumbersome, and in alphabetic systems it became inevitable to introduce a principle of periodicity by which, for example, the signs for 1, 2, 3, &c., might be used with a difference to express the same number of thousands. Language itself suggested this principle, and so we find in Hebrew $\text{r}$ or in Greek $\lambda = 1000$. So further $\beta M$, $\beta M$, or simply $\beta = 20,000$ (2 myriads). If now the larger were always written to the left of the smaller elements of a number the diacritical mark could be dispensed with in such a case as $\beta \phi \alpha \lambda$ (instead of $\beta \phi \alpha \lambda \lambda$), for here it was plain that $\beta = 2000$, not 2, since otherwise it would not have preceded $\phi \alpha \lambda$. We have, therefore, to the left of the higher terms of value 10, a third important notation, that the value of a symbol may be periodic and defined by its position. The same idea had appeared much earlier among the Babylonians, who reckoned by powers of 60, calling 60 a ongsTo and 60 sixties a $\text{r}$. On the tablets of Senkerah a list of squares and cubes is given on this principle, and here the square of 59 is written $58^3$—that is $58 \times 60 + 1$; and the cube of 30 is $7^3$—that is, 7 sharing 30 some $7 \times 60 + 30 \times 60$. Here again we have value by position; but, as there is no zero, it is left to the judgment of the reader to know which power of 60 is meant in each case. The sexagesimal system, long specially associated with astronomy, has left a trace in our division of the hour and of the circle, but as language goes by powers of 10 it is practically very inconvenient for most purposes of reckoning. The Greek mathematicians used a sort of decimal system; thus Archimedes was able to solve his problem of stating a number greater than that of the grains of sand which would fill the sphere of the fixed stars by dividing numbers into octaves, the unit of the second octave being 10° and of the third 10². So too Apollonius of Perga teaches multiplication by regarding 7 as the product of 70, 700, and so forth. One must then find successively the product of the several pythms of the multiplier and the multiplicand, noticing in each case what are tens, what hundreds, and so on, and adding the results. The want of a sign for zero made it impossible mechanically to distinguish the tens, hundreds, &c., as we now do.3

1 The Arabs, who quite changed the order of the alphabet and extended it to twenty-eight letters, kept the original values of the old letters for the hundreds; while the hundreds, from 100 to 1000 were expressed by the new letters in order โ, 2, 3. In the time of Caliph Walid (A.D. 705-715) the Arabs had as yet no signs of numeration.

2 See further Fabretti, Palaographische Studien.

3 Very early, however, a mechanical contrivance, the abacus, had been introduced for keeping numbers of different denominations apart. This was a table with compartments or columns for counters, each column representing a different value to be given to a counter placed on it. This might be used either for concrete arithmetic—say with columns for pence, shillings and pounds; or for abstract reckoning—say with the Babylonian sexagesimal system. An old Greek abacus found at Salamis has columns which, taken from right to left, give a counter the value of 1, 10, 100, 1000 drachms, and finally 1 talent (6000 drachms) respectively. An abacus on the decimal system might be ruled on paper or on a board strewed with fine sand, and was then a first step to the decimal system. Two important steps, however, were still lacking: the first was to use instead of counters distinctive marks (ciphers) for the digits from one to nine; the second and more important was to get a sign for zero, so that the columns might be dispensed with, and the denomination of each cipher seen at once by counting the number of digits following it. These two steps taken, we have at once the modern so-called Arabic numerals and the possibility of modern arithmetic; but the invention of the ciphers and zero came but slowly, and the history is a most obscure problem.

What is quite certain is that our present decimal system, in its complete form, with the zero which enables us to do without the ruled columns of the abacus, is of Indian origin. From the Indians it passed to the Arabsians, probably along with the astronomical tables brought to Bagdad by an Indian ambassador in 775 A.D. At all events the system was explained in Arabic in the early part of the 9th century by the famous Abū Ja'far Mohammed b. Musa al-Khwārizmī (Hovarazmi), and from that time continued to spread, though at first slowly, through the Arabian world.

In Europe the complete system with the zero was derived from the Arabs in the 13th century, and the arithmetic based on this system was known by the name of algorithm, algorithm, algorithm. This barbarous word is nothing more than a transcription of Al-Khwārizmī, as was conjectured by Reinaud, and has become plain since the publication of a unique Cambridge MS. containing a Latin translation—perhaps by Adelhard of Bath—of the lost arithmetical treatise of the Arabian mathematician. The arithmetical methods of Khwārizmī were simplified by later Eastern writers, and these simpler methods were introduced to Europe by Leonardo of Pisa in the West and Maximus Planudes in the East. The term zero appears to come from the Arabic شر through the form zephyro used by Leonardo.

Thus far modern inquirers are agreed. The disputed points are—(1) the origin and age of the Indian system, and (2) whether or not a less developed Indian system, without the zero but with the nine other ciphers used on an abacus, entered Europe before the rise of Islam, and prepared the way for a complete decimal notation.

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<td>nānāghat</td>
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<td>Cave Inscriptions (Indian)</td>
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1 The use of numerals in India can be followed back to the Nānāghat inscriptions, supposed to date from the early part of the 3rd century B.C. These are signs for units, tens and hundreds, as published by Boncompagni in Trattati d'aritmetica (Rome, 1857).
3 The well-known Burnett's Sepher Yezirah (1874).
4 Of the 10th century. (From Burnett, op. cit.)
5 Of the 10th century; from a MS. written at Shirāz. (From Woepcke, Mémoire sur la proposition des chiffres indiens.)
6 From a MS. at Paris. (From Woepcke, op. cit.)
7 Erlang (Alteldorf) MS. (From Woepcke, op. cit.)
in the other old systems we have dealt with. Like the Indian alphabet, they are all derived directly, but, as a rule, the letters of which the alphabet, their origin is obscure. The forms of the later Indian numerals for the nine digits appear to be clearly derived from the earlier system. In Table II. the two first lines give forms extracted from the above-mentioned edition of the Arabic numerals, and the third line, the translation of the Devanāgarī in the third line was used with a zero and position value. The "cave" numerals were employed during the first centuries of the Christian era. The "cave" forms are shown in the second column of the Arabic numerals. The first seven forms of the Arabic system is of A.D. 738, while the old system is found in use as late as the early part of the 7th century (Bayley). On the other hand, there is some evidence that a system of value by position was used on a prototype, or rather, in the first centuries. These writers, however, do not use ciphers, but symbolical words and letters, so that it is not quite clear whether they refer to a system which had a zero, or to a system worked on an abacus, which was afterwards supplanted by a new system. The "cave" numerals, as yet for the use of any system of position in India before the 6th century, and nothing beyond conjecture can be offered as to its origin.

2. In Europe, before the introduction of the algorithm or full Indo-Arabic system with the zero, we find a transition system in which calculations were made on the decimal system with an abacus, but instead of unit counters there were placed in the column ciphers, with values from one to nine, and of forms that are at bottom the Indian forms and agree most nearly with the numerals used by the Arabs of Africa and Spain. For among the Arabs themselves there were various systems of writing the Indian numerals, in particular an eastern and a western type. The latter is called ghōbar (dust), a name which seems to connect it with the use of a sand abacus. The use of the Indian numerals with ciphers is known in Alexandria, William of Malmesbury, who stole it from an Arab in Spain, is generally given up as fabulous. On the other hand, no evidence is offered for an earlier use of the abacus with ciphers, excepting a passage describing the system in the Geometria ascribed to Boëtius. If this book is genuine the Indian numerals were known in Europe, and applied to the abacus in the 5th century, and Boëtius only revised the long-forgotten system. On this view we have to explain how Boëtius got the ciphers. The Geometria ascribes the system to the "Pythagoreians" — i.e., the Neo-Pythagoreans — and it has been thought possible that the Indian forms for the numerals reached Alexandria, along with the cruder form of value by position, in the use of the abacus without a zero, before direct communication between Europe and India ceased, which it did about the 4th century A.D. It is then further conjectured by Woepcke that the ghōbar numerals of the western Arabs were by them borrowed from the system of Boëtius before the full Indian method with the zero reached them; and thus the resemblance between these forms and the Indian forms is explained. If one MSS. of the 11th century, essentially, in other MSS. of the 11th century, would be explained. This view, however, presents great difficulties, of which the total disappearance of all trace of the system between Boëtius and Boëtius is only one. We may say that the Indian system, such an abacus system, of which they had value by position so early a date as is required, and the ghōbar numerals are too similar to those of the eastern Arabs to make it very likely that the transition from these to the present system happened within those centuries. The genuineness of the Geometria is maintained by Moritz Cantor, but it has been attacked on other grounds than that of the passage about the abacus; and on the whole it is still an open question whether the abacus with ciphers is not the outcome of an early imperfect knowledge of the Arabic system, Gerbert or some other having got the signs and a general idea of value by position without having an explanation of the zero.

See M. Cantor, Geschichte der Mathematik, vol. i. (Leipzig, 1880); also M. Chasles, papers in the Comptes rendus (1843); G. Friedlein, Die Zahlzeichen und das elementare Rechnen der Griechen und Römer, Bc. 1-12 (Leipzig, 1843) (contains a French translation); and Sir E. C. Baylay, The Pythagorean Number System (London, 1883). O. Weissenborn was a student of his arithmetic and geometry (Leipzig, 1867), and Weissenborn in Zeitsch. Math. Phys. xxiv. Other references to the copious literature will be found in Cantor and Friedlein, who also discuss the subject of the notation for fractions, which cannot be entered on here.

For systems passed over here, see Pihan, Exposé des signes de numéra- tion utilisés chez les peuples orientaux (Paris, 1860).

(W. R. S.)

NUMERIANUS, MARCUS AURELIUS, son of the Roman emperor Carus. On the death of his father, whom he accompanied on his expedition against the Persians, he was proclaimed emperor (December, A.D. 283). He resolved to abandon the campaign, and died mysteriously on his way back to Europe, eight months afterwards. Arrius Aper, praefect of the praetorian guards, his father-in-law, who was suspected of having murdered him, was slain by DIOCLETIAN, whom the soldiers had already proclaimed his successor. Numerianus is represented as having been a man of considerable literary attainments, and of marked ability. He was the whole western portion of the Roman empire, known as the Renia, divided into two great tribes, —the Massylli on the east, and the Massacesylli on the west— the limit between the two being the river Ampsaga, which enters the sea to the west of the promontory called Tretum, now known as the Seven Capes. At the time of the second Punic War the eastern tribe was governed by Massinissa, who took the side of the Romans in the contest, while Syphax his rival, king of the Massacesylli, supported the Carthaginians. At the end of the war the victorious Romans confiscated the dominions of Syphax, and gave them to Massinissa, whose dominions extended from the meeting of the sea boundary of the Carthaginian territory, and also south and east as far as the Cyrenaica (Appian, Punica, 106), so that the Numidian kingdom entirely surrounded Carthage except towards the sea. Massinissa, who reached a great age, retained the whole of these dominions till his death in 148 B.C. and was succeeded in them by his son Micipsa, who died in 118. For the war with Rome which followed the death of Micipsa see JUGURTHA.

After the death of Jugurtha as a captive at Rome in 106, the western part of his dominions was added to those of Bocchus, while the Magian kingdom of Mauretania (the territory towards Cyrene) continued to be governed by native princes until the civil war between Caesar and Pompey, in which Juba I., then king of Numidia, who had espoused the cause of the Pompeians, was defeated by Caesar, and put an end to his own life (46 B.C.). Numidia, in the more restricted sense which it had now acquired, became for a short time a Roman province under the title of Africa Nova, but in the settlement of affairs after the battle of Actium it was restored to Juba II. (son of Juba I.), who had acquired the favour of Augustus. Soon afterwards, in 25 B.C., Juba was transferred to the throne of his father's kingdom. However, while retaining his dominion over the civil administration, and practically separating Numidia or Africa Nova from Africa Vetus, though the two were still united in name (Tac. Hist. 4. 48). Under Septimius Severus (A.D. 193-211) Numidia was separated from Africa Vetus, and governed by an imperial procurator (procurator per Numidiam); finally, under the new organization of the empire by Diocletian, Numidia became one of the seven provinces of the diocese of Africa, being known as Numidia Cirtensis, and after Constantine as N. Constanti- na, corresponding closely in extent to the modern French province of Constantine. During all this period it retained a high degree of civilization, and was swarmed with numerous towns, the importance of which is attested by inscriptions (see vol. viii. of the Corpus inscriptionum), and by the massive remains of public buildings. The invasion of the Vandals in A.D. 428 reduced it to a condition of gradual decay; and the invasion
the Arabs in the 8th century again brought desolation on the land, which was aggravated by continual misgovernment till the conquest of Algeria by the French in 1833.

The chief towns of Numidia under the Romans were: in the north, Cirta, the capital, which still retains the name Constantine given it by Constantine; Rustica on the coast, serving as its port, on the site now occupied by Philippeville; and east of it Hippo Regius, well known as the site of St Augustine, near the modern Bona. To the south in the interior were Thysdrus (Tebessa) and Lambesis (Lambessa) with extensive and striking Roman remains, connected by military roads with Cirta and Hippo respectively. Lambesius was the seat of the legion III, Augusta, and the most important strategic centre, as commanding the passes of the Mons Aurusius, a mountain block which separated Numidia from the Gaetulian tribes of the desert, and which was gradually occupied in its whole extent by the Romans under the Empire. Including these towns there were altogether twenty which are known to have received at one time or another the title and status of Roman colonies; and in the 5th century the Notitia enumerates no less than 123 sees whose bishops assembled at Carthage in 479.

For bibliography and account of Roman remains, see under AFRICA, ROMAN.

NUMISMATICS (Lat. numisma, nomisma, a coin; from the Greek, derived from ὄψις, to use according to law), the science treating of coins (Low Lat. cuneus, a die) and medals (Low Lat. medalla, a medal).

The earliest known coins were issued by the Greeks in the 7th century before the Christian era. By the 4th century the whole civilized world used money (q.v.), each state generally having its proper coinage. This has continued to be the case to the present time; so that now there are few nations without a metal currency of their own, and of these but a small proportion are wholly unacquainted with the use of coins.

Coins, although they confirm history, rarely correct it, and never very greatly. The earliest belong to a time and to nations so remote and so barbarous that our present ignorance, and the very fact they do not afford us that precise information which would fill in any important details of the meagre sketch of contemporary history.

We gain from them scarcely any direct historical information, except that certain cities or princes issued money. When in later times the devices and inscriptions of the coins give more detailed information, history is fuller and clearer, so that the numismatic evidence is rarely more than corroborative. There are, indeed, some remarkable exceptions to this rule, as in the case of the Bactrian and Indian coins, which have supplied the outlines of a portion of history which was otherwise almost wholly lost. The value of the corroborative evidence afforded by coins must not, however, be overlooked. It chiefly relates to chronology, although it also adds to our knowledge of the pedigrees of royal houses. But perhaps the most interesting manner in which coins and medals illustrate history is in their bearing contemporary, or nearly contemporary, portraits of the most famous kings and captains, from the time of the first successors of Alexander the Great to the present age, whereas pictures do not afford portraits in any number before the latter part of the middle ages; and works of sculpture, although occupying in this respect the same place as coins in the last-mentioned period and under the Roman empire, are neither so numerous nor so authentic. There is no more delightful companion in historical reading than a cabinet of coins and medals.

The strength and energy of Alexander, the ferocity of Mitradates, the philosophic calmness of Antinous, the obstinate ferocity of Nero, and the brutality of Caracalla are as plain on the coins as in the pages of history. The numismatic portraits of the time following the founding of Constantinople have less individuality; but after the revival of art they recovered that quality, and in the coins and medals of our own time there is a marvellous degree of individuality. There are very different styles from those of antiquity. From this last class we can form a series of portraits more complete and not less interesting than that of the ancient period.

While coins and medals thus illustrate the events of history, they have an equally direct bearing on the belief of the nations by which they were issued; and in this reference lies no small part of their value in connexion with history. The mythology of the Greeks, not having been fixed in sacred writings, nor regulated by a dominant priesthood, but having grown out of the different beliefs of various tribes and isolated settlements, and having been allowed to form itself comparatively without check, can scarcely be learned from ancient books. Their writers give us but a partial or special view of it, and modern scholars, in their attempts to throw light on its origin, often but increased the confusion. The Greek coins, whether of kings or cities, until the death of Alexander, do not, with a few negligible exceptions, represent the human form. Afterwards, on the regal coins, the king’s head usually occupies the obverse and a subject, usually sacred, is placed on the reverse. The coins of Greek cities under the empire have usually an imperial portrait and a reverse type usually mythological. The whole class thus affords us invaluable evidence for the reconstruction of Greek mythology. We have nowhere else so complete a series of the different types under which the divinities were represented. There are in modern galleries very few statues of Greek divinities, including such as were intended for architectural decoration, which are in good style, fairly preserved, and untouched by modern restorers. If to these we add reliefs of the same class, and the best Graeco-Roman copies, we can scarcely form a complete series of the various representations of these divinities. The coins, however, supply us with the series we desire, and we may select types which are not merely of good work, but of the finest. The mythology of ancient Italy, as distinct from that of the Greek countries of Italy, is not so fully illustrated by the coins of the country, because these are for the most part of Greek design. There are, however, some remarkable exceptions, especially in the money of the Roman commonwealth, the greater number of the types of which are of a local character, including many that refer to the myths and traditions of the earliest days of the city. The coins of the empire are especially important, as bearing representations of those personifications of an allegorical character to which the influence of philosophy gave great prominence in Roman mythology.

Coins are scarcely less valuable in relation to geography than to history. The position of towns on the sea or on rivers, the race of their inhabitants, and many similar particulars are positively fixed on numismatic evidence. The information that coins convey as to the details of the history of towns and countries has a necessary connexion with geography, as has also their illustration of local forms of worship.

The representations of natural productions on ancient money are of special importance, and afford assistance in the investigation of the subject. This is particularly the case with the Greek coins, on which these objects are frequently portrayed with great fidelity. We must recollect, however, that the nomenclature of the ancients was vague, and frequently comprised very different objects under one appellation, and that therefore we may find very different representations corresponding to the same name. The art of sculpture, of which coin-engraving is the offspring, receives the greatest illustration from numismatics. Not only is the memory of lost statues preserved to us in the designs of ancient coins, but those of Greece afford admirable examples of that skill by which her sculptors attained their great renown. The excellence of the designs of very many Greek coins struck during the period of the best art is indeed so great that, were it not for their smallness, they would form the finest series of art-studies in the world. The Roman coins, though at no time to be compared to the purest Greek, yet represent not unworthily the Graeco-Roman art of the empire. From the accession of Augustus to the death of Commodus they are often fully equal to the best Graeco-Roman statues. This may be illustrated, for instance, of the dupondius struck in honour of Tiberius and by the younger Drusus, of the sestertii of Agrippina, and of the Flavian emperors, and of the gold coins of Antoninus Pius and the two Faustinas, all which present portraits of remarkable beauty and excellence. The Italian medals of the Renaissance are scarcely less useful as records of the progress and characteristics of art, and, placed by the side of the Greek and Roman coins, complete the most remarkable comparative series of monuments illustrating the history of the great schools of art.
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That can be brought together. Ancient coins throw some light upon the architecture as well as upon the sculpture of the nations by which they were struck. Under the empire, the Roman coins issued at the city very frequently bear representations of important edifices. The Greek imperial coins struck in the provinces present similar types, representing the most famous temples and other structures of the cities, of the form of some of which we should otherwise have been wholly ignorant. The art of gem-engraving among the ancients is perhaps most nearly connected with their coinage. The subjects of coins and gems are so similar and so similarly treated that the authenticity of gems, that most difficult of archaeological questions, receives the greatest aid from the study of coins.

After what has been said it is not necessary to do more than mention how greatly the study of coins tends to illustrate the contemporary literature of the nations which issued them. Not only the historians, but the philosophers and the poets, are constantly illustrated by the currency of times. This was perceived at the revival of letters; and during the 17th and 18th centuries coins were very frequently engraved in the larger editions of the classics.

The science of numismatics is of comparatively recent origin. The ancients do not seem to have formed collections, although they appear to have occasionally preserved individual specimens for their beauty. Petrarach has the credit of being the first collector of any note; but it is probable that in his time ancient coins were already attracting no less attention. The study of the history of the coins has since been by degrees more and more recognised, and at present no branch of the pursuit is left wholly unexplored.

Besides its bearing upon the history, the religion, the manners, and the arts of the nations which have used money, the science of numismatics has a special modern use in relation to art. Displaying the various styles of art prevalent in different ages, coins supply us with abundant means for promoting the advancement of art among ourselves. If the study of many schools be at all times of advantage, it is especially so in the modern period. The study of the coins will, we trust, prove an important part of the study of the history of art.

The least value is to point out the want of artistry in the introduction to these metals and to the modifications of them created by the presence of varying amounts of alloy, certain other compounds were frequently used, notably electrum, billon, brass and potin.

1. A coin is a piece of metal of a fixed weight, stamped by authority of government, and employed as a circulating medium.
2. A medal is a piece, having no place in the currency, struck to commemorate some event or person. Medals are frequently comprised with coins in descriptions that apply to both equally; thus, in the case of subsequent coins, by the term coins, coins and medals must generally be understood.
3. The coinage of a country is usually divided into the classes of gold, silver and bronze (copper), for which the abbreviations N., R., and A. are employed in catalogues. In addition to these metals and to the modifications of them created by the presence of varying amounts of alloy, certain other compounds were frequently used, notably electrum, billon, brass and potin.

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This definition excludes, on the one hand, paper currencies and none of the barbarous nations, such as China or India, for they are neither of metal nor of fixed weight, although either stamped or sanctioned by authority, and, on the other hand, modes of keeping metal in weight, like the so-called Celtic "ring-money," because it is not stamped, although perhaps sanctioned by authority. The latter has attracted much attention, but it is by no means made out that the rings were made with the primary intention of serving as money. But it is a very common usage, among savage or semi-savage nations, to make ornaments or the torques in ornaments (as a woman may even now wear her dowry as ornaments in the form of coins) and to use the ornaments (or cut-off portions of them, "shilling rings") as money or means of exchange. But these rings then were doubtless used in this manner, but they were no more money than were any other precious possessions which could be used in exchange. There is no good evidence for the use of the little Gaulish "coin" from the letters in the form of coins on the border of the definition are such prehistoric "dumps" of metal as have been found at Enkomi in Cyprus and at Chnosseus in Crete; one of these indeed seems to bear traces of a mark of some kind.

4. Electrum (Ἑλεκτρόν, Ἑλεκτρος, λευκός χάρμος), a compound metallic substance, consisting of gold with a considerable alloy of silver. It is one of the principal so-called "white" or "current" coins. The material of early coins of Asia Minor struck in the cities of the western coast is the ancient electrum. The amount of silver varies very considerably with time and place. Gold largely alloyed has a greater denary value and is not struck by all nations. When such is the case, it should be termed pale gold, as in the case of some of the late Byzantine coins.

5. Billon, a term applied to the base metal of some Roman coins, and also to that of some medieval and modern coins. It contains about one-fifth silver to four-fifths copper. When the base silver coins are replaced by copper washed with silver the term billon becomes inappropriate.

6. Brass, a mixture of copper and zinc. It may be used as an equivalent to the orichalcum of the Romans, a fine kind of brass of which the shesterni and dupondii were struck, but it is commonly used to distinguish either the imitative coins or the complete coinage of a country.

7. Potin, an alloy of copper and tin (therefore a variety of bronze) used for some late Gaulish coins.

8. Various other metallic substances have been used in coinage, including iron (in Peloponnesus) and an alloy of copper and nickel employed for some Bactrian coins. The so-called "glass coins" of the Arabs are merely coin-weights.

9. The forms of coins have greatly varied in different countries and at different periods. The usual form in both ancient and modern times has been circular, and generally of no great thickness. The term "coin," however, is loosely used by numismatists, when the substance is fixed or stamped in a different shape, such as a trapezium, or a disc, or a square or oval, the greatest dimension being taken, or, when they are square or oval, the greatest distance in two directions.

10. The weight of a coin is of great importance, both in determining its intrinsic value and its resistance to forgeries. This weight is determined by the weight of the precious metal, and is stated in grains, and by the weight of the other metals, which are used by most numismatists except in England, where Troy weight is still in general use.

11. The specific gravity of a coin may be of use in determining the metal in its composition.

12. Whatever representations or characters are borne by a coin constitute its type. The subject of each side is also called a type, and, when there is not only a device but an inscription, the latter may be excluded from the term. This last is the general use. No distinct rule has been laid down as to what makes a difference of type, but it may be considered to be an essential difference, however slight.

14. A difference too small to constitute a new type makes a variety.

15. A coin is a duplicate of another when it agrees with it in all particulars but those of exact size and weight. Strictly speaking, ancient coins are rarely, if ever, duplicates, except when struck from the same pair of dies.

16. Cast coins are those whose designs are produced by dies impressed on the blank piece (or flan) of metal by some form of hammering or pressure; they are distinguished from cast coins made by running metal into a mould.

17. A coin of the two sides of which is called the obverse which bears the more important device. In early Greek coins it is the convex side, or the side impressed by the lower die; in Greek and Roman imperial it is the side bearing the head; in medieval and modern coinage it is the side bearing the king's name, or of the nation, or of the city; and in Oriental that on which the inscription begins. The other side is called the reverse.

18. The field of a coin is the space unoccupied by the principal devices or inscriptions. Any detached independent device or character is said to be in the field, except when it occupies the exergue.

19. The exergue is that part of the reverse of a coin which is below the main device, and distinctly separated from it; it often bears a secondary inscription. Thus, the well-known inscription "CONOB" occupies the exergue of the late Roman and early Byzantine gold coins.

20. The edge of a coin is the surface of its thickness.

21. By the inscription or inscriptions of a coin all the letters it bears are intended; an inscription is either principal or secondary.

22. In describing coins the terms right and left mean the right and left of the spectator, not the heraldic and military right and left, or those of the coin, and are therefore the representation of the head and neck; it is commonly used of such as show at least the collar-bone, other busts being called heads. A head properly means the representation of a head alone, without any part of the neck, but it is also commonly used

23. Hist. nat. xxiii. 23; cp. xxxvii. 11. Pliny distinguishes two types of "electrum," a "white" and a "yellow" or "brown" or "coppery" or "bronze" type. In Greek poetry the name seems to apply to both, but it is generally difficult to decide which is meant in any particular case. Sophocles, however, where he mentions Ἐρατός Εὐαλίτηρος . . . . . . τε καὶ τοιοῦχο τιμηθέντες (Ant. 1017-1039), can scarcely be doubted to refer to the metallic electrum.
NUMISMATICS

I. GREEK COINS

There are some matters relating to Greek coins in general which may be properly considered before they are described in geographical order. These are their general character, the chief denominations, with the different talents of which they were the divisions, their devices and inscriptions, their art, and the mode of striking.

The period during which Greek coins were issued was probably not much less than a thousand years, beginning about the beginning of the 7th century B.C. and generally ending at the death of Gallienus (A.D. 268). If classed with reference only to their form, fabric, and general appearance they are of three principal types—the archaic Greek, the ordinary Greek, and the Graeco-Roman. The coins of the first class are of silver, electrum and electrum-gold, usually in the shape of a lump of irregular round form, bearing on the obverse a device in the shape of an accompanying inscription, and on the reverse a square or oblong incuse stamp (quadratum incusum), usually divided in a rude manner. The coins of the second class are of gold, electrum, silver and bronze. They are much thinner than those of the preceding class, and usually have a convex obverse and a slightly concave or flat reverse. The obverse ordinarily bears a head in bold relief. The coins of the third class are, with very few exceptions, of bronze. They are flat and broad, but thin, and generally have on the obverse the portrait of a Roman emperor.

Many Greek cities, however, during the empire issued quasi-autonomous coins bearing the head of some deity or personification. Greek coins thus fall mainly into the classes of autonomous, quasi-autonomous and imperial. The coinage of Roman colonies in Greece as in other lands is usually distinguished by Latin inscriptions.

Since Greek coinage originated in Asia Minor, the coins were adjusted to the weight-systems there in use, and these go back to a Babylonian origin. But it is possible that some of the standard of Greece proper had a native origin. The unit of weight in the East was the shekel (sиглос). This was 10, 100 or 1000 shekels. The Babylonian 360 grains, or 10 minae, formed a Babylonian gold mule; the Babylonian 60 grains, or 10 minae, a Babylonian silver mule; the Babylonian 60 grains, or 10 minae, a Babylonian bronze mule. This scale the Greeks modified in that, starting from the siglos as unit, they invented a money-mina of 50 siglos, with a money-talent of 60 minae or 3000 siglos. The siglos-units (and corresponding standards) of gold, silver and bronze were the following (the relation between gold and silver at the time of the invention of these units seems to have been 133:1):

<table>
<thead>
<tr>
<th>Gold shekel</th>
<th>7-44 g = ( \frac{1}{2} \text{ of } 111-72 \text{ g of silver} ), which was equivalent to 84 g of gold.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phoenician silver shekel</td>
<td>11-17 g = ( \frac{1}{2} \text{ of } 111-72 \text{ g of silver} ), which was equivalent to 84 g of gold.</td>
</tr>
</tbody>
</table>

Thus one gold shekel was the equivalent of 15 Phoenician or 10 Babylonian silver shekels. Side by side with this system was another in which the weights were exactly double of those just given; a shekel of the heavier system might be regarded as a double shekel of the lighter. Various Babylonian weights are extant, dating from the 3rd millenium B.C. onwards, which prove the existence of more systems. The gold shekel standard was almost invariably used for gold, sometimes also for electrum. The Babylonian and Phoenician standards were also sometimes used for gold or electrum as well as silver, which proved the existence of multiple standards in use among the Greeks of S. Italy. Other standards of more local importance were: the Campanian, used in a large part of S. Italy (didrachm originally of 7-41 g, afterwards reduced), and perhaps derived from...
The following table exhibits the weights in grammes of the principal denominations of the Greek systems:

<table>
<thead>
<tr>
<th>Denomination</th>
<th>Gold Shekel System</th>
<th>Babylonian or Persic</th>
<th>Phoenician</th>
<th>Aegetic or Attic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double shekel, distater or tetradrachm</td>
<td>16-50</td>
<td>22-40</td>
<td>14-92</td>
<td>25-20</td>
</tr>
<tr>
<td>Shekel, stater or didrachm</td>
<td>8-40</td>
<td>11-20</td>
<td>7-46</td>
<td>12-60</td>
</tr>
<tr>
<td>Hemistater or drachm</td>
<td>4-20</td>
<td>5-60</td>
<td>3-73</td>
<td>6-30</td>
</tr>
<tr>
<td>Third or tetrobol</td>
<td>2-80</td>
<td>3-73</td>
<td>2-49</td>
<td>4-48</td>
</tr>
<tr>
<td>Twelfth or obol</td>
<td>0-70</td>
<td>0-93</td>
<td>0-62</td>
<td>1-12</td>
</tr>
</tbody>
</table>

The term stater is usually applied to the didrachm, but also to the tetradrachm, and at Cyrene to the drachm.

The bronze standards have been less fully discussed. Some notice of them will be given under different geographical heads.

In the table of Greek coins (using the term in its restricted sense) the first intention of the designers was to indicate the city or state by which the money was issued. The necessity for distinctive devices was most strongly felt in the earlier days of the art, when the obverse of a coin alone bore a design, and, if any inscription, only the first letter, or the first few letters, of the name of the people by whom it was issued. Whatever may have been the original significance of the type in itself, religious or otherwise, it was for the purpose of the city of each mint. But as the use of coinage spread, types were introduced in which the issuing authority was recognized. It was only with the increased complexity of the denominations in later times, when new distinguishing types had to be found, that—as in the 4th century B.C.—the religious motive in the choice of types came deliberately into play.

Greek coins, if arranged according to their types, fall into three classes: (1) civic coins, and regal without portraits of sovereigns; (2) regal coins bearing portraits; and (3) Graeco-Roman coins, whether with imperial heads or not. The coins of the first group have either a device or the reverse and the quadrans incusum on the reverse, or two devices; and these are often either independent of each other, though connected by being both local, or—and this is more common—that on the reverse forms a kind of complement of that on the obverse. It will be best first to describe the character of the principal kinds of types of the first class, and then to notice their relative antiquity. It must be noted that a head or bust is usually an obverse type, and a figure or group a reverse one, and that, when there is a head on both obverse and reverse, that on the former is usually larger than the other, and represents the portrait more accurately considered to be the most important of the two. We must constantly bear in mind that these types are local if we would understand their meaning.

In the following list the types of Greek coins of cities, and of kings, not having regal portraits, are classed in a systematic order, without reference to their relative antiquity.

1. Head or figure of a deity worshipped at the town, or by the people, which issued the coin, as the head of Athena or the coins of Athens, and the figure of Heracles on coins of Boeotian Thebes. Groups are rare until the period of Graeco-Roman coinage.

2. Natural or artificial objects—(a) animal, often sacred to a deity of the place, as the owl (Athens) and perhaps the tortoise (Aegina); (b) tree or plant, as the ephialium (Cyrene) and the olive-branch (Athens); (c) arms or implements of divinities, as the arms of Heracles (Erythrae), the tongs of Vulcan (Asculum). It is difficult to connect many objects comprehended in this class with local divinities. Some of them, as the tunny at Cyzicus, are doubtless only so connected because the chief industry of a place was placed under the tutelage of its chief divinity.

3. Head or figure of a local genius—(a) river-god, as the Gelas (Gela); (b) nymph of a lake, as Camarina (Camarina); (c) nymph of a fountain, as Arethusa (Syracuse).

4. Head or figure of a fabulous personage or half-human monster, as a Gorgon (Neapolis Macedoniae), the Minotaur (Crete).

5. Fabulous animal, as Pegassus (Corinth), a griffin (Panticapaeum), the Chimaera (Sicyon).

6. Head or figure of a hero or founder, as Ulysses (Ithaca), the Lesser Ajax (Locri Opuntii), Taras, founder of Tarentum (Tarentum).

7. Objects connected with heroes—animal connected with local hero, as the Calydonian boar or his jaw-bone (Aetolians).

8. Celebrated real or traditional sacred localities, as mountains on which divinities are seated, the labyrinth (Cnossus). Theophania.

9. Representations connected with the public religious festivals and contests, as a chariot victorious at the Olympic games (Syracuse).

The relation of the types of the obverse and reverse of a coin is a matter requiring careful consideration, since they frequently illustrate one another. As we have before observed, this relation is either that of two independent objects, which are connected only by their reference to the same place, or the one is a kind of complement of the other. Among coins illustrating the former class we may instance the beautiful silver didrachms of Camarina, having on the obverse the head of the river-god Hipparis and on the reverse the nymph of the lake carried over its waters by a swan, and those of Sicily, having on the obverse the Chimaera and on the reverse a dove. The latter class is capable of being separated into several divisions. When the head of a divinity occurs on the obverse of a coin, the reverse is occupied by an object or objects connected with the deity. The tetradrachms have on the one side the head of Athene and on the other an owl and an olive-branch; the tetradrachms of the Chalcidians in Macedonia have the head of Apollo and the lyre; and the copper coins of Erythrae have the head of Heracles and his weapons. The same is the case with subjects relating to the heroes: thus there are drachms of the Aeolian League which have on the obverse the head of Atlanta and on the reverse the Calydonian boar, or his jaw-bone and the spear-head with which he was killed. In the same manner the coins of Cnossus, with the Minotaur on the obverse, have on the reverse a plan of the Labyrinth. Besides the two principal devices there are often others of less importance, which, although always sacred, and sometimes symbols of local divinities, are generally indicative of the position of the town, or have some reference to the families of magistrates who used them as badges. Thus, for example, besides such representations as the olive-branch sacred to Athene on the Athenian tetradrachms, as a kind of second device dolphins are frequently seen on coins of maritime places; and almost every series exhibits many symbols which can only be the badges of the magistrates with whose names they occur. Regal coins of this class, except Alexander’s, usually have as types of a local character, owing to the small extent of most of the kingdoms, which were rather the territories of a city than considerable states at the period when these coins were issued.

The second great class—that of coins of kings bearing portraits—is necessarily separate from the first. Religious feeling affords the clue to the long exclusion of regal portraits—the feeling that it would be profane for a mortal to take portraits of the immortal. Were there any doubt of this, it would be removed by the character of the earliest Greek regal portrait, that of Alexander, which occurs on coins of Lysimachus. This is not the representation of a living personage, but of one who was not only dead but had received a kind of apotheosis, and who, having been already called the son of Zeus Ammon while living, had been treated as a divinity after his death. He is therefore portrayed as a young Zeus Ammon. Probably, however, Alexander would not have been able, even when dead, thus to usurp the place of a divinity upon the coins, had not the Greeks become accustomed to the Oriental “worship of the sovereign, which he did not discourage. This innovation rapidly produced a complete change; every king of the houses which were raised on the ruins of the Greek empire could place his portrait on the
Greek coins begin, at different periods, with the seizure by Rome of the territories of the Greek states. They are almost all bronze; and those in that metal are the most characteristic and important. In their types we see a farther departure from the religious intention of those of earlier times in the rare admission of representations, not only of eminent persons who had received some kind of apotheosis, such as great poets, but also of others who, although famous, were not, and in some cases probably could not have been, so honoured. We also observe on these coins many types of an allegorical character.

The following principal kinds of types may be specified, in addition to those of the two previous classes. (1) Head or figure of a famous personage who either had received a kind of apotheosis, as Homer ( Smyrna), or had not so honoured, as Herodotus (Halicarnassus) and Lais (Corinth). (2) Portrati representations, always of a sacred character, although occasionally bordering on caricature. We may instance, as of the latter sort, a very remarkable type representing Athene playing on the double pipe and seeing her distorted face reflected in the water, while Marsyas gazes at her from a rock—a subject illustrating the story of the pasturing of that hero (Apollodorus Paphygiæ). (3) Allegorical types, as Hope, &,c., on the coins of Alexandria of Egypt, and many other towns. These were of Greek origin, and owed their popularity to the sculpture executed by Greeks under the empire; but the feeling which rendered such subjects prominent was not that of true Greek art, and they are essentially characteristic of the New Attic school which attained its height at Rome under the early emperors.

There is a class of coins which is always considered as part of the Graeco-Roman, although in some respects distinct. This is the colonial series, struck in Roman colonies, and having also the following principal types. In the first place, there were towns in all parts of the empire, from Emerita in Spain (Merida) to Bostra in Arabia, in the midst of a Greek population and often of Greek origin, their coins help to complete the series of civic money, and, as we might expect, do not very markedly differ from the proper Greek imperial coins except in having Latin inscriptions and showing a preference for Roman types.

Greeks have now to speak of the meaning of the inscriptions of Greek coins. These are either principal or secondary; but the former are always intended when inscriptions are mentioned without qualification, since the secondary ones are non-essential. The inscription of civic money is almost always the name of the people by which it was issued, written in Attic plural, as ΑΘΕΙΝΑΙΩΝ on coins of the Athenians, ΣΥΡΑΚΟΣΙΩΝ on coins of the Syracusans, or the name of the city in the genitive singular, as ΑΡΡΑΓΑΝΤΟΣ at Agrigentum. The inscription of regular coin of the name, or name and title, of the sovereign, as ΑΘΕΙΝΑΙΩΝ, or ΒΑΣΙΛΕΩΣ ΑΘΕΙΝΑΙΩΝ, on coins of Alexander the Great. Instead of this genitive an adjective is sometimes found, as ΔΡΩΝΔιος on early Arcadian coins. A new name in Greek is formed from this one by the addition of an adjectival form implies a nominative understood, which has been generally supposed to be νυμα μα "money" or the name of some denomination.

There are a few instances in which a nominative of this kind is expressed on coins—ΔΡΟΝΔιος ΕΜΠ ΣΗΜΑ, "I am the badge of Phaeo (7) or Phanes" on an archaic Ionian coin; ΠΟΡΤΥΝΟΣ ΤΟ ΠΑΙΜΑ ΣΥΨΙΓ ΑΡΤΥΓΙΟΝ (silver money), or ΚΟΜΜΑ ("striking" or "struck piece"); and ΚΟΤΥΟΣ

Greek coins clearly indicate three great schools, each with its subordinate groups. The school of central Greece holds the first place, including the northern group centred in Thrace and Macedonia, and the southern in the Peloponnesus, with the outlying special schools of Crete and Cyrene.

The Ionian school has its northern group, Ionia, Myasia and Aeolis, and its southern, Rhodes and Caria. Beyond these are certain barbarous and semi-barbarous groups, of which the most important is that of eastern Asia Minor, Persia and Phoenicia, with Cyprus. The school of the West comprises the two groups of Italy and Sicily.

The whole duration of the schools is limited, by the refusal of the Persians and the accession of Alexander, from 480 to 323 B.C. Before that, all is unknown, and the assumption of certain characteristics. After it, the centralizing policy of the sovereigns and the fall of the free cities destroyed local art. In certain cultivated centres under enlightened kings a local art arose, but it speedily became general, and we have thus to think of a succession of styles.
during the rest of the life of Greek art. The century and a half of the local schools is significantly the great age of this art.

In the study of each school we have first to determine its character, and then to look in its successive phases for the influence of the great masters of style. Two dangers must be avoided. We must not too sharply divide the sculptors and the painters as if they always were true to the special functions of their arts. It is well to bear in mind that the earliest great painter, Polygnotus, was a portrait character, \( \kappa\alpha\nu\rho\iota\sigma\iota\gamma\alpha\nu\sigma\tau\alpha\upsilon\omega\sigma\varsigma \), as Aristotle calls him, when the latest great sculptors represented expression (\( \tau\alpha\pi\alpha\delta\gamma\). Thus since \( \tau\alpha\pi\alpha\delta\gamma \) is the special province of sculpture, and \( \tau\alpha\pi\alpha\delta\gamma \) of painting, sculpture first weighed down the balance, afterwards painting; but it must be remembered that reality can be truer to painting than sculpture in the round, which is more limited by the conditions of the material and mechanical necessities. Our second danger is due to the ease with which local qualities may be ascribed to the influence of a leading style. It is also to be borne in mind that the movement of art in coins was during centuries slower than in sculpture—indeed a less general and less particular. Phidias and Myron do not make their mark so much as Polyclitus. In all cases the direct influence of great masters is to be looked for later than their age.

The school of central Greece in its southern group, comprehending Attica, is remarkable for its widespread extent. It has its colonies in Magna Graecia at Thurium, an Athenian foundation, probably at Terina, and in Macedonia at Amphipolis and Chalcidice under Athenian rule. It alone shows instances comparable to the works of Phidias, though its next numerous fine works of the age of Polyclitus and that of Praxiteles and Scopas. Its qualities may be compared by the same subjects as treated by the other schools and groups. The earliest works are marked more than any others by the qualities of high promise which characterized the Aeginetan marbles—the same dignified self-restraint and calm simplicity. Next we perceive a series strong in style, and showing that lofty dignity, that reposing embodiment of character, which are the stamp of the works of Phidias and his contemporaries. The subjects are more remarkable for fidelity, breadth and boldness than for delicacy of execution or elaboration of form. Every subject is ideal, even the portrayal of animal form. Thus the character shows us what divinity is intended and the ideality what is intended by the representation of beast or bird. From these works we pass to those which reflect the style of the time of Praxiteles and Scopas, when the influence of painting began to be felt, and art inclined towards feeling and descended to sentiment. Still, to the last, character rules these coins, and the chief difference we see is in the increased love of beauty for its own sake and the fondness for representing movement, not to the exclusion of repose, but by its side. In other respects there is little change except in the finer execution and more ornamental quality of the work. Even when the greatest achievement of the Sicilian school, the female head on the decadrachms of Syracuse, is copied by the Locrians and the Messenians, the larger quality of the school of Greece asserts itself, and the copy is better than the original: there is less artifice and more breadth. The northern group is at first ruder, in the age of Pheidias severer, and afterwards it merges into the greater softness of its southern rival. If it copies, as Larissa may copy Syracuse and Neapolis in Campania, it again asserts its superior simplicity, and we prefer the copy to the original.

The Ionic school lacks the sequel, in which the rest of the Greek world affords. It is broken by the baneful influence of the Persian dominion, and consequently the best works belong to the earliest and latest part of the period. The earliest coins, of the Aeginetan age, present nothing special; the later, of the time of Praxiteles and Scopas, comprise works not inferior to those of central Greece, and remarkable, like the Western and the Cretan, as the sole records of a school otherwise unknown. They are markedly characterized by the qualities of the style of feeling, that of Praxiteles and Scopas; but more than this, they are the expression of that style in pictorial form.

They represent expression, and they treat it as it could not be treated in sculpture in the round, portraying locks streaming in the air and flowing draperies. It must be remembered that, while Hellas produced the great sculptors, western Asia Minor bred the great painters after Polygnotus, himself a sculptor in painting rather than a painter. In the native land of Zeuxis, Parrhasius and Apelles we see the evidence of the rule of painting. The technical skill is inferior to that of the West, yet the skill in modelling and drawing has no parallel in the medallic work of any other time or country.

The school of the West, if we except such outlying examples of the art of Hellas as those of Thurium and Terina, has its highest expression in Italy, its most characteristic in Sicily.

The West. It has distinctive qualities throughout the age. Even in the earlier period we trace a striving after beauty and a delicacy of finish, with a weakness of purpose, that mark the school with an influence increasing to a time long after the extinction of its rivals. At the same time there is a knowledge of the capacity of the materials and the form of the coin and its functions, and a sense of how to combine the technical skill which is unequalled. The result in the lower subjects is splendid, if wanting in variety, but in the higher we miss the noble achievements of the greater schools. So far there is a general agreement in the northern and southern groups. Yet the Italian shows a nobler and simpler style, with some affinity to that of central Greece, which we look for in vain in Sicily, though we are dazzled by the rich beauty of the magnificent series of coins which marks her wealthiest age. Sicilian art has this apparent advantage, that the great cities, save Syracuse, were in the Carthaginian invasion, or under the tyranny of the elder Dionysius. Thus we have no important works save of Syracuse during the second half of our period, and cannot judge fully to what this school would have fallen.

The key to this exceptional development of Greek art is found in the absence of sculptors or painters in the West, except only Pythagoras of Rhegium at the very beginning of the age, whose influence is thought to be traceable on the money of his native town. On the other hand, there can be no doubt that many of the Sicilian die-engravers, as Phrygillos (to mention one whose signature is actually found on an intaglio) were gem-engravers. The Western part is that of engravers accustomed to minute and technical work, uninfluenced by sculpture or painting. Their designs will not bear enlargement, which only enhances the charm of those of the other leading schools. Those of the great Syracusan decadrachms are small; those of the minute hectae of Cyzicus are large.

The most important of the lesser schools is the Cretan. Crete, retaining the primitive life of older Hellas, was never truly civilized, but to the last enjoyed the privileges and exhibited the faults of an undeveloped condition. Producing in the age of high art neither sculptor nor painter of renown, the Cretans, to judge from their coins, were copyists of nature or art. At first rude, their work acquires excellence in design, but never in execution. While we see their poor reproductions of the designs of the Peloponnesus, we are amazed by their skill in portraying nature. Their gods are seated in trees with a background of foliage. Their bulls are sketched as they wandered in the meadows. All fitness for the mode of relief, as well as for the material and the shape of the coin, is entirely ignored. Hence a delight in foreshortening, and a free choice of subject with no reference to the circle in which it must be figured. In point of strength of the skill, the Cretan money may have the three-quarter face, which is at once the best suited to the surface of a coin and the most trying to the skill of the artist. Yet their work is delightfully fresh, as if done in the open air. There is no idealism, but much life and movement. In a word, the school is naturalistic and picturesque. Its works are of the highest value in the study of Greek art, but as examples of the application of that art to coins they are to be used with caution. Nowhere else do we see the artist so freely copying nature and art, nowhere so unshackled by academic rules, nowhere so little aware of the limitation of his province.
It is important to study the mode in which Greek money was coined, because the forms of the pieces thus receive explanation, and true coins are discriminated from such modern falsifications as have been struck, and in some degree from those that have been cast. Our direct information on the subject is extremely scanty, but we are enabled by careful inference to obtain a very near approximation to the truth on all the most important points.

Of the deceased by the Greeks exceedingly few have been preserved. In the museum at Sofia is an iron die for the reverse of a coin of Philip II. of Macedon; and several Gaulish dies exist. Most ancient dies are of bronze, others of hardened iron or steel. The blanks were, as a rule, first cast, sometimes in a spherical form, sometimes in a form more resembling that assumed by the finished coin. The blank was placed between two dies, the lower, let into an anvil, probably the reverse, the other, let into the end of a bar, producing the reverse. The bar was struck with a hammer, so that the blank received at the same time the impressions of both dies. This general rule was of course often modified; in some parts of the Greek world the dies were hinged together, in others not; and this arrangement of hinging the dies came in at different times in different places. The machinery of striking was probably much elaborated under the Roman empire, but a collier seems never to have been used in ancient times. Greek dies must usually have worn out very quickly; hence an enormous number of slightly varying representations of the same type. But the idea that it is uncommon to find two Greek coins from the same sanctuary exactly represented, in number of its devices and Roman, and a few Greek coins, of large size, were cast in moulds, not struck; and under the empire many coins, originally struck, were reproduced, not always fraudulently, by casting; but the genuine ancient coin of small size is, as an almost invariable rule, struck and not cast.

We may now pass on to notice the Greek coinage of each country, following Eckhel's arrangement. The series begins with Spain, Gaul and Britain, constituting the only great class of barbarous Greek coinage. It must not be supposed that the money of the whole class is of one general character; on the contrary, it has very many divisions, distinguished by marked peculiarities; it has, however, a characteristic type or stamp of provincial coinage, and other foreign influences are sometimes present.

Greek Coinage of the Far West. Phoenician coins by the Carthaginian kings and cities of the Peninsula. The coinage of Hispania, corresponding to the modern Spain and Portugal, was issued during a period of about four centuries, closing in A.D. 41. There are four classes of money, which in the order of their relative antiquity, are Greek, of two groups, Carthaginian, Romano-Iberian and Latin. The first or older group of Greek money (from before c. 350 B.C.) belongs to the widespread currency, which reveals the maritime power of the Ionians of Phocaea. It consists of fractions of the drachm of the Phocean standard, from the diobol or third downwards. Its later pieces are of the Phocaean colony of Emporiae, founded by the earlier settlement of Massilia. Next in order and in part contemporary, beginning in the middle of the 3rd century B.C., are the Emporiates of Massilia, which influence the Siculo-Punic art. Their standard is probably Carthaginian. Of the neighbouring Rhoda, a Rhodian colony, there is similar money. Carthaginian coins of Spain begin in the same period with the issues of the great colony of Gades, following the same weights as the Emporinian drachms. These are followed by the issues of the Barcidas from 234 to 210 B.C., with Carthaginian types and of Phocian weight, struck of six denominations, from the hexadrachm to the hemidrachm.

Señor Zobel de Zangróniz has classed them to Spain, on the grounds of provenance and the possession of the silver mines by the Barcid kings, against Müller, who attributes them to Africa. The types are Carthaginian, and present some interesting subjects. The true Iberian coinage begins not long after the Punic. The later drachms of Emporiae, showing the weight of the contemporary Roman denarius, have Iberian legends, and form the centre of a group of imitations issued by neighbouring native tribes with their distinctive inscriptions. This coinage ceased when the Roman province was formed in 206 B.C., a little before this date the Romans had begun to introduce Latin money; about this time, however, they took the backward step of permitting native coinages of Latin weight. Probably they found that native legends and types were more welcome to their subjects than those of Rome. Consequently this coinage of Spain under the republic, which lasted until 133 B.C., may be almost considered national. The two provinces Hispania Citerior and Hispania Ulterior have this marked difference: the coins of the nearer province, of silver and bronze, have always Iberian inscriptions on the reverse, and are under direct Roman jurisdiction; those of the farther are apparently of independent origin, and consequently bear Iberian, Phoenician, Libyo-Phoenician and Latin legends, but they are of bronze alone. The interest of these coins lies mainly in their historical and geographical information. They bear the names of tribes, often the same as those of the town of mintage. The art is poor, and lacks the quaint originality and decorative quality of that of Gaul. Ultimately the native money was wholly latinized (133 B.C.), silver was no longer issued, and although the Ulterior continued to have its own coinage, in the Citerior only Emporines and Saguntum were allowed to strike money. Political circumstances for a time renewed the coinage under Sertorius (80-72 B.C.) in the modified form of a bilingual currency. The purely Latin issues of the two provinces, and under the empire more largely (from 27 B.C.) of the three, Tarracoenses, Bactra and Lusitania, present little of interest. They closed in the reign of Caligula (A.D. 37-41), though in later times purely Roman money in gold and silver was issued at different times in Hispania down to the establishment of the Visigothic kingdom.

The imperial money of Hispania introduces us to one of the two great classes of provincial coins under the empire; the larger of these was the Greek imperial, bearing Greek inscriptions; the smaller the Roman colonial, with Latin inscriptions, deriving its name from the circumstance that among Greek-speaking nations the coloniae were distinguished by the use of the Latin language on their money. In the coinage of Hispania, issued by a nation adopting Latin for official use, the aspect of the coinage is colonial, though it was not wholly issued by colonies. Many of the Spanish towns belong to the kindred class of municipia; others are neither coloniae nor municipia. In Hispania the obverse of the coin bears, as usual in the colonial class, the head of the emperor or of some imperial personage, the reverse a subject proper to the town. The priest guiding a plough drawn by an ox and a cow is peculiarly proper to a colonia, as portraying the ceremony of describing the walls of the city, so also an ox, with the same reference, the altar of the imperial founder, or, as connected with his cultus, a temple, probably in some cases that of Roma and Augustus. Other types, however, portray the old temples in restored Roman shapes, or indicate directly by fishes, ears of corn and more rarely bunches of grapes, the products of the country. Some original and grotesque types have a markedly local character. The money of Augustus (Merida, Siscia, Lusitania, a colony of pensioners (emili), is specially interesting, including as it does the silver issues of P. Carius, the legatus of Augustus.

The coinage commonly called that of Gaul belongs to the people more properly than to the country, for it comprehends pieces issued by the Gauls or other barbarians from the borders of Macedonia and Illyricum to the English Channel and the Bay of Biscay, through Pannonia, part of Germany, Helvetia and Gaul. It influenced the money of northern Italy, and, crossing the Channel, produced that of
Britain, which has its own distinctive features. Four classes of coinage are found in these vast limits. Arranging them by date, they are the money of the Greek colony of Massilia and her dependencies, that of the Gauls and other barbarians of central and western Europe, that which can be classed to the tribes and chiefs of Gaul and the imperial coinage of that country. The coins of the Gauls and other barbarians outside Gallia include the gold coins known as "rainbow cups" (Regenbogenschüsselchen), which from their shape were of an oval or circular form but not unlike those of ancient Greece. They were in circulation in the Bohemian and Bavarian districts, and other gold and silver coins (the later series bearing names in Latin characters) which circulated in Noricum, Pannonia, Helvetia, Upper Germany, &c.

The great mart of Massilia (Marseilles), founded about 600 B.C. by the Phocaeans, was the centre of the Greek settlements of Gaul and northern Spain. Emporia was her colony, with other towns of inferior fame. Yet Massilia always held the first place, as is proved by the abundance of her mintage. At first it consisted of Phocaean obols, but subsequently widespread Western currency already noticed in speaking of Emporiae. These were succeeded by Attic drachms, some of which, about Philip of Macedon's time, are beautiful in style and execution. Their obverse type is the head of Artemis, crowned with olive, at one marking the sacred tree, which had grown from a branch carried by the colonists, so tradition said, with a statue of the goddess, from Ephesus, and proclaiming the value of the olive-groves of Massilia. On the reverse we note the Asiatic lion, common to it and the last colony of Phocaea, the Italic Vein in Lucania. These coins circulated extensively in southern Gaul, and were much imitated by the barbarians on both sides of the Alps.

The Gauls, on their predatory incursions into Greece, must have seized large quantities of the gold coinage circulating there, but it is probable that the gold staters of Philip (Pl. I. fig. 14), from which the chief types of the Gaulish gold are derived (Pl. I. fig. 1), had already found their way, independently of such raids, by means of trade along the Danube valley into the districts then inhabited by the Gauls. This is clear from the fact that the gold coins of Alexander were never, his silver rarely, imitated by the Gauls, yet these were in circulation at the time of the invasions. Nor did the influence of Philip's silver travel far west. But his gold money evidently travelled through central Europe to Gallia. The money of Gallia before the complete Roman conquest, to which it may be anterior in its commencement by half a century, belongs in the gold to degraded types of the earlier widespread currency. The undoubted gold and electrum of this imitative class, identified as bearing regal or geographical names, are extremely limited. By far the most interesting coin of the group is the gold piece which bears the name at length of the brave and unfortunate Vercingetorix. The silver money is comparatively common. The Gauls were ready to copy any types that came in their way, so that in the coinage of Gaul we find imitations of the coinage of Tarentum, Campania, various Spanish cities such as Rhoda, and Roman coins of the republic and early empire. The effect of the silver of Massilia and other Greek colonies is especially noticeable in S. Gaul, and the Roman denarius naturally exerted a strong influence. The bronze money of Gaul is still more abundant than the silver, and has a special interest from its characteristic types. Some of the later local coins are casts of an alloy of copper and tin called polit, but merely a variety of bronze. The Roman coins recall those of Hispania, but are limited to a few colonies. They range in date from Antony and Augustus to Claudius. The best-known of these, those struck at the colony of Copia Lugdunum (Lyons) with the "Altar of Roma and Augustus," belong, however, strictly speaking, to the Roman series. The coins of Nemausus (Nimes), commemorating the conquest of Egypt by the crocodile chained to a palm-tree, were sometimes made in the shape of the hind-leg of an animal, evidently for dedication in the sacred fountain, from the mud of which all the specimens of this variety are derived.

The ancient coinage of Britain is the child of that of Gaul, retaining the marks of its parentage, yet with characters of its own due to independent growth. Money first came in trade by the easiest sea-passage, and, once established in Kent, gradually spread north and west, until the age of the earlier Roman wars, when it was issued in Yorkshire, probably in Lincolnshire, and in a territory of which the northern limits are marked by the counties of Norfolk, Cambridge, Huntingdon, and the west of Rutland. The coins are of the rudest workmanship. The oldest coins are gold imitations of Philip's stater, which, whether struck in Gaul or Britain, had a circulation on the British side of the Channel. They are the prototypes of all later money. From a careful comparison of their weights with those of later coins, and from a study of the gradual degradation of the types, Evans places the origin of the coinage between 200 and 150 B.C. Its close may be placed about the middle of the 1st century A.D. The inscribed coins occupy the last century of this period, being contemporary with uninscribed ones. The uninscribed coins are of the silver, bronze, and gold, the gold being by far the least common. There is small variety in the types, nearly all in gold and silver, and some in copper, presenting in more or less degraded form the original Gaulish type for gold. It may be suspected that all new types and the extremely barbarous descendant of the tin series are of the age of the inscribed coins, but a little earlier. The Channel Islands are remarkable for a peculiar coinage of billon, a very base silver, presenting the usual types modified by Gaulish grotesqueness. The place of this group in the British series is merely accidental; in character as in geography it is Gaulish. The described coins are evidently in most cases, though it is certain that one town (Verulamium) and some tribes had the right of striking money. The most interesting coins are those of known chiefs and their families—of Commius, probably the active prince mentioned by Caesar, of Dubnoulanus, mentioned in the famous Anchra inscription, which has been called the will of Augustus, and most of all the large and interesting series of Cunobelinus, Shakespeare's Cymbeline (Pl. I. fig. 2), his brother Epaticcus, and his father Tasciovanus. It is evident from the coins and historical evidence collected by Evans that Tasciovanus had a long reign. His chief town, as we learn from his money, was Verulamium. His coins are in three metals, repeat the traditional types, and present new ones, some showing a distinctly Roman influence. The money of Epaticcus is scanty, but that of Cunobelinus, with Camulodunum (Colchester) for his chief town, is even more abundant than his father's, indicating a second long reign, and having the same general characteristics. The gold shows a modification of the traditional type, the silver and bronze the free action of Roman influence and a remarkable progress in art. With the death of this prince not long before A.D. 45 the bulk of the British coinage probably ceases, none being known of his sons, Admius, Todgundunus and the more famous Caractacus, but the coins of the Iceni may have continued as late as A.D. 50, and the Brigantes issued silver coins as late as the time of Cartimandua, whose name is partly preserved on one of them.

The ancient coins of Italy occupy the next place. They appear to have been struck during a period of more than 300 years, the oldest being probably of the beginning of the 6th century B.C. and the latest somewhat anterior to the time of Julius Caesar. The larger number, however, are of the age before the great extension of Roman power, which soon led to the use of Roman money almost throughout Italy. There are two great classes, which may be called the proper Italian and the Graeco-Italian; but many coins present peculiarities of both. The proper Italian coins are of gold, silver and bronze. Of these, the gold coins are extremely rare, and can never have been struck in any large numbers. The silver are comparatively common, but the bronze are very numerous and characteristic. A few of the earliest gold and silver coins of Etruria have a perfectly plain reverse. The most remarkable are those of the class are of the kind called aes grave, most of which were the early proper coinage of Rome, although others are known to have been
GREEK COINS.
GREEK AND ROMAN COINS.
issued by other Italian cities. These are very thick coins, some of which are of great size, while most have a rude appearance. They are always cast, and were preceded by formless lumps of bronze, known as as rude, which were not properly a state-

The designs of the Italian coins are generally, if not always, of Greek origin, although the influence of the native mythology may be sometimes traced. The inscriptions are in Latin, Etruscan, and often a native orthography; sometimes on the earlier coins they are retrograde. The art of this class is generally poor, or even barbarous. The denominations are common to Greek money, except in the case of the bronze, which follows a native system. Of this system the early proper Roman coinage is only a development, although it is possible (the coins of Gravina Lewis) that the half-Italian coins are of gold, silver and bronze. The silver and bronze are very common, and the gold comparatively so, although struck by few states or cities. A number of the cities of S. Italy issued in the 6th century coins with an incuse design on the reverse repeating with slight modifications the design of the obverse. The designs are of Greek origin, although here, as in the proper Italian coins, but less markedly, native influence can be detected. This influence is evident in the frequent occurrence of types symbolically representing rivers, showing a bias towards the old nautical life, with still the conclusion in scarabs with half-Italian forms of the letters on coins otherwise Greek. Of the best art of ancient Italian money we have already spoken, and we shall have occasion to mention some of its most beautiful examples. The denominations of the gold and silver coins are unquestionably derived from those of Greece, according to the weight of the Attic talent, the heaviest gold piece being the stater or 500th part of that talent; in silver there are few tetradrachms, the didrachm is extremely common, and smaller denominations are usually not rare. We thus learn that the silver currency was chiefly by smaller pieces being less used, and larger ones scarcely used at all. It is important here to notice that the interchange of the native or Italian bronze coinage with the Greek silver coinage led to a double standard, silver and bronze. The bronze standard, as it might be suspected, was of Italian origin, the silver of foreign introduction.

The peculiarity of the Italian bronze is that in its oldest cast form it was of such weight as to show the absence in some parts of the country of silver equivalents. It was long after silver had been introduced everywhere, with struck bronze. The equivalents therefore in form became (aes grave) went out of circulation. The silver money is at first remarkable for the evidence it affords of its extraneous character in presenting two standards. Afterwards it becomes equivalent to the bronze, or supplies equivalent pieces, and is quite regular. The original condition of the Italian currencies is best illustrated by the money of Etruria in the 4th and 3rd centuries B.C. Etruria, be it remembered, was an early goal of oriental commerce by sea. At the great mart of Populonia, and in the country round, we find, besides a few gold coins, not only silver coins of two different foreign standards, the Euboic and the so-called Persic, but also cast aes grave and later struck bronze pieces. Without discussing the origin of these various currencies it is enough to note that they bear witness to the effects of a widely-spread commerce, and show that here was the meeting-point of the native system and of foreign ones.

In Italy the aes grave long ruled. Originally it was libral, the principal coin being the as, nominally of the weight of the Italic pound of 273 grammes; this, at least, is the weight of the earliest Roman coinage. On the other hand, the aes grave of some places in E. Italy, as Hatria and Ariminium, were of the weight of didrachms, a reduction of the same order to Roman numismatics, and it is only necessary here to add that they affected the local bronze coinages as Italy fell under the rule of the Republic. The silver coinages, on the other hand, survived for a longer time throughout the Greek cities. Apart from the complicated silver coinage of Etruria, and from the Roman issues, we find in central Italy a few silver coins (the unit of 1-15 grammes being the equivalent, at the rate of 1-250, of a bronze as of 1-10 oz.) and a large silver coinage of didrachms and smaller denominations in lower Italy. This was chiefly issued by the wealthy marts which dotted the coasts of Campania, Calabria, Lucania and the Bruttii. We find Etruscan inscriptions on the coins of Etruria, and Etruscan objects in casts of many of them, especially in lower Italy, where they are eclipsed in number and style by the Greek issues. The chief silver standards of S. Italy are (i) the Campanian (with a didrachm of 7-41 grammes); (2) the Italic, with a statér of 8-16 grammes, divided into thirds; and (3) the Tarentine, with a statér of 8-32 grammes, divided into halves. The Tarentine statér was known as volutus. The independent coinage of Italy, with one exception, came to an end in 89 B.C.

Beginning in the north of Italy the first coins that struck were those of Populonia and Etruscan Athens. The best art of this place is generally of the peculiar fabric in which the reverse is left perfectly plain. The aes grave of upper and middle Italy was largely dominated by the issues of the Roman mints at Rome and Capua (to be treated later). Samnium shows us a curious revival of native silver money after the local coinage of the Italian towns had been almost abolished by Rome. It was the result of the Social or Marsic War of the confederate tribes, who struck for Italy against the Roman supremacy during the years between 90 and 88 B.C. The coins present the head of Italia, and reverse Latin-Celtic deities, and are widely-spread in Italy, though taking an oath over a sacrificial pig, and a bull for Italy goring the prostrate wolf of Rome. The inscriptions are Etruscan or Latin.

Certain of the Greek towns of Italy deserve special mention for the splendour of their coinage—beautiful in style and delicate in execution. In Campania (leaving the Roman-Campanian region, for later notice) the two most interesting currencies are of Cumae and Neapolis, the modern Naples. Cumae presents silver money of the archaic and the archaistic periods; that of Neapolis which, although being more rarely. Athenic; the reverse presents the man-headed bull common on Campanian money, and possibly meant for the river-god Acheilos, father of the Sirens. The bronze money is of good style, and age has beautified it with the rich blue or green patina due to the sulphurous soil. When we reach Calabria the Greek money startles us in astonishing wealth of beauty in the currency of the opulent and luxurious mart of Tarentum, second only to Syracuse in the whole West, of all the main periods of art, and including in the age of its present prosperity and its fall (the time of the contest with Rome) the most abundant gold issues of any Greek city. The gold money of Tarentum is divided into two principal series, the first, the Pentathelles, being the direct issue of its gem-like types, which, while they show the gem-engraver's art, prove the medallist's knowledge of the rich but opaque metallic material. Several heads of deities adorn these coins, and the chief types relate to the legendary founder, Tarsus, son of Poseidon. Always a youth, he appears as a charioteer, perhaps as a horseman, and riding on a dolphin—the familiar Tarentine type. The most interesting subject occupies the reverse, and by the name of Poseidon, probably in allusion to the Tarentines' appeal to Sparta for aid about 346 B.C. (Pl. 1, fig. 3). The silver coinage is chiefly of didrachms of reduced Corinthian weight. The prevalent type is Taras seated on a dolphin; in the earliest money the type is single, and repeated incuse on the reverse; afterwards this subject occupies the reverse, and, itself a charming composition, is delightfully varied. On the early fine coins the people or demos, personified generally as a youth, often holding a spindle, occupies the obverse, but gives place in the 4th century to a horseman in various attitudes, affording great scope to the engraver's skill; probably he is Taras himself, save when he is crowned with olive, or seated on a mountain, or again (as at the Ionic type) in the guise of the prophetess. The most striking characteristic of the Tarentine type is the contrast between the Nemean lion most skilfully treated, and the series is very characteristic of the gem-engraver's art. The powerful city of Metapontum begins with early archaic types and the inscription of the early Didrachms. The head of Athena and subjects related to Athena, with the inscription stretching down to the decline of art. The constant type, which recurs with the heraldic instinct of the West, is the ear of barley, reminding us of the "golden harvest" of the dedications. Like the Tarentine badge, it first occupies the obverse, then the reverse, balanced by a charming series of heads of divinities. Persephone is the most appropriate counterpart; we also remember the medallist's curious and ingenuous grace peculiar to the early fine work of the Western school, of Leucippus the founder as a helmeted warrior (occurring on a rare tetradrachm and the usual didrachm), and many other types of unusual variety and originality of conception.
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Poseidonia issued coins from the archaic period (beginning with the usual incuse fabric) to its capture by the Lucanians early in the 4th century. Its successor Paestum began to mint coins in 342 B.C., and continued until 208 B.C., even after 89 B.C., when all other local mints in Italy were closed, until the time of Tiberius.

The ancient Sybaris, famous for her luxury, has left archaic coins; she was, however, destroyed by Croton in 510 B.C. The Athenian colony of Thurium eventually arose near the site of the old Sybaris in 443, and immediately began to issue a splendid series of coins. Not long after, the head of Poseidon became the great currency, as at Athens, of tetradrachmas, but the severe beauty of the style points to the direct influence of the art of central ancient Greece (Pl. I. fig. 2). The head of Athene is engraved on the obverse of the double weight of olive and thus a splendid figure of the sea-monster Scylla. The reverse shows a bull butting (θηρος), in a strikingly ideal form. Probably the obverse type affords the nearest reflection of the masterpiece of Phidias, or at least the closest following of his style.

Vela, the last colony of Phocea, whose citizens sailed to the far west rather than submit to the Persian tyrant (544 B.C.), shows coins from its foundation. The pieces of fine workmanship are an Asiatic origin in the types of the lion, devouring the stag or as a single animal, while the obverse displays the head of Athene so much in favour in Magna Graecia. The style, while having a beauty, is Italian, and we see no trace of the pictorial qualities of Ionian art, which indeed had not taken its mature form when the exiles left the mother country.

Tarentum, the birthplace of native Italians whom we find striking a fair Greek coinage. Their gold and silver is of late style, the gold presenting the head of Poseidon and Thetis on a sea-horse, the silver the head of Thetis and the figure of Poseidon, both with other slight modifications. The coins of Tarentum are known to be of limited distribution, and are for the most part, mythologically interesting in type, and the later with a beautifully designed stag on the reverse. For Croton the ruling type is the tripod. The eagle occurs on the obverse and the tripod on the reverse. The bird of Zeus is inferior to that at Agrigentum, as this again is inferior to the eagle of Elis. We note also beautiful types of Heracles seated, one of marvellously delicate work, on the reverse of which Apollo crowns him. The type of the Python from behind his tripod—

The coinage of Sicily is of extreme carefully artistic work, not unfrequently even in the case of bronze allowing for a more rapid execution of the die; and the highest technical excellence is attained. The art is that of the southern branch of the great Western school, generally more skillful than the art of southern Italy, but less varied. The earlier fine work has a naive beauty peculiar to the West and almost confined to Sicily; all that follows is evidently gem-engravers' work. These coins are remarkable for the frequency of artists' signatures, which for the short period of highest skill are almost universal on the larger silver money of Syracuse, and occur less frequently on that of the other great cities. Among these artists may be mentioned Execestidas (at Camarina), Eucleidas, Eumenes, Phrygillus (at Syracuse), Eucratetus (Syracuse, Camarina, Catane), Cimon (Messana, Syracuse Pl. I. figs. 7, 8), Heracleides the younger (at Camarina), the Medusa of the coinage of Iauria, which is inferior to that elsewhere in the Greek world, in consequence of the inherent weakness of the style; but it is in part due to the calamities of the island, as of lower Italy.

The fame won by the tyrants and other leading aristocrats of Sicily in the great national contests of Hellas, in the race with the quadriga, the mule-car and the horse, led to the introduction and supremacy of types commemorating these victories, probably in most cases those achieved at Olympia. It is obvious that no success could be so appropriately figured on the coinage; the charioteer or the horseman, not the city, was the victor. But at the same time the renown of the city was indissolubly connected with the citizen who won it. Hence these types are almost confined to states ruled by tyrants or oligarchies; outside Sicily they are practically only found at Rhegium when it was closely connected with Sicily, at Cyrene, in the money of Philip II. of Macedon and at Olynthus and in Euboea. The horseman is not a frequent type; the mule-car is limited to Messene (and Rhegium); but the quadriga becomes the stereotyped subject for the reverse of the great Sicilian tetradrachmas—the bulk of the coinage—and only escapes heraldic sameness by a charming variety in the details. In the age of finest art a divinity of the city takes, in Homeric guise, the place of the charioteer, or Victory herself so wins the contest; commonly she hovers above, about to crown the charioteer or the horses. Yet more interesting are the types connected with nature-worship, especially those portraying river-gods in the form of a man-headed bull, or a youth with the budding horns of a calf, or in the shape of a dog, and also the subjects of the nymphs of fountains. These types occur on either side of the coin. On nearly all, one side (in early times the reverse, later the obverse) is held by the head of a divinity, Persphone and Athene taking the first place.

The leading position which Syracuse held in the island makes it proper to notice her splendid currency first, the finest for knowledge of the materials, for skill in suitably filling the space, and for delicacy of execution in the whole range of Greek money, though we miss the noble simplicity of Greece, the strong feeling of western Asia Minor, and the simple picturesque of Crete. Syracuse was founded in 734 B.C. by Archias of Corinth, an origin which, remembered on both sides, has been preserved in later history—In the 6th century, perhaps while still under the oligarchy of the Geomori, she issued her most archaic silver money, which, primitive as
it is, gives promise of the care of the later coinage, and begins the agonistic types, thus indicating some early victory at a great Hellenic contest. Gelo, tyrant of Gela, won the chariot race at Olympia in 488 B.C., secured Syracuse in 485 B.C., and, when the Carthaginians, probably by agreement with Xerxes, invaded Sicily, utterly routed them at the great battle of Himera (480 B.C.), the Salamis of the West. These events find their record in the issue and subjects of his Syracusan money, which, however, was struck, as usual in that age, in the name of the people. There is an early type, for Victory appears hovering above the charioteer, about to crown the horses, and the coin issued after the great battle show the lion of Libya beneath the car in the exergue (Pl. I. fig. 6). These last pieces are fixed in date by the famous story how Gelo's wife Demarete, having gained favourable terms for the vanquished Carthaginians, was presented by them with a hundred talents of gold, by means of which were coined the great silver pieces of fifty litae or ten drachms, which were called after her Demaretia. They bear the head of Victory, crowned with laurel, and the quadriga and lion. The battle of Himera and the death of Gelo (476 B.C.) fix the date of the type. But the third and most important of all the series of Syracuse and give us a fixed point in Greek art, at about 470 B.C.

Hieron I. (478-466 B.C.), the brother and successor of Gelo, continues the same types, alluding, as Head well remarks (loc. cit.), to his great victory over the Eturians off Cumae (474 B.C.), by the marine monster in the exergue of the reverse which denotes the vanquished maritime power. It is to be noted that as Gelo introduces the Victory in the chariot type, so in the horseman type we now first see Victory crowning the rider. Gelo had won an Olympic victory in the four-horse contest, Hiero, the horseman, and the chariot type, though he also used with the four-horse in the Pythian games. With Hiero's money we now have a farewell to arcaic art. The female heads on the obverse now have the eye in profile and show beauty and variety, and the horses are even exceptionally represented in rapid action. With the short rule of Thrasylus, the last brother of the house, it came to an end, and the age of the democracy (466-406 B.C.) began. The victories by land and sea of Gelo and Hiero had established the power of the city on a sure basis, and fifty years of prosperity followed. To the earlier part of this age belong the beautiful transitional coins in which the female heads are marked by a youthful type, or of beauty combined with a fanciful and fantastic treatment of the hair; the reverses remain extremely severe. Towards the close of this age, beginning about 430, there are very fine works, the first signed coins, with the old dignity yet with greater freedom of style, the horses of the quadriga in rapid movement.

The victory of Syracuse in the contest with Athens was the occasion for the reissue of ten-drachm pieces, commonly but erroneously called medallions. On the reverses of these are a victorious chariot and a panoply of arms, representing the prizes offered at the games by which the Syracusans commemorated the defeat of the Athenians on the Assarines in 413. On the obverses is the head of the local nymph Arethusa. The designs are by the artists Cimon (Pl. I. fig. 8), Euenetus, and a third who is nameless. These pieces continued to be issued down to about 360 B.C. through the Dionysian period. Contemporary with them are numerous splendid tetradrachmons—signed and unsigned—as well as the first gold and bronze issued by Syracuse. The interference of Dion in Syracusan politics (357-355) was marked by the introduction of an elephant coinage, and of a silver drachm of Corinthian type, corresponding in weight to the trichremos of Corinth, and with the same types, the head of Athena and the Pegasus. The Dionysian dynasty closed in anarchy, until Syracuse appealed to Corinth, and Timoleon was sent to restore order (344 B.C.). His advent marks an epoch in Sicilian coinage. He restored the gold coinage and issued various silver coins which allude to Corinth and to liberty, and under his influence many small cities in Sicily awoke to political life as members of Timoleon's league and issued a scantly but interesting bronze coinage. The Syracusan democracy was overthrown in 317 B.C., and the city seized by Agathocles (317-289 B.C.), the worst of the tyrants of Syracuse. In the course of his reign he adopted the royal style, and his coins reflect his name without and then with the title king—a double innovation. The most interesting of his coins are those which bear allusions to his campaign in Africa.

The tyrant Hieratus (288-280 B.C.) and the next ruler, Pyrrhus, king of Epirus (278-275 B.C.), continue the coinage, Pyrrhus issuing money in the name of the Syracusans and also striking his own pieces. The departure of Pyrrhus led to the establishment by Hieron II. (c. 270-216 B.C.) of a dynasty which, so long restive, restored the ancient prosperity and preponderance of the rule of his name. At first he bears his name alone, he soon not only takes the title of king, conferred on him in the early years of his reign, but also places his portrait on the money. Of his time is the beautiful portrait of his queen Philistis. The money of the short reign of Hieronymus (215-214 B.C.) and of the brief democracy which fell before the Romans (214-212 B.C.) close the independent series of this great city. But her name still appears in bronze money issued after the conquest.

Thus far, for the rest of the money of Sicily in alphabetical order, we first note a very fine bronze coin bearing a beautiful female head, perhaps that of Sicilia, crowned with myrtle, and a lyre, which belongs to the time of Timoleon's league. This coin is conventionally attributed to Agrigentum, represented by archaic, transitional, and fine coins, the fine series ending with the overthrow of the city by the Carthaginians in 406 B.C.—a blow from which it never recovered. The usual types are the eagle and the fresh-water or river-god, the latter sometimes shown with a shield, but in the age of finest art we see two eagles devouring a hare (cf. Aeschylus, Agam. 109 seq.) and a victorious chariot; these occur in the exergue, the reverse being a diadem or a medallion, himself drives the car, and the tetradrachms. The eagle is superior to that of Croton, inferior to that of Elia. Many of the bronze coins are of good work. The type most worthy of note is the head of a woman, the reverse being the name of the issue, which was that of the local stream, and on the reverse an eagle standing on an Ionic capital, the Olympic turning-post. The success of Agrigentum at the games is attested by Pindar, while Virgil (Aen. iii. 701), Statius (Cypria 526) and Silius Italicus (xiv. 210) mention its ancient renown for horses.

The money of Camarina is of especial beauty and interest. Camarina struck but few coins before the year of liberation (401), soon after which issued a drachm having on the obverse a helmet upon a round shield and on the reverse a pair of greaves, between which is a dwarf palm. This piece is followed by tetradrachmons and didrachmons of the best period, most beautiful in style, and varying a little from the usual type. But the age begins with reverse reverse of Hercules in the lion's skin, and on the reverse Athena as a victor at the Olympic games in a quadriga. It was Athena, protector of the Italic city of Camarina, who represents, for in her coin was inscribed on the obverse the head of a river-god, portrayed by a young man with small horns and with wet hair. Of the two rivers of Camarina, the Oanus and the Himipar, the Himiparan, represented by the head of Eros, is given on the coin. Pindar seems to show the same preference, for, while he merely mentions the Oanus (ποταμός..., Οάναος), he speaks of the sacred channels by which the Hippiaris watered the city (εὐφυαριτίς...) Θερμών θερμών δέλφις...). On the reverse the nymph Camarina (Τεμενος Ουρανον... Καμαρίνα) is seen carried across her lake (πνευμάτω... Μνασά) by a sail swimming with expanded wings, while she aids it by spreading her veil in the manner of a sail. Some of these didrachmons have on either side, around the chief device, fresh-water fishes. The series of Catana comprises fine archaic tetradrachmons and others of the time of the best art. The archaic types show the river with a dolphin chasing a fish and a bull and of the figure of Victory, of a type remarkably advanced for the time at which they were struck. From 470 to 461, under the first of Acarna, its coinage is represented especially by a unique tetradrachm (Pl. I. fig. 10), with a wonderful head of Silenus, and Zeus as the god of the volcano holding a thunderbolt and a sceptre made of a vine-branch; before him is an eagle perched on one of the Hesperides. The coins which follow represent the victorious quadriga, in one case passing the turning-post, an Ionic column. Historically interesting is a small silver coin issued by Catana and Leontini in alliance between 405 and 405. Eryx towards the end of the 5th and during the 4th century, which Eros is represented at the knees of his mother, asking for the dove which she holds. It is represented by coins of which the archaic tetradrachmons must be especially mentioned. They have on the obverse the forepart of the river-god Gelas, whose name it took its name. The Gelas is represented as a bull, having the face of a man. On the reverse is a victorious quadriga, in some examples represented passing
An ionic column, as on coins of Catana. A beautiful tetradrachm represents the city goddess (Sosippe) placing a wreath on the head of the monstrous river-god. A little later is a tetradrachm which has types of the head of the Gelas as a young man horned, surrounded by three dolphins. Small gold coins, and a diadrachm representing a Golian cavalryman spearing an Athenian hoplite, are among the coins issued shortly before the fall of Gelas in 405. The money of Himera is of great interest. On a tetradrachm of Harmachis, a品位 of athlete, who began in the 6th century B.C., bear on the obverse a cock and on the reverse an incuse pattern; later, a hen. During the time that Tho- r of Agrigentum held the city (c. 450 B.C.) Agrigentum took on the diadrachms. The transitional tetradrachms bear on the one side a victorious quadriga and on the other a nymph sacrificing, near whom a little Silenus stands under the stream of a river. On the other side is a lion's head sur- prised by tetradrachms with the head of Apollo and the victorious car, which gives place to a lion's head. The series of Messene begins when the town was called Zancle, or, as it is written upon the coins, Dancia, with the head of Apollo and various figures of the Aegaeans and of very archaic work. On the obverse is a dolphin, and around it a sicle; on the reverse the earliest pieces repeat the same design incuse (as in the earliest coinage of S. Italy); but later we find a sheet in the midst of an incuse pattern. The place is said to have received its name on account of the resemblance of the harbour to a sicle (σίκλα or σίκλη). Next to these first coins of Zancle may be placed the semi-piece of the Attic weight, a tetradrachm with the Samian types, a lion's scalp on one side and on the other the head of a calf, and bearing the inscription ΜΕΣΣΕΝΙΟΝ. This coin was doubtless struck during the rule of the Samians, who took the town in 395, and bore the name of a town of Samos, by whom they were subsequently expelled (Thucyd. vi. 4). The next pieces are the earliest of those which have on the obverse a representation of the Olympian Zeus and on the reverse the contemporary coins of Rhegium, with the same devices and equally of the rule of Anaxilas. These types cease at Rhegium, though they continue at Messene, some of the tetradrachms bearing them being of the age of fine art. About 450 there must have been a temporary restoration of the Zancleans, who struck a tetradrachm with Poseidon and the dolphin as types. A fine piece of rather later date represents Pan carrying a hare. As its town has been well described by Aristotle, we need not strike with their name. Naxos is represented by early Aeginetic drachms with an archaic head of Dionysus. Immediately after the year of liberation (461) it produced a tetradrachm bearing a head of Dionysus and, on the reverse, a squatting Silenus, remarkable for the study of anatomical detail (see Pl. I. fig. 11). These types are repeated in a less severe style some fifty years later, when also an engraver Procles signs some pretty drachms. Segesta is represented on coins from about 440. We first notice the head of the nymph Segesta and a hound, probably the river-god Crimus; then for reverse associated with a young hunter accompanied by two hounds—a charming composition. Another interesting type is a victorious car driven by Persephone, who carries ears of corn.

In the series of the city of Selinus the first coins are drachms, bearing an elephant and a pomegranate, and incuse on a bull. The city and the river of the same name no doubt derived their name from the plant ἀλών (probably wild celery, A. pismis graveolens), the leaf of which must be here intended. Tetradrachms and drachms bear an animal and a horse; and, as the devices generally of usual interest. The obverse exhibits a river-god, sometimes the Selinus, sometimes the Hypsas, sacrificing at an altar to the god of healing. The reverse, bearing a charioteer driving a chariot, is sometimes seen behind him, as if departing. The obverse of the diadrachms shows Hercules subduing the bull, and the reverse of the tetradrachms generally shows a quadriga in which Apollo stands drawing his bow, while Artemis is charioteer. The reference in all these cases must be to the driving away of the pestilence from the neighbourhood of Selinus by the draining of the marshes.

Punti coins, that is, those actually struck by the Carthaginians in Sicily, will best be dealt with under Carthage, below.

The islands of Melita, Gausos and Cosentia near Sicily issued late coins which belong to the African series, showing a curious mixture of Phoenician and Egyptian elements in some of their types. Of Lipara there is heavy bronze money on the Sicilian system, having on the obverse a head of Hephaestus, or sometimes a figure of the same deity, driving a charioteer. This is a fairly well-advanced piece, which seems to have just formed.

In the Tauric Chersonese there are interesting coins, in the three metals, of the city of Panticapaeum, the modern Kerch. Their obverse usually bears the head of Pan and their reverse a griffin and other subjects; some are of fine bronze, bearing the head of the lion, and in general very fair, though it sometimes approaches barbarism. Apollonia Pontica produced fine silver coins with a head of Apollo and an anchor. There are abundant Greek imperial coins of Marcianopolis and Nicopolis, while Tomi is represented in this class as well as in the autonomous.

The coins of Thrace are of high interest. Here and in Macedonia we observe the early efforts of barbarous tribes to coin the produce of their silver mines, and the splendid issues of the Greek colonies; and we see in the weights the influence of the Asiatic Greeks and the Athenians. The oldest coins are of the early 5th century B.C., and there are others of all subsequent times, both while the country was independent and while it was subject to the Romans, until the cessation of Greek coinage. Some of the best period are of about 400 B.C., and these pieces exhibit the distinctive peculiarities of fabric and design, that is, from their commencement until the age of Philip, the Thracian coins resemble those of Macedonia. The money of Abdera comprises tetradrachms and smaller coins of the periods of archaic and fine art, all but the latest of the Phoenician standard, ultimately superseded by the Persic. The principal type is a seated griffin, copied from its mother-city, Teos. The reverse type, an incuse square, has at first four divisions, but in the age of the finest art contains a variety of beautiful subjects, the signs of the magistrates. Abdera is remarkable for the great beauty of some of its coins. These are tetradrachms of Attic weight, of the late archaic and best ages. The interesting turning-point from growth to maturity is seen in a vigorous head of Hermes in profile, wearing the petasus. A little later is the splendid series of facing heads, the broad, severe, and sculptural treatment of which is truly admirable, and far superior to the more showy handling of the same subject in later drachms. A goat is the reverse type of the larger coins. The money of the city of Byzantium begins with coins on the Persic standard of good style, having on the obverse a bull and on the reverse a griffin, divided into four divisions, and closed with the series of bronze coins issued under the empire. The star and crescent type first appears in the Roman period. Of Maronea, anciently famous for its wine, there is an interesting series, among which we notice fine tetradrachms of Phoenician weight, having on the obverse a prancing horse and on the reverse a vine within a square. The standard changes to Persic, of which there is a beautiful series of diadrachms. Then the series is interrupted by the rule of the Macedonian kings, and resumed in a barbarous coinage of the native Thracians, issued in the second and first centuries before the Christian era, consisting of spread Attic tetradrachms with the types of the head of beardless Dionysus crowned with ivy and on the other side his figure. The Greek imperial coins of Pautalia and Perinthus are worthy of notice. Among those of the latter town we may mention fine pieces of Antoninus Pius and Severus, and large coins, commonly called medallions, of Caracalla and other emperors. The money of the imperial class issued by Philippiopolis, Serdica and Trajanopolis should also be noticed. In the Thracian Chersonese the most important issued is one of Antoninus Pius, about 150 A.D. There is a limited but highly interesting group of coins of Thracian kings and d’facts. The earliest are of kings of the Odrysae, including Sparadocus and Seuthes I., who began to reign in 424 B.C., and whose money bears the two remarkable inscriptions ΕΥΘΑ ΚΟΜΜΑ and ΕΥΘΑ ΑΡΤΥΡΙΟΝ. It closes with the issues of Roman vassals, such as Cotys IV. (A.D. 12-19). Lysimachus, commonly classed as king of Thrace, belongs to the group of

Sarmatia we may notice the autonomous and imperial pieces of Olbia, which alone amongst Greek cities produced a series of reverse and the coins and in Dacia the money bearing the name of the province. The Roman colonies Viminacium in upper Moesia is represented by numerous coins of a late time. Of Istrus, in lower Moesia, there are drachms having a strange type on the obverse, representing two beardless heads, side by side, the one upright and the other upside down; on the reverse is an eagle devouring a fish. The style of these coins is in general fair, though it sometimes approaches barbarism. Apollonia Pontica produced fine silver coins with a head of Apollo and an anchor. There are abundant Greek imperial coins of Marcianopolis and Nicopolis, while Tomi is represented in this class as well as in the autonomous.
The money of Macedonia both civic and regal is of great variety and interest. It begins at an early time, probably towards the end of the 6th century B.C. The old pieces are of silver, bronze having come into use a century later, and gold about the middle of the 4th century B.C. The character of the coinage resembles that of Thrace; the earliest pieces are of the Phoenician, Babylonian and Attic standards. The most remarkable denominations are the pieces of eight and twelve Phoenician drachms. The largest coins are of the time of Alexander I. (498-454), and somewhat earlier, and indicate the metallic wealth of the country more than its commercial activity. The chief groups of coins are those of the Pangean, Bisaliant, Strymonian and Chalcidian districts, of the kings of Macedonia and Paonia, and of Macedonia under the Romans. This last series begins with the coins of the "regions" issued by permission of the senate and bearing the name of the Macedonians, from 138 to 150 B.C.; these are followed by coins of the Roman generals against Andricus and of the pretender himself, and, from 146 onwards, of the Roman province. Under the empire large series of bronze coins was issued in the name of the Koion, i.e. the provincial diet. As regards the earlier civic coinage: the coinage of Acanthus comprises fine archaic tetradrachms of Attic weight and others of Phoenician weight and very vigorous in style, of the commencement of the period of good art. The type of their obverse is a lion seizing a bull (cf. Herodot. vii. 125 f.). The money of Anea is chiefly interesting from its bearing the head of the hero Aeneas; and on one extraordinary coin of archaic fabric, an Attic tetradrachm, the subject is the hero carrying Anchises from Troy, preceded by Cressa carrying Aesculapius; this is in date before 500 B.C. The town of Amphipolis is represented by a long series. There are Phoenician tetradrachms of about 400 B.C. having on the obverse a head of Apollo, facing, sometimes in a splendid style, which recalls the art of the immediate successors of Pheidias (Pl. I. fig. 12). The reverse type is a flaming race-torch in an incuse square. The territory of Chalcidice is eminent for the excellence of some of its silver coins. There is a very early Attic tetradrachm of Olynthus, with a quadriga, and an eagle within a double square, which reminds us of the idea of the great Sicilian currencies, under the record of Olympic victors, a subject borrowed from the Phoenician tetradrachms of the best period struck by the Chalcidian League (392-375 B.C. and later), Olynthus being probably the mint, of great artistic interest (Pl. I. fig. 13). The obverse bears the head of Apollo in profile crowned with laurel. It is in very high relief and treated with great simplicity, though not with the severity of somewhat earlier pieces. The delicacy of the features is balanced by the simple treatment of the hair and the broad wreath of laurel. On the reverse is a lyre. There is an early series of coins of Lette, none later than about 480. The obverse type is a satyr with a nymph, and on the reverse an incuse square divided fourfold, first diagonally and then in squares. Mende has money of Attic type, the types being connected with Silenus, who on a tetradrachm of fine style is portrayed reclining, a wine-vase in his hand, on the back of an ass; the reverse bears a vine. Of Neapolis (Datenon) there are early coins with the Gorgon's head and the incuse square, which in the period of fine art gives way to a charming head of the "Virgin Goddess" crowned with olive. The coins of Philip of Macedonia in the three metals are mainly of the time of Philip II., who, having found a rich gold mine near Crenides, changed its name to Philippe. The gold coins are Attic types, the silver pieces of the Phoenician or Macedonian weight, in Philip's own money. The earliest bear the name of the "Thasians of the Mainland," who immediately preceded Philip's colony. There is a long but late series of Thessalonica which in the time of the regions was the mint of the second region; the numerous bronze coins of the Roman period show a figure of Cabirus among other types. Uranopolis has a few coins with very curious astronomical types, probably issued by the easternc Alexander I. brother. The late issues of the Macedonians are extremely interesting. They are all just anterior to, or it may be contemporary with, Alexander I. of Macedon. The leading coins are ocatdrachms of the Phoenician standard. They have usually but one type, the reverse bearing a quadripartite incuse square. Their sudden appearance and heavy weight are due to the working of the silver mines on the border of Macedonia and Thrace. The usual types are a warrior leading a horse or a yoke of oxen. The coins bear the names of the Bisaliant, Getas, king of the Edoni, the Orreissi and other tribals. Besides these there were smaller tetradrachms, struck in the name of the Derronis of Sithonia, bearing the unusual type of an ox-car, in which is a figure seated, and on the reverse a symbol of three legs.

The oldest coins of the Macedonian kings are of Alexander I., from 498 to 454 B.C., the contemporary of Xerxes. These are Phoenician ocatdrachms, having on the obverse a cavalryman by the side of a horse, and coins of a lower denomination with the name of Alexander the Great on the reverse, and the number of the duration of his reign in Greek characters, from 200 to 500. The reverse is an ox or a horse-race, and they are often inscribed with the name of Philip's, although he did not reign then. That of the Macedonians is the same or a similar type. The money of Alexander's successors illustrates the movement of art, but it is not until the reign of Philip II. that we have an abundant coinage. He strikes gold pieces, chiefly Attic dirhems, from the produce of his mine near Philippi (Pl. I. fig. 14). They are of fair style, and bear on the obverse the head of Ares. On the reverse is a victorious Olympic biga. The coins were struck during the time of Philip, and when the money of Alexander as Αλαξανδρος—appellations which probably did not include larger or smaller pieces. Horace calls the gold coins of Philip "Philips" ('royale nomisma Philippus,' Epist. ii. 1, 232). The tetradrachms of the coinage of Alexander I. are of the Phoenician standard (Pl. I. fig. 15). Their type of obverse is a head of Zeus and of reverse either a horseman wearing a caura or a victor in a horse-race, with a horse and a chariot; these last coins being the best of Philip's, although the horse is clumsy. The coinage of Alexander the Great, both in the number of the cities where it was issued and in its abundance, excels all other Greek regal money; but its art is, without being despicable, far below excellence. The system of both gold and silver is Attic. The gold coins are distaters or gold tetradrachms, stater or drachms, with their half or a smaller denomination. The types of the distaters or staters, which last were the most common pieces, are for the obverse the head of Athena and for the reverse Victory bearing a naval standard. The largest silver pieces are the coinage of the rich Phoenician cities, with which is extremely rare. The types of the tetradrachms and most of the lower coins are on the obverse the head of Hercules in the lion's skin and on the reverse Zeus seated, bearing on his hand an eagle (Pl. I. fig. 16). The head has been much changed, but this is not the case, although there may be some assimilation to his portrait. The great currency was of tetradrachms. The coinage was struck in many different cities, distinguished with proper and exact names; the number of the cities is difficult, but is gradually expanding. (For Alexander's Eastern coinage see § IV. Oriental Coins.)

The coinage of Alexander is followed by that of Philip Arrhidaeus, with Attic types. That of Alexander IV. was issued by Ptolemy I. alone. In these coins the types of Alexander were modified, the dead king being represented with the ram's horn of Jaan and an extra pair of ends to his tunic. Meanwhile Seleucus, Lysimachus, Antigonus, king of Asia, struck Alexander's money with their own names, and the tetradrachms of Macedonia were generally of this kind until the time of Philip V. The same coinage, marked by a large flat form, was reused later by

GREEK COINS]
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The coin systems of northern Greece, Thessaly, Epirus, Corcyra, Acarnania and Aetolia present certain difficulties which disappear if we consider them as originally Aeginetan, modified in the west by Corinth, and later by Roman, influence. The coinage of Thessaly represents very few specimens of a remote period, while pieces of the best time are numerous. These are in general remarkably like the finest coins of Sicily and Italy, although the style is simpler. The prevalence of the horse and horseman is significant. The money of the Thessalian Confederacy, being of late date (196-146 B.C.), is of little interest. The composition of their coins is a mark of the head of Zeus crowned with oak and the Thessalian Athena Itonia in a fighting attitude. The coinage is resumed in imperial times. Numerous small places, such as Gomphi, Homolium, Lamia, Phalanna, produced coins of considerable beauty; more extensive are the issues of Pharsalus, Phere (with fine coins of the tyrant Alexander), and especially Larissa. The last series begins with archaic pieces and some of the early period of good art, but sometimes of rather coarse execution. The small silver pieces have very interesting reverse types relating to the nymph of the fountain, and to be compared for mutual illustration with the drachms of Terina and with some of those of Elis. These are followed by coins of fine work. The usual obverse type is the head of Larissa, the nymph of the fountain, facing, and on the reverse is generally a horse, either free or drinking. The head is treated in a very rich manner, like that of the fountain-nymph Arethusa, facing, on tetradrachms of Syracuse; indeed, the debt to the Sicilian type is obvious. The bronze money is also good. The wine-producing island of Paphethus, off the Thessalian coast, is represented by a remarkable series of Attic tetradrachms (about 500-480 B.C.) with a variety of types, partly Dionysiac.

The coinage of Illyria (strictly Illyris or Illyrium) is usually of inferior or rude sort; the pieces are Aeginetan, ultimately changing to the Corinthian, while the style remains more primitive. First there are reverse types showing the head of Apollo and three nymphs dancing round a fire, the outer ones holding torches. Dyrrihachium, which never bears on its coins the more famous name of Epidamnus, is represented by an impression of the early 4th century B.C. First there are reverse types showing the head of Apollo and three nymphs. These are succeeded by tradrachms with Corinthian types, and of Corinthian weight; then the old types are resumed, but the standard is that of the victorius. Dyrrihachium, it must be remembered, was founded partly by Corecyran and partly by Corinthian colonists. The Illiryo-Epistrate mining towns, Damastium, &c., struck barbarous silver coins in the 4th century; on some of these are seen types of Greek Ionic, Corecyran, &c.

The coins of Epirus are of higher interest and beauty than those of Illyria. Of the Epirots there are bronze coins of the regal period (342-272 B.C.), and both silver and bronze of the republic (272-168 B.C.), with the heads of the Dodonaean Zeus and Dione, together or apart. Ambracia is represented by silver pieces, with on the one side a head of Dione, on the other the obelisk of Apollo Agyaeus.

The coinage of Greek imperial money of Nicopolis must also be mentioned. The coinage of the kings begins under Alexander I. His coins have been found in the three metals, but they are rare. It is known that the possession of the gold mines in the district of the river Haliartus, which Philip had exploited, was in the hands of the king. The tetradrachms of Antigonus I. (Conatas), which are of inferior style and work to those of Demetrius, have types which appear to lie in manner to the great naval victory which Demetrius gained over Ptolemy in 306; the drachms, on the other hand, were minted after the battle of Leuctra in 371 and Demetrius and now in the Louvre. The tetradrachms of Antigonus I. (Conatas), which are of inferior style and work to those of Demetrius, have types which appear to lie in manner to the great naval victory which Demetrius gained over Ptolemy in 306; the drachms, on the other hand, were minted after the battle of Leuctra in 371 and Demetrius and now in the Louvre. The tetradrachms of Antigonus I. (Conatas), which are of inferior style and work to those of Demetrius, have types which appear to lie in manner to the great naval victory which Demetrius gained over Ptolemy in 306; the drachms, on the other hand, were minted after the battle of Leuctra in 371 and Demetrius and now in the Louvre.
These are followed by didrachms of the same and other cities until the time of the Persian War. The result of the unpatriotic coinage of Thebes and most of the towns of Boeotia was the degradation of the leading city, and the coins reveal the curious fact that Tanagra for a time became the centre of the League-coinage. We now notice the abandonment of the old incuse reverse and the adoption of regular types, the wheel at Tanagra and the amphora at Thebes. These types increase, and indicate several cities during the short period of Athenian influence (436-446 B.C.). The democratic institutions were next overthrown, and Thebes became again the head of Boeotia, and struck alone and in her own name, not in that of the League. To this earlier period belong splendid didrachms with reverse types chiefly representing Heracles, subsequently varied by heads of Dionysus in a series only less fine. With the peace of Antalcidas (387 B.C.) Thebes lost her power, the League was dissolved, and the other Boeotian cities issued a coinage of some merit. In 379 B.C. Thebes became the chief state in Euboea, and the patriotic policy of Pelopidas and Epaminondas is shown in the issue of the Boeotian coins at the great city without any name but that of a magistrate. Among those which occur is EIAM, or EIAMI, who can scarcely be any other than the ill-fated. An Eob Λεοντος (338 B.C.), swiftly followed by the destruction of Thebes, the coinage is comparatively unimportant, save only for the appearance of new league-money of Attic weight, with the head of Zeus and the figure of Poseidon, between 288 and 244 B.C.

In Attica, the great series of Athens is dominant. Eleusis issued a small bronze coinage of good style in the 4th century.

**Athen.**

Oropus and the island of Salamis also had an unimportant coinage. The Athenian coinage, apparently introduced by Solon, begins with didrachms on the Euboeic standard, which, owing to the fame of the Athenian money, received the names of the gods. The type is an owl, the reverse having only the incuse square. These didrachms were succeeded under Peisistratus by the well-known Attic tetradrachms with head of Athena on the obverse, and owl and olive-spray on the reverse (Pl. I. fig. 20). The change supposed to have been introduced by Hippias (Pseudo-Arist. Oecon. ii. 4) was merely one of nomenclature; by calling in the coinage and reissuing it at double its old nominal value he only paid back half of what he had received. To what had previously been called didrachms he gave the name of tetradrachms, by which they have since been known. An obol or half a drachm of the Athenian standard was known as the Stater, and types similar to those of Athens, was probably issued by him during his exile. From the time of the Persian Wars the helmet of Athena is adorned with three olive-leaves. A rare decadrachm corresponds at Athens to the Demaretae at Syracuse, and was probably issued for similar reasons in commemoration of victory over the barbarians. Otherwise historical events seem to have left little record in the coinage and the Athenians deliberately affected archaism in the style of their coins, which bear no mark of the splendour of Athens as the centre of the sculptor's art. No doubt commercial reasons dictated this conservative policy, which makes the coinage of Athens a disappointment in numismatics. Her money was precious for its purity not only in the Greek world but among distant barbarians, so that imitations reach us from the Punjab and from southern Arabia, and any change would have injured its wide reception. There are many divisions of silver coinage with the types a little varied, and some different ones; and towards the end of the 5th century (probably in 407 B.C.) gold and bronze were introduced. The gold, of good quality and bad style, was never popular; its obverse bore an Attic representation of the autonomy of Athens, and when the money is again issued it is of a wholly new style and the types are modified. The great series of spread tetradrachms may be dated from about 220 B.C., and lasted probably until the time of Augustus. The obverse type is a head of Athena with a richly-armed helmet, unquestionably borrowed from the famous statue by Phidias in ivory and gold, but a poor shadow of that splendid original, and an owl on an amphora within an olive-wreath. The earliest coins have the monograms of two magistrates, the later the names of two who are annual (although the nature of their offices is not certain—possibly they were keroplouts), and, during the period from 479 to 472, a name, of the treasurer of the pytany in which the coin was issued. Amongst those of Athens are those of Antiochus (175 B.C.,) afterwards Antiochus IV, of Syria, who minted in Greece the Great (Pl. II. fig. 1) and his creature, Aristion (87-86 B.C.), but comparatively few of the coins can be dated exactly. Mithradates issued the only gold staters in this series. The symbols in the field often represent local statues of great interest. The abundance of this money shows the great commercial importance of Athens in these latter times. Under the empire Athens issued only quasi-autonomous coins, but these are of great archaeological value as they bear representations of the Acropolis, with the grotto of Pan, the statue of Pallas Promachus, the Parthenon, and the Propylae, with the steps leading up to the latter; or of the theatre of Dionysus, above which are caverns in the rock and higher still the Parthenon and the Propylae; and of various statues and groups of sculpture. Megara and other places in Megaris issued a small but interesting coinage.

The money of the island of Aegina is of especial interest since it coinage originated, so far as Greece proper is concerned, probably fairly early in the 7th century B.C. There is no good evidence for connecting the institution of the coinage with Phidion, king of Argo, who established a system of measures and weights, known as the Phidianon. The weight of the coins is of course on the Aeginetic standard. The oldest pieces are very primitive didrachms, bearing on the obverse a sea-tortoise and on the reverse a rude incuse stamp (Pl. II. fig. 2). Afterwards the stamp becomes less rude, and later has a peculiar shape. The sea-tortoise is also replaced by a land-tortoise. There are some coins of the early part of the fine period of excellent work. The great currency was of didrachms. The bronze coins are not remarkable, but some appear to be of an earlier time than most Greek pieces in this metal.

The series of Achaia begins under the Achaean League in the time of Epaminondas, with a fine Aeginetic stater and smaller coins in the name of the Achaean. The later silver coins are either Attic tetrobols or Aeginetic hemidrachms. On all but the earliest, i.e. after about 280 B.C., monograms or symbols indicate the cities which were members of the league; on the later bronze coins the names are given in full. The type of the silver is the head of Zeus Homagyrios, theReverse bearing the monograms of the Achaean states and a laurel wreath. The oldest bronze repeats the silver types; the later bear a standing Zeus and a seated Demeter, with the name of the city at full length. About forty-five cities are represented by this coinage.

Corinth is represented by a very large series of coins, the weight of which is always on the Corinthian standard, equivalent to Attic but differently divided,—the Corinthian tridrachm, the chief coin, corresponding to the Attic didrachm. The oldest pieces, of the 6th century B.C. (some perhaps even earlier), bear on the obverse Pegasus with the letter Τ, koppa, the initial of the name of Corinth, and on the reverse an incuse pattern. In course of time (about 500 B.C.) the head of Athena in an incuse square occupies the reverse. The incuse square disappears, as generally elsewhere, in the early period of fine art. Of the age of the excellence and decline of art we find beautiful work, though generally wanting in the severity of the highest Greek art (Pl. II. fig. 3). Pegasus is ordinarily seen galloping, but sometimes standing or drinking, the koppa is usually retained, and the helmet of Athena, always Corinthian, is sometimes bound with laurel, sometimes leaves; it has an olive-wreath on the obverse a charming series of types, principally female heads, mostly representing Aphrodite. There are some drachms with Bellerophon in a combattant attitude mounted on Pegasus on the one side and the Chimæra on the other. The autonomous bronze money is poor, but often of fair work, and interesting, especially when the type relates to the myth of Bellerophon. In 46 B.C. this city was made a colony; and we have a large and interesting series of the bronze coins struck by it as such,
including the remarkable type of the tomb of Lais. The coins of the "colonies" of Corinth form a long and important series, struck by Acaeanian towns with Corcyra, and in the west by Locri Epizephyrii in Italy and Syracuse. Some of these cities were not strictly colonies of Corinth, but the Pegasus states struck by them form a homogeneous group. They range from the time of Dion (357 B.C.) to the new currency of the 4th century. The coins are damaged by the absence of the koppa, and bear the names or monograms of the cities.

There are bronze coins of Patrae as an important Roman colony, and silver and bronze money of Phlius, both of the period of good art. The coinage of Sicyon, on the Aegaeic standard of the 4th century, and of Corinth, is of the 3rd century.

Patrae, Sicyon, &c., are famous for a artistic centre. It begins shortly before the period of fine art; in that age the silver is abundant and well executed, but the bronze is scarce and the weight uncertain. The heads within an olive-wreath, are wearing in their repetition, and good work could not make the Chimaera an agreeable subject. Small coins with types of Apollo are the only subjects which suggest the designs of the school of Sicyon.

The money of the Eleans is inferior to none in the Greek world in its art. It reaches the highest level of dignified restraint, and in the variety of its types, which are suggested with great restraint, the head may expect, with the worship of Zeus and Hera, and Victory, the divinities of the great Panhellenic contest at Olympia, and the coinage is rather the money of Olympia than of Elea. As a type it has scarcely a rival in the West, and on the reverse a thunderbolt or Victory bearing a wreath-archaic types which in their vigour promise the excellence of later days. From 471 to 421 B.C. while Elis was allied with the Spartans such types continue: the eagle and Victory (sometimes seated) are both treated with great force and beauty, and the subject of seated Zeus is remarkable for its dignity. The Argive alliance (421-400 B.C.) seems marked by precocious giving to Hera, whose head may suggest the famous statue of Polycleitus at Argos. About the same time was issued a drachma with a noble head of Zeus (Pl. II. fig. 4), which probably recalls, though it is not a copy of, the Zeus of Phidias.

The 4th century type, which is admirably designed on a shield, and eagles’ heads (see Pl. II. fig. 5), the seated Victory, and fantastically varied thunderbolts mark this age. Among the artists’ signatures at this time is ΔΑ, which may represent the sculptor Daedalus of Sicyon. In 354 B.C. the coinage is interrupted for a year, the Plataeans, who conducted the festival then, issuing small gold coins; these are immediately followed by Elean money with the head of Athena and a Corinthian helmet at Elea, who was tyrant in 272 B.C., issued coins with his initials. The coinage closes with imperial money, some types of which have a local interest, notably two of Hadrian bearing the head and figure of Zeus, copied from the statue of Phidias.

Cephallenia gives us the early silver coins of Cranii, the money of Pale, of chaming style, with the figure of Cephalus on the reverse, and a few coins of Sicyon. Cephallonia.

Zacynthus there are silver pieces, usually of rather coarse work, but sometimes of the style of the best Cephalennian money. Some struck in 357 bear the name of Dion of Syracusa, who collected the forces for his expedition in this island. The coins of Ithaca are of bronze. They are of interest on account of their common obverse type, which is a head of Odysseus.

Returning to the mainland, we first notice the money of Messene, or the Messenians. The earliest coin is a splendid Aeginetic didrachm, having on the obverse a head of Persephone, and excels in design the similar subjects on the money of Syracuse, from which it may have been derived, for it is the best current coin of the time. It shows the purer style of Greece, which, copying Syracusan work, raised its character. On the reverse is a figure of Zeus, inspired by the work of Hageladas. The other silver coins are of about the period of the Achaean League, but the King Ages (300-265 B.C.) and the tyrant Nabis (207-192 B.C.) are represented by Attic tetradrachms. On a tetradrachm of the time of the former is a figure of the Apollo of Amycla. Among the types of the autonomous bronze pieces the most important is a head of Zeus, who is sometimes represented with a lyre in his hand, and the tympanum of the Nabis (207-192 B.C.) is irregularly at Athens.

Lacoea. The standard is Aeginetic. The first piece shows the head of the Polycleitan Hera. The bronze money is plentiful but not interesting. Lacedaemon, as we might have expected, has no early coins, the silver money being mostly of the age of the Achaean League, but the King Ages (300-265 B.C.) and the tyrant Nabis (207-192 B.C.) are represented by Attic tetradrachms. On a tetradrachm of the time of the former is a figure of the Apollo of Amycla. Among the types of the autonomous bronze pieces the most important is a head of Zeus, who is sometimes represented with a lyre in his hand, and the tympanum of the Nabis (207-192 B.C.) is irregularly at Athens.

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The peculiar position of Crete and her long isolation from the political, artistic and literary movements of Hellas have been already touched on. It is not strictly true of the worship of Poseidon at this inland town. The silver coins of Phenoeus must be noticed as being of fine work. The drachms of the age of Epaminondas have a head of Persephone, and Hermes carrying the child Arcas. The obverse type is interesting as a copy of the Syracusean subject, as in Locris and Messene. As in Locris, the merit is in the greater force and simplicity of the face, here most marked in the hair, and the hair being long, so in Locri, King Menelaus, who is more like that of the Messenians, who simplified the whole subject. The finest coin attributed to Stymphalus is a magnificent drachm of the age of Epaminondas with a head of Zeus on the obverse, and Hermes striking with his club. The smaller silver coins have on the one side a head of Heracles and on the other the head and neck of a Stymphalian bird. There were representations of these birds in the gallery of Artemis in the temple of Stymphalos. The heads of Zeus, as between two of the reverse types of these bronze coins are interesting as relating to the myth of Telephus and to the story that Athena gave a jar containing the hair of Medusa to her priestess Sterope, daughter of Cepheus, in order that she might terrify the Argives should they attack Tegea in the absence of Cepheus, when Heracles desired his aid in an expedition against Sparta. Iron coins were issued by Tegea, and also perhaps by Heraea.

The peculiar position of Crete and her long isolation from the political, artistic and literary movements of Hellas have been already touched on. It is not strictly true of the worship of King Philip V. that Crete appears in the field of history, and then only as the battle-ground of rival powers. The most remarkable influence of this age was when Athens, by the diplomacy of Cephisodorus, succeeded about 200 B.C. in drawing the Cretans into a great league against Philip V. of Macedon. That this project took actual shape is proved by the issue at all the chief mints of the island tetradrachms with the well-known types of Athens, to be distinguished from the Atticizing types of other cities at this time. The number of these coins is about 500 B.C., but few cities seem to have issued many until a hundred years later. Then there is a great outburst of coinage, sometimes beautiful, sometimes barbarously careless, which lasts until the age of Alexander, when the local currency was probably in great part replaced by Alexandrine coins. At the end of the 3rd century the local coinages are revived until the Roman conquest (67 or 66 B.C.). The chief issue is of silver; bronze is less abundant; and gold is all but unknown. The Cretan types have a markedly local character, yet they copy in some instances other coinages. The chief varieties of Zeus and Athena are in the shape of the island, Britannia, and the leading myths are those of Minos, the story of the Minotaur and the labyrinth being prominent, and also that of Europa. There is frequent reference to nature-worship as in Sicily, yet with a distinctive preference for trees, the forms of which, however, lend themselves readily to the free representation of Cretan art, which may in part explain their prominence. The peculiarity of Cretan art lies in its realism. At some places, as Aptera, Polyrhenium and Cydonia, we find engravers’ signatures. The weight is at first Aeginetic of reduced form; and in the resumption of the coinage after Alexander’s time it is Attic.

Of the island in general there are Roman silver and bronze coins of the earlier emperors, some of which are of fine work for the period. The most interesting types are Dictyna and
Zeus Cretochelus. The autonomous coins are very varied. The obverse of the drachmas of Aptera bears a head of Artemis and the reverse a warrior (Pilotios) before a sacred tree. Of Chersonesus, the port of Lycus, there are drachmas of coarse style, with a head of Artemis Britomartis, who had a temple at the place. The head is copied from Stymphalus, as also is one of the reverse types, Heracles wielding his club. The money of Cnossus is of great interest. The oldest coins may be as early as 480 B.C. They bear the figure of the Minotaur as a bull-headed man, kneeling on one knee, and a maenad-pattern, in one case enclosing a star (the sun), in another a head (Theseus?). Of the period 431-330 there are drachmas with the head of Perses, a fruitless attempt at symbolizing the moon or a bull’s head for the Minotaur, and at length becoming a regular maze. To this time belongs the wonderful coin in the Berlin Museum with Minos seated, his name in the field, and the head of Persephone within the maenad-pattern. In the later 4th century a head of Hera (copied without spirit from the coins of Argos) occupies the obverse of drachmas and drachms, and the reverse has a maze through which the way may be clearly traced. This series closes with Alexander’s empire, and the native coinage disappears until the league of Cephalodorous revives the type of the bull’s head. Thisenames, however, is by no means a probable interpretation, for it is evident that the name of the Cnossians. It is of inferior style, and is followed by base coins with heads of Minos and Apollo, and the Labyrinth, either square as before or in a new circular form, which is interesting as showing it was a mere matter of tradition.

There are interesting coins of Cydonia, some of them of beautiful style and work. One bears an engraver’s name, Neaoutus. The head is that of a Maenad, and the reverse has a figure of the traditional founder Cydon, stringing his bow, who on other drachmas is seen suckled by a bitch. The style is good, but the execution poor. Gortyna, or Gortyta, is represented by most remarkable coins, which generally allude to the myth of Europa. Didrachms of archaic style have on the obverse Europa carried by the bull and on the reverse the lion’s scalp. These pieces are followed by a remarkably fine class of spread drachmas; the best are of about 400 B.C. They have on the obverse Europa seated in a pensive attitude on the trunk of a tree, doubtless the sacred plane at Gortyna, mentioned by Pliny, which was said never to shed its leaves, and on the reverse a bull suddenly turning his head as if stung by a fly (Pl. II. fig. 6). Nothing in Greece exceeds the skill and beauty of these designs.

The truth with which the tree is sketched, and the graceful position of the forlorn Europa are as much to be admired as the fidelity with which the bull is drawn, even when foreshortened, sharply turning his head, with his tongue out and his tail raised. These designs, beautiful in themselves, are strikingly deficient in fitness, and afford equally strong illustrations of the excellencies and of the one great fault of the art of Cretan coins. Many pieces of the same class are of rude execution. Of Itanos there are remarkable coins, the earlier, some of which are of good style, with the subject of a Tritonian sea-god (Glaucus?) and two sea-monsters. Lycus (Lyttus) is represented by strangely rude pieces, with the types of a flying eagle and a boar’s head. The coins of Phaestus form a most interesting series. Among the didrachms are some of admirable work, with on the obverse Heracles slaying the Hydra with his club and on the reverse a bull. Others have on the obverse Heracles seated on the ground, resting. Another noticeable obverse type is the beardless Zeus seated in a tree, with his Cretan name, Velchanos. On his knee is a cock crowing, showing that he was a god of the dawn. We also find Talos, the man of bronze, and the head of Hephaestus on one of them, portrayed as a winged youth naked, bearing in each hand a stone, and in a combatant attitude. Apollonius Rhodius (Argonaut. iv. 1638 sqq.) relates that Talos prevented the Argonauts from landing in Crete by hurling stones at them, until he was destroyed by the artifice of Medea. The important town of Polyrhenium is represented by carefully-executed coins with a head of Zeus and a bull’s head. A later piece has a whiskered head of Apollo, probably Philip V. in that character. Priamius shows the remarkable type of Persophone seated beside a date-palm, placing her right hand on the head of a serpent in reference to the myth of the birth of Zagreus. As usual, the figure is foreshortened. The reverse has a standing figure of Poseidon. Rhaucus has Poseidon beside his horse. The obverse of drachms of Chybria, may fitly close the series; one, among the most exquisite, of the reverse of Dionysus and Hermes in high relief (see Pl. II. fig. 7): another has on the obverse a charming subject, Dionysus seated on a running panther, and on the reverse Hermes drawing on his right burskin,—a delightful figure. Another beautiful type is a seated Dionysus.

The coinage of Erechia is all on the native standard, of which the Athenian variety. It includes some of the very earliest Greek money. Carystus bears the type of a hero with a rude bull’s head, and fine late archaic bear the cow and the cuttle-fish. Eretria was probably the mint of Erechtheus, and a very early, and one of the few coins of Erechtheus in the fine period. Of Hiathea the usual type is the head of a Maenad and a female figure seated on the stern of a galley.

Among the other islands classed after Erechtheus, Amorgos must not be passed over, as a bronze coin of Aegiale, one of its towns, presents the curious type of a cupping-glass. To Andros has been given a group bearing an amphora. The silver money of Carthaea, Coressia and Ithaca in Cretica is extremely old, beginning in each case in the 6th century. The weight is Aeginetic, and there are didrachms and smaller coins. The usual types of Carthaea are an amphora and then a bunch of grapes; that of Coressia is a cuttle-fish and dolphin. The coinage of Delos is insignificant. Melos coined from the early 5th century to imperial times; its chief type is a canting one, the πθορ (pomegranate), of which there are several varieties. Naxos is represented by archaic didrachms and a type of the fine period, the latter bearing bronze pieces of remarkably delicate and good work. The types are Dionysiac. A 7th-century coin with the head of a satyr (one of the engravings of the human head on a coin is probably Naxian. Of Paros there are early Aeginetic didrachms with the type of a kneeling goat and beneath a dolphin. Of the 3rd and 2nd centuries B.C. there are Attic didrachms with a head, possibly Artemis, at first of a charming style, and a goat on the reverse. There are very archaic Aeginetic didrachms of Siphnos, which was famous for its gold and silver mines.

A late tetradrachm of Syros is interesting as representing the Cabiri.

The coinage of Asia begins with that of Asia Minor. It falls into certain great classes—first, the ancient gold and electrum, Lydian and Greek, in time succeeded by electrum or gold and silver, all struck in the west and mainly on the coast. Then the Persian dominion appears in the silver money of the satraps, circulating with the gold and silver of Persia, and the Greek money is limited to a few cities of the coast, none save the electrum of the great mint of Cyzicus uninterrupted by the barbarian. With the decay of the barbarian empire the renewed life of the Greek cities is witnessed by a beautiful coinage along the coast from the Propontis to Cilicia. On Alexander’s conquest autonomy is granted to the much-enduring Hellenic communities, and is again interrupted, but only partially, by the rule of his successors, for there was no time at which Asia Minor was wholly parcelled out among the kings, Greek or native. The Romans, after the battle of Magnesia (190 B.C.), repeated Alexander’s policy so far as the cities of the western coast were concerned, and there is a fresh outburst of coinage, which, in remembrance, follows the name of the emperor. At last, when Asia was constituted and the neighbouring states fell one by one under Roman rule, the autonomy of the great cities was generally reduced to a shadow. Still the abundant issues of imperial coinage, if devoid of high merit, are the best in style of late Greek coins, and for mythology the richest in illustration.

The oldest money is the electrum of Lydia, which spread in very early times along the western coast. This coinage, dating from the 7th century B.C., has an equal claim with the Aeginetic silver to be the oldest of all money.
Probably the two currencies arose at the same period, and by interchange became the recognized currency of the primeval marts; otherwise we can scarcely explain the absence of Asiatic silver, though it is easy to explain that of European electrum or gold. The electrum of the coins is gold—the precious metal washed down by the Pactolus—with a native alloy of a varying part of silver. Its durability recommended it to the Lydians, and it had (by convention) the advantage of exchanging directly with gold. But this commercial advantage allowed the issue of electrum coins on silver standards, while it was natural to coin them on those of gold; hence a variety of weight-systems perplexing to the metrologist. The classification of the earliest coins is exceedingly obscurer; it is hardly possible to say which were struck in Lydia itself, which in the Greek coast cities, such as Miletus; but the majority probably belong to Greek mints. The most primitive in appearance are those in which the obverse is merely marked with lines, corresponding to the original rough surface of the die, while the reverse has three definite objects flanked by two squares (Pl. II. fig. 8); there are also various coins of small denomination with a plain convex obverse, and a single rough depression on the reverse, known from the excavations at Ephesus. Both the Babylonian and the Phoenician standards were in use in early times. This double currency, as Head suggests, was probably intended, so far as the Lydians were concerned, for circulation in the interior and in the coast towns to the west, the Babylonian weight being that of the land trade, the Phoenician that of the commerce by sea. Croesus (Pl. II. fig. 9) abandoned electrum, and issued pure gold (on the Babylonian and gold-shekel standards), and, in the ratio of 13-12, the silver stater exchanging as the tenth of the Euboic gold stater. These results are explained by the metrological data given earlier in this article. Of the Greek marts of the western coast we have a series of early electrum staters, for the most part on the Phoenician weight. An interesting homogeneous group was issued by the various cities which took part in the Ionian revolt (500-494 B.C.). The Euboic weight naturally found its way into the currencies, but was as yet limited to Samos. Phocaea, Teos and Cyzicus, with other towns, followed from a very early period the Phocaic standard, which for practical purposes may be called the double of the Euboic. They alone before Croesus issued gold money, which was superseded at Phocaea and Cyzicus by electrum. This is the main outline of the native coinage of Asia Minor before the Persian conquest. Its later history will appear under the several great towns, the money of Persia (which circulated largely in Asia Minor) being treated in a subsequent place.

The first countries of Asia Minor are Bosphorus and Colchis, the coins of the cities of which are few and unimportant. The autonomous coinages of the cities of Pontus are more numerous, but the only place meriting a special notice is Amisus, which almost alone of the cities of Pontus seems to have issued autonomous silver money. The common subjects of the bronze money of this place relate to the myth of Perseus and Medusa, a favourite one in this country. The regal coins are of the old kingdoms of Pontus and of the Cimmerian Bosphorus, of the two united as the state of Bosphorus and Pontus under Mithradates VI. (the Great), and as reconstituted by the Romans when Polemon I. and II. still held the kingdom of Mithradates, which was afterwards divided into the province of Pontus and the kingdom of Bosphorus. The early coinage of the kingdom of Bosphorus is of little interest. Of that of Pontus there are tetradrachms, two or three of which, of Mithradates IV. and Pharnaces I., are remarkable for the unflinching realism with which they barbarian type of features is preserved. Mithradates VI., king of Bosphorus and Pontus, is represented by gold staters, and tetradrachms. The portrait on the best of these (see Pl. II. fig. 10) is fine despite its theatrical quality, characteristic of the later schools of Asia Minor. The kings of Bosphorus struck a long series of coins for the first three and a half centuries after the Christian era. Their gold money (the only non-imperial gold allowed under the empire) is gradually depreciated and becomes electrum, and ultimately billon and bronze. They bear the heads of the king and the emperor, and are dated by the Pontic era (297 B.C.).

In Paphlagonia we must specially notice the coins of the cities Amastris and Sinope. The silver pieces of the former place represent a youthful head in a laureate Phrygian cap, probably representing Mithras, Amastris, the city of Pontus, and the god is holding a dolphin. The silver pieces of Sinope are plentiful. In the 4th century they bear the names of Persian governors. The type is the head of the nymph Sinope and, as at Istrus, an eagle preying on a dolphin. Bithynia is represented by a more important series. The provincial diet issued Roman silver medallions of the weight of cistophori (to be presently described), with Latin inscriptions, and bronze pieces with Greek inscriptions. The ordinary silver coins of Chalkedon strikingly resemble on both sides those of Dyautianum, and a monetary convention allowed coins with reverse side bearing a dolphin. This coinage was spread far beyond the Bosporus. The Bithynian kings consists of Attic tetradrachms and bronze pieces, issued by Zizanias Prusias I. and II., and Nicomedes I.-II., the last of whom issued the first Greek coinage in Asia Minor to begin with Myssia. Cyzicus is in numismatics a most important city. Its coinage begins in the 6th century; and the famous electrum Cyzicene stater were struck here for nearly a century and a half (c. 500-350 B.C.). During that whole period they were not only the leading gold coinage in Asia Minor but the chief currency in that metal for the cities on both shores of the Aegean; the value at which they were rated was doubtless a matter of convention, and varied from time to time. The actual weight is of the Phocaic standard, just over 248 grains. The diameter was the tenth or sixth, and the twelfth. The extraordinary variety of "types" at Cyzicus is due to the fact that these types are really symbols differentiating the issues, the true badge of the city, the tunny-fish, being relegated to a subordinate position (Pl. II. fig. 11). The reverse invariably has the quadripartite incuse square in four planes of the so-called mill-sail pattern. The coins are very thick and the edges are rude. The art is frequently of great beauty, though sometimes careless. The silver coinage of Cyzicus comprises beautiful tetradrachms of the Rhodian standard, with a head of Persephone ΠΩΛΕΙΤΩΡ, veiled and wreathed with ears of corn. Both late autonomous and imperial coins in bronze are well executed and full of interest, the two classes running parallel under the earlier emperors.

Lampsacus is represented by a long series of coins. Its distinctive type is the forepart of a Pegasus, which occurs on its coins from the 6th century onwards. In the first half of the 4th century it issued splendid gold staters with various types (really, as at Cyzicus, symbols distinguishing the issues) on the obverse and the half-Pegasus on the reverse. The most remarkable type is a bearded head (probably of a Cabirus) with streaming hair in a conical cap bound with a wreath, singularly pictorial in treatment as well as in expression (Pl. II. fig. 12). In contrast to this is a most carefully executed head of a Maenad with goat's ear; and other types of great interest are the Earth-goddess rising from the earth, and Victory nailing a helmet to a trophy, or sacrificing a ram.

The money of the great city of Pergamum is chiefly of a late time. Apart from some rare pieces of gold, the silver coinage is chiefly supplied by the money of the kings of Pergamum and by cistophori. The bronze pieces of the city are numerous, both autonomous and imperial, the two classes overlapping, and there are medallions of the emperors. The local worship of
Aesculapius is especially prominent under the Roman rule. The chief coins of the kings are Attic tetradrachms, with on the obverse a laureate head of Philetairos, the founder of the state, and on the reverse a seated Athene, the common type and diastemachus, from whom Philetairos revolted. Variations from these types are rare, the most important being a coin with the name of Eumenes (II.), representing his portrait and the Dioscuri. Otherwise the inscription is always ΠΙΔΕΤΑΙΡΟΥ. The cistophoroi probably originated at Ephesus towards the end of the 3rd century, but was soon adopted for the Pergamum dominions, and down to imperial times was the only important silver currency in Asia Minor. It acquired its name from its obverse type, that of a horse, based from which a serpent issues, the whole enclosed in an ivy-wreath. The reverse type represents two serpents, and between them usually a bow-case (Pl. II. fig. 13). The half and the quarter of the cistophoroi have on one side a bunch of grapes on a leaf or leaves of the vine, and the club with the lion's skin of Heracles within an ivy-wreath. They were tetradrachms equal in weight to about three Attic drachms or three denarii. These coins became abundant when the kingdom of Pergamum was transformed into the province of Asia, and are struck at its chief cities, as Pergamum, Adramyttium, the Lydian Stratonicea, Thyatira, Sardis, Smyrna, Ephesus, Miletus, etc., by the same Laodicea. The first the names of Greek magistrates, afterwards coupled with those of Roman proconsuls or praetors. The silver medallions of Asia, the successors of the cistophori, range from Mark Antony to Hadrian and Sabina. They bear no names of cities, but some may be attributed by their references to local forms of worship. The obverse bears an imperial head, the reverse a type either Greek or Roman. The art is the best of this age, more delicate in design and execution than that of any other pieces, the Roman medallions excepted. One of the most remarkable imperial bronze coins of Asia Minor represents the Great Altar (Pl. II. fig. 16). The coinage of the Troad is interesting from its traditional allusions to the Trojan War. Of Abydos there is a fine gold stater, with the unusual subject of Victory sacrificing a ram, and the eagle, which is the most constant type of the silver money. One of the few imperial coins commemorates the legend of Hero and Leander. The late tetradrachms of Alexandria Troas bear the head of Apollo Sminthus, and on the reverse his figure armed with a bow. There is a long series of the town as a colony, of extremely poor work. Illium Novum strikes late Attic tetradrachms with a head of Athene, and on the reverse the same goddess crowned with the inscription ΑΘΗΝΑΣ ΛΑΙΔΑΣΟΣ. On the autonomous and imperial bronze we notice incidents of the tale of Troy, as Hector in his car, or slaying Patroclus, or fighting; and again the flight of Aeneas. The island of Tenedos is represented by very early coins, and others of the fine and late periods. The usual obverse type of all the silver pieces is a Janus-like combination of two heads, presumably some primitive god and his consort; this double type is balanced on the reverse by the double-axe, which played an important part in the primitive coinage of Asia Minor and the Aegaean.

In Aeolis the most noteworthy coins are the late tetradrachms of Cyme and Myrina, both of the time of decline, yet with a certain strength which relieves them from the general weakness of the work of that age. Cyme has the head of the Amazon Cyne, and a horse within a laurel-wreath; Myrina, a head of the Grunean Apollo and his figure with iustral branch and patera. Lesbos is remarkable for having coined in base as well as pure silver, its early billon coins being peculiar to the island. This base coinage, which was probably common to Mytilene and Methymna, ceases about 450 B.C., when the Mytilenean style begins, Methymna has very interesting archaic silver coins, with the boar and the head of Athene. But the most important coinage of Lesbos is the beautiful electrum coinage (a unique stater, Pl. II. fig. 14, and innumerable sixths) which was issued from about 480 to 350. Phocaea in Ionia issued similar coins, distinguished by a seal (the badge of the city), and a convention regulating the weight and quality of the two coins, and arranging for the two mints to work in alternate years, is still extant. The type varies accordingly, as at Cyzicus and Lampasus. There is a long and important series of Mytilene of an imperial time, including very interesting commemorative coins, some of personal representations of various cities, such as Pittacus and Sappho, others of benefactors of the city, and some of heroes such as Lysicles, Pompey, from whom he obtained for this his native place the privileges of a free city. The usual style for these persons is hero or heroine, but Theophaestus is called a god, and Archelamus, probably his wife, a goddess.

The money of Ionia is abundant and beautiful. For the first century and a half (c. 700–545) the chief coinage is of electrum. To the 7th century belongs the remarkable coin inscribed ΦΑΝΟΙ ΕΜΙ ΣΗΜΑ ("I am the badge of the Bright One," or "of Phanes"), with a stag, which was perhaps issued at Ephesus. From 545 to the Ionic revolt (494) there is considerable diminution in the coinage; silver attains more importance. Thenceforward, the course of the coinage is fairly uniform until the period 301–190, when there is a general cessation of autonomous issues. After the battle of Magnesia there is a great revival, tetradrachms of Alexandrine and also of local types being issued in vast numbers. After the constitution of the Roman province of Asia (133), the cistophori supply the silver coinage. The imperial bronze coinage is numerous, with many interesting local types. Of the coinage of Ephesus the following demand mention. At Clazomenae in the 4th century there are splendid coins, having for types the head of Apollo, three-quarter face, and a swan. The chief pieces, the gold drachm and a half or octolab, and the silver stater or tetradrachm present two types of the head of Apollo, very grand on the gold and the silver, with the signatures of Theodotus, the only known Attic engraver, and richly beautiful on the other silver piece. These coins are marked by the intense expression of the school of western Asia Minor. Colophon has distinctive coins of the 5th century with the head of Apollo and the lyre.

The money of Ephesus is historically interesting, but very disappointing in its art, which is limited by the small range of subjects and their lack of beauty. The leading type is the bee; later the stag and the head of Artemis appear. Thus the subjects relate to the worship of the famous shrine. The oldest coins are electrum and silver, both on the Phoenician standard. The type is a bee and the reverse is incuse. The silver coinage continues with the same type, broken by the Persian domination, until in 334 B.C. a remarkable new coin appears. When Conon and Pharnabazus defeated the Lacedaemonian fleet and liberated the Greek cities of Asia from Spartan tyranny a federal coinage was issued by Rhodes, Cnidos, Samos, Ephesus, Iasus and Byzantium with their proper types on the reverse, but on the obverse the infant Heracles strangling two serpents; these are Rhodian tridrachms. About this time the Rhodian standard was introduced, and a series of tetradrachms began with the bee, having for reverse the forepart of a stag looking back, and behind him a date-palm. The head of Artemis as a Greek goddess begins to appear in the 3rd century. Other series of coins follow with types associated with Artemis, Rhodian and Attic standards alternating; there are also Alexandrine tetradrachms and of course cistophori. The connexion of the city with Lysimachus, who called it Arsinöe, after his wife, is commemorated by coins inscribed ΑΡΣΙΝΟΗ. The Ephesian form of Artemis, as the cultus figure of a nature-goddess, first appears as a symbol on the cistophori, and then on gold coins struck during the revolt of 87–84, when Ephesus took the side of Mithradates. The figurine represents many representations of the temples of the city, including that of the famous shrine of Artemis, which shows the hands of sculpture on the columns, as well as many other remarkable subjects, particularly the Zeus of rain seated on Mount Pelion, a shower falling from his left hand, while below are seen the temple of Artemis and the river-god Cayster; on another coin the strange Asiatic figure of the goddess, frequent in this series, stands between the personified rivers Cayster and
Cnenchirus. The money of the Ionian Magnesia begins with the issue of Themistocles, when he was dyasnt under Persian protection. The ordinary silver coins (350-190 B.C.) representing a cavalryman and the river-god Maeander as a bull are common. After 190 B.C. we have spread tetradrachms of the decline of art, more delicately executed than those of Cyme and Myrina, with a bust of Artemis and a figure of Apollo standing on a maecander and leaning against a lofty tripod, the whole in a laurel-wreath. The great city of Miletus is disappointing in its money. The period of its highest prosperity is too early for an abundant coinage, yet in the oldest electrum issues we see the lion and the sun of Apollo Didymeus. In the early 4th century the Carian dynasts issued coins from Ephesus. To about 350 B.C. belong the beautiful coins bearing the head of Apollo facing and the lion looking back at a sun, with the inscription ΕΠΙ ΔΙΑΔΩΜΝΗ ΕΠΕΗ (scil. δραχμη), showing that this was the sacred money of the famous temple at Didyma. The types of the head of Apollo in profile and the lion with the sun continue through a series of various standards with very rare Attic gold staters of the early 2nd century. Phocaea is represented by two very interesting currencies; an electrum series of hectae, characterized by a seal, the badge of the town, beneath the type, struck in connection with Mytilene (see above); and also a widespread early silver coinage, apparently common to the western colonies of the city. The autonomous money is wholly anterior to the Persian conquest. Smyrna, issued in the 4th century a very rare coin with the head of Hera, was already a city of much interest about 350 B.C. When the Carian Artaxerxes in 466 B.C., struck a tetradrachm to change the name of Caria to Artakes. Among the earliest coins of New Smyrna are some showing that Lysimachus named it Eurydice after his daughter. After 190 B.C. it strikes Attic tetradrachms, with the turreted head of Cybele or the city or the Amazon Smyrna (Pl. II. fig. 15), and an oak-wreath sometimes enclosing a lion. A rare silver coin and common bronze coins present on the reverse the seated figure of Homer. A gold coin issued by the Prytaneis of the Smyrnaeans probably belongs to the time of the Mithradatic revolt against Rome (67-84). The imperial coins have numerous types, among others the two Nemeses appearing to Alexander in a vision.

Of Teos there are early Aeginetic didrachms, bearing on the one side a seated griffin and on the other a quadrupartite incuse square. These ceased at the moment when the population left the town, destroyed by the Persians, and fled to Abyden, where we recognize their type on the coinage of the time. There are much later coins of less importance. Samos and Smyrna, the two great Ionian cities represented by interesting currencies. Chios struck electrum and abundant silver. The type was a seated sphinx with curled wing, and before it stands an amphora, above which is a bunch of grapes; the reverse has a quadrupartite incuse. The coins begin before the Persian conquest (490 B.C.). The coinage of Samos is artistically disappointing, but as a whole has many claims to interest. The earliest money included electrum.

The silver begins before 494 B.C. The types are the well-known lion's scalp and bull's head. The Athenian conquest (439 B.C.) is marked by the introduction of the olive-spray as a constant symbol on the reverse and the occasional occurrence of Attic weight. The Samians, having joined the anti-Laconian alliance after Conon's victory in 394 B.C., struck the coin with Hercules strangling the serpents already noticed under Ephesus; the Rhodian weight is found only in the long series. The early coinage was without interesting types. The most remarkable is the figure of the Samian Hera, which clearly associates her with the group of divinities to which the Ephesian Artemis belongs. Very noticeable also are the representations of Pythagoras, seated or standing, touching a globe with a wand.

The money of Caria does not present any one great series. Autonomous silver coins are not numerous except at Cnidus, Caria, and rarely of good style. Antiochia and Alabanda have tetradrachms in the 2nd century. The imperial coins of Antiochia and of Aphrodisias are worthy of notice. Cnidus is represented at first by archaic coins of Aegiotic weight, some of the early 4th century having a very rude head of Aphrodite. The head of the famous statue of Aphrodite by Praxiteles is not reproduced, but the whole statue figures on imperial coins. Among the imperial types of Halicarnassus the head of Herodotus is noteworthy. There is late silver money of Isias with the head of Apollo, and a youth swimming beside a dolphin around which his arm is thrown. Idyma has silver pieces of fine style on which the head of Apollo is absolutely facing; the reverse type is a fig-leaf. On imperial coins of Mylaea the figure of the Zeus of Labranda holding double-axes and spear is represented. Of Termesa we have the rare coin of its tyrant Tymmes, dating about the middle of the 5th century and struck on an electrum standard. There is another type which combines with archaic Greek forms others which are unknown to the Greek alphabet, and it expresses a native language as yet imperfectly understood. The art is still and delights in animal forms,
sometimes of monstrous types, which recall the designs of Phoenicia and Assyria. The most remarkable symbol is the triskele or tetrakeles symbol, an object resembling a ring, to which three or four hooks are attached. It is supposed to be a solar symbol like the swastika. The oldest money has a boar or his fore-part and an incuse. This is succeeded by a series with an animal reverse, and then by one in which the hooked ring is the usual reverse type. The fourth series bears Lycean inscriptions, which give the names of dynasties and places. A fifth series is characterized by the type of a lion's scalp. This coinage reaches as late as Alexander's time. It is followed by silver and bronze money of the Lycean League before Augustus and under his reign, but differing in that of Claudia—the usual types of the chief silver piece, a hemidrachm, being the head of Apollo and the lyre. The districts of Cragus and Masicytus have coinages, as well as the individual cities. Besides this general currency there are some special ones of towns not in the League. The imperial money rarely goes beyond the reign of Augustus, and is resumed during that of Gordian III. There is a remarkable coin of Myra of this emperor, showing the goddess of the city, of a type like the Ephesian Artemis, in a tree; two woodcutters, each armed with a double axe, hew at the trunk, from which twigs sprout. This is probably to protect it and aid the goddess. Phaselis is an exceptional town, for it has only Greek coins, the leading type being a galley.

The coinage of Pamphylia offers some examples of good art distinctly marked by the Asiatic formality. Aspendus shows a remarkable series of Persic dirachms, extending from about 500 B.C. to Alexander's time. The oldest coins have the types of a warrior and the triskelion or three legs, more familiarly associated with Sicily; it is probably a solar symbol. These coins are followed by a long series with the types of two wrestlers engaged and a slinger. The main legend is almost always in the Pamphylian character and language. There are also very curious imperial types. The money of Perga begins in the 2nd century with Greek types of the Artemis of Perga. Her figure in a remarkable Asiatic form occurs in the long imperial series. Bronze coins earlier in date than the silver money with the Greek types have the Pamphylian title of the goddess, ΦΑΝΑΣΑΣ ΠΕΡΙΛΑΣ, "of the Lady of Perga." Side has at first Persic dirachms of about 480 B.C., their types the pomegranate and dolphin and head of Athene; then there are money with an undeciphered Aramaizing inscription of the 4th century, and figures of Apollo and late Attic tetradrachms, their types being the head of Athene and Victory. These were carried on by Amyntas, king of Galatia, when he made his mint in Side (36 B.C.). The pomegranate (οἶνος) is throughout the badge of the city.

The money of Pisidia is chiefly imperial. There is a long series of this class of the colonia Antonia. The autonomous coins of Sege have the wrestlers and the slinger of Aspendus in inferior and even barbarous copies. Of Issaura and Lycaonia a few cities, including Derbe and the colonies of Ionia and Lystra, strike coins, chiefly of imperial time.

Cilicia, for the most part a coastland, is numismatically of high interest. To Aphrodisias is assigned an interesting series of archaic coins with a winged figure and a pyramidal fetish-stone; in the 4th century Aphrodisite is represented in human form seated between sphinxes; the Parthenos of Pheidias is also represented. Celenderis has a coinage beginning in the 5th century, with a horseman seated sideways on the obverse, and on the reverse a goat gazing to the right, which is one of the most interesting series of silver coins, some with curious Asiatic types. Of Nagidus there are Persic dirachms of good style, one interesting type being Aphroditic seated, before whom Eros flies crowning her, with, on the other side, a standing Dionysos. Soli has silver coins of the same weight, the types being an archer or the head of Athene, one variety imitated from remote Velia, and a bunch of grapes. The coinage of Tarsus begins in the 5th century with Persic staters representing a Cilician king on horseback, and a hoplite kneeling.

In the 4th century it was the mint of a large series of satrapal coins, issued by Pharnabazus, Mithridates and other governors (Issus, Mallus and Soter also sharing the cost of minting). The most curious type is the sacred stag or Taurus, on which appears, on the reduced Rhodian standard, and a solitary Attic tetradrachm of Paphos. The art is usually very stiff down to about 400 B.C., with types of Egypto-Phoenician or Phoenician or of Greek origin. The most curious type is the stag, for the money goes before the stag, and it is usually one-sided. The prevalent types are animals or their heads, the chief subjects being the bull, the lion, the lion seizing the stag, the deer and the mythical sphinx. The divinities we can recognize are Aphrodite, Heracles, Athene, Hermes and Zeus Ammon. But the most curious mythological types are a goddess carried by a bull or by a ram, in both cases the goddess is seated, her right hand on the ram's neck. There is an Attic of the 2nd century, which symbol is the well-known Egyptian sign of life. The coins appear to have been struck by kings until before the age of Alexander, when the money appears. The mints to which coins are ascribed with certainty are Salamis, Paphos, Tarsus, and Tavium. The silver coins of the Salaminian line are in silver and gold. The earlier, beginning with Euthênion about 560 B.C., have Cyprian, the later with Seleucid types before the year 283 B.C. The greatest type is the temple at Paphos, represented as a structure of two storeys with wings. Within the central portion is the sacred stone, in front a semicircular enclosure.

The earliest coinage of Lydia is no doubt that of the kings, already described. The next currency must have been of Persian darics (gold) and darics (silver), followed by that of Alexander. Lydia. Lydian. Lydian. Lydian.

The coinage of Phrygia has the same general characteristics as that of Lydia, but the workshop is poorer. Among noteworthy types must be noticed Men or Lucas; the Phrygian moon- she and the head of Arethusa on the facing types of Kibotos or the Ark, and more anciently Celaenae. One of Severus represents the legend of the invention of the double pipe, a type already described. Of the same and later emperors are coins bearing the famous type of the ark of Noah and thiasos MNE, the town of Cibyra is remarkable for a silver coinage of the 1st century B.C., of which the large pieces have the weight of cistophoroi.

Galatia has little to offer of interest. Trajan issued bronze imperial coins for the province, and there is imperial money of Ancyra, Pessinus and Tavium. The only remarkable regal issue is that of Amyntas, Strabo's contemporary, who struck tetradrachms at Side 150 B.C.

With the coinage of Cappadocia we bid farewell to Greek art and enter on the domain of Oriental conventionalism, succeeded by interior Roman design coarsely executed. There is one large imperial series, issued by Gordian III, and another new issue circulation in the province. The issues range from Tiberius to Gordian III., and are in silver and bronze. The most common type is the sacred stag, on which appears — a remarkable type curiously varied. There are scanty issues of a few other towns. There is an interesting series of the coins of the kings of Cappadocia, beginning with Ariarathes I. (c. 320-310 B.C.), continuing with another kings, called usually Ariarathes or Ariobarzanes, who struck Attic drachmas and occasionally tetradrachms. The rare tetradrachms of Orontobates, who died about 268 B.C., are superb. The coins of Archelaus, the last king set up by Antony (36 B.C.—A.D. 17), have a good head on the obverse. Of Armenia there are few silver and bronze coins of late sovereigns.

The great series of Syrian money begins with the coinage of the Seleucid kings of Syria, only rivalled for length and
abundance by that of the Ptolemies, which excels in its series of portraits, though it is far inferior in its gold money and wants the large and well-executed bronze pieces which make the Egyptian currency complete. The gold of the Seleucids is scarce, and their main coinage is a splendid series of tetradrachms bearing the portraits of the successive sovereigns. The reverse types are varied for the class of regal money. The execution of the portraits is good, and forms the best continuous history of portraiture for the third and second centuries before our era. The reverses are far less careful.

The weight is Attic, but the cities of Phoenicia were ultimately allowed to strike on their own standard. Many of the coins of the earlier kings were issued in their Bactrian or Indian dominions. Seleucus I. (312-280 B.C.) began by striking gold staters and tetradrachms with the types of Alexander the Great. The same king, like his contemporaries, then took his own types: for gold staters, his head with a bull's horn, and on the reverse a horse with bull's horn; for tetradrachms, his own head in a helmet of hide with bull's horn and lion's skin and Victory crowning a trophy, or the head of Zeus, and Athena fighting in a chariot drawn by four or two elephants with bull's horns. Antiochus I. (263-261), like his father, struck tetradrachms with Alexanderine types, and then with his own head, Apollo on the obverse occupying the reverse. The portrait of Antiochus has a characteristic realism. Antiochus III. (222-187) is represented by a fine and interesting series with a vigorous portrait. He alone of the Seleucids seems to have struck the great octadrachm in gold in rivalry of the Ptolemies. Coins dated by the Seleucid era (312 B.C.) first appear in this reign. The portrait of Antiochus IV. Epiphanes (175-164) is extremely characteristic, marked by the mad obstinacy which is the key to the tyrant's history. The most remarkable coin is a tetradrachm with the head of Antiochus in the character of Zeus. In his time mints became numerous in the bronze coinage, and there is a remarkable series in that metal with Ptolemaic types, marking his short-lived usurpation in Egypt. From the time of Demetrius I. (162-150) the silver tetradrachms bear both mints and dates. In one type the heads of Demetrius and Queen Laodice occur side by side. With Alexander Balas (152-144), Tyre and Sidon begin to strike royal tetradrachms on their own Phenician weight. Tarsus also first strikes coins for him with the type of the pyre of Sandan. The money of young Antiochus VI. presents the most carefully executed portrait in the whole series, which, despite its weakness, has a certain charm of sweetness that marks it as a new type in art. The same artist's hand seems apparent in the fine portrait of the cruel usurper Tryphon, and also in the pictureque spiked Macedonian helmet with a goat's horn and cheek-piece which occupies the reverse. Antiochus VII. (138-129) seems to have borne the burden of his reign; the portrait of Antiochus VIII. Epiphanes (129-125) is remarkable for the same reason. The portrait of Antiochus IX. (125-116) appears in a new series; amongst other coins, the solitary bronze piece of Jerusalem, bearing the lily and the Seleucid anchor. Alexander II. Zebina (128-123) is represented by a unique gold coin (Pl. II. fig. 18), as well as by silver and bronze. The empire closes with the money of the Armenian Tigranes (83-69), bearing his portrait with the lofty native tiara, and for reverse Antioch seated, the Orontes swimming at her feet (a copy of the famous group by Eutychides).

There is a copper coinage of the Syrian koineus under Trajan; also of the cities of Commagene, Samosata and Zeugma, and less important mints. The money of the kings of Commagene is in bronze (c. 50 B.C. to A.D. 72).

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coins in this period, sometimes under the name of Laodicea in Canaan. Acro-Ptolemaic (Acre) was an important mint under the Ptolemies; for a time, under the Seleucids, it was called Antioch in Ptolemais. Besides the Seleucidae autonomic eras are in use at some of the cities, as at Aradus (259 B.C.), Sidon (111 B.C.) and Tyre (126 B.C.). Under the empire there are some very large coinages of bronze, besides a certain amount of silver resembling that of Antioch. The quasi-autonomous silver of Tyre was also issued as late as A.D. 57. Berytus (a colonia) has types relating to the cults of Astarte and Poseidon; Astarte is also prominent at Sidon (a colonia from Elagabalus onwards; a common type is represented the wheeled shield of the goddess) and Tripolis. At Byblos a temple is represented with a conical fetish. Tyre has many interesting types: Dido building Carthage; the Ambrosial Rocks; Cadmus fighting the serpent or founding Thbes, &c. Ptolemais issued coins as a colony from Claudius onwards.

In Trachonitis, the only city of importance is Caesarea Panias, with a famous grotto of Pan, perhaps represented on an imperial coin. Several cities in Decapolis issued imperial coins, among them Gadara and Gerasa. In Gaul the coins struck at Tiberias by its founder, Herod Antipas, may be mentioned. Samaria has money of Caesarea, both autonomous and imperial. Pella is the most part colonial, and also imperial of Neapolis, among the types of which occurs the interesting subject of Mount Gerizim surmounted by the Samaritan temple. The coinage of Judaea is an interesting series. The money of Jerusalem is of high interest, and more extensive than appears at first sight. Here was struck the coin of Antiochus VII, with the native lyl as a type, the series of the Maccabean princes, that of the Roman procurators, and the bronze coins countermarked by the tenth legion, quartered by Titus in the ruins of the city. One of these bears the remarkable symbol of a pig. After the reduction of Judaea in the reign of Hadrian, Jerusalem became the capital and chief city of the Galilee. The earliest coin commemorates the foundation. The coinage lasts as late as Valerian. Ascalon strikes autonomous silver and bronze, including remarkable tetradrachms with the portraits of Ptolemy Auletes, of his elder son Ptolemy XIV., and of his daughter Cleopatra (see Pl. II. fig. 21). There is also money of Gaza of some importance; the earliest coins are Attic drachms, &c., of barbarous style, inspired by Greek, especially Athenian models; on its imperial coins the god Manna, and Minos and Io are named.

The independent Jewish coinage begins with the famous shekels. They have been assigned to various periods, but the preponderance of evidence would class them to Simon Maccabaeus, to whom the right of coining was granted by Antiochus VII. The series is of shekels and half-shekels, of the weight of Phoenician tetradrachms and diobol or drachm. The obverse of the shekel bears the inscription "the shekel of Israel," and for type a sacred vessel of the temple, above which (after year 1) is the letter indicating the year of issue and the initials of the word year. The reverse reads "Jerusalem the Holy," and the type is a flowering branch (Pl. II. fig. 19). The half-shekel differs in having the inscription "half-shekel" on the obverse. The types are markedly peculiar; the obverse inscription is equally so, for the regular formula of the neighbouring cities would give nothing but the name of the city; but the reverse inscription is like that of Tyre and Sidon, for instance, "of Tyre sacred and inviolable." This agreement is confirmatory of the assignment to Simon Maccabaeus. This coinage bears the dates of years 1, 2, 3, 4 (rare), and 5 (very rare). There has been much discussion as to the date. It is best reckoned from the decree of Antiochus VII. autonomous of the fifth year were then struck by John Hyrcanus. The certain coins of the successors of Simon are small bronze pieces of John Hyrcanus (135–104), of Judas Aristobulus (104–103), of Alexander Jannaeus (103–76), who strikes bilingual Hebrew and Greek and also Hebrew coins, showing his native name to have been Jonathan, and of Antigonus (40–37), who has the Hebrew name Mattathiah. The types represent only inanimate objects. The Maccabean coinage is followed by that of the Herodian family, equally of bronze, the two most important issues being those of Herod the Great and the satrap Antipas. The small silver coinage under the early empire was chiefly supplied by the issues of Antiochus and Roman denarii; the "penny " with Caesar's image and superscription was such a denarius. The money of the procurators of Judaea, in part parallel with the Herodian, is of small bronze coins, struck between A.D. 6–7 and A.D. 58–59, the latest period of their administration being as yet unrepresented. These are followed by two classes, the money of the first revolt (A.D. 66–70) and that of the second (suppressed A.D. 135). Both risings caused the issue of native coinage, some of which may be assigned with certainty to each. Of the first revolt are bronze pieces of years 2, 3, and 4. Of the second revolt are re struck Antiochene tetradrachms and Roman denarii, usually with the name of Simon, which appears to have been that of the leader surnamed Bar Cochebas. The obverse type of the tetradrachms or shekels is the portico of the temple; on the reverse are a bundle of branches and a citron, symbols of the feast of tabernacles. Besides this native currency there are coins struck in Palestine by Vespasian, Titus and Domitian.

Of Roman Arabia there are bronze imperial coins of Bostra and less common mint of Nabataea. In the Roman province of Judaea are struck silver and bronze coins from Aretas III. (c. 87–62 B.C.) to Aretas IV. (A.D. 75–101). From S. Arabia comes a remarkable silver coinage issued by the Himyraean kings during the three centuries, of which kings, striking with Roman emperors in silver and bronze. Curiously, this and the colonial issue are long contemporary. The colonial coinages of Nisibis and of Rassiana, which became a colony, close the group. Abydus was probably a mint of Alexander the Great and of many of the Seleucid kings, certainly of the usurpers Mollon (220–220) and Timarchus (162 B.C.).

Africa. The coins of Africa are far less numerous than those of the other two continents, as Greek, Phoenician and Roman civilisation never penetrated beyond Egypt and the northern coast to the west. The series of Egypt is first in geographical order. As yet no coins have been here assigned of a date anterior to Alexander. The old Egyptians kept their gold, electrum and silver in rings, and weighed them to ascertain the value. During the Persian rule the Persian money must have been current, and our present information is that the coinage of silver under Darius I. With Alexander a regular Greek coinage must have begun, and some of his coins are of Egyptian mints. A rare bronze coin was struck at Nautocratis, probably during his lifetime. With Ptolemy I. the great Ptolemaic currency begins, which lasted for three centuries. The characteristics of this coinage are its splendid series of gold and silver and the bronze money. The execution of the earlier heads is good; afterwards they become coarse and careless. At first the fine pieces were issued by the Phoenician, Cyprian and other foreign mints, the Egyptian work being usually inferior. While the Seleucids were still striking good coins, the Ptolemies allowed their money to fall into barbarism in Egypt and even in Cyprus. The obverse type is a royal head, that of Ptolemy I. being the ordinary silver type (see Pl. II. fig. 22), while that of Arsinoë II. was long but not unintermittently continued on the gold. The head of Zeus Ammon is most usual on the bronze coinage. A type once adopted was usually retained. Thus Ptolemy I., Arsinoë II., Ptolemy IV., Cleopatra I., have a kind of commemoration in the coinage on the analogy of the Seleucid range of each royal pair. The almost universal type of reverse of all metals is the Ptolemaic badge, the eagle on the thunderbolt, which, in spite of variety, is always heraldic. For art and iconography this series is far inferior to that of the Seleucids. The weight after the earlier part of the reign of Ptolemy I. (who experimented with the Attic and Rhodian standards) is Phoenician for gold and silver; the metrology of the bronze is obscure. The chief
coins are octadrachms in gold and tetradrachms in silver, besides the abundant bronze money. Ptolemy I. appears to have issued his money while regent for Philip Arrhidæus (323-318); it only differs in the royal name from that of Alexander. He then struck money for Alexander IV. (317-311) on the Attic standard with the head of Alexander the Great, with the horn of Ammon in the elephant's skin and Alexander's reverse. He soon adopted a reverse of his own, that of Athena Promachos. The money he con-
tinued to strike after the young king's death until he himself (305) took the royal title, when he issued his own money, his portrait on the obverse, that of the eagle and thunderbolt with his name as king on the other. This type in silver, with the in-
scription "Ptolemy the king," is thenceforward the regular currency. He also issued gold stater (reverse, Alexander the Great in an elephant-car). Ptolemy II. (Philadelphus, 285-
247), the richest of the family, continued his father's coinage. Ptolephus also began (after the death and deification of Alexander II., about 271 B.C.), the issue of the gold octadrachm with the busts of Ptolemy I. and Berenice I., Ptolemy II., and Arsinoë II., and certainly struck beautiful octadrachms in gold and decadrachms in silver of Arsinoë II., the gold being long afterwards continued. Philadelphus also began the great bronze issues of the system. Ptolemy III. (Euergetes I. c. 247-223) struck gold octadrachms with his own portrait, wearing a crown of rays. His queen Berenice II., striking in her own right as heiress of the Cyrenaica and also as consort, issued a showy currency with her portrait, both octadrachms and decadrachms like those of Arsinoë, and a coinage for the Cyrenaica of peculiar device. Under Ptolemy IV., Philopator (222-205) the gold-
coined octadrachms are continued with his portrait and that of Arsinoë III. Ptolemy V. (Epiphanes, 205-181) still strikes octadrachms with his portrait and with that of Arsinoë, and begins the con-
tinuous series of the tetradrachms of the three great cities of Cyprus. The coinage thenceforward steadily degenerates in style and eventually also in metal. In the latest series, the money of the famous Cleopatra VII., it is interesting to note the Egyptian variety of her head, also occurring on Greek imperial money and on that of Ascanol. Under the Roman rule the imperial money of Alexandria, the coinage of the imperial province of Egypt, is the most remarkable in its class for its extent and the interest and variety of its types. It begins under Augustus and ends with the usurper or 
patriot Achilleus, called on his money Domitius Domitianus, 
overthrown by Diocletian (A.D. 297), thus lasting longer than 
Greek imperial money elsewhere. In the earlier period there are 
base silver coins continuing the base tetradrachms struck by 
Auletes, and bronze money of several sizes. Most of the coins are 
dated by the regnal years of the emperors, the latter L. being unused. Under the Romans the types are very various, and may be 
broadly divided into Greek, Graeco-Roman and Graeco-
Egyptian. The Graeco-Roman types have the closest analogy to 
those of Rome herself; the Graeco-Egyptian are of high 
interest as a special class illustrative of the latest phase of 
Egyptian mythology. These native types, at first uncommon, 
from the time of Domitian are of great frequency. The money 
of Trajan, Hadrian and Antoninus Pius is abundant and 
intriguing. A coin of Antoninus, dated in his sixth year, records 
the beginning of a new Solstitial cycle of 1460 years, which 
happened in the emperor's second year (A.D. 139). The reverse 
type is a crested crane, the Egyptian bennu or phoenix, with 
a kind of radiate nimbus round its head, and the inscription 
AINON. Under Claudius II. (Gothicus) and thenceforward there 
is but a single kind of coin of bronze washed with silver. In 
this series we note the money of Zenobia, and of her son 
Vabalathus. Coins bearing the names and local types of the names of Egypt were struck by a few emperors at the Alexandrian mint. Their 
metal is bronze, and they are of different sizes. 
Passing by the unimportant coinage of the Libyans, we reach the interesting series of the Cyrenaica, the only true Roman 
coinage of Africa. It begins under the line of Battus about the 
middle of the 7th century, and reaches to the Roman rule as 
far as the reign of Augustus. The coins were issued at Cyrene, 
Barca, Euesperides and smaller towns. The weight of the gold 
always, and of the silver until some date not long after 450 B.C., is 
Eubolos; afterwards it is Phoenician. The ruling types are the 
silphium plant and its fruit, and the head of Zeus Ammon, first 
bearded (Pl. II. fig. 23) then beardless. The art is vigorous, and 
in the transitional and fine period has the best Greek qualities. In 
the last fine series of the 4th and 3rd centuries, Greek 
The oldest coins are unindexed, so that it cannot always be 
said at which mint they were struck. The money with the name of Cyrene comprises a fine series of gold Attic stater and silver 
tetradrachms. It was an important mint of the Ptolemies. Barca 
has a smaller coinage then Cyrene. It comprises a wonder-
ful tetradrachm (Phoenician), with the head of Ammon bearded, 
boldly represented, absolutely full face, and three silphiums 
joined, between their heads an owl, a chameleon and a herboa. 
The money of Euesperides is less important. 
Syrita and Byzacena offer little of interest. Their coins are 
late bronze, first with Punic inscriptions, then in imperial times 
with Latin and Punic or Latin. Latin and Greek are used in the 
same coins at Leptis Minor in Byzacena. 
In Zeugitana the great currency of Carthage is the last repre-
sentative of Greek money, for, despite its Orientalism, its origin is 
Hellenic, and of this origin it is at first not unworthy. Its 
coins begin about 380 B.C., when the Carthaginians invaded Sicily, 
and 247-223) 

Carthage, 

This, and certain gold coins with similar types, were issued 
itself, called "Camp," and afterwards continued to also. The types are of the coinage of Sicilian cities, especially Syracuse; but they show also distinct 
Punic motives, such as a lion before a palm-tree, or a head of a 
Punic woman. The Punic type of the Sicilian money is of the types, 
that of Motya, Sulcis, Eryx; others name "Carthage," "the 
Camp," "the Paymasters," many, inscribed Zis, were issued from 
Panormus. The coinage from about 340 to 242 B.C., perhaps all 
issued at Carthage itself, is scanty; the types, head of Persophone 
and a horse, or horse and palm-tree, now come in, and prevail to 
the end of the independent coinage. 
The acquisition of the Spanish mines about 241 caused the issue of a large coinage, but the gold and 
silver soon degenerate into electrum and potin. The metropolis, 
Sicily, has the various series (excepting the Siculo-Punic) is obscure, but 
the standard seems to be Phoenician. The late silver 12-drachm pieces 
and some of the bronzes are among the heaviest struck coins of the 
ancients. The art of the earlier coins is sometimes purely Greek 
of Sicilian style. There is even in the best class a curious tendency 
to exaggeration, which gradually develops itself and finally becomes 
very barbarous. Roman Carthage has a bronze coinage which is 
insignificant. There are a few other towns which issued money 
with Roman legends, such as Utica. The denarii of Claudius Macer, 
which revolted in A.D. 68, are curiously illustrative of his policy, which 
was to let the Romans rule 

The cities of Numidia and Mauretania have a late bronze coinage; but an interesting series of silver and bronze coins is attributed 
with more less certainty to the Numidian kings (202-148), to Juba I. (60-46 B.C.), and to the 
Mauretanian kings from Syphax (213-202 B.C.), to Juba II. (who also struck coins with his consort Cleopatra, 
daughter of Mark Antony and the famous Egyptian queen) and 
Ptolemy their son, the last of the great family of the kings of Egypt 
(A.D. 25-40). 

II. ROMAN COINS 
The Roman coinage is of two great classes,—the republican 
and the imperial; the first lasted from the origin of money 
at Rome to the reform of Augustus in 16 B.C., and the second 
from this date to the fall of the Western empire in A.D. 476. 
The evidence of the coins themselves as to the origin of the 
republiean coinage is at variance with that of the ancient writers; 
but the general principles of criticism must be maintained here 
as in other matters of early Roman story. 
The tradition which ascribed the introduction of coins bearing 
types to Servius Tullius must be unhesitatingly rejected. The 
type and style of the earliest Roman coins point clearly to a 
date not earlier than the middle of the 4th century. The native 
copper which the Italians used from primitive times as a sort of 
medium of exchange, in amorphous blocks (aes rude) was 
probably not a state-currency, being produced by primitive 
smelting, and was not of uniform nature: and Campania under 
her rule that central Italy acquired a true coinage. This 
must have been about 328 B.C. The history of the republican
the sestertium remained the unit of account. Marks of value occur on all the coins from 269 B.C. for some time onward, except on the smallest bronze and the victoriatius. After the reformation of the bronze had been carried far, it became possible to issue large denominations of a circular form; thus circular bronze decussae (equal each to 1 denarius) are known of various periods, weighing from over 1100 to 650 grammes.

Gold was not regularly coined by the Romans until the close of the republic; but certain exceptional issues must be noticed. The earliest (some time during the first Punic War) consisted of pieces of 60 (Pl. II. fig. 26), 40 and 20 sestertii; they were issued both from Rome and from some external mint or mints. To this series belongs the Punic War issue of Sulla which contained certain electrum coins of 1/3 scruple weight (types: janiform form head, and Jupiter in quadriga). It is to this time that Pliny attributes the fixing of the as at the weight of an uncia, and the valuation of the denarius at 16 instead of 10 asses (although in estimating the pay of soldiers the denarius continued to be given for 10 asses). Finally there is some probability in the attribution to the year 209 of the well-known gold coins of 6 and 3 scruples which have on the obverse a head of the young Janus, and on the reverse two soldiers taking an oath of alliance over a so-called eagle. This alliance was the loyalty to Rome of her Latin colonies (Livy xxvii. 9, 10).

Without following the fortunes of the various denominations, we may note that in 89 B.C. the lex Papiria suppressed all local mints throughout Italy, ordered the reissue of the silver sesterius, and introduced the semuncia (1/4 ounce) standard for bronze. This was just after the close of the Social War, which had been signalized by the issue, on the part of the revolted allies, of an interesting series of coins (denarius and—most troublesome of all—a gold piece) chiefly from Italy, as they called Corfinium. These coins bear in Oscar letters the names of the Italian and military leaders, such as C. Papius Mutilus. In 81 B.C. the regular bronze coinage came to an end, and the denarius remained for a long time the only coin issued by the Roman mint. Roman generals sometimes, however, issued exceptional coins in their own names, such as "bronze sestertiae."

We have already dealt with the earliest gold money of the republic. Another exceptional issue was the gold coin bearing the name of T. Quinctius Flamininus, the liberator of Hellas (struck between 198 and 190 B.C.); but it was minted in Greece and conforming to Greek standards. The earliest Roman aureus proper (those of Sulla) were also struck outside Rome. They weigh 3.5 or 3.66 of a Roman pound. The aurei of Pompaeius were of, those of Julius Caesar 3.5 to the pound. After Caesar's time the weight of the aureus fell to 3.41 lb, under Augustus.

Of the administrative side of the Roman system of coinage little is known but what the coins reveal. The earliest indication of monetary freedom is found in the coins which occur on the obverse before the close of the first Punic War. Then the names begin to appear, at first abbreviated, then at length. Probably the right of coinage was in the beginning vested in the consuls, but it would seem that about the time of the second Punic War it was transferred to a special board of magistrates, the tresviri aere argentio auro flando ferando. Whether they were appointed every year, or only when need arose, we do not know; but it is improbable that there was an annual board until the beginning of the 1st century, if then; and even when annually appointed, they cannot all have exercised their right. On the other hand, there were in some years, as 92 B.C., no less than five moneyers' names in the 162 busts which occur on the reverse of coins struck before the close of the first Punic War. Then the names begin to appear, at first abbreviated, then at length. The type of the period before 209 have already been mentioned. The earliest denarius, quinarius and sesterctium bear a head of the goddess Roma, helmeted, and the Dioscuri charging on horseback, as they appeared at Lake Regillus. The victoriatius has a head of Jupiter and a figure of Victory crowning a trophy. The types of the bronze coins are practically the same as in the earlier period. About 190 B.C. the goddess Diana in her chariot begins to appear on the reverses of some of the denarii. Later, other types gradually encroach on the reverses; first, Victory in a chariot; still later such types as the Juno of Lanuvium in a chariot drawn by goats. This and other types which now begin to relieve the monotony of the series usually have a personal reference, such as the images of a moneyer or a member of the family of a denarius of Sex. Pompeius Fosstitus is seen the shepherd Faustulus discovering Romulus and Remus suckled by the she-wolf. Imaginary or more or less authentic portraits of ancestors, such as Numa, L. Junius Brutus or M. Claudius Marcellus, belong to the same category. An elephant's head on a Macedonian shield, with a coin of M. Caecilius Metellus (c. 94 B.C.), alludes to victories won by Caecili at Panormus (in 251, over Punic elephants) and in Macedonia (in 148). The cult of Venus by the Julian family is illustrated by a denarius of L. Julius Caesar showing Venus with the two Cupids drawn by two Cupids. The surrender of Jugurtha by Bocchus to Sulla is represented on a denarius of Sulla's son Faustus (62 B.C., Pl. II. fig. 27). The type is probably a copy of the design which we know the dictator used for his signet-ring M. Aemilius Lepidus (TVTOR REGIS) crowning Ptolemy Epiphanes, or Paullus Aemilius erecting a trophy, while King Perseus and his two children stand before him, are of other historical types. A contemporary event is commemorated on a special issue inscribed AD FRV(Vmentum) EMIV(ndum) EX S(enatus) C(on-sulto), coined by L. Calpurnius Piso and Q. Servilius Caepio in 100 B.C. Caepio, quaestor in that year, defeated the proposal of Saturninus to sell corn publicly at a nominal price; but the senate voted a special issue of money to meet the strain of the market. On the obverse is a head of Saturn, from whose treasury the funds for the issue were drawn; on the reverse are Caepio and Piso on their official seat, and two ears of corn. Perhaps the most graphic allusion to a contemporary event to be found on any coin is furnished by the cap of liberty with two daggers and the inscription EID(bus) MAR(tibus) on coins of Brutus. Representations of 3 less obviously historical character, as personifications of countries or places (Hispania, Alexandrea) or qualities (Honos and Virtus) or mythological figures (Scylla), are all, it would seem, inspired by some personal interest. Many types will only be explained when more light is thrown in the obscure corners of Roman mythology and ritual; but they will all probably be found to have some personal reference to the moneyer. Roman types of the later republic, therefore, though they may be classified externally as "religious," "historical," "canting," &c., are all inspired by some personal motive. The inevitable outcome of this character was that, when once contemporary portraits were regarded as legitimate on the coin, it speedily became its most important feature. The portrait of Flamininus on his gold coin struck in Greece long remained without a Roman analog. In 44 B.C., by order of the senate, the head of Julius Caesar was placed on the silver coins (Pl. III. fig. 1; the gold coin bearing his portrait is of doubtful authenticity). After Caesar's death portraits occur on coins issued by men of all shades of political opinion, showing that portraiture on coins was not then regarded as the monarchial prerogative, but which became current from A.D. 9 onwards, when it was limited to members of the imperial family.

The history of the imperial coinage is full of metrological difficulties. These arise from the conditions fixed by Augustus (16-15 B.C.), by which the emperor alone coined gold and silver, the senate alone bronze. Consequently the senate was wholly at the mercy of the emperor. Augustus struck the aurei at 42 to the pound, equal to 25 denarii at 84 to the pound (Pl. III. fig. 3). He introduced a new coinage in two metals, the staterius of 4 asses and dupondius of 2, both in fine
Changes under later emperors.

Constantine, probably in A.D. 312 (though some critics attribute the reform to Constantius Chlorus) daring to rectify the gold coinage which had long been quite irregular in weight, reduced the chief gold piece to 2 1/3 of the pound, and issued the solidus (Pl. III. fig. 5), a piece destined to play a great part in civilized history. It was never lowered in weight, though a few centuries later it was of less than half the weight of the parent of the gold coinages of Westerns and Easterns alike throughout the civilized world. The letters OB which are commonly found in the exergue of gold coins from the 4th century on are, however, autograph, and they do not occur on silver coins Postulatum (refined silver). Under Constantius II. (A.D. 337) and Julian the silver coin of 5 lb. was suppressed, and the siliqua of 1/16th of the pound (which had already been issued in small quantities in 325 to 330) took its place. From about 350 there was a system of 4 bronze coins (follii, denarii, centenionalis and sestertius). The last soon disappeared, and under Honorius (395) only the centenionalis remained. Honorius and his successors issued the silver denarius (=10 denarii). The bronze coinage of this time was small and mean. It will be seen that a fuller system of bronze was originated by Anastasius, the Byzantine emperor.

Under Augustus the Roman monetary system became the official standard of the empire, and no local mint could exist without the imperial licence. Thus the Greek imperial money is strictly Roman money coined in the provinces, with the legends and types of the emperors. The emperors were allowed to strike bronze, silver. The kings of the Cimmerian Bosporus enjoyed the exceptional privilege of striking gold, which, however, became rapidly debased. The silver becomes limited about Nero's time, but lasts under the Antonines, and is also found under Caracalla and Macrinus. It is chiefly supplied by the mints of Cappadocia, Antioch and subsidiary mints in Syria, and Alexandria in Egypt. None of these were city-mints, but served the purposes of the provincial government. The bronze increased in mints and quantity in the 2nd century, but, through the debasement of silver, one city after another ceased to strike about the middle of the 3rd. The provincial mint of Alexandria, however, continued to strike until the end of the century. From the coins of the ordinary Greek and other cities under the empire must be distinguished the issues of the Roman colonies. In the west these mostly ceased in Nero's time; in the east they lasted as long as the other Greek coinage. Purely Roman gold and silver was coined in certain of the provinces, in Spain and Gaul, and at the cities of Antioch and Ephesus. When the base silver had driven the Greek imperial bronze out of circulation, Gallienus established local mints which struck pure Roman types. Diocletian increased the number of these mints, which lasted until the fall of the empire of the West, and in the East longer. These mints were (with occasional additions) Londonium (or Augusta), Camulodunum, Treviri, Lugdunum, Arelate (or Constantina), Ambianiun, Tarraco, Carthago, Roma, Ostia, Ravenna, Aquileia, Mediolanum, Sicia, Serdica, Sirmium, Thessalonica, Constantiopolis, Herculea, Nicomedia, Cyzicus, Antioch (ultimately Theopoli) and Alexandria. A few were speedily abandoned.

As regards the internal organization of the mints under the empire, we know, that although the names of the triumviri monetae do not occur on the coins after 15 A.D., they continued to exist (with the title IIIiviri aere angento auro fendo feriundo, although their competence was restricted to the first metal) until probably the time of Aurelian, when, according to a passage from a note by Chonisarius, the imperial treasury superintended the gold and silver coinage; Trajan placed a procurator monetae Augusti of equestrian rank at the head of the whole system, subject to the emperor's rationalis (the chief official of the imperial treasury) and responsible for it both to his nominal and real authority.

The three monetae (of the three metals) appear together on medallions for the first time under Hadrian, and probably indicate the organization of the mints for the three metals in one place. From the middle of the 3rd century onwards a special department is usually occupied with the coins, indicating the various mints, the officinae in each mint, &c. Sometimes these marks form "secret combinations"; thus the letters LV, and BL, some of the three different coins of Diocletian were struck at different officinae, and the letters HP, KOY and AI on three corresponding coins of Maximian, combine into Greek words representing the genitives of the Latin titles Ioius and Hercules assumed by these two emperors.

The obverse type of the imperial coins is the portrait of an imperial personage, emperor, empress or Caesar. The type only varies in the treatment of the head or bust—if male, laureate, radiate or bare; if female, sometimes sometimes veiled, but usually bare. The reverse types of the pagan period are mythological of deities, allegorical of personifications, historical of the acts of the emperors. Thus the coin of Hadrian, besides bearing the figures of the chief divinities of Rome, commemorates by the legend, or from the emperor's progresses, and by actual representations his architectural works. Types often occur purely personal to the emperor, such as the sphinx which Augustus used as his signet, or the capricorn, his natal sign. The most remarkable feature of imperial types is the increase of personifications, such as Abundantia, Concordia, Liberalitas, Pudicitia—for the most part drearily conventional. The inscriptions are either simply descriptive, such as the emperor's names and titles in the nominative on the obverse, or partly or wholly grammatical, and the name of the subject on the reverse; or else they are dedicatory, the imperial names and titles being given on the obverse in the dative and the name of the type on the reverse. Sometimes the reverse bears a directly dedicatory inscription to the emperor. The inscriptions on the earlier imperial coins from Tiberius to Severus Alexander are generally chronological, usually giving the current or last consulsiphip of the emperor and his tribunitian year. It must be noted that Christian symbols first made their appearance on coins in an unsystematic, almost accidental way. The earliest known, on a denarius of 314, when a cross occurs as a symbol on the reverse. In a.d. 320 the Christian monogram is found as a detail in the field at several mints. But the types still remain pagan; these symbols are not introduced by order,
The art of Roman imperial coins, although far inferior to that of Greek, is well worthy of study in its best ages, for its intrinsic merit, for its illustration of bronze craftsmanship, and as a criterion of the moral and religious as well as of the political state of the empire. In the reign of Constantine, the Christian emperor, who held the standard of the cross, the inscription is HOC SIGNO VICTOR ERIS.

Another type of the same reign is the Christian monogram flanked by alpha and omega. Under Julian there is a temporary recrudescence of pagan types; with the revival of Christianity the monogram of type sets in.

The beauty of a coin in the later periods, which resulted from the efforts of medallists, and from the growth of the study of form and line as an academic discipline, is not always to be found in coins struck in its earliest days. In the reigns of Valerian and Gallienus, for instance, we find cameo and intaglio portrait types, and the decadence is evident in the diminution of the size of the figural representation on the reverse.

The coinage of Constantine and his successors introduces a new and prominent class of coins. The portrait of the emperor, who is often shown wearing the crown of the diadem, is usually reduced in size, but is still representative of his majesty. The reverse type is usually a legend, such as: "Ludovicus Augustus," indicating the name of the emperor.

The coinage of Constantine is remarkable for its uniformity throughout the empire, and for the excellence of its execution. But in the reign of his successor, Licinius, we find a marked difference in style, and a more elaborate treatment of the design. The coinage of Constantine was generally considered the best of any period in Roman history.

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ROMAN AND MEDIEVAL COINS.
ORIENTAL COINS.
The style of this age is at first excellent. The medals gave the tone to the coinage. Art had wholly thrown off the rules of the ages before and attained the faculty of portraiture and the power of simply representing objects of nature and art. Great masters now executed medals in gold and silver, and engraved them in precious stones, for the mere love of art, and not for the sake of commerce, and by the beginning of the modern period it was fast falling into the poverty and barbarism in which it has ever since remained. The details of the numismatics of these two periods scarcely deserve the notices of the modern account of the main events.

Money of account.

The whole was the chief and practically the sole coin, the solidus passed from foreign piece into a money of account. The value of the solidus, like the German gulden (shilling) contained usually 12 dimes. As there were 20 shillings to the pound of silver, we obtain the reckoning by f. s., librae, solidi and denarii. The pound contained 12 oz., and its two-thirds was the German mark of 8 oz.

It would be interesting, did space permit, to notice fully the art of this entire class, to examine its growth, and to trace its decline; but, as with that of Greek and Roman coins, we must

Art.

mainly limit ourselves to the best period. This is a space of about a hundred and fifty years, the age of the classical Renaissance, from the middle of the 15th century to the close of the 16th.

The finest works are limited to the first half-century of this period, from a little before 1450 to about 1500, in Italy, and for as long a time, beginning and ending somewhat later, in Germany. The artists that figured are master of the field, and their work had not degenerated into a trade; but with the larger production of the period following the work was more mechanical, and so fell into the hands of the moneyers. The quality of the materials of this period were worthily placed by the side of its sculpture and its painting. Not only have some of its medallists taken honourable places in a list where there was no room for ignoble names, but to design medals was a matter of course for every great Italian artist.

There are, as we should expect, two principal schools, the Italian and the German. The former attained a higher excellence, as possessing more a symbol of the age, and more especially in coins or medals. The object which the artists strived to attain was to present a portrait, or to commemorate an action in the best manner possible, without losing sight of the fitness of the designs to the form and use to which they were to be placed. For the same reason, the attainment of this purpose the style of the later pre-Raphaelites was eminently suited. Its general love of truth, symmetrical grouping, simple dignity, and extremely skillful, but one especially fitted to produce a fine portrait and a good medal. It is to be noted that their idea of portraiture did not depend on such a feeling for beauty as influenced the Greeks. Rather did it set before the moral or intellectual attainments and capabilities, what the Italians called the virilis, of the subject. The German art, as seen in the medals, is mostly the work of carvers in wood or hones, or goldsmiths. It exceds in vigorous, realistic portraiture, and in decorative treatment of heraldic subjects, but is lacking in breadth of style and in the imagination shown by the best Italian medalists. Both these schools, but especially the Italian, afford the best models for a modern design. The finest coins and medals of Italy and Germany have an object similar to that which it is sought to fulfil in the English, and their nearness in time makes many details entirely appropriate. Thus, without blindly imitating them, modern artists may derive from them the greatest aid.

There are some delicately beautiful Italian medals of the 16th century, too closely imitated from the Roman style. A vigorous school, the only great one of modern times, arose in France before the close of the 16th century and lasted into the next. It was rendered illustrious by Dupré and the inferior but still powerful Warin. From this age until the time of Napoleon there is nothing worthy of note. The style of his medalists is the weakest classical manner then in vogue, but yet is superior to what went before and what has followed.

The 内容 intended here to enter in any detail into the various divisions of the subject already treated in its main outlines. The questions that would require consideration are of too complicated and detail to be treated in a space limited as this is; the principal matters of inquiry may, however, be indicated.

We begin with a survey of the transitional coinages in the various countries of the West. They cover the period from the 5th to the 8th centuries, and are of immense historical significance. The types throughout are monotonous: the bust of a Roman emperor or local ruler, a cross of some kind, a Victory, &c. The style is quite barbarous.

The classification of the earliest servile imitations of Roman and Byzantine money rests solely upon provenance and character. The following general series will distinguish these gold (A) The Vandals and the Alaric (477-484) to Gellimer (530-543); the gold is anonymous. (B) The Suevians (Spain, 409-558) had little but imitations of
NUMISMATICS

MEDIEVAL AND

Byzantine gold; but Richar (448-456) issued a denarius in his own name. (C) The Ostrogotths (Italy, 489–553) were preceded by the Herulian Odacert (476–494), who coined silver and bronze; their kings (including Theodoric, 493–526, and Totila or Badulla, 541–553) issued solidi from Rome, Ravenna, Milan, &c. (D) The Lombards (Italy, 568–714) had no coins in their own names before Grimoald, duke of Beneventum (662–671); later there are gold solidi and thirds and silver from many mints. Gold was issued for the duchy of Beneventum in the 8th century. (E) The Burgundians (Gaul, to 534) first issued recognizable coins under Gundobald (473–516). (F) The Visigoths (South Gaul and Spain) had imitative gold thirds in the 5th and 6th centuries; the kings’ names appear from Leovigild (573–586) to Roderic (710–711). Sixty-one mints were five penates (20). The Merovingians (in gold, solidi and thirds) and silver sceattas (treasure, Ger. Schacht) of about 20 grains troy, and stycas (= pieces, Ger. Stück), first of silver, then of copper. The gold is rare and confined to the south; only two solidi are known, imitations of Honorius, with runic legends on the reverse. The types of the gold thirds, as of the coinage in other metals (which does not begin until the 7th century), are derived more or less directly from Roman. Some of the inscribed sceattas bear the name of London in Roman letters; others, in runes, the names of Epis and Peada (who is perhaps the son of Penda) in Mercia; some (d. 869) were also issued in East Anglia towards the end of the 8th century. But the sceatta was superseded by the penny introduced by Offa (757–796). Offa also struck a gold coin, bearing his name and an inscription copied directly from an almost contemporary Arab coin; but this is quite an exceptional issue, represented now by a unique specimen. The stycas, which begins c. 670, was characteristic of the Northumbrian coinage, lasting, long after the introduction of the penny farther south, down to the Danish invasions of the second half of the 9th century. A series was issued by the archbishops of York. Wigmund (857–854) struck a gold solidus inscribed MVNVS DIVINVM, copied from the solidi of Louis le Debonnaire, and evidently meant for a religious purpose (PI. III. fig. 11). For the whole question of Anglo-Saxon coins see BRITAIN: Anglo-Saxon. (I) The Frisians had a small coinage of gold thirds (imitated from Byzantine), and one with the name of Audulfus also exists (end of the 6th century?). The chief mint was probably Docuem.

We now proceed to consider the coinages of the various countries from the 8th century to modern times. The coinage of the Visigoths of Spain, after the expulsion of the Moors, with Alphonso I. (1031); it is exclusively religious, and not of great interest except as affording indications of the wealth and commercial activity of the state in the early part of the 18th century. The coinage of Spain, after the reconquest from the Moors, is almost without exception gold. The kingdom of Navarre had a coinage from the time of Sancho III. (1003). The series of Castile and Leon begins with Alphonso VI. (1053) with deniers and obols. Aragon first has coins under Sancho Ramirez I. (1063). Gold (imitated from Moorish money) is introduced in the middle of the 12th century. A 12th-century coin was about 22 mm in diameter. The Spanish dollar of the 17th and 18th centuries was one of the most widely circulating currencies in the West (see Pl. V. fig. 5). The medals of Spain are not important.

In 1755 Pippin abolished the gold coinage of his Merovingian predecessors and introduced the silver denier (see PI. III. fig. 10); the coinage became a royal prerogative once more, and was confined to a few mints. The denier, which at first weighed c. 1·28 grammes (191 grammes), was for centuries the most important of European silver coins. Under Charlemagne and his weight was slightly raised; the Carolingian establishments and there are other modifications in the types. Charlemagne also issued money from various Italian, German and Spanish mints. He also introduced the obol, and struck gold (chiefly at Italian mints). Among his types must be noted the temple with the inscription XPISTIANA RELIGIO. Louis le Debonnaire (814–840) was the last Carolingian to strike gold. In the 9th century are perceptible the first traces of the movement which led to the extensive feudal coinage. The advent of the house of Capet made no great change in the system, but the feudal issues now became numerous. The issue of the abbey of St Martin at Tours (denier tournois); the royal coinage was known as the monnaie paris. St Louis (1226–1270) effected a great reform late in his reign, making the sou (hitherto a money of account) into a real coin as the gros (see Pl. III. fig. 14), and introducing a gold coinage. Henceforward the coinage increases in complexity; in the 14th century it had great artistic merit (see PI. III. fig. 17). The French medals are far more interesting than the modern coins. The earliest of artistic importance not by Italian artists show nevertheless strong Italian influence (medals of Charles VIII. and Anne of Brittany, of Phillibert of Savoy and Margaret of Austria). A series of large medallions of the Valois is attributed to Germain Plon. The most characteristically French artists are Guillaume Dupré (working 1595–1643) and Jean and Claude Warin (middle and second half of 17th century). The long historical series of Louis XIV. has no artistic value; but that of the Napoleonic period shows great technical ability on the part of artists like Andrieu, in spite of the false classicalism of their designs.

The silver penny was introduced into England by Offa, king of Mercia (757–796), following the lead of Pippin in France (see IBID. 1795, 10). Offa (757–796) coined a double silver penny called the penny (1·22 grammes), at which it long remained. The types were usually, over the king’s head, or some form of cross or religious symbol; reverse some form of cross, religious symbol or ornament. The inscriptions gave the names of the king and of the moneyer, later also the mint. An important gold coin of Offa was imitated from an Arab dinar of 774, with the addition of the words OFFA REX. The Mercian coinage ends about 874. The pennies of the kings of Kent extend from 765 to 825; the archbishops of Canterbury went on striking to the beginning of the 9th century. The East Anglian regal series of Alfonso III., King of Portugal (1139–1185) and of his son Alfonso IV. (1185–1223), was of much interest. The coinage of the king was of similar type to the existing shilling. The type is generally termed the "penny," and is made of copper, usually cut into halves and quarters among the lines of the cross to make small change. During the reign of Stephen the monitory is relieved by a few issues by barons like Robert, earl of Gloucester. The number of mints is much reduced by the time of Henry III., and the moneys cease
to sign the coins in Edward I's reign. Henry III. made an abortive attempt to introduce a gold coinage, which was successfully established by Edward III. in 1343, with the gold florin, and in 1344 with the gold noble (see Pl. III. fig. 20). (The obverse type of the noble, the king in a ship, is generally thought to refer to the victory of Sluys in 1340.) He also introduced the silver groat (4d.) and half-groat. The English coinage, both gold and silver, was now of such high quality and reputation that it (especially the silver sterling) was largely exported and imitated, chiefly in the Low Countries. The gold coinage of Edward III. is perhaps the most successful, from an artistic point of view, in the English silver of the reign of his grandson Edward the Black Prince (see Pl. IV. fig. 7), a design not very complicated. Edward IV. distinguished his noble by a rose on the obverse and a sun on the reverse, and introduced a new gold coin, the angel. The Tudor period is distinguished by the splendid, variety and size of the coins; Henry VII. introduced the sovereign of 20s. (240 grains) and the shilling, and on his coins the first serious attempt at portraiture is found (see Pl. III. fig. 21). Under Henry VIII. the quality of the silver money declines, being not effectually restored until the reign of Elizabeth, when an unsuccessful attempt was made to introduce a copper coinage. (The Bing, or Cindy, is of these coins, and the pattern coinage does not begin until the next reign. The use of the mill, as distinct from the hammer, was begun in 1562, but it took just a century to oust the old-fashioned method. In 1613 John, Lord Harrington, obtained a patent for the issue of copper farthings, and private tradesmen's tokens were prohibited. The gold sovereign of James I., from its inscription (FACIAM EOS IN GENTEM VNAM) and the fact that it was meant to circulate on both sides of the Border, was known as the unite. The coinage of Charles I. presents great varieties owing to the civil war. The best workmanship is seen on the milled coins issued by the Royalists. But the majority of the money was struck in London at the Royal Mint. The scarcity of gold in the royal treasury during the troubles induced the king to coin twenty- and ten-shilling pieces of silver, in addition to the crowns and smaller denominations. Gold three-pound pieces, or triple-units, however, were issued from the Oxford mint. One of the most remarkable of his pieces is a crown struck at Oxford by Rawlins. It bears on the obverse the king on horseback, with a representation of the town beneath the horse, and on the reverse the heads of the "Oxford Declaration." The so-called "Juxon medal," given by Charles II. to William Juxon, bishop of London, was probably struck by Rawlins (see Pl. V. fig. 1). Of equal interest are the sieges-pieces of many castles famous in the annals of those days. They are mostly of silver, often mere pieces of plate with a stamp; but Colchester and Pontefract issued gold. The coinage of the Commonwealth is of a plainness proper to the principles of those who sanctioned it. The great Protector, however, caused money to be designed of his own bearing his head. It is not certain that this was ever sent forth, and it is therefore put in the class of patterns. Simon, the chief of English medallists, designed the coins, which are unequaled in the whole series for the vigour of the portrait (a worthy presentation of the head of Cromwell) and the beauty and fitness of every portion of the work. The finest coin produced under Charles II., and technically the best executed piece in the whole English series, is the "Petition Crown" (see Pl. V. fig. 2), a pattern by Simon, to which, however—for political reasons—the work of Jan Roettier was preferred. Maudy money was first struck in this reign, and the name guinea was now applied to the 20s. piece. In 1672 a true copper coinage of halfpence and farthings was introduced. Henceforward there is a decline in the coinage, although skill is perceived in the portrait of William III., whose grand features could scarcely have failed to stimulate an artist to more than a common effort. Queen Anne's money is also worthy of note, on account of the attempt, on Dean Swift's suggestion, to commemorate current history on the copper coinage, which led to the issue of the famous farthings (see Pl. V. fig. 4). These have been the cause of an extraordinary delusion, to the effect that a very small number (some say three) of these pieces were struck, and that their value is a thousand pounds each, instead of usually some shillings. Worth-
The money of Ireland is more scanty and of less importance than that of Scotland. The pieces most worthy of notice are the silver pennies of the early Danish kings, the earliest being that of Sihtric II. (989-1029), copied from contemporary English pennies. The Anglo-Irish coinage begins in 1177, when John as lord of Ireland received the right of coinage. A copper coinage was introduced as early as the reign of Henry VI. The quality of the Irish coinage was exceedingly poor in the 16th century, especially under Elizabeth. Between 1642 and 1647 various kinds of money were issued, including the only gold Irish coin, the Irishquaque, produced under his express authority. James II. issued enormous quantities of coins of necessity made of gunmetal or pewter. The latest Irish coins were the penny and halfpenny of 1822.

The Isle of Man had a regular copper coinage, beginning in 1709 with pence and halfpence under the Derby family, continued by the James, duke of Athol (issue of 1758), and by the English sovereigns until after his expulsion. In 1815, the Isle of Man adopted the three-legged symbol, with the motto Quocunque jeceris stabit.

Belgium occupies the next place in our arrangement. Its coinage, which, except for the few mints operating under the Merovingians and Carolingians, does not begin until the 11th century, comprises many pieces struck by foreign rulers, and has little of an independent character in either the regal or the seigniorial class. The most important coinages are those of the house of Burgundy and Charles V. and his son, and of the bishops of Liége. In character the coinage of Belgium approximates to the French on the one side, the German on the other. About 1400 the Burgundian sovereigns began to strike for his own account a small series of the coinages of the Roman emperors, of which two (those of Constantine and Heraclius) have come down to us; these form a link between the late Roman medallion and the Italian medal of the Renaissance. The series of Holland is similar in character until the period of the revolt of the provinces. The Dutch dollars of the 16th to the 18th centuries had an immense circulation (see Pl. V. fig. 3). Among the early Dutch medallists must be mentioned Stephen H., generally without reason known as Stephen of Holland (working 1555-1572), whose portraits show great charm. The Dutch historical medals are of great interest, more especially those which were struck by the Protestants in commemoration of current events. There is also a remarkable series of bronze medalllets or jettons, which form a continuous commentary on history during the 16th and early part of the 17th centuries. Both are interesting as largely illustrating not only local events but also those of the chief European states. Such are the pieces recording the raising of the siege of Leiden, likened to the destruction of Sennacherib's army, the assassination of William the Silent, and the discomfiture of the Armada, affording striking indications of the zeal, the pieté and the confidence in the right which built up the great political structure of the Dutch republic. After this time the medals lose much of their interest.

The money of Switzerland illustrates the varying fortunes of this central state, and the gradual growth of the stronghold of European freedom. First we have the gold money of the Frankish kings, among whose mints Basel, Lausanne, St Maurice-en-Vahls and Sitten (Sion) already appear. The silver denominations, which Charlemagne made the coinage of the empire, are issued by fewer mints; the dukas of Swabia began to strike at Zurich in the 13th century, and the empire granted during the 10th and to the 13th century the right of coinage to various ecclesiastical foundations, bishoprics and abbeys. Bern was allowed a mint by the emperor Frederick II. in 1218, and other towns and seigneurs subsequently gained the same right. The demi-bracteate appears about the middle of the 11th century, and about 1125 is superseded by the true bracteate, which lasts until about 1300. The 14th century witnessed the rise of the Swiss confederation, and by degrees the cantons struck their own money. These, together with the coins of some few seigneurs, form the bulk of Swiss money of the medieval and modern periods. The separate cantonal coinage, interrupted by the French occupation, was finally suppressed in 1848, when a uniform currency was adopted by the whole republic. The monetary systems of the cantonal and ecclesiastical mints were extremely complicated. This was partly due to the variety of coins, partly to the debasement practised by the ecclesiastical mints. Geneva had a peculiar system of her own.

Italy, with Sicily, has peculiar features. Here the barbaric coinage were mixed with the Byzantine issues which marked the recovery of the Eastern empire, and left a lasting influence in the north at Venice, and in the south at Beneventum. Later the Arab conquest left its mark in the curious Oriental coinages of the Normans of Sicily and the emperor Frederick II., mixed after his fashion with Latin coinage. The earliest money is that of the barbarians, Ostrogots and Lombards, and local Byzantine issues in Sicily. This is followed by the deniers of Charlemagne and his successors, supplanted by the gold currencies of the Normans and Frederic III. The age of the free cities is marked by the great coinages of Florence, Venice and Genoa, while the Angevien and Aragonese princes coined in the south, and the popes began to issue a regular currency of their own at Rome. The Italian princes of the next period coined in Savoy, and at Florence, Modena, Mantua and other cities, while Rome and the foreign rulers of the south continued their mintages, Venice and Genoa of the republics alone surviving. The Italian monetary systems have already been touched on in the introductory notice. For art the series is invaluable. First in Italy the revival influenced the coins, and in them every step of advance found its record. The Italian medals are without doubt the most important in the whole of Europe.

Following the geographical order which is best suited to the Italian coinage, we first notice the money of Savoy, which is inferior in art to that of the rest of the country. It begins with Umberto II. (1086); in 1170 the dukas became kings of Sardinia, and their coinage merged eventually in 1861 in that of the kingdom of Italy. Genoa is the first of the great republics. She obtained the right of coinage from Conrad II. in 1139, and struck gold coins from the time of the general origin of civic coinage in that metal; these are ducats and their divisions, and after a time their multiples also. In the 17th century there are very large silver pieces. In the money of Mantua there are fine coins of Gianfrancesco III. (1484-1519) and Vincenzo II. (1627-1628), these last splendid examples of the late Renaissance, large pieces of gold and silver; the portrait is fine, and the bound on the reverse a powerful design. The vicissitudes of the story of Milan find their record in no less than ten groups of money—Lombard regal coins, Carolingian deniers, money of the republic (1260-1310), next of the Visconti family (1329-1447), succeeded by the republic (1447-1450) and by the Sforza line, next of Louis XII. and Francis I. of France, of the restored Sforza, of Charles V. by Spanish right and his successors of Spain, and lastly of Austria. There are extremely fine coins of the 15th century, showing great beauty in their portraits (see Pl. III. fig. 22). The money of Florence is disappointing in its art. The Athenes of the middle ages had the same reason as her prototype to preserve as faithfully as might be the types and aspect of her most famous coin, the gold florin (see Pl. III. fig. 8), and thus those who expect to see in this series the story of Italian art will be much disappointed. The silver florin was first struck in 1189. It is heavier than the denier, weighing about 27 grains, and bears the lily of Florence and the griffon of the Medici. The florin was heavier than the ling pieces, the flower never changing, but the representation of the saint being varied. On the gold florin, first issued in 1252, the Baptist is represented standing, while in the contemporary silver florins he is seated. In the 14th century the arms of a moneyer appear in the field, two such officers have had the right of striking yearly, each for six months. The coins of the duchy from 1532, in spite of their new types, are not a fine series; the best are those of Alessandro, designed by Cellini.

Venice as a mint even surpasses Florence in conservatism, and, the early style being distinctively Byzantine, this is the more striking in a great artistic city. We find Venice as an imperial mint issuing Carolingian deniers, but the doges begin to coin, placing their own names on their currency, in the 12th century.
MODERN COINS AND MEDALS.
PLATE VI.

NUMISMATICS

ITALIAN MEDALS.
The most famous silver coin, the matapan, was first struck in the brilliant time of Enrico Dandolo (1192–1205). This coin is a grossus weighing about 33 grains, with on the obverse St Mark giving the standard or gonfalon to the doge, both figures standing, and on the reverse the famous figure of the Saviour. The famous Venetian zecchino or sequin (see Pl. III. fig. 9), the rival of the florin of Florence, appears to have been first issued under Giovanni Dandolo (1284). On the obverse St Mark gives the gonfalon to the kneeling doge, and on the reverse a standing figure of the Saviour within an oval nimbus. Niccolo Trono (1421–1473) introduces his portrait on most of his coins, but this custom is not continued. By the latest part of the 15th century large silver coins appear. The archaic changes in the beginning of the 16th century, but there is no later movement. The large silver pieces increased in size, and large gold pieces also. The last doge, Ludovico, St Peter (1788–1797) issued the 100 sequin piece in gold, a monstrous coin, worth over 450. The doges of Venice from 1521 to 1797 issued a peculiar silver token or medallet, the osella, five of which they annually presented to every member of the Great Council. They replaced the wild ducks (uccello) which it had been customary to present at Christmas. Two dogareseas struck similar medallets. Their types are usually allegorical; some are commemorative.

The series of the coins of Rome is rather of historical than of artistic merit. The popes begin to strike money, with Adrian I. (A.D. 858), his son Hugon (867), and those whose deniers are in a Lombard style. The coins of his successors, with few exceptions, down to Leo IX. (1046) associate the names of pope and emperor. From Leo IX. to Urban V. (1362) there is no papal coinage at Rome. The papal series continues from 1188 onwards. We then see on the silver the style of the senate and Roman people, and ROMA CAPUT MUNDI. Some coins have the figures of St Paul and St Peter, others Rome seated and a lion. Charles of Anjou, king of Sicily (1265–1283), strikes as a senator, and Cola di Rienzo (1347–1348) as tribune. The gold ducat of about 1300 imitates the type of a Venetian sequin. St Peter here gives the gonfalon to a kneeling senator. The arms of the moneying senator next appear in the field. The papal coinage is resumed at Avignon; and Urban V., on his return to Rome, takes the sole right of the mint. From Martin V. (1417) to Pius IX. there is a continuous papal coinage. The later coins, though they have an interest from their bearing on the history of art, are disappointing in style. There is indeed a silver coin of Julius II. struck at Bologna and attributed to Francis, with a very fine portrait. We have beautiful gold coins of Giovanni Bentivoglio (see Pl. III. fig. 23), lord of Bologna, who then overran the Papal States. His mint of Cagli, in the Apennines, remained at his post after Julius II. had taken the city. There are also pieces of Clement VII. by Cellini, vigorous in design, but careless in execution. There were papal mints at Ancona, Bologna, Piacenza, Parma, Ferrara and other Italian towns; and coins were also struck at Avignon from 1432 to 1700. The papal portraits are highly characteristic and interesting. It is, however, in the fine series of papal medals that we find a worthier artistic record.

The coinage of Sicily, afterwards that of the Two Sicilies, or Naples and Sicily, begins with the Normans. There is a curious series of gem coins. It begins with Robert Guiscard, as duke of Apulia (1075) and Roger I. of Sicily (1072). The gold money is almost wholly Arabic, though Roger II. struck the Latin ducat, the earliest of its class; the silver is Arabic, except the great Latin scaphati of Roger II. with Roger III.; the copper is both Latin and Arabic. The gold series (Augustales) of the emperor Frederick II. (1198–1250) shows the first sentiment of reviving classical art, its work being far in advance of the age. These are Latin coins; he also struck small Arabic pieces in gold. Under Conrad and Manfred there is an insignificant coinage, copper only, but with Charles I. of Anjou (1266–1285) the gold money in purely medieval style is very beautiful, quite equal to that of his brother, St Louis of France. After this time there is a great issue of gigliati, silver coins with, for reverse, a cross fleurdelis cantonned with fleurs-de-lis. These coins acquired a great reputation in the Levant, and were even struck by the emirs of Asia Minor. With Alphonso, the founder of the Aragonese line, we note the old style of the coins, which are in singular contrast to his fine medals. Good portraiture begins on the money of Ferdinand I., his successor. The later coinage is interesting only for its illustration of the varying fortunes of the Two Sicilies. The curious early gold coinage of the Lombard dukes of Beneventum, which follows the Byzantine type, has been mentioned under the transitional series; the dukes and princes of Beneventum and the princes of Salerno continued to issue coins (sometimes gold, usually deniers) down to the middle of the 11th century.

Italian medals (Pl. VI.) are next in merit to the works of the Greek die-engravers. Certain small pieces of a medallic character were made in Italy, as early as the 14th century, and there existed also large cast and chased pieces representing various Roman emperors (perhaps Burgundian work of the 14th century), which influenced the beginnings of the true medal. This began, and also reached its highest excellence, with Vittore Pisano (Pisanello), the Venetese painter, whose medals date from 1438 (or earlier) to 1449. The finest work of Italian medalists is seen in the cast medals of the 15th and early 16th century; with the increase of classicism in the 16th the style declines rapidly. The earlier medals are independent works, marked by simple vigorous and characteristic; the expression of character and virtù takes precedence over ideal beauty, especially in the work of the Florentine school. As the art became popular the execution of medals passed into the hands of inferior artists, and by degrees striking became usual for the smaller pieces; at the same time, a slavish imitation of the classical style weakened or destroyed originality and stamped the works with the feebleness of copies. The greatest medalists of the first age are Pisano, Matteo de' Pasti, Enzola, Boldù, Sperandio, Guazzalotti, Bertoldo, Gambello, Niccolò di Niccolò of Lucca, Candido da Trastevere. Some of the most beautiful medals, however, are by unknown artists (Pl. VI. fig. 2). In the 16th century must be mentioned Pomedello, Benvenuto Cellini, Leone Leoni, Giovanni Cavino “the Paduan,” Pastonero of Siena, Giacomo da Tresso, Pietro Paolo Galleotto, called Romano, and Antonio Abbondio. Incomparably the finest of all Italian medals are the works of Pisano, particularly the medals of Alphonso the Magnanimous, with the reverses of the boar-hunt and the eagle and lesser birds of prey, those of Sigismondo Malatesta, his brother surmounted Novello (see Pl. VI. fig. 1), Leonello d’Este, John VIII. (Palaeologus), Nicolò da Lézze, Guglielmo Niccolò Gonzaga of the same family, the great humanists Vittorino da Feltre and Pier Candido Decembrio. Pisano is great in portraiture, great in composition and design, and marvellously skilful in depicting animals. He alone represents the moral qualities of his subject in their highest expression and even capability. That he has high ideal power is seen at once if we compare with his portrait Pasti’s inferior though powerful head of Sigismondo Malatesta. Pasti’s medal of Isotta, wife of Sigismondo, is also noteworthy, likewise the medal by the otherwise unknown Constantius of Mahomet II., the conqueror of Constantinople—interesting work, but lacking the master’s technical skill and inspiration. An artist of great power is Sperandio of Mantua; but his productions lack the finish necessary to good medallic work, his drawing and composition are careless, and his realism too often becomes brutal or vulgar. The work of Niccolò Fiorentino and of his pupils is astonishingly vigorous in portraiture, but they lack the power of designing reverses (see Pl. VI. fig. 3). In the later age Cavino executed a remarkable series of imitations of Roman sesterii, which have been frequently mistaken for originals. In art these Italian works frequently surpass the originals in spite of a degree of weakness inseparable from copies. A comparison of the Italian with the Roman pieces is thus most instructive. The works of Pastonero of Siena (who had an extraordinary facility in graceful portraiture) are especially charming (see Pl. VI. fig. 4). Historically the Italian
medals supply the defects of the coinages of Florence and Rome, and in a less degree of Venice. The papal series is invaluable as a continuous chronicle, although artistically, after the earliest period, it is monotonous.

The money of Germany is, like that of Italy, far too various for it to be possible here to do more than sketch some of its main features. In the Frankish period mints were in operation at cities in the west, such as Mainz, Strassburg, Spires, Treves, Worms, Cologne. Pippin issued denarii from Strassburg and Mainz; under his successors denarii and obols were also coined at other mints, as Bonn, Cologne, Spires, Treves. After the reign of Louis the Sturmgottes (864–911), the Charlemagne series continued to the day of the Peace of Strassburg with Conrad III. (1138–1152). In the succeeding period, which ends with the introduction of the grossus and the gold coinage under Louis of Bavaria (1314–1347), the uniformity of the currency disappears. In the west (in Lotharingia, including the southern Low Countries, the Moselle and Rhine-lands, in Frisia, Bavaria, parts of Franconia and Swabia) the denier continues; but elsewhere we find the bracteate. The right of coinage is acquired in an increasing measure by the feudatories of the empire. The coinages native to the region, even the imperial coinage is not uniform, but consists of denarii in the west and bracteates in the east. For example, before the 12th century, the fiscal coinage of the Swabians with Conrad III. (1138–1152). In the succeeding period, which ends with the introduction of the grossus and the gold coinage under Louis of Bavaria (1314–1347), the uniformity of the currency disappears. In the west (in Lotharingia, including the southern Low Countries, the Moselle and Rhine-lands, in Frisia, Bavaria, parts of Franconia and Swabia) the denier continues; but elsewhere we find the bracteate. The right of coinage is acquired in an increasing measure by the feudatories of the empire. The coinages native to the region, even the imperial coinage is not uniform, but consists of denarii in the west and bracteates in the east.

The earliest imperial bracteate is of Frederick I.; the large fine bracteates last but a short time, reaching their acme about the end of the 12th century (see Pl. III. fig. 18). The fine pieces of the bishops of Halberstadt and the abbesses of Quedlinburg are characteristic of this class. With the introduction of the regular gold coinage (chiefly florins) and the grossus in the 14th century, Germany enters on the modern period. From the 16th century the thaler (so called from Joachimsthal in Bohemia, where the centres of Schlick first struck the coin in 1518) dominates the currency. Even the imperial coinage is not uniform, but consists of denarii in the west and bracteates in the east. The earliest imperial bracteate is of Frederick I.; the large fine bracteates last but a short time, reaching their acme about the end of the 12th century (see Pl. III. fig. 18). The fine pieces of the bishops of Halberstadt and the abbesses of Quedlinburg are characteristic of this class. With the introduction of the regular gold coinage (chiefly florins) and the grossus in the 14th century, Germany enters on the modern period. From the 16th century the thaler (so called from Joachimsthal in Bohemia, where the centres of Schlick first struck the coin in 1518) dominates the currency. Even the imperial coinage is not uniform, but consists of denarii in the west and bracteates in the east. The earliest imperial bracteate is of Frederick I.; the large fine bracteates last but a short time, reaching their acme about the end of the 12th century (see Pl. III. fig. 18). The fine pieces of the bishops of Halberstadt and the abbesses of Quedlinburg are characteristic of this class. With the introduction of the regular gold coinage (chiefly florins) and the grossus in the 14th century, Germany enters on the modern period. From the 16th century the thaler (so called from Joachimsthal in Bohemia, where the centres of Schlick first struck the coin in 1518) dominates the currency. Even the imperial coinage is not uniform, but consists of denarii in the west and bracteates in the east. The earliest imperial bracteate is of Frederick I.; the large fine bracteates last but a short time, reaching their acme about the end of the 12th century (see Pl. III. fig. 18). The fine pieces of the bishops of Halberstadt and the abbesses of Quedlinburg are characteristic of this class. With the introduction of the regular gold coinage (chiefly florins) and the grossus in the 14th century, Germany enters on the modern period. From the 16th century the thaler (so called from Joachimsthal in Bohemia, where the centres of Schlick first struck the coin in 1518) dominates the currency. Even the imperial coinage is not uniform, but consists of denarii in the west and bracteates in the east. The earliest imperial bracteate is of Frederick I.; the large fine bracteates last but a short time, reaching their acme about the end of the 12th century (see Pl. III. fig. 18). The fine pieces of the bishops of Halberstadt and the abbesses of Quedlinburg are characteristic of this class. With the introduction of the regular gold coinage (chiefly florins) and the grossus in the 14th century, Germany enters on the modern period. From the 16th century the thaler (so called from Joachimsthal in Bohemia, where the centres of Schlick first struck the coin in 1518) dominates the currency. Even the imperial coinage is not uniform, but consists of denarii in the west and bracteates in the east.

German medals perhaps rank next to Italian, although they lack the higher artistic qualities. They are the work of craftsmen —jewellers, wood-carvers, workers in bone-stone—and show great facility of minute workmanship and chasing and decorative design (the last is especially clear in the heraldic reverses); the faults of these qualities are to some extent redeemed by the native German vigour and directness of the portraiture. The original models from which the medals were cast were in many cases made in bone-stone or box-wood, which did not, like the favourite wax of the Italian artists, give much scope for subtlety. The chief centres of the art were Nuremberg and Augsburg. Many medals have been attributed to Albrecht Dürer; whether he did more than design them is uncertain. Among other medallists may be mentioned Hans Schwarz (working 1516–1527), Ludwig Krug, Friedrich Hagenauer (working 1525–1546), see Pl. V. fig. 8, Peter Flötner (c. 1538, although it is doubtful whether this artist, whose plaquettes are famous, made any of the portrait-medals ascribed to him), Mattes Gebel, Hans Reinhart the Elder, &c. Some other good artists are known only by their initials, or quite unidentified. After the middle of the 17th century the coins of Nuremberg and Augsburg, with which we still have skilful artists like Valentin Maler (1568–1603). In this later period striking gradually superseded casting.

The earliest Polish coins are of the 10th century; the types are copied from English, German and Byzantine sources. In the 12th and 13th centuries there is a bracteate coinage. The grossus was introduced about 1230. In later times the town of Danzig, while belonging to the Kingdom, issued remarkable gold pieces, thalers, &c., down to its restoration to Prussia (1793).

The origin of the coinage of the Scandinavian states: Norway, Denmark and Sweden, is clearly English and due to the Danish conquest of England. The runic alphabet is employed, though not by any means exclusively, on many of the early coins of Denmark and Norway. The Norwegian coinage is referred to that of England with the finishing touches of the name of the king; whereas the Norwegian and Danish were united under Eric of Pomerania in 1396. The money of Denmark begins with pennies of Sweyn (985–1014) which are copied from the coinage of England with the finishing touches of the name of the king; whereas the Norwegian and Danish were united under Eric of Pomerania in 1396. The money of Denmark begins with pennies of Sweyn (985–1014) which are copied from the coinage of England with the finishing touches of the name of the king; whereas the Norwegian and Danish were united under Eric of Pomerania in 1396. The money of Denmark begins with pennies of Sweyn (985–1014) which are copied from the coinage of England with the finishing touches of the name of the king; whereas the Norwegian and Danish were united under Eric of Pomerania in 1396. The money of Denmark begins with pennies of Sweyn (985–1014) which are copied from the coinage of England with the finishing touches of the name of the king; whereas the Norwegian and Danish were united under Eric of Pomerania in 1396. The money of Denmark begins with pennies of Sweyn (985–1014) which are copied from the coinage of England with the finishing touches of the name of the king; whereas the Norwegian and Danish were united under Eric of Pomerania in 1396.

The coinage of Sweden is remarkable for the very uniformity of its types, which are in current use to the present day. The money was restored by Albert of Mecklenburg (1363–1387). The modern coinage was introduced under Eric of Pomerania (1396–1432). The money of Gustavus Adolphus is historically interesting. Under Charles XII. there is highly curious money of necessity. The daler is struck as a small copper coin, sometimes plated. The types include
the Roman divinities. At the same time and later there was a large issue of enormous plates of copper, stamped with their full value in silver money as well.

The earliest Russian coinage begins with the princes of Kiev as early as the end of the 10th century; it shows strong Byzantine influence. The grand princes from the early 15th century on issued little silver pieces. The coinage was modernized by Peter the Great, who introduced a regular gold coinage. The silver large and copper coins of his successors are very plentiful. Nicholas I. (1825-1855) introduced a platinum coinage of the several kinds of gold.

The Christian coinages of the northern Balkan States are of great interest. They are chiefly silver gros, showing a mixture of Byzantine and Venetian influences. The Bulgarians had a regular silver coinage from Asen I., (1186-1196) to John Sismans (1371-1395). The Servian coinage lasts from Vladislas I. (1324-1340) to the middle of the 15th century. There is also a coinage of the Ban of Bosna (late 13th century) and of grand-masters at Malta; second group, Latin emperors of Constantinople, Frankish princes and lords of Greece and the Archipelago whose power was due to the crusade of 1204, such as the princes of Achaia, the dukes of Athens, Neapolitan kings who struck money for their Eastern possessions, Latin lords of the Archipelago, the Genoese at Chios, the Galliulesi at Mytilene, the Genoese colonies, the Venetian colonies, the Turkomans emirs of western Asia Minor who struck Latin coins. The most important currencies are the bullion and copper of the princes of Antioch (Bohemund 1, 1068, to Bohemund IV, 1201-1238) and the kings of Jerusalem (Baldwin II, 1118, to Conrad 1, 1243), the silver and copper of the counts of Tripoli (12th and 13th centuries) and the gold imitations of Arab dinars, the currency in that metal of the crusaders of Palestine. These Bisaniti Saraceni, or Saracen beznats, are at first imitations of Fatimite dinars, known to have been struck by Venetian moneyers at Acre, and probably at Tyre and Tripoli also. After these coins had been current for nearly a century and a half they were forbidden on account of their Mahommedan aspect by Pope Innocent IV. The Venetians then issued gold and silver coins with the same aspect but with Christian inscriptions. The kings of Cyprus issued a really good coinage in the three metals and in bullion from Guy de Lusignan (1192) to Catherine Cornaro; from 1489 to 1571 the Venetians issued coins for the island. The coinage of the order of St John begins on the conquest of the island of Rhodes (1309) and the suppression of the Templars; the earliest coins known are of Foulques de Villaret (1305-1310), and the last of the Rhodian series are of Villiers de l'Isleadam, the gallant defender of the island who was forced to capitulate to the Turks and sail for a new home in 1522. The coinage is of fine gold, silver, billon and copper. On the establishment of the order at Malta in 1530 it is resumed there till the capture of the island by the French at the close of the 18th century; it has little interest except as showing the wealth of the order. The other currencies of the crusaders, notwithstanding their great historical interest, are far less remarkable numismatically; the influence of the denier tournois is, however, noticeable on the coinage of the princes of Achaia (1245-1364), and the dukes of Athens (1225-1358).

Of the money of America little need be said here. Neither of the coinages of the Spanish and Portuguese dependencies, and of the states which succeeded them, nor those of the English colonies and of the United States, present much that is worthy of note. In style they all resemble those of the parent countries, but, originating in the decline of art, they are inferior in style and work. They are most remarkable in the south for the abundance of gold and silver. The chief coin is the dollar. Some coins are of historical interest, and there are a few rarities, such as the colonial money of Lord Baltimore struck for Maryland, the pine-tree coins of Massachusetts, and the hog-money of Bermuda.

**IV. — ORIENTAL COINS**

Oriental coins may be best classed as ancient Persian, Arab, modern Persian and Afghan, Indian and Chinese, and other issues of the far East. The first place is held by the money of the old Persian empire, the Parthians and the Sassanians. The conquests of the Arabs introduce a new currency, carried on by the Moslem inheritors of their empire. The modern Persian and Afghan money, thought of Arab origin, is distinguished by the use of the Persian language with Arabic. The Indian currencies, though Greek, Sanskrit, Arabic and Persian in their inscriptions, must be grouped together on account of their mutual dependence. They rise with the Bactrian kings, whose Greek types are gradually debased by the Indo-Scythians and Greeks; these are followed by a group of currencies with Sanskrit legends; next follow the money of Arab conquerors and the great series of the Pathans of Delhi and subsidiary dynasties, with Arabic inscriptions; the main series is continued in the currency of the Moguls, who largely use Persian, and the last series is closed by local currencies mainly with Sanskrit or Arabic legends. The Chinese coinages form the source and centre of the group of the far East, which, however, includes certain exceptional issues. The order throughout is historical, each empire or kingdom being followed by the smaller states into which it broke up, and then by the larger ones which were formed by the union of these fragments.

The Persian coinage was probably originated by Darius I. about the time that he organized the empire in satrapies. The regular taxation thus introduced made a uniform coinage necessary. Avoiding the complex gold system of Crousus, which was intended to accommodate the Greek cities in commercial relation with Lydia, Darius chose two weights, the gold shekel of 8.4 grammes and the silver shekel of 26 grammes. One gold piece was equal to twenty silver. The gold coin was called the daric, the silver the siglos. The metal was very pure, especially that of the daric. Thus not only was the Lydian gold and silver coins of inferior weight thrown out of circulation, but the gold coin became dominant, and was the chief gold currency of the ancient world so long as the empire lasted. The issuing of gold was a royal prerogative, and for minor money the same style was adopted by the kings of the other provinces by satraps, who used local types, and by tributary states. The following classes must be distinguished: (1) regal, (2) satrapal, (3) of tributary states. The art of Persian coins varies according to the different ages, from the style of Croesus to that of the 4th century B.C. The large and smaller types are found at Babylon, the capital of Asia Minor to the more formal style of Cilicia and the thoroughly hieratic stiffness of Phoenicia and Persia.

The regal coinage is of darics (P. IV. fig. 2) and subdivisions in gold and of sigli and subdivisions in silver. The obverse type is the king as an archer, the reverse an irregular oblong incuse. The darics show differences of style, and must extend through the whole period of the empire. The sigli no doubt run parallel with them. Both these denominations are uninscribed.

The satrapal coinage is very important and interesting. It belongs mainly to Cilicia. The most remarkable series is that of Sardis, the capital of Bithynia, which was a large city and an important mint, and contains a combination of the greatest beauty of workmanship and the most elaborate and interesting designs. A full series may be found at Colophon, Cyzicus and Lampacus, and in one instance bearing the name of the satrap Pharnabazus, but usually the word 'king' in Greek. The coin of Colophon shows a splendid portrait, often with an inscription; that from Lampatos is very fine, and that of Pharnabazus (see P. IV. fig. 1). Of other satrapal issues those of Datames, of Tiribazus and Cilician states, struck at Tarsus, are specially noteworthy. Their inscriptions are Aramaic.

The coinages of the tributary states have been but part noticed in their geographical order.

After the fall of the empire, the generals and satraps such as Mazedon, who governed the north-western part, issued Alexander's newly-acquired dominions issued coins from various mints, especially Babylon. The gold coins were double darics of the same type as their single predecessors. The silver coins were mainly modelled on the coins which Mazedon had previously issued in his own name, and some of them are called 'Missar.' Some of them may have been issued as far East as Bactria and North West India. These are followed by the first native coinage, inscribed below under India.
The conquest of Alexander did not wholly destroy the independ-
ence of Persia. Within less than a century the warlike Parthians,
once subjects of Persia, revolted (229–248 B.C.) against
Persia, and founded, for the first time, a Persian empire.
Parthia thus became an empire, ultimately the one successful
rival of Rome. Their money is Greek in standard and inscriptions,
as well as in the origin of types. The coins are silver, following the Attic
weight, and gold, imitating the Electrum coinage of Lydia. They are not
infrequent; there are also bronze coins, but none in gold are known.
The drachm has the head of the king on the obverse,
diademated or diademed, above the reverse legend and name.
Arsaces seated, holding a strong bow, the later tetradrachms varying
in this uniformity. Every king is styled Arsaces, to which many of the
later sovereigns add their proper names. The inscriptions are usu-
ally Greek, but occasionally they are in Parthian.

The Persian line of the Sassanian kings began about A.D. 220,
and rested the empire from the Parthians in 226-227, under the leader-
ship of Ardashir or Artaxeres. This dynasty issued a standard and
national and thus Oriental coinage in gold and silver.
Sassanian. The denominations follow the Roman system, and there
are but two coins, equivalent to the aureus or solidus and the denarius.
The aureus or solidus was a basic coin with a bull's head, usually
elaborate head-dress, varied with each sovereign, and the reverse
the sacred fire-altar (see Pl. IV. fig. 3) ordinarily flanked by the king and
a priest. The attachment which Ardashir, the founder, bore to Zoro-
astrianism, is shown in this national coinage. The first coins of
the four hundred years of the sovereignty of his line to
A.D. 652. The inscriptions are Pahlavi.

The Arab coinage forms the most important Oriental group. It
has a duration of twelve centuries and a half, and at its widest
geographical extension was coined from Morocco to the
borders of China. When the Arabs made their grand con-
quista money became a necessity. They first adopted in the
East imitations of the current Persian silver pieces of the last
Sassanians, but in Syria and Palestine of the Byzantine copper,
in Africa of the gold of the same currency. Of these early coins the Sassanian
silver, or ancient, or imitation coins inscribed with many shorter ones in Arabic (Cuici). The regular coinage with purely
Persian inscriptions begins with the issue of a silver coin at Basrah,
in 40 A.H. (A.D. 660), by the caliph 'Ali; after subsequent efforts thus
to imitate and copy the gold and silver coins of the Tigris-Euphrates
region, the coinage was finally established, in 76 A.H. (A.D. 695), by Abdalmalik. The names of the denominations and the weight of the gold are plainly indicated
by varieties of the figures of a bull engraved on the obverse
(Pl. IV. fig. 6) and a leopard or a lion, a figure, or a square, in the
reverse which mark the coinage.

The earliest silver coinage in the Near East was brought forth
by the Parthians in the first century B.C. and a little later. The
forms of coinage employed by the Parthians were derived
from the forms used in the Seleucid kingdom. The introduction of
the tetradrachm is perhaps the first coinage which is distinctively
Persian. It is a regular coinage with a weight of 11.8 grams and a diameter
about 30 millimeters. The figures of the king on the obverse and the figures
of the bull on the reverse are the principal features.

The Parthians, like the Seleucid rulers before them, issued coinage
with the name of the king on the obverse and the symbol of the
king or a bull, a lion, or a leopard on the reverse. These coins
were usual in the Parthian kingdom, although the Seleucid rulers
also issued coinage with the name of the king on the obverse
and symbols on the reverse. The Parthian coinage was
not widely used outside of the Parthian kingdom, but it
had a significant influence on the coinage of later
kings in the region.

The Parthians were succeeded by the Sassanians, who
continued the coinage of the Parthians but added their own
name to the coins. The Sassanians also issued coinage
with symbols of the king on the obverse and symbols of
the king or the bull on the reverse. These coins were
not widely used outside of the Sassanian kingdom, but
they had a significant influence on the coinage of later
kings in the region.

The Parthians and Sassanians were succeeded by the
Seljuks, who continued the coinage of the Sassanians
but added their own name to the coins. The Seljuks
also issued coinage with symbols of the king on the
obverse and symbols of the king or the bull on the
reverse. These coins were not widely used outside of
the Seljuk kingdom, but they had a significant influence
on the coinage of later kings in the region.

The Seljuks were succeeded by the Mamelukes, who
continued the coinage of the Seljuks but added their own
name to the coins. The Mamelukes also issued coinage
with symbols of the king on the obverse and symbols
of the king or the bull on the reverse. These coins were
not widely used outside of the Mameluke kingdom, but
they had a significant influence on the coinage of later
kings in the region.

The Mamelukes were succeeded by the Ottomans, who
continued the coinage of the Mamelukes but added their own
name to the coins. The Ottomans also issued coinage
with symbols of the king on the obverse and symbols
of the king or the bull on the reverse. These coins were
not widely used outside of the Ottoman kingdom, but
they had a significant influence on the coinage of later
kings in the region.

The Ottomans were succeeded by the British, who
continued the coinage of the Ottomans but added their own
name to the coins. The British also issued coinage
with symbols of the king on the obverse and symbols
of the king or the bull on the reverse. These coins were
not widely used outside of the British empire, but
they had a significant influence on the coinage of later
kings in the region.

The British were succeeded by the United States,
who continued the coinage of the British but added their own
name to the coins. The United States also issued coinage
with symbols of the king on the obverse and symbols
of the king or the bull on the reverse. These coins were
not widely used outside of the United States, but
they had a significant influence on the coinage of later
kings in the region.
Regarding the coinage of the Scythians of Central Asia between 450 B.C. and 300 B.C., the Scythians were known for their extensive trade networks, which included the production and circulation of a variety of coins. The Scythians were also known for their military conquests, which were often financed by the sale of loot captured during their campaigns. The Scythian coinage was characterized by a high degree of variability, with different regiments producing their own distinctive coins.

The Scythian coinage was often made of silver and gold, and was divided into a variety of weights and types. The Scythians were also known for their use of animal motifs, such as the stag, which was often depicted on their coins.

The Scythian coinage was not only used in Central Asia, but also in other parts of the ancient world, including the Roman Empire. The Scythian coinage was known for its high degree of variability, and was often imitated by other coinage systems.

Despite the Scythian coinage's success, it eventually declined in the 3rd century B.C., as the Scythian empire disintegrated. The Scythian coinage was replaced by other coinage systems, including the Greek, Roman, and Persian coinage systems.

However, the Scythian coinage had a lasting influence on the coinage systems of the ancient world. The Scythian coinage's use of animal motifs and its high degree of variability are examples of the ways in which the ancient world learned from and adapted to the Scythian coinage.
far more elegant than that of the Pathans, but the money of the former is more refined. This may be due, in part, to the influence of zodiacal motifs and repoussé, as well as to the more refined workmanship of the coiners of the Pathan empire.

NUMISMATICS

The regular copper coinage, Chinese in pattern, began with the explication.

The coins of the Java, 19), are small and of a style similar to that of China, and Chinese coins were long the currency of Java, which more recently has issued the money of its Mahometan empire.

The empire of Japan shows in its coinage that Chinese source is modified by the influence of native independence which marks all its institutions. The use of a metallic currency probably shows strong Chinese influence. Amongst the earliest are rude silver pieces, disks of somewhat irregular shape, with a central hole, attributed to the 5th century B.C., and there are also copper coins of similar character dating from the end of the 7th century. A

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adopted for the gold and silver in 1893, new reverse types were prepared for the half-crown, florin, and shilling, and the issue of the double florin was discontinued. The portrait of the queen was the work of the sculptor Thomas Brock, R.A., who was careful to avoid the defects which had been somewhat severely criticized in Sir J. Edgar Boehm’s design of 1887. The new type for the half-crown, a spade-shaped shield within the garter, was also executed by Mr Brock; and those for the florin and shilling, three shields placed triangularly, were by Sir Edward Poynter. In 1895 a new issue of bronze money was ordered, when the queen’s bust of 1893 was adopted, and a slight alteration made in the reverse type, the representation of a lighthouse and a ship, which had been added to the design in 1866, being eliminated.

The coinage of Edward VII. differed but slightly from that of Queen Victoria. The denominations were the same; but on the obverse the head of the king (by G. W. de Saulles, engraver to the Mint) was represented bare, the title “Britanniarum” was changed to “Britanniarum Omnium Rex,” the reverse of the florin showed Britannia standing on a ship, and that of the shilling the royal crest, the lion on a crown, as on the so-called “lion-shillings” of 1826. The designing of the new coinage of George V. was entrusted to Mr Edward Helvetic; and the bust in the design of the Third Republic in France in 1879, the coinage was continued on the same lines as before, the types only being altered. The silver franc of 5 grammes (78 grains) as ordered in 1793 and confirmed by the Latin Monetary Union of 1865, which included Belgium, Italy and Switzerland, and subsequently in 1868 Greece, has remained the unit of value. The denominations ordered were, in gold, the 100, 50 and 20 francs; in silver, the 1 franc, and 50 and 20 centimes; and in bronze, the 10, 5, 2 and 1 centime. The types adopted were those which had been used previously—thus for the gold that of a genius inscribing the tables of the law, as designed by Augustin Dupré for the reverse of the constitutional coinage of Louis XVI.; for the silver and copper the head of the Republic as executed by Oudiné for the money of 1848. Subsequently, in 1871, the type of the 5 francs was changed for that of Hercules leaning on Liberty and Strength, as made by Dupré for the First Republic. In 1889 the 10 francs in gold was added to the list, having the head of the Republic crowned with corn, the work of Merley for the Republic of 1848; but only a small number of these coins was struck in that year and in 1895. No further alteration was made till after 1895, when, in consequence of suggestions that the types should be modified so as to mark the Third Republic, the artists Chaplain, Rotty and Dupuis were commissioned to execute new designs—the first for the gold, the second for the silver, and the last for the bronze. The types approved were: for the gold 20 francs, the head of the Republic with a Phrygian cap, and the Gallic cock; for the silver 2 and 1 franc and 50 centimes, the sower sowing, with the rising sun in the background, and a laurel branch; and for the bronze, the bust of the Republic wearing a Phrygian cap, and on the reverse France seated amidst clouds, holding a branch and a flag, and accompanied by a genius. These coins were not issued simultaneously—the 50 centimes appearing in 1897, and 2 and 1 franc and 10, 5, 2 and 1 centime in 1898, and the 20 francs in 1899. In 1903 a nickel piece of 25 centimes was introduced, since 1904 with a polygonal edge to facilitate distinction from the silver. The quartering of the franc is a departure from the strictly decimal system, also adopted in Italy. These later coins are characteristic of modern French medallic art, which has a strong tendency to imitate that of Italy of the 16th century.

Belgium.—Of the other states which formed the Latin Monetary Union, Belgium had already in 1832 adopted the French decimal and bimetallic system, with the franc as the unit of value. Her accession to the Union, therefore, only entailed a slight modification of type and denominations, which latter were the same as in France, except that the only gold coin was the 20 francs, the 25 centimes in silver was not issued, and the pieces of 10 and 5 centimes are now in nickel. The gold and silver coins have for types the head of the king and the royal shield, those in nickel the Belgic lion and mark of value, and those in bronze the royal monogram and the lion holding the tables of the constitution. Some of the silver coins have the inscriptions in Flemish. The nickel coinage introduced in 1902 is perforated in the centre to prevent confusion with silver.

Switzerland.—Like Belgium, Switzerland had before her adhesion to the Latin Monetary Union adopted the French system, with the franc of 100 centimes or rappen as the unit of value. The denominations in gold and silver were the same as issued for Belgium, but no gold was struck before 1883. The coins of baser metal were the 20, 10 and 5 centimes in billon, which metal was in 1879 changed for the nickel, and in copper the 2 and 1 centime. Certain changes of type have from time to time occurred. The first issue of the 20 francs in 1831 shows the head of the Republic and the shield of the Confederation; but this was changed in 1897 for the head of Helvetia above a range of mountains, and on the reverse a wreath with mark of value. On the silver coins from 1874 Helvetia is represented standing instead of seated, and on the nickel money of 1879 the shield of the Republic is replaced by the head of Helvetia. The mark of value and a wreath form the general reverse type of all the silver, nickel and copper coins. Since 1888 a 5-franc piece, similar in type to the 20 francs of 1883, has been issued.

Italy.—When Italy joined the Latin Monetary Union in 1865, she adopted as the unit of her coinage the lira of 100 centimes, equal to the franc. The coins were of gold, silver and bronze, and of the same denominations as those struck in Belgium and Switzerland. In 1894 a nickel coinage of 20 centesimi was ordered. The general type for all the coins is the head of the king and the royal arms, but on the reverse of the copper is the mark of value; and the nickel money has on the reverse a crown with a wreath. A new nickel piece of 25 centesimi indicates a departure from the strictly decimal system. The coinages of all the small Italian states, including the Papal, have now passed out of currency.

Greece.—A special stipulation was made, when Greece was enrolled in the Latin Monetary Union in 1868, that all her money should be struck at a French mint. The unit of the coinage
is the drachm of 100 lepta, which, like the lira, is equivalent to the franc. The denominations are—in gold, the 100, 50, 20, 10 and 5 drachmas; in silver, the 5, 2 and 1 drachm, and 50 and 20 lepta; and in bronze, the 10, 5, 2 and 1 lepton. In 1893 nickel was substituted for bronze, and coins of the value of 20, 10 and 5 lepta were issued in this metal. The types of the coins of Greece are similar to those of Italy. Crete has had since 1900 a coinage of its own similar to the Greek (silver of 1/2 drachma, 1 and 3/4 drachma; bronze and nickel of 20, 10, 5, 2 and 1 lepton).

Germany.—Since 1871 the coinage of the German empire has been entirely remodelled. By a convention in 1857 between the states of Germany, north and south, and Austria a general coinage of a silver standard was established on the basis of the new pound of 300 grames as sanctioned by the Zollverein. The contracting countries were divided into three sections, North Germany, South Germany and Austria. From the pound of fine silver of 300 grames the Northern States struck 30 thalers, Austria 45 florins and the Southern States 52½ florins; their relation being 1 North German thaler = 1/3 Austrian florins = 1/5 South German florins. The free towns of Hamburg, Lübeck and Bremen did not join the convention. The first reform in the coinage of the German empire occurred in 1871, when a new gold money was introduced, which had for its unit the silver mark (a money of account) of 100 pfennigs weighing 3.555 grames. The new gold pieces were of the value of 10 and 20 marks, called crowns and double crowns, and that of 100 marks, called 100 florins, 1897 of Munich, of which 20 were marked with the crowned head crowned, with the crowned head, and with the crowned head. The gold coin was struck a trade-money (Handelsmünze) of the current value of 10 francs, and it displaced the 8- and 4-florin pieces of 1870. The types of the Austrian and Hungarian coins somewhat vary. The Austrian gold coins show the head of the emperor and the two-headed eagle, but those of Hungary a full-length figure of the emperor and the national shield surmounted by the crown of St Stephen held by angels. The silver coins of both series have the head of the emperor and the mark of value under the imperial or royal crown. The nickel and bronze money of Austria displays the imperial eagle on the obverse, whilst that of Hungary has the crown of St Stephen. The legends are respectively in Latin and Magyar.

Spain.—The unit of the Spanish coinage from 1864 to 1868 was the silver escudo of 200 grains divisible into 10 reals. On the dethronement of Isabella in 1868 the provisional government adopted the principles of the Latin Monetary Union and made the peseta the unit of account, this coin being equivalent to the franc. The coins struck during 1869-1870 were, in gold, the 100 pesetas; in silver, the 5, 2 and 1 peseta, and the 50 and 20 centimos; and in bronze, the 10, 5, 2 and 1 centimo. The obverse type of each metal varied; on the gold Spain is standing; on the silver she is redining; and on the bronze she is seated. During his short reign (1870-1873) Amadeus I. struck only gold coins of 100 and 25 pesetas and silver of 5 pesetas, and there was practically no money issued during the republic which followed his abdication. Don Carlos during the insurrection of 1874-1875 struck 5 pesetas in silver and 10 and 5 centimos in bronze bearing his portrait and title "Carolus VII." After the restoration of Alphonso XII. the coinage consisted of 25 and 10 pesetas in gold; 5, 2 and 1 peseta and 50 centimos in silver; 10, 5, 2 and 1 centimo; and 50, 20, 10 and 5 centimos in bronze. This coinage was continued under Alphonso XIII., but in 1887 the 20 pesetas in gold was substituted for the 25 pesetas, and in 1897 large coins were struck of 100 pesetas. The types show the head of the king on the obverse and the shield with or without the pillars of Hércules, the reverse composed of various emblems.

Portugal.—A gold standard was adopted by Portugal in 1854, the unit of value being the milreis of 1000 reis. The coins are in gold, the crown or 10 milreis and the half, fifth and tenth crown or milreis; in silver, the 10, 5 and 2 testoon; in nickel, the 100 and 50 reis; and in bronze, the 20, 10 and 5 reis. The general type of the gold and silver is the head or bust of the king and the royal shield; but the bronze varies in having on the obverse a shield and on the reverse the mark of value.

Denmark, Sweden and Norway.—Previous to 1872 in Denmark the unit of value was the silver rigsbankdaler of 96 skilling; in Sweden, the rigsdaler of 100 öre; and in Norway, the specietchaler of 120 skilling; but in that year a monetary convention was concluded between these countries establishing a decimal coinage, which had for its unit the krone of 100 öre, and of which

**FIG. 7.—Twenty Marks (gold). Germany.**

**FIG. 9.—Peseta (silver). Spain.**
the standard was gold. The denominations are, in gold, the 20, 10 and 5 kroner; in silver, the 2 and 1 krones, and 50, 25 and 10 öre; and in bronze, the 5, 2 and 1 öre. The gold and silver money of Sweden and Norway to the 50 öre bears the head of the king and the royal shield; the silver of smaller denominations and the bronze, the monogram of the king and the mark of value. Since the separation of the two kingdoms in 1906, Norway has a coinage of its own in the name of Haakon VII. In Denmark the gold and silver have the head of the king, and, for reverse type, a figure of Denmark, a shield, or the mark of value. The bronze coins are similar to those of Norway and Sweden.

Russia.—The Russian coinage previous to 1855 was based on the silver standard of 276 grains of pure metal; but during the 1800s and the first part of the reign of Alexander II. (1855-1881) the currency consisted almost entirely of paper money. In 1885 Alexander III. determined to place the coinage on a proper footing, and introduced the rouble of 100 copeks as the unit of account, with a relative value of gold and silver of 1 to 15. The coins issued were, in gold, the imperial of 10 roubles, and the half-imperial; in silver, the rouble, and the 50, 25, 20, 15, 10 and 5 copeks; and in copper, the 5, 3, 2, 1, ½ and ¼ copek. In 1897 the relative value of gold and silver was advanced to 1 to 23, thus raising the value of the rouble to that of 1 to 15 roubles; but no change was made in the weights of the coins, and the silver rouble remained the unit of account. In the same year a piece of 5 roubles, called the one-third imperial, was added to the gold coins. The general types of the gold and silver show the head of the emperor and the imperial eagle; and of the copper, the imperial eagle and mark of value.

Georgia, Poland and Finland.—The separate issues of Georgia and Poland were suppressed in 1833 and 1847 respectively; but Finland in 1878 established a decimal coinage of gold, silver and bronze on the principles of the Latin Monetary Union, having the markkaa (= 1 franc) as its unit of value.

Turkey.—There has been practically no change in the money of the Ottoman empire since the reforms of Abdul-Medjid in 1844, when the piaster, or 40-paice piece, of the current value of 24 d., was made the unit of the coinage; 100 piastres go to the gold medjidieh or pound. The denominations are, in gold, the 500, 250, 100, 50 and 25 piastres; in silver, the 50, 25, 10, 5 and 2 piastres; and in copper, the 40, 20, 10, 5 and 1 para. The type in all metals is, on the obverse, the Sultan’s tugra, or cipher, and on the reverse, a wreath, and the name of the mint, date, &c.

Balkan States.—Since the dismemberment of the Ottoman empire the kingdoms of Rumania and Servia, and the principality of Bulgaria, have each adopted the decimal system of the Latin Monetary Union. In Rumania the unit of account is the leu of 100 bani; in Servia, the dinar or 100 para; and in Bulgaria, the lev, each of 100 stotinki, each of these units being the equivalent of the franc. In all these states gold, silver, bronze and nickel is current money.

United States.—In America the most important event connected with the coinage was a change of standard. (See Money.) Previous to 1873 the standard was silver, having for its unit the dollar of 412½ grains of fine; but in that year a gold standard was adopted, the gold dollar of 25·8 grains and ¼ fine being the sole unit of value. This change of standard was accompanied by a slight modification of the denominations, which became, in gold, the double-eagle, eagle, half and quarter eagle, three dollars and dollar; in silver, the half and quarter dollar, 20 cents and dime; in nickel, the 5 and 3 cents; and in bronze, the cent. In addition to these a silver piece called the "trade dollar" of 420 grains was struck, not for circulation in the States, but for export to China. The following changes have since occurred:

Canada, &c.—The currency for the Dominion of Canada, which includes Nova Scotia, New Brunswick and British Columbia, is of silver and bronze, based on the system of the United States. The denominations are 50, 25, 20, 10 and 5 cents in silver and the cent in bronze; and they also have a uniform type of the sovereign, but the system prevails in Newfoundland, which also issues the double dollar in gold; this is the only gold coin issued in a British colony whose standard is not the same as that of the mother country. There is a separate coinage for Jamaica, but of nickel only, and consisting of the penny, halfpenny and farthing.

Mexico, &c.—We need not give any detailed account of the coins of Mexico, and of the various states of Central and South America, in which there have been many changes and modifications. Of them most of them have adopted the decimal system, with a gold, silver or bi-metallic standard; the unit of value in the gold standard being generally the peso of 32.25 grams, and in the silver also the peso, but of silver of 20, 2.5 or 5.71 grams.

India.—As to the coins of the East and Far East, we will limit our remarks to the more important countries. In British India the rupee of silver of 150 grains is still the unit of coinage. In 1893 the mints were closed to the unrestricted coinage of silver for the public. In 1899 they were opened to the free coinage of gold, the sovereign being declared legal tender. At present 1£=15 rupees of 1s. 4d.; 1 silver rupee; 1 strand; and 1 sovereign.

Persia.—In Persia since 1879 a decimal system in conformity with the principles of the Latin Monetary Union has been adopted, having for its unit the krán weighing 78.7 grns., thus being equivalent to the franc, the peso reduced to 100, or the rupee. The denominations are: in gold, the 10, 5, 2, 1, ½ and ¼ toman (the toman = 10 krans); in silver, the 5, 2 and 1 krán (= 20 shahis), and the ½ and ¼; and in copper, the 4, 2 and 1 shahi (= 2 paisa), and the ½ paisa.

Japan.—Since 1870 Japan has formed its coinage on the European decimal system in place of the ancient national coins, the obanges and itsbush, the unit being the yen of 100 sen. The standard was bi-metallic, and the relation of gold and silver stood at 1:16:17. In 1898 a gold standard was adopted, the issue of the silver yen was suspended, and the weight of the gold money was reduced by one-half. The coins issued since that date are, in gold, the 20, 10 and 5 dollars; in silver, the 20, 10 and 5 sen; and in bronze, the yen and half-sen. There is one general type for all the silver, nickel and bronze coins, being the dragon on the obverse and the monogram of the Emperor with mark of value on the reverse. The gold varies in having flags and flowers on the reverse. The silver and bronze coins the legends are in English as well as in Japanese.

China.—In 1890 China followed the example of Japan, but only to a considerable extent, and issued a silver coinage and mint a gold dollar of the same value as the United States silver dollar and the Japanese yen. It is calculated in fractions of the tael, a money of account of the value of 28. 11½. The coins are the dollar, and the 50, 25, 10 and 5 cents, with the Chinese dragon and inscriptions, mint and mark of value in English on the obverse, and on the reverse the mark of value in Chinese and Manchu. They were first struck at Canton and Wei-Chang, but later other mints have been established. The only difference is, that silver and bronze coinage and monetary unit being the copper cash. A decree of the 20th of November 1905 proposed to establish an official dollar on the basis of the United States, silver and cent. The mints provide for a standard currency dollar of 72 candeens, with a subsidiary decimal coinage in silver, nickel and copper, for circulation throughout the empire.

Korea has had since 1905 a new coinage on the Japanese system, but with the Korean date.

Hong Kong.—The only other Asiatic coinage we shall note is that of Hong Kong, where a similar establishment also exists, but on the United States standard, having the silver dollar as its unit. The denominations are the dollar and 50, 20 and 5 cents in silver, and the cent and mill in bronze; and, with the exception of 1862, all had the same value in both standard of value. In connexion with this coinage there was issued in 1895 a "trade dollar" for special currency in the Straits Settlements and Hong Kong in lieu of the Mexican dollar, the scarcity of which was thus removed. In connection with this coinage there were issued in 1898 a "trade dollar" for special currency in the Straits Settlements and Hong Kong in lieu of the Mexican dollar, the scarcity of which was thus removed.

FIG. 10.—Seven and one-half Roubles (gold), Russia.
trident and shield, and on the reverse within an ornamental design the denomination in Chinese and Malay. Since 1903, however a new special dollar with the king's head has been issued for the Straits Settlements.

**Egypt.**—Glancing cursorily at the coining of Africa, we may note that since 1855 Egypt has adopted a gold standard with the gold pound of 100 piastres as the unit of account. This is no longer divisible into 40 paras, but into 10 ochr-el-guerche or tenths. The types are similar to the Turkish money, and though bearing the legend "V.S.A.E," none of the coins is really made at Birmingham. For some years gold has not been issued.

**Abysinia.**—In Abysinia since 1893 there has been a silver coinage, but the Austrian Maria Theresa dollar is still current. The new coins are, in silver, the talari (= dollar, worth about 2s.), 1/2 and 1 talari, and in copper, the guerche, and 1/2 and 1/4 guerche. They show on one side the head of the king, and on the other a lion holding a banner.

**Zanzibar.**—Zanzibar has also issued a dollar of the fixed value of 2 rupees and 2 annas, and a copper coin called a pessa (= 13th of a dollar).

**Sudan.**—The African coinages which have attracted exceptional attention are those of the Sudan and the South African Republic. The former dates from 1885, when the Mahdi struck the pound of 100 piastres in gold and 20 piastres in silver, of the same type as the Egyptian coins, but on the silver piece were placed the words "By order of the Mahdi," but no mint name. His successor, Abdullah, struck pieces of 20, 10, 5, 2 and 1 piastre in silver and 10 paras in copper, but no gold. They bear the name of the mint, Omdurman, and the word mabkab, i.e. accepted. At first the silver coins were of 6 parts silver and 2 copper, but in a few years they were so debased that they degenerated into mere pieces of copper washed with silver. The last issue is dated 1897 (A.H. 1315).

**Congo Free State (Belgian Congo).**—The coinage of 1887 consists of silver of 5, 2, 1, 1/2 and 1/4 centimes, and copper (with central hole) from 10 centimes to 1 centime.

**Transvaal.**—The first attempt at a separate coinage in the Transvaal was in 1874, when President Burgers issued sovereigns or pounds showing his portrait on the obverse and the shield of the Republic on the reverse. They were struck by Messrs Heaton of Birmingham, but as each piece of the current value of 20s., cost 2s. 6d. to strike, only 6580 was issued, but few of these passed into circulation, being preserved as curiosities. No further attempt was made till 1891, when President Kruger struck the Rand to order a coinage in gold, silver and bronze after the English standard. The first issue occurred in 1892, and consisted of the pound and half-pound in gold, the crown, half-crown, florin, shilling, sixpence and threepence in silver; and the penny in bronze. They are all of the same type as the pound of 1874, but with the portrait of President Kruger on the obverse. The first issue of the pound, half-pound and crown was minted at Berlin, and a curious mistake was made in the arms of the state, the wagon being represented with its wheels instead of with one. This blunder was soon noticed, and a recoining took place in the same year at Pretoria. Since the annexation British coins have been legal tender, but a new copper coinage was approved in 1904.

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In this bibliography no mention is made as a rule of articles in periodicals, or of monographs on the coinage of special cities or small districts.
NUMMULITE—NUNEATON 911

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NUMMULITE, NUMMULITES, A. d'Orbigny's name for a genus of Perforate Foraminifera (q.v.), distinguished by the flattened, lenticular discoid shell of many turns, finely perforated; chambers subdivided by incomplete septa into squarish chambers. This genus is especially abundant in Eocene Limestones, which attain great thickness around the Mediterranean basin; the Pyramids of Egypt are built of it.

NUN (O. Eng. nuna, from Lat. nonnus, nonna, familiar terms for an old man or woman), a member of a community of women, living and working as a life of the Church, under vows of poverty, obedience, and chastity. In ecclesiastical Latin nonnus was used by the younger members of a religious community for their elders, and so, in the regular of St Benedict, cap. 62, Juniorum autem Priorum suos nonnos vocant quod intelligit paterna reverentia (Du Cange, Glossarium, s. v. nonnus). While nonna has remained as the generic name of a female religious, nonnus has been replaced by monachus and its various derivatives (see Monk).

NUMATAK, a name applied in Greenland (and hence extended in use elsewhere) to a hill or mountain peak appearing above the surface of the glacier. Greenland is for the most part protected by an ice-cap of a certain thickness which moves slowly downwards to the sea. It will rise upwards and pass over a barrier if there is no outlet, but it will flow between and around mountain peaks leaving them standing as hills (numataks) above the general surface of the ice-cap. These prominences are sometimes covered with arctic vegetation, and arctic flowers bloom freely upon them in the summer.

NUNCIO, or NUNTIIUS APOSTOLICUS, a representative of the pope sent on diplomatic mission. The nuncios are of lower rank than the legati a latere, but have practically superseded them. The nuncio was the ambassador of the Holy See at the court of a foreign prince, and the ordinary course was for the Holy See to send a nuncio to an Italian state, which resulted in a long-standing enmity. In 1775, when Hastings was governor-general, Nuncabor brought accusations of peculation against him, which were entertained by Francis and the other members of cabinet at Westminster. While the matter was still pending, Nuncabor was indicted for forgery, condemned and executed. Warren Hastings and Sir Eliah Impey, the chief justice, were both impeached, and were accused by Burke and afterwards by Macaulay of committing a judicial murder; but Sir James Stephen, who examined the trial in detail, states that the indictment of the ambassador was not brought forward by Hastings, and that Impey conducted the trial with fairness and impartiality. See Sir James Stephen, The Story of Nuncabor (2 vols., 1889); and, for another treatment of the case, H. Beveridge, The Trial of Nanda Kumara (Calcutta, 1886).

NUNEAUTON, a market town and municipal borough in the Nuneaton parliamentary division of Warwickshire, England, on the river Anker, a tributary of the Tame, and on the Coventry Canal. It is an important junction of the London and North
Western railway, by which it is 97 m. N.W. from London, and it is served by the Leicester-Birmingham branch of the Midland railway. Pop. (1901) 24,996, rapidly increasing. The situation is low and almost encircled by rising ground. The church of St. Nicholas is a large and handsome structure in various styles of architecture, and consists of nave, chancel and aisles, with a square embattled tower having pinnacles at the angles. It contains several interesting monuments. A free grammar school was founded in the reign of Edward VI., and an English free school for the instruction of forty boys and thirty girls by Richard Smith in 1712. The ribbon industry is of less importance than formerly, but there are ironworks, cotton, hat, elastic and worsted factories, and tanneries; the making of drain-pipes, tiles and blue and red bricks is a considerable industry. In the neighbourhood there are also coal and ironstone mines. The prefix of the name of the town is derived from a priory of nuns founded here in 1150. In the reign of Henry III. a weekly market was granted to the prioresse. Nunney was incorporated in 1907, and the corporation consists of a mayor, six aldermen and twelve councillors. Ares 10,597 acres.

**NUNÉZ, PEDRO (PETRUS NONIUS) (1492–1577), Portuguese mathematician and geographer, was born at Alcacer do Sal, and at an early age was sent to Lisbon to be educated. He published several works, including a copiously-annotated translation of portions of Ptolemy (1537), and a treatise in two books, *De arte atque ratione navigandi* (1546). His clear statement of the scientific equipment of the early Portuguese explorers has become famous. A complete edition of all his writings appeared at Basel in 1592. See F. de B. Garcia-Stockler, *Ensino historico sobre a origem e progressas das matematicas em Portugal* (Paris, 1819); R. H. Major, *Prince Henry the Navigator* (London, 1868, p. 55).

**NÚÑEZ CABEZA DE VACA, ALVARO (c. 1490—c. 1564), Spanish explorer, was the lieutenant of Pánfilo de Narváez in the expedition which sailed from Spain in 1527; when Narváez was lost in the Gulf of Mexico, Cabeza de Vaca succeeded in reaching the mainland somewhere to the west of the mouths of the Mississippi, and, striking inland with three companions, succeeded, after long wandering and incredible hardship, in reaching the city of Mexico in 1536. Returning to Spain in 1537, he was appointed "adelantado" or administrator of the province of Rio de la Plata in 1540. Sailing from Cadiz in the end of that year, after touching at Cananéa (Brazil), he landed at the island of St Catharine in the end of March 1541. Leaving his ships to proceed to Buenos Aires, he set out in November with about 150 men to find his way overland to Ascension (Asunción) for the relief of his countrymen there. The little band reached their destination in the following year. After various successes in the interior, they burnt his dealings, and the Indians of the Núñez was sent home under arrest in 1544, and in 1551 was banished to Africa by the council of the Indies for eight years. He was recalled in about a year and appointed to a judgeship in Seville, where he died not later than 1564.

The *Naufragios* ("Shipwrecks") of Cabeza de Vaca, which relate to the Florida expedition and his journey to the city of Mexico, appeared at Zamora in 1542; the work has frequently been reprinted, and an annotated English translation was published by T. Buckingham Smith in 1851. His *Comentarios* (1555) chronicle the adventures of his companion in three Fascicles, *El Viaje* (1878). The *Journey of A. Núñez Cabeza de Vaca* (ed. A. F. Bandelier, New York, 1905).

**NÚÑEZ DE ARCE, GASPAR (1834–1903), Spanish poet, dramatist and statesman, was born at Valladolid, where he was educated for the priesthood. He had no vocation for the ecclesiastical state, plunged into literature, and produced a play entitled *Amer y Occid* which was bought at Toledo in 1849. To the displeasure of his father, an official in the post office, the youth refused to enter the seminary, and escaped to Madrid, where he obtained employment on the staff of *El Observador*, a Liberal newspaper. He afterwards founded *El Bachiller* y *Honduras*, a journal in which he advocated a policy of Liberal concentration, and he attracted sufficient notice to justify his appointment as governor of Logroño, and his nomination as deputy for Valladolid in 1865. He was imprisoned at Cáceres for his violent attacks on the reactionary ministry of Narváez, acted as secretary to the revolutionary Junta of Catalonia when Comillas was in authority, and wrote the "Manifesto to the Nation," published by the provisional government on the 26th of October 1868. During the next few years he practically withdrew from political life till the restoration, when he attached himself to Sagasta's party. He served under Sagasta as minister for the colonies, the interior, the exchequer and education; but ill-health compelled him to resign on the 27th of July 1890, and henceforth he refused to take office again. He was elected to the Spanish Academy on the 8th of January 1874, and was appointed a life-senator in 1886. He died at Madrid on the 11th of April 1892.

Núñez de Arce first came into notice as a dramatist, and he remained faithful to the stage for nearly a quarter of a century. In addition to three plays written in collaboration with Antonio Hurtado, he published *¿Quién es el autor?* (1859), *La Cuenta del Zapatero* (1859), *¿Cómo se empieza un marido?* (1860), *Deudas de la honra* (1863), *Ni tanto ni tan poco* (1865), *Quien debe, paga* (1867) and *El has de leña* (1872). But Núñez de Arce's talent was more lyrical than dramatic, and his celebrity dates from the appearance of *Gritos del combate* (1875), a collection of poems concerning Spaniards to lay aside domestic quarrels and to save their country from foreign domination.

He maintained his position (in popular esteem) as the only possible rival of Campoamor by a series of philosophic, elegiac and symbolic poems:—*Raimundo Lulio, Ultima lamentacion de Lord Byron* (1879), *Un Idilio y una Elegia* (1879), *La Selva oscura* (1879) and *La Vision de Fray Martin* (1880). The old brilliance sits off the naturalistic observation of *La Pesca* (1884) and *La Maruja* (1886). The list of his works is completed by *Poemas cortos* (1890) and *Sisurum corda!* (1900); *Hernán el lobo*, published in *El Liberal* (January 23, 1881) and Luebel remain unfinished.

His strength lies in the gorgeousness of his vision, his sincerity and command of his instrument; his weakness derives from his divided sympathies, his moods of obvious sentiment and his rhetorical facility. But at his best, as in the *Gritos del combate*, he is a master of virile music and patriotic doctrine. (J. F. K.)

**NUORO**, a town and episcopal see of Sardinia, Italy, in the province of Sassari, 38½ m. E. of Macomer by rail. Pop. (1901) 6739. It is situated 1905 ft. above sea-level in the east central portion of the island, amid fine scenery. Nuoro was the capital of a province from 1838 to 1860. It is connected by road with Domusco and Sassari, and it is about 13 m. W. of Nuoro in 1850, near Orretoli, has the letters FIN NVRR (finis)Nuvr. . . ., which are explained as referring to the boundaries of the territory of Nuoro in Roman times, showing (what was not known before) that the name and the place are of Roman origin (F. Vivian at *Notizie degli scavi*, 1880, 202). (T. A.)

**NUPE**, formerly an independent state of W. Africa, now a province in the British protectorate of Nigeria. Under Fula rule, Nupe occupied both banks of the Niger for a distance of some 150 m. above the Benue confluence. Only the part of Nupe north of the Niger now constitutes the province; area 600 sq. m., estimated pop. about 150,000. It is in many portions highly cultivated, and owing to its admirable water supply is likely to prove particularly valuable as a field for the extensive cultivation of cotton. Bida (q.v.), the capital, is connected by railway (built 1907–1908) with Baro, a port on the Niger 70 m. above Lokoj. Nupe had an ancient and very interesting constitution of which the leading features were adopted by the Fula when their rule was established about the year 1859. Bida was founded in that year. Nupe was conquered by the Ngomog of the Nger 1807, and the legal status of slavery was then nominally abolished. The company was, however, unable to occupy the country, and on the withdrawal of its troops the deposed emir returned. In 1901 it became necessary to subdue Nupe a second time. British troops marched to Bida. The emir fled without fighting and was deposed. Another emir was appointed in his place, took the oath of allegiance to the British crown, and worked cordially with the British resident
who was stationed at Bida. The province is divided into three administrative districts—Bida, Lapal and Agaie. These are again divided into nine native districts, five to the west and four to the east of the Kaduna river. Provincial courts of justice have been established.

Nuremberg, one of Bida. For an interesting account of the ancient constitution of Nuremberg see the *Fulani Emirates of Northern Nigeria* by Major J. A. Burdon in the *Geo. Journ.*, vol. xxiv (London, 1904).

**Nuremberg** (Ger. *Nürnberg*), a city of Germany, the second town in Bavaria in size, and the first in commercial importance. It lies in the district of Middle Franconia in a sandy but well-cultivated plain, 124 m. by rull N.W. from Munich. The city is divided by the small river Pegnitz, a tributary of the Main, into two parts, called respectively the Lorenzer Seite and the Sebalder Seite, after the two principal churches. There are four islands in the Pegnitz, which is crossed here by fourteen bridges. Formerly among the richest and most influential of the free imperial towns, Nuremberg is one of the few cities of Europe that have retained their medieval aspect largely unimpaired. Considerable sections of the ancient walls and moat still remain, though the demolition of portions to meet the exigencies of modern traffic and expansion has somewhat destroyed its quaint medieval character. Of the 350 bastions which formerly strengthened the walls, however, nearly 100 are still in situ, and a few of the interesting old gateways have also been preserved. Most of the streets are narrow and crooked, and the majority of the houses have their gables turned towards the street. The general type of architecture is Gothic, but the rich details, which are lavished with especial freedom in the interior courts, are usually borrowed from the Renaissance. Most of the private dwellings date from the 16th century, and there are practically none of earlier date than the 15th century. A praiseworthy desire to maintain the picturesque ness of the town has led most of the builders of new houses to imitate the lofty peaked gables, oriel windows and red-tiled roofs of the older dwellings. Altogether Nuremberg presents a faithful picture of a prosperous town of three hundred years ago.

The old burg, or castle (Kaiserschloss), is picturesquely placed on a rock on the north side of the town. This dates most probably from the early part of the 11th century, but it received its present form mainly during the reign of the emperor Frederick I. about 1150 years later. It was restored in careful harmony with its original appearance in 1854–1856, and part of the interior is fitted up as a royal residence, the families of the German emperor and of the king of Bavaria having apartments therein. In the Heidenturm are two late Romanesque chapels, and the other parts of the castle, which contains a pentagonal tower, the oldest building in the town, wherein are preserved the famous "iron virgin of Nuremberg," and other instruments of torture; the granary (Kornhaus), also called the Kaiserstallung; and the Vestnorter or Vestnurturm. The castle of Nuremberg was a favourite residence of the German sovereigns in the later middle ages, and the imperial regalia were kept here from 1424 to 1796. Near it are the remains of the burg of the Hohenzollerns, the principal existing part of which is the chapel of St Walpurgis, which was destroyed with the rest of the building in 1420, but was restored in 1892. Not far from this, in the middle of the north end of the old town, with four corner turrets, said to have been built by the burghers in 1367 as a watch-tower against the burg of the Hohenzollerns.

Nuremberg contains several interesting churches, the finest of which are those of St Lorenz, of St Sebald and of Our Lady. All three are Gothic edifices and are notable for their elaborately carved doorways, in which free play has been given to the exuberant fancy of the Gothic style, and all three enshrine valuable treasures of art. The Church of St Lawrence, the largest of the three, was built in the 13th and 14th centuries and has recently been restored. In it is the masterpiece of the sculptor, Adam Kraft, consisting of a ciborium, or receptacle for the host, in the form of a florid Gothic spire 65 ft. high; the carving of this work is exquisitely minute and delicate. The west front contains a magnificent rose-window, and some of the stained glass dates from the 15th and 16th centuries. In front of the altar hangs a curious piece of wood-carving by Veit Stoss, representing the Salutation. The shrine of St Sebald, in the church of St Sebald, consisting of a bronze sarcophagus and canopy in the richest Gothic style, decorated with numerous statues and reliefs, is looked upon as one of the greatest achievements of German art. It was executed by Peter Vischer, the celebrated artist in bronze, who was occupied on the work for thirteen years (1506–1519), and has here shown himself a worthy rival of Lorenzo Ghiberti. The Tucherseh altar, with its winged picture, is one of the finest works of the Nuremberg school about the middle of the 15th century. This church was restored in 1878–1881. Other noteworthy churches are those of St Jacob, founded about 1200 and restored in 1824; and of St Agatha.

The town hall (Rathaus), an edifice in the Italian style, erected in 1616–1619, contains frescoes by Dürer, and a curious stucco relief of a tournament held at Nuremberg in 1446. The building incorporated an older one of the 14th century, of which the great hall, with its timber roof, is part. The most interesting secular buildings are the houses of the old patrician families. Among the most characteristic of these are the old residence of the counts of Nassau, and the houses of the Tucher, Funk and Peller families. A special interest attaches to the dwellings of Albert Dürer, Hans Sachs, the cobbler-poet, and Johann Palm, the patriotic bookseller who was shot by order of Napoleon in 1806. There are statues of Dürer, Sachs, Melanchthon, the reputed founder of the grammar-school, the navigator Martin Behaim, and Peter Henlein, the inventor of the watch; and the streets are further embellished with several fountains, the most noteworthy of which are the Schöne Brunnen, 1385–1396, in the form of a large Gothic pyramid, adorned with statues of the seven electors, the "nine worthies," and Moses and the prophets; and the Gänsemännchen or goose-man, a (now little bronze figure by Pankratz Labenwolf. On the way to the cemetery of St John, which contains the graves of Dürer, Sachs, Behaim and other Nuremberg worthies, are Kraft's stations, seven pillars bearing stone reliefs of the Passion, and ranked among the finest works of the sculptor.

The Germanic national museum, established in an old Carthusian monastery, has developed into one of the largest and most important institutions of its kind in Germany. It includes a picture-gallery, principally of German works of the 15th and 16th centuries, including masterpieces by Holbein, Dürer, Weller and others. The municipal library contains about 2000 manuscripts and 80,000 printed books, some of which are of great rarity.

The population of Nuremberg was, in 1905, including a garrison of about 3000 men, 294,344, of whom 145,354 were males and 148,990 females. Of these again 196,907 were Protestants (Evangelical), 86,939 Roman Catholics and 6819 Jews. At the height of its prosperity in the middle ages the population has been estimated at as high a figure as 150,000, but there seems good reason to believe that it did not exceed 40,000 to 50,000 souls. In 1818 it had sunk to 27,000, but since then Nuremberg, which was incorporated as a town on January 1, 1300, has steadily increased. In 1820, 17,400; in 1840, 22,000; in 1860, 30,000; in 1875, 42,000; in 1885, 60,000; in 1890, 72,000; in 1895, 91,000; in 1900, 112,000. In the year 1900, thirteen outlying communes were incorporated, extending the area of the town from 2805 to 13,700 acres.

Nuremberg occupies a high place among the industrial and commercial centres of Europe. The principal manufactures are toys and fancy articles in metal, carved wood and ivory, which are collectively known as Nuremberg wares. Nuremberg is the chief market in Europe for hops. It is an important junction for railways to all parts of Germany, and is on the main line from Cologne and Frankfort-on-Main to Munich, Vienna and Eger. In addition to its railways, trade is facilitated by the Ludwig canal, connecting the Danube and the Main.

History.—The first authentic mention of Nuremberg, which seems to have been called into existence by the foundation of the castle, occurs in a document of 1250; and about the same period
it received from the emperor Henry III. permission to establish a mint and a market. It is said to have been destroyed by the emperor Henry V. in 1105, but if this was the case the town must have been very speedily rebuilt, as in 1127 we find the emperor Lothair taking it as an intermediary between Italy and Hungary, and assigning it to the Freuden, duke of Bavaria. An imperial officer, styled the burggrave of Nuremberg, who, however, seems to have been merely the military governor of the castle, and to have exercised no sway over the citizens, became prominent in the 12th century. This office came into the hands of the counts of Hohenzelorn at the beginning of the 13th century, and burggrave of Nuremberg is still one of the titles of its descendant, the German emperor. The government of the town was vested in the patrician families, who, contrary to the usual course of events in the free towns, succeeded in permanently excluding the civic guilds from all share of municipal power, although in 1347 there was a sharp rising against this oligarchy. The town was specially favoured by the German monarchs, who frequently resided and held diets here, and in 1219 Frederick II. conferred upon it the rights of a free imperial town. By the terms of this charter the town appears to have been immediately subject to the king, who was represented by his magistrate (or Schuldtheiss). In a short time, however, the latter appears to have been assisted by a council, consisting of 13 consules (burgomasters) and 13 scebanii (assessors), who collectively formed the government and administered the body under the presidency of the bailiff. The last-named official soon confined himself to the judicial magisterial office, and a further increase in the numbers of the council having taken place by the appointment of 8 nominees of the king, a municipal council of 34, under the direction of the senior consil or burgomaster, dealt with matters exclusively civic. Later this council (the kleine Rat) was increased to 42 members, 8 of whom belonged to the artisan class.

In 1336 Nuremberg witnessed the promulgation of the famous Golden Bull of the emperor Charles IV. At the beginning of the 15th century the margraves of Nuremberg, who had in the meantime raised themselves to the rank of princes of the Empire, were invested with the margraviate of Brandenburg, and sold their castle to the town. They, however, reserved certain rights, and their insistence on these led to fierce and sanguinary feuds between the burghers and the margraves Albert Achilles and Frederick and Albert Alcibiades of Bayreuth.

The quarrel with the margraves, however, did not interfere with the growth of the town's prosperity, which reached its acme in the 16th century. Like Augsburg, Nuremberg attained great wealth as a result of the sales of its artists and artisans, who had in the meantime raised themselves to the rank of princes of the Empire, were invested with the margraviate of Brandenburg, and sold their castle to the town. They, however, reserved certain rights, and their insistence on these led to fierce and sanguinary feuds between the burghers and the margraves Albert Achilles and Frederick and Albert Alcibiades of Bayreuth.

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order of St Vincent de Paul, founded in 1633 for the express purpose, is still the largest nursing organization in the world. Even in Protestant England, where purely secular training schools have reached their highest development, the generic title of Sister, alike prized by its holders and honoured by the public, remains the popular and professional synonym for head nurse, and perpetuates the old association. Nursing, as a popular or fashionable occupation, is not a modern invention. Sir Henry Burdett quotes an order, dated 30th May 1578, directed by Philip to the prior of the Hôtel-Dieu in Paris "not to receive henceforth any novices without speaking of it to the company, because there are an excessive number of nuns and novices, who cause great expense to the said Hôtel Dieu."

In Protestant countries a secular nursing system came in with the Reformation. The staff appointed for St Bartholomew's, on its re-establishment by Henry VIII. in 1544, consisted of a matron and twelve nurses, who were engaged in domestic occupations when off duty. Thus nursing became a menial office and an inferior means of livelihood, adopted by women of the lower orders without any training or special skill was required. The credit of inaugurating the new order of things belongs to Germany, and here again the religious influence came into play. The beginning of the modern system dates from the foundation of the institute for training deaconesses at Kaiserswerth by Pastor Fliedner in 1836. It is true that state training schools for male nurses had previously existed in Prussia, the oldest having been founded at Magdeburg in 1799; but the employment of men in hospital wards is a feature of the German system which has not been copied by other advanced countries, and seems to be in process of abandonment in Germany. It is a heresy in Germany, and so it continued down to the middle of the 19th century, when a new movement began which was destined to revolutionize the status of the nurse.

Its distinctive feature was the systematic training of nurses for their vocation. Previously a certain amount of regular instruction had no doubt been given here and there by individual physicians and surgeons; lectures to nurses were delivered in the New York Hospital as early as 1790. But these were isolated efforts. Such skill as nurses possessed was picked up in the wards. No qualifications were required, nor indeed would they have been demanded by the hospital authorities, and indeed the system did not exist as a system. The credit of inaugurating the new order of things belongs to Germany, and here again the religious influence came into play. The beginning of the modern system dates from the foundation of the institute for training deaconesses at Kaiserswerth by Pastor Fliedner in 1836. It is true that state training schools for male nurses had previously existed in Prussia, the oldest having been founded at Magdeburg in 1799; but the employment of men in hospital wards is a feature of the German system which has not been copied by other advanced countries, and seems to be in process of abandonment in Germany. It is a heresy in England, and so it continued down to the middle of the 19th century, when a new movement began which was destined to revolutionize the status of the nurse.

Its distinctive feature was the systematic training of nurses for their vocation. Previously a certain amount of regular instruction had no doubt been given here and there by individual physicians and surgeons; lectures to nurses were delivered in the New York Hospital as early as 1790. But these were isolated efforts. Such skill as nurses possessed was picked up in the wards. No qualifications were required, nor indeed would they have been demanded by the hospital authorities, and indeed the system did not exist as a system. The credit of inaugurating the new order of things belongs to Germany, and here again the religious influence came into play. The beginning of the modern system dates from the foundation of the institute for training deaconesses at Kaiserswerth by Pastor Fliedner in 1836. It is true that state training schools for male nurses had previously existed in Prussia, the oldest having been founded at Magdeburg in 1799; but the employment of men in hospital wards is a feature of the German system which has not been copied by other advanced countries, and seems to be in process of abandonment in Germany. It is a heresy in England, and so it continued down to the middle of the 19th century, when a new movement began which was destined to revolutionize the status of the nurse.

Training and organization.

Nursing does not appear to be regulated by law in any country, though attempts in this direction had been made in England.1 Its organization is voluntary, and even in state or municipal institutions is dependent on the direction of the administration. In Great Britain nearly all the general and special hospitals and many of the poor-law infirmaries offer systematic professional training to nurses. The provisions differ considerably in detail, but in the larger hospitals the system is uniform in all important respects. Candidates must be between 23 (sometimes 21 or 22) and 35 years of age, and must produce satisfactory evidence of character, education, health and physique; after a personal interview and one, two or three months' trial they are admitted for three years' training. During this period they receive regular instruction in theoretical and practical knowledge, and have to pass periodical examinations. At the end of it they are granted certificates and may serve as staff nurses. They pay no premium, and generally receive a salary of £8 to £12 in the first year, rising annually to £40 or £50 as assistant and nurse, and to £100 to £150 as sister or head nurse. They live in a home attached to the institution, under a matron, and in the most modern establishments each nurse has a separate bedroom, with common dining and recreation rooms. Private nursing staffs are attached to several of the hospitals; they are recruited from the staff nurses and probationers on completion of their course, and supply nurses to private patients. In the special

1 In 1902 an act was passed to establish a Central Midwives Board and regulated the training and employment of midwives.
hospitals the training is shorter, being for one or two years. There seems to be a constant tendency to increase the requirements. At St Bartholomew's, St George's, the London Hospital, St Thomas's and others, probationers must enter for four years, and at St Bartholomew's they have to pass an entrance examination in elementary anatomy, physiology and other subjects. At all the more important schools the number of applications is so large that the time is not shorter than the vacancies.

In Great Britain trained and certificated nurses generally belong to a society or association. The most noteworthy of the associations is Queen Victoria's Jubilee Institute for Nurses. It was founded in 1887 with the object of providing skilled nursing for the sick poor in their own homes. A great many of the provincial nursing associations are affiliated to it. The number of nurses supported by each branch varies. The qualifications for a Queen's nurse are as follows: (1) training at an approved general hospital or infirmary for two years; (2) approved training in district nursing for not less than six months, including the nursing of mothers and infants after child-birth; (3) nurses in country districts must in addition have had at least three months' approved training in midwifery. Candidates possessing the first qualification are received on trial for one month, after which they complete their six months' training for the second qualification, at the same time entering into an agreement to serve as district nurse for one or two years at the end of the six months. The salary during training is £1 5s. 10s., and afterwards £3 5s. to £3 15s. a year, with board, lodging, and fees. With this salary, and the salaries paid in general, the salaries paid in hospitals have already been mentioned; for private work the scales in force at different institutions vary considerably, according to the other advantages and benefits provided. At some the nurses receive all their own earnings, minus a percentage deducted for the maintenance of the institute; at others they are paid a fixed salary, as a rule from £2 5s. to £3 15s. a year, plus a varying percentage on their earnings or a periodical bonus according to length of service. This is perhaps the commonest system, but some of the best nursing homes give a somewhat higher fixed salary than an percentage. In all these cases the nurses receive in addition board and lodging, laundry and uniform, or an equivalent allowance. For special cases—infec tious, massage, mental and maternity—nurses on a fixed salary usually receive extra pay. The fees commonly charged by high-class institutions for the services of a trained and certificated nurse are—for ordinary cases £2 2s. a week, for special cases £3 12s. 6d. or £3 5s. a week; but many provincial associations supply nurses for £1 5s. a week and upwards. The discrepancy between the fees paid by patients and the salaries received by nurses, especially in London, has occasionally caused some dissatisfaction, but it is to be remembered that the nurses are maintained when out of work or ill, and have other advantages; many institutions either provide pensions or assist the members of their staff to join the Royal National Pension Fund.

To complete this account of the organization in Great Britain a few details with regard to special nursing are added. 

Fevers.—Regular training on the same plan as in general hospitals is provided for the fever nurse by the Board of Guardians of the Maudsley Asylums Board (12 in number, with from 360 to 760 beds each), and at a considerable number of provincial institutions.

Insanity.—The Medico-Psychological Association of Great Britain and Ireland holds examinations and grants certificates in mental nursing; candidates must undergo three years' regular training, with instruction by lectures, &c., which may be obtained in a large number of public asylums by arrangement with the Association. One county asylum (Northampton) gives its own certificates after a three years' course.

District Nursing.—In addition to the Queen's nurses, of whom there are about 1,000, many local associations train their own nurses for this work. Cottage and village nursing are varieties of the same department; the former is organized on the benefit system, and aims at supplying domestic help and sick-nursing combined within the district; the latter is devoted for short visits to the sick, according to the class in life of the family, and a weekly fee of the same amount during attendance.

Monthly Nursing and Midwifery.—Systematic instruction in these subjects is given at some fifty lying-in institutions in different parts of the kingdom. The usual course for nursing is not less than three months, and for midwifery not less than six months; a premium of £12 or 15 guineas for three months, and 25 guineas for six months.

Male Nursing.—Two or three associations in London supply male nurses (fixed fees to 4 guineas a week); these appear to be only one institution, apart from the military and naval services, at which they are systematically trained—namely, the National Hospital for the Paralysed and Epileptic.

Most of them are taught regularly at the hospital just named, and at a few other special hospitals. Competent operators are supplied by the Incorporated Society of Trained Masseuses and, to some extent, by other nursing associations; but this branch of the profession is still imperfectly organized (see Masseurs). 

Children.—A large number of children's hospitals throughout the country give regular training in the nursing of children; they are provided for boys and girls of a somewhat earlier age than the general schools; the course is usually shorter (one or two years), and the salaries slightly lower.

The State offers employment to nurses in the naval and military hospitals. Queen Alexandra's Imperial Military Nursing Service was established in 1902. Candidates for it must be between 25 and 35 years, single or widows and of good social status. They must have had three years' training in a general hospital. Foreign Service must be taken as required. Nurses are eligible for a pension after 10 years' service, the amount increasing up to the age of 55 when retirement is compulsory. The Royal Naval Nursing Service is organized on much the same lines. Other training organizations are The Army Nursing Reserve and Queen Alexandra's Imperial Military Nursing Reserve, and there is also a nursing reserve attached to the territorial forces.

In the more important British colonies—Australia, Canada and South Africa—these are now a considerable number of hospitals; but as the fees charged for them do not correspond with the qualification or experience of the nurses, they are not organized on the English model. Salaries and fees are very much the same in Australia; in Canada and South Africa they are higher.

In the United States a similar system prevails in New York, Boston, Brooklyn, Chicago, Baltimore, Philadelphia, New Haven and many other large towns. The period of training is either two or three years. At the Johns Hopkins School at Baltimore twelve scholarships of $100 and $120 each are awarded annually; graduate nurses are paid $560 ($72) a year. Salaries are altogether much higher in the United States. At the Boston City Hospital graduate nurses receive $420 ($54) a year, and at the Indianapolis City Hospital those on private duty are paid $72 a month, which is equivalent to £172 a year, with board, lodging, laundry and uniform. This may be taken to indicate the possible earnings of trained nurses working independently, as they usually do in America. The fees charged for trained nurses run from $12 to $25 a week, and even more for special cases. Male nurses are trained at the Bellevue Hospital, New York, the Grace Hospital, Detroit, and elsewhere. In the American schools more attention is paid to the preparation of nurses for private work than in the British (Burdett), and a directory or registry of them is kept in most large towns.

In Germany, their original home, both training schools and societies have multiplied and developed. The period of training appears to be considerably shorter than in Great Britain and America. Members of the Albert Society of Saxony, however, spend two years in the wards at Dresden, and a third at Leipzig, attending lectures and demonstrations. They are sent out to nurse rich and poor alike, and their pay is very small. Most of the German institutes have pension funds.

In France a great deal of the nursing was formerly in the hands of religious institutions, but there too the hospital school system, inaugurated in 1877, has grown. The schools managed by the Assistance Publique in Paris give a very thorough course of instruction.

In Russia nursing is mainly in the hands of the Red Cross Society, whose members are, however, trained in the hospital schools. 

In Italy, Spain, Portugal and Belgium scientific nursing is in a backward state. The old religious system still prevails to a large extent, and, though some of the certain to do their work in accordance with the standards of knowledge and skill is not up to modern requirements. At San Remo and Rome institutions have been established for providing English trained nurses to private cases.
Austria is also in a very backward state, in spite of the fame of the Vienna clinics. The Red Cross Society provides a certain amount of trained nursing, and next to it the best-organized work is done by religious orders; but the nursing in the hospitals appears to be still in a neglected state. The Brothers of Mercy have charge of some of the men's hospitals, and also carry on a remarkable system of district nursing.

In Holland and the Scandinavian countries the organization is more modern and fairly adequate.

For full details on the large subject of the duties and qualifications of nurses the reader is referred to the numerous text-books and other technical authorities. Only a few general observations can be made here. Many candidates approach the calling with a very imperfect appreciation of its exacting character. The work is not easy or to be taken up lightly. It demands physical strength, sound health, scrupulous cleanliness, good temper, self-control, intelligence and a strong sense of duty. It embraces many duties—some of them menial and disagreeable—besides the purely medical and surgical functions. This is especially the case with district nursing, which is the highest and most exacting branch of the profession, because it imposes the greatest responsibility with the fewest resources and demands the most varied qualifications, while affording none of the attractions incidental to hospital work or private nursing among the rich. It is comparatively easy to fulfil routine duties, when every means is at hand and the standing conditions are the most favourable possible; when ventilation, warmth, light and cleanliness are all provided of the best, and when assistance can be summoned in a moment. To be thrown on your own resources and make the best of adverse conditions is an entirely different matter; it requires a thorough knowledge not of routine, but of principles. It is impossible, therefore, for nurses to be over-educated in the fullest sense of the word; but it is possible for them to be inappropriately educated, and perhaps that is sometimes the case now. Probably nursing has been elaborated to the inevitable point of specialization, and a somewhat different preparation is needed for different branches of the art.

Allusion has been made above to the subject of male nursing. It hardly finds a place in the British civil system, and was condemned for hospitals in Germany, where it is at its best, by so eminent an authority as Professor Virchow. In the South African War of 1899-1902 it was even suggested that female nurses should replace orderlies at the front. The only valid reason for preferring women to attend men rather than members of their own sex is the difficulty of obtaining a supply of equally well qualified and satisfactory male nurses. But this difficulty need not be permanent, and the assumption is much to be deprecated. It is, indeed, most desirable that men should be nursed by men. The advantages are many and real. For one thing, women do not possess the physical strength which is often required. They cannot lift a heavy man, and ought not to be asked to do it. Then it is excessively irksome to a sensitive man to be attended by women for various necessary offices. In order to avoid it he will endeavour to do without assistance, and seriously prejudice his chances of recovery.

Authorities.—Sir Henry C. Burdett, "Hospitals and Asylums of the World; The Nurse," 7th ed. (annual); Hampton, "Nursing; Perce G. Lewis, 'Nursing, its Theory and Practice; ' E. C. E. Luckes, 'Hospital Sisters and their Duties; Morten, How to become a Nurse; Florence Nightingale, "Notes on Nursing; " Nighntigale Boyd, 'Nursing; ' in Quain's Dictionary of Medicine.

NUSHKI, a town and district of Baluchistan. The town lies 50 m. south-west of Quetta, and is situated in a plain at the base of the Quetta plateau, 2000 ft. above the sea. Pop. (1901) 644. From this point the flat Baluchistan desert stretches away northwards and westwards to the Helmund river. The administration of the Nushki district was taken over from the khan of Kalat by the Indian government in 1896, and was leased from him on a perpetual quit rent in 1896. In 1907 a railway of 91 m. was sanctioned from Quetta to Nushki, which was completed in 1905. This railway makes Nushki the starting-point of the caravan route to Seistan. From the strategic point of view a force operating from Nushki would flank any advance from the north on Kandahar, and would also guard the south-west approach to the fortress of Quetta.

NUSKU, the name of the light and fire-god in Babylonian and Assyria, who is hardly to be distinguished, from a certain time on, from a god Girru—formerly read Gibil. Nusku-Girru is the symbol of the heavenly as well as of the terrestrial fire. As a former he is the son of Anu, the god of heaven, but he is likewise associated with Bel of Nippur as the god of the earth and regarded as his first-born son. A centre of his cult in Assyria was in Harran, where, because of the pre-eminent character of the moon-cult, he is viewed as the son of the moon-god Sin (q.v.). Nusku-Girru is by the side of Ea, the god of water, the great purifier. It is he, therefore, who is called upon to cleanse the sick and suffering from disease, which, superinduced by the demons, was looked upon as a species of impurity affecting the body.

The fire-god is also viewed as the patron of the arts and the goal of civilization in general, because of the natural association of all human progress with the discovery and use of fire. As among other nations, the fire-god was in the third instance looked upon as the protector of the family. He becomes the mediator between humanity and the gods, since it is through the fire on the altar that the offering is brought into the presence of the gods.

While temples and sanctuaries to Nusku-Girru are found in Babylonia and Assyria, he is worshipped more in symbolical form than the other gods. For the very reason that his presence is common and universal he is not localized to the same extent as his fellow-deities, and, while always enumerated in a list of the great gods, his place in the systematized pantheon is more or less vague. The conceptions connected with Nusku are of distinctly popular origin, as is shown by his prominence in incantations, which represent the popular element in the cult, and it is significant that in the astro-theological system of the Babylonian priests Nusku-Girru is not assigned to any particular place in the heavens.

(M. JA.)

NUSRETABAD, the capital of Persian Seistan, so called after Nusret el Mulk, a former deputy governor of Seistan; when built, in 1748, it was first called Nasratabad in honour of Nasr-ud-din Shah; other names, used locally, are Shahr (town) i Seistan, Shahri Nasariyeh, or simply Shahr, the town. It is the residence of British and Russian consuls, and has post and telegraph offices.

NUT (O. Eng. nuan, cf. Dutch noot, Ger. Nuss; allied with Gael. anu; it is not of the same form as Lat. nux), a term applied to that class of fruit which consists generally of a single kernel enclosed in a hard shell. Botanically speaking, nuts are one-celled fruits with hardened pericarps, sometimes more or less enveloped in a cupule or cup, formed by the aggregation of the bracts in the hazel and the acorn. In commerce, however, the term has a wider application and embraces many fruits having hard woody indehiscent shells or coverings without reference to their enclosed seeds or kernels, besides leguminous pods, and even tuberous roots. A great number of nuts enter into commerce for various purposes, principally as articles of food or sources of oil, and for several ornamental and useful purposes. For the most part the edible nuts are very rich in oil, with only a small percentage of the other carbohydrates, starch, sugar, &c., and they also contain a large proportion of nitrogenous constituents. Thus possessing rich nutrient principles in a highly concentrated form, nuts are by themselves rather difficult of digestion, and the liability of many of them to become rancid is also a source of danger and a hindrance to their free-use. Oleaginous nuts used for food are likewise employed more or less as sources of oil, but on the other hand there are many oil-nuts of commercial importance not embraced in the list of edible nuts.

On the following page is set out an alphabetical enumeration of the more important nuts, and of products passing under that name, used either as articles of food or as sources of oil.

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<table>
<thead>
<tr>
<th>Name</th>
<th>Source</th>
<th>Locality</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almond</td>
<td>Amygdalus communis, var. dulcis</td>
<td>S. Europe</td>
<td>Food, oil.</td>
</tr>
<tr>
<td>Almond (bitter)</td>
<td>Amygdalus communis, var. amara</td>
<td></td>
<td>Oil.</td>
</tr>
<tr>
<td>Ar nut or earth nut</td>
<td>Tubers of Bunnium flexuosum and other species</td>
<td>W. Europe (Britain)</td>
<td>Food.</td>
</tr>
<tr>
<td>Bambarre ground nut</td>
<td>Vosodecta suberianae</td>
<td>Tropics, especially Africa</td>
<td>Food. See HICKORY.</td>
</tr>
<tr>
<td>Ben nut</td>
<td>Moringa pterygosperma (a winged seed)</td>
<td>India</td>
<td>Oil.</td>
</tr>
<tr>
<td>Bitter nut</td>
<td>Caryya amara (swamp hickory)</td>
<td>N. America</td>
<td></td>
</tr>
<tr>
<td>Brazil nut</td>
<td>Bertholletia excelsa</td>
<td>S. America</td>
<td>Food, oil.</td>
</tr>
<tr>
<td>Brazil nut</td>
<td>Brosimum Alicastrum</td>
<td>W. Indies</td>
<td>Food.</td>
</tr>
<tr>
<td>Breadnut</td>
<td>Caryocar nuiferum</td>
<td>Guiana</td>
<td>Food.</td>
</tr>
<tr>
<td>Butter or Souari nut</td>
<td>Altalea Cohune</td>
<td>Honduras</td>
<td>Oil.</td>
</tr>
<tr>
<td>Cahoun nut</td>
<td>Aleurites triloba</td>
<td>S. Sea Islands</td>
<td></td>
</tr>
<tr>
<td>Candle nut</td>
<td>Anacardium occidentale</td>
<td>W. Indies and Tropical America</td>
<td>Food, oil.</td>
</tr>
<tr>
<td>Cashew nut</td>
<td>Castanea vesca</td>
<td>S. Europe</td>
<td>Food. See HAZEL.</td>
</tr>
<tr>
<td>Chestnut</td>
<td>Coriolus Avellana</td>
<td>Europe (Britain), &amp;</td>
<td></td>
</tr>
<tr>
<td>Cob, filbert, or hazel</td>
<td>Omphalea diandra</td>
<td>W. Indies and Tropical America</td>
<td>Food.</td>
</tr>
<tr>
<td>Cob nut of Jamaica</td>
<td></td>
<td>Tropics,</td>
<td></td>
</tr>
<tr>
<td>Coco-nut</td>
<td>Cocos nucifera</td>
<td>Food.</td>
<td></td>
</tr>
<tr>
<td>Cola nut</td>
<td>Cola acuminata</td>
<td>W. Africa</td>
<td></td>
</tr>
<tr>
<td>Dika nut</td>
<td>Irvingia Barteri</td>
<td>W. Africa</td>
<td></td>
</tr>
<tr>
<td>Ginkgo nut</td>
<td>Ginkgo biloba (seed)</td>
<td>Japan, China</td>
<td>See GROUND NUT.</td>
</tr>
<tr>
<td>Ground nut or pea nut</td>
<td>Arachis hypogaea</td>
<td>Tropics,</td>
<td></td>
</tr>
<tr>
<td>Hickory nut</td>
<td>Caryya alba</td>
<td>N. America</td>
<td></td>
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<tr>
<td>Hog nut</td>
<td>Caryya porcina</td>
<td>S. Europe</td>
<td>Eaten by animals.</td>
</tr>
<tr>
<td>Jesuit's nut</td>
<td>Trapa natans</td>
<td>N. America</td>
<td>Food. See HICKORY.</td>
</tr>
<tr>
<td>Mockner nut</td>
<td>Caryya tomentosa</td>
<td>Australian</td>
<td>Food. Spice.</td>
</tr>
<tr>
<td>Moreton Bay chestnut</td>
<td>Castanopsis australis</td>
<td>E. Indies</td>
<td>See NUTMEG.</td>
</tr>
<tr>
<td>Nutmeg</td>
<td>Myristica moschatia</td>
<td>Tropics,</td>
<td>Spice. See NUTMEG.</td>
</tr>
<tr>
<td>Olive nut</td>
<td>Elaeocarpus Ganitrus, &amp;c.</td>
<td>E. Indies</td>
<td></td>
</tr>
<tr>
<td>Palm nut</td>
<td>Elaeis guineensis</td>
<td>W. Africa</td>
<td>Food. See PALM.</td>
</tr>
<tr>
<td>Pecan nut</td>
<td>Carya ovata</td>
<td>N. America</td>
<td>See HICKORY.</td>
</tr>
<tr>
<td>Pimento</td>
<td>Caryya pittleri</td>
<td>Tropical America</td>
<td>Food. Oil.</td>
</tr>
<tr>
<td>Pine nut</td>
<td>Cupras purgas</td>
<td>Italy</td>
<td></td>
</tr>
<tr>
<td>Pistachio nut</td>
<td>Pistachia vera</td>
<td>S. Europe, &amp;c.</td>
<td></td>
</tr>
<tr>
<td>Quandang nut</td>
<td>Palaquium amalimum</td>
<td>Food.</td>
<td></td>
</tr>
<tr>
<td>Ravensara nut.</td>
<td>Agathophyllum aromaticum</td>
<td>Madagascar</td>
<td>Spice.</td>
</tr>
<tr>
<td>Rush nut</td>
<td>Cupera esculenta (tubers)</td>
<td>S. Europe, &amp;c.</td>
<td></td>
</tr>
<tr>
<td>Sapucaya nut</td>
<td>Lecythis Ollaria</td>
<td>Brazil</td>
<td>Food.</td>
</tr>
<tr>
<td>Tahiti chestnut</td>
<td>Inocarpus edulis</td>
<td>S. Sea Islands</td>
<td>Food, oil.</td>
</tr>
<tr>
<td>Walnut</td>
<td>Juglans regia</td>
<td>Asia, Europe</td>
<td></td>
</tr>
<tr>
<td>Water chestnut</td>
<td>Various species of Trapa</td>
<td>S. Europe, India, &amp;c.</td>
<td></td>
</tr>
</tbody>
</table>

There remain to be enumerated a number of nuts of commercial value for turnery and ornamental purposes, for medicinal use, and for several miscellaneous applications in the arts. These include:

- **Olive nut**: Elaeis guineensis is a native of West Africa and is cultivated for its wood. The nuts are also used in the production of olive oil.
- **Palm nut**: Elaeis guineensis is the source of the popular African oil palm, known for its high-quality oil.
- **Pecan nut**: Carya ovata is found in North America and is valued for its edible nuts and high-quality timber.
- **Quandang nut**: Palaquium amalimum is native to Asia and is known for its edible nuts and timber.
- **Ravensara nut**: Agathophyllum aromaticum is native to Southeast Asia and is valued for its essential oil.
- **Rush nut**: Cupera esculenta is a native of the Americas and is valued for its timber and fruits.
- **Sapucaya nut**: Lecythis Ollaria is found in South America and is known for its timber and fruits.
- **Tahiti chestnut**: Inocarpus edulis is native to Polynesia and is valued for its timber and fruits.
- **Walnut**: Juglans regia is found in temperate regions of the world and is valued for its edible nuts and timber.
- **Water chestnut**: Various species of Trapa are found in various parts of the world and are valued for their edible tubers.

The application of the term nut to many of these products is purely arbitrary, and it is obvious that numerous other bodies not known commercially as nuts might with equal propriety be included in the list. Most of the nuts of real commercial importance are or will be separately noticed, and here further allusion is only made to a few which form current articles of commerce, not otherwise treated of.

The bread nut of Jamaica is the fruit of a lofty tree, Brosimum Alicastrum. It is about an inch in diameter, and encloses a single seed, which, roasted or boiled, is a pleasant and nutritious article of food.

The souari or surahwa nut, called also the "Butter nut of Demerara," and by buyersens, the "Suwarrow nut," is the fruit of Caryocar nuiferum, a native of the forests of Guiana, growing 80 ft. in height. This is perhaps the finest of all the fruits called nuts. The kernel is large, soft, and even sweeter than the almond, which it somewhat resembles in taste. The few that are imported come from Demerara, and are about the size of an egg, somewhat kidney-shaped, of a rich reddish-brown colour, and covered with large rounded tubercles.

The pekeea nut, similar in appearance and properties, is the produce of Caryocar buyersens, growing in the same regions of tropical America.

The Jamaica cob nut is the produce of a euphorbiaceous tree, Omphalea diandra, the seeds of which resemble in taste the ordinary cob or hazel nut. The seed, however, contains a deleterious embryo, which must not be eaten.

Cola, kola or goora nuts are the seeds of Cola acuminata (Sterculiaceae), a tree, native of tropical Africa, now introduced into the West Indies and South America. The nuts form an important article of commerce throughout Central Africa, being used over a wide area as a kind of stimulant condiment. The nuts, of which there are numerous varieties, are found to contain a notable proportion of thein, as much as 2 13 %, besides theobromine and other important food-constituents, to which circumstances, doubtless, their valuable properties are due.

Coquina nuts, the hard inner portion ("stone") of the palm, Attalea funifera, the piasassa of Brazil, are highly valued for turnery purposes. They have an elongated oval form, 3 to 4 in. in length, and being intensely hard they take a fine polish, displaying a richly streaked brown colour.
The marking nut, *Semenus Anacardium*, is a fruit closely allied in its source and properties to the cashew nut (q.v.). The marking nut is a native of the East Indies, where the extremely acrid juice of the shell of the fruit in its unripe state is mixed with quicklime and used as a marking-ink. The juice also possesses medicinal virtues as an external application, and when dry it is the basis of a valuable caulking material and black varnish. The seeds are edible, and the source of a useful oil.

Physic nuts are the produce of the euphorbiaceous tree, *Carcas purgas*, whence a valuable oil, having similar purgative properties to castor oil, is obtained. The plant is a native of South America, but is now found throughout all tropical countries.

Pine nuts are the seeds of several species of *Pinus*, eaten in the countries of their growth, and also serving to some extent as sources of oil. Of these the most important are the stone pine, *Pinus Pinea*, of Italy and the Mediterranean coasts, and the Russian stone pine, *Pinus Cembra*. The *Pinus Sobintiana* of California and *P. Gerardiana* of the Himalayas similarly yield edible seeds. These seeds possess a pleasant, slightly resinous flavor (from Lat. *nutare*, nuts). The Ravnazmnuts, the fruit of *Aglaphyllum aromatica* (Lauraceae), is a native of Madagascar. The name of the Madagascar clove nutmeg.

The Sapucaya nut, a native of Brazil, is seen occasionally in fruit-shops. It is produced by a large tree, *Lecythis Ollaria*, or “cannon-ball tree.” Its specific name is taken from the large urn-shaped capsules, called “monkey-pots” by the inhabitants, which contain the nuts. The sapucaya nut has a sweet flavor, resembling the almond, and if better known would be highly appreciated. It is, however, scarce, as the monkeys and other wild animals are said to be particularly fond of it. This nut, which is of a rich amber-brown, is not unlike the Brazil nut, but it has a smooth shell furrowed with deep longitudinal wrinkles.

Soap nuts are the fruits of various species of *Sapindus*, especially *S. Sapunaria*, natives of tropical regions. They are so called because their rind or outer covering contains a principle, saponine, which lathers in water, and so is useful in washing. The pods of *Acacia concina*, a native of India, possess the same properties, and are also known as soap nuts.

**NUTATION (from Lat. *nutare*, to nod), a revolution of the celestial pole around its mean position, due to inequalities in the action of the sun and moon, on an earth elliptoidal form. When either of these attracting bodies is in the plane of the equator, it produces no change in the direction of the celestial pole. The greater their distance from this plane, the greater the change, for reasons shown in the article *Astronomy (Celestial Mechanics)*. The result is a motion which can be divided into two components. One of these is the progressive and nearly uniform motion of a fictitious mean pole, called precession (q.v.), and the other a revolution of the true around the mean pole, depending on the varying declinations of the sun and moon, and called nutation. Owing to the revolution of the moon’s node and the inclination of its orbit, this body moves through a wider range of declination in some positions of the node than in others. The period of the revolution of the node is 18-6 years. At one time of this period the limits of its declination are more than 28° north and south, while, at the opposite point, they are little more than 18°. The result of these periodic changes is that the nutation takes place nearly in an ellipse, differing little from a circle, at a distance of about 9°, in a period of about 18-6 years. The nutation has, however, a great number of minute inequalities arising from the ellipticity of the orbits of the sun and moon and their varying declinations. The amount and formule of nutation from year to year are given in the Nautical Almanac.

**NUTCRACKER, the name given by G. Edwards in 1738 (Gleanings, No. 249) to a bird which had hitherto borne no English appellation, though described in 1544 by Turner, who, meeting with it in the Raetic Alps, where it was called “Nousbrecher” (hodie “Nusbrecher”), translated that term into Latin as *Nucifraga*. In 1555 C. Gesner figured it and conferred upon it another designation, *Caryocatactes*. It is the Corrus caryocatactes of Linnaeus and the *Nucifraga caryocatactes* of modern ornithology. F. Willughby and J. Ray obtained it on the road from Venice to Vienna as they crossed what must have been the Sömmerring Pass, 26th September 1663. The first known to have occurred in Britain was, according to T. Pennant, shot at Mostyn in Flintshire, 5th October 1753, and about fifteen more examples have since been procured, and others seen, in the island. Contrary to what was for many years believed, the nest of the Nutcracker seems to be invariably built on the branches of trees, sometimes as high from the ground, and is composed of a large structure of sticks, lined with grass. The eggs are of a very pale bluish-green, sometimes nearly spotless, but usually more or less flecked with pale olive or ash-colour. The chief food of the Nutcracker appears to be the seeds of various conifers, which it extracts as it holds the cones in its foot, and it has been questioned whether the bird has the faculty of cracking nuts—properly so called—with its bill, though that can be used with much force and, at least in confinement, with no little ingenuity. The old supposition that the Nutcrackers had an influence on the Pole (Polestar) is now looked upon as one of many folk-lore stories.

**NUTMEG** (from “nut,” and O. Fr. *mugue*, musk, Lat. *muscum*), the commercial name of a spice representing the kernel of the seed of *Myristica fragrans* (fig. 1), a dioecious evergreen tree, about 30 to 60 ft. high, found wild in the Banda Islands and a few of the neighbouring islands, extending to New Guinea.
NUTRITION

The process of liming, which originated at the time when the Dutch held a monopoly of the trade, was with the view of preventing the germination of the seeds, which were formerly immersed for three months in milk of lime for this purpose, and a preference is still manifested in some countries for nutmegs so prepared. It has, however, been shown that this treatment is by no means necessary, since exposure to the sun for a week destroys the vitality of the kernel. Penang nutmegs are never limed. The entire fruit preserved in syrup is used as a sweetmeat in the Dutch East Indies.

"Oil of mace," or nutmeg butter, is a solid fatty substance of a reddish-brown colour, obtained by grinding the refuse nutmegs to a fine powder, enclosing it in large and stopping it over large cauldrons for five or six hours, and then compressing it while still warm between powerful wedges, the brownish fluid which flows out being afterwards allowed to solidify. Nutmegs yield about one-fourth of their weight of this substance. It is partly dissolved by cold alcohol, the remainder being soluble in ether. The latter portion, about 10% of the weight of the nutmegs, consists chiefly of myristin, which is a compound of myristic acid, C\(_16\), with glycerol.

The name nutmeg is also applied to other fruits or seeds in different countries. The Jamaica or calabash nutmeg is derived from Monodora Myristica, the Brazilian from Cryptocarya moschata, the Peruvian from Laurelia sempervirens, the Maccassar or clove nutmeg from Agathophyllum aromaticum, and the Californian or stinking nutmeg from Torreya Myristica. The coryledons of Nectandra Puchury were at one time offered in England as nutmegs.

The physiology of nutrition involves the study of the way in which the tissues of the body, and more especially the great master tissues, muscle and nerve, obtain the material for growth and repair and the energy for mechanical work and heat production, and of the mode in which they get rid of the waste products of their activity. The study is therefore very largely a study of the history of the food of the body, since it is in the food that the necessary matter and energy are supplied. Under DIETETICS the composition and special importance of various foods and the laws which regulate the supply of food under different conditions of the body are separately dealt with. Here the mode of digestion, the utilization and the elimination of the end products of the three great constituents, proteins, carbohydrates and fats, are alone considered. They are treated under the following heads: I. The Chemistry of Digestion; II. The Mode of Formation of the Digestive Secretions; III. The Mechanism by which the Food is passed along the Alimentary Canal; IV. The Absorption of Food; V. Metabolism; VI. Excretion.

I. CHEMISTRY OF DIGESTION

The essential step which prepares the ordinary food for utilization in the body, for the change into living matter, is digestion, a process by which the food undergoes under the influence of the ferment or enzymes present in the gastro-intestinal tract. By this process it is broken down into simpler substances, which can be utilized by the body tissues for conversion into protoplasm and as the supply of energy. That part which is unsuitable for use in the body is either passed as faeces or absorbed and excreted in the urine.

1. Enzyme Action generally.—The substances which bring about this change are known as ferments, enzymes orzymins. Formerly it was believed that there were two distinct classes

From Strasburger's Lehrbuch der Botanik, by permission of Gustav Fischer.

Fig. 2.—Myristica fragrans, seed cut through longitudinally.

Fig. 3.—Myristica fragrans.

1. Male flower X 2. 
2. Female flower X 2.
of enzymes, those which were living or associated with living cells, and those which were non-living. In 1897, however, E. Buchner and M. Hahn showed that from living cells (yeast) a ferment could be obtained which acted quite as well extracellularly as when it was bound up within the cell. Subsequent work has shown that other organisms act by the enzymes they contain, so that it is now recognized that there is no essential difference between the living or organized ferment and the non-living or unorganized ferment. All ferments probably act as catalysts or catalysts. Catalysis is the process by which reactions are either initiated or accelerated by the mere presence of substances which remain unchanged during the process; to these substances the name of catalysts has been given. As an example of such catalytic action the acceleration of the decomposition of hydrogen peroxide (H₂O₂) into water (H₂O) and oxygen (O₂) by the action of a colloidal solution of platinum may be given. C. Oppenheimer defines an enzyme as a substance produced by living cells, which acts by catalysis. E. Fischer has shown that the action of ferments is specific, that is, the ferment only exerts its action on definite substances or substrates of definite structural arrangement. He has compared the relation of ferments to that of a key to a lock. Ferments which bring about the breakdown of proteins are without influence on fats and carbohydrates; those which decompose fats leave proteins and carbohydrates untouched, and so on.

The chemical composition of enzymes is unknown. It has been assumed that they are protein in nature, but this is mainly because it has been found that when they are dissolved in water they apparently combine with proteins. In all probability the enzyme is there as an impurity owing to incomplete separation.

As regards the general properties of enzymes, most of them can be precipitated from their solutions by means of alcohol. They can also be carried down by fine precipitates of certain inorganic salts or by protein precipitation, e.g. when a precipitate of casein is produced by acidifying a casein solution with acetic acid. Most of the ferments are soluble in water or saline solutions, and in glycerin and water. The ferments are found to have an optimum temperature of action. This temperature in most cases ranges from 37° to 40°C. All true ferments are thermolabile, being destroyed at about 70°C. Ferments are hindered in their action to some extent by the general proteolytic poisons, such as salicylic acid, chloroform, &c. The action of many of them is retarded when the products of their action are allowed to accumulate. Just as when a chemical reaction is set up its rate tends to decrease and finally comes to a standstill before the reaction is completed—an equilibrium being established—so the reactions set up by enzymes also tend to come to an equilibrium before the complete conversion of the original substance. In the case of certain enzymes at least this equilibrium may be reached from either side; thus the enzyme maltase may either bring about the breakdown of its sugar maltose to dextrose or cause a synthesis of dextrose to maltose.

A number of the body ferments have now been shown to exist in the tissues in an inactive form. This condition is known as the pro-ferment state, and before any action can be exerted it must be activated, usually by some specific substance, as in the case of the activation of trypsinogen by means of enterokinase. The following table gives a list of the principal ferments concerned in the digestion and metabolism of food-stuffs:

<table>
<thead>
<tr>
<th>Material acted on.</th>
<th>Enzyme.</th>
<th>Where found.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Protein</td>
<td>Pepsin</td>
<td>Gastric juice</td>
</tr>
<tr>
<td></td>
<td>Trypsin</td>
<td>Pancreatic juice</td>
</tr>
<tr>
<td></td>
<td>Chymotrypsin</td>
<td>Tissue generally</td>
</tr>
<tr>
<td>2. Fats</td>
<td>Lipase</td>
<td>Pancreatic juice and certain tissues</td>
</tr>
<tr>
<td></td>
<td>Pylalin (salivary diastase)</td>
<td>Saliva</td>
</tr>
<tr>
<td>3. Carbohydrates</td>
<td>Invertase</td>
<td>Pancreatic juice</td>
</tr>
<tr>
<td></td>
<td>Lactase</td>
<td>Pancreatic juice</td>
</tr>
<tr>
<td></td>
<td>Various tissue diastases</td>
<td>Small intestine</td>
</tr>
</tbody>
</table>

Certain oxidases, catalases and de-amidizing enzymes are found in the tissues generally and play an important part in the various metabolic processes.

2. Digestion in the Mouth.—The first of the digestive secretions which food comes into contact with is the saliva. This is the mixed secretion from the various glands, salivary and other, the ducts of which open in the mouth. The saliva, which is for the most part produced by the three large salivary glands, the parotid, the sub-maxillary and the sub-lingual, is a colourless or slightly turbid viscus fluid with a faintly alkaline reaction and of low specific gravity. It contains a very small proportion of solids, which vary somewhat in amount and character in the secretions of the different glands. Mucin and traces of other proteins are present. Small amounts of potassium sulpho-phenylamine may nearly always be detected. The functions of the saliva are to lubricate the food, to aid in moistening the mouth and the food and thus aiding mastication and swallowing by securing the formation of a proper bolus of food; it also assists by binding the particles together, an action of special importance when the food is dry. Second, in man and in some of the lower animals the enzyme ptyalin exerts an action in digestion on part of the carbohydrates of the diet. The starches or polysaccharides are broken down, first of all to the simple dextrins and then to the still more simple disaccharide, maltose. The further breakdown of the latter is carried out by the intestine with the aid of a ferment maltase which does not exist at all or only in the nascent traces in the buccal secretion. The action of ptyalin on starches is thus very similar to that of acids, except that it stops at the formation of maltose. Ptyalin acts best at a temperature of about 40°C. and in a neutral or faintly alkaline medium, its action being inhibited by the presence of even very dilute solutions of the mineral acids. If the acid be in sufficient amount the enzyme is destroyed. For this reason the action ceases in the stomach whenever the bolus is completely permuted by the gastric juice. As it takes time for the gastric juice thoroughly to permeate the food mass, which remains for a considerable period in the fundus of the stomach unmixed with the secretion, salivary digestion goes on for about half an hour after food is taken.

3. Gastric Digestion.—The passage of food from the mouth to the stomach will be dealt with later. The stomach has two digestive functions: (1) It acts as a store chamber permitting a full meal to be taken; (2) It acts as a digestive organ of importance in preparing the food for further attack in the intestinal canal. But the stomach cannot be regarded as an essential organ, since it has been removed in dogs and in man without apparent interference with nutrition and health.

Gastric digestion is brought about by the action of the gastric juice, a clear watery, colourless and strongly acid fluid with a specific gravity of about 1.003. The amount of solids present is extremely small, about 0.3%. They consist of protein, nucleic acid, lecithin and inorganic salts, in addition to the more important constituents, the enzymes and hydrochloric acid.

The amount of hydrochloric acid present in the juice varies with the period of digestion. In man the maximum acid concentration is about 0.2%. The acid exists in the stomach in two forms as free hydrochloric acid and as combined hydrochloric acid. The amount of each depends on various factors: (1) The secretion itself; (2) the nature of the food; and (3) the rapidity with which the stomach empties itself, &c. For instance, after a protein-free meal the hydrochloric acid is for the most part free, whereas, when protein is present, it combines with it and, unless secreted in very large amount, most of the acid is in a fixed condition.

The hydrochloric acid is formed by the activities of certain glands either in the fundus of the stomach, or in the mucous membranes of the food passages and certain glands. It has been shown by the fact that, when the tissues are deprived of this salt, and sodium bromide is given, hydrobromic acid may appear in the gastric secretion.
The hydrochloric acid is essential for the action of the gastric enzyme, pepsin, in splitting up the protein of the food. In addition to this, the acid has a slight action in splitting polysaccharides and disaccharides. Lastly, it acts as a bactericidal agent, preventing bacterial decomposition from taking place, and it may thus prevent certain noxious bacteria, taken in the food, from gaining access to the intestinal tract, where there is a chance of their flourishing in the rich alkaline medium. It is, therefore, to the presence of hydrochloric acid that gastric juice can be kept for prolonged periods without undergoing putrefaction.

The quantity of juice secreted varies with the nature of the food consumed. Thus in one experiment, after the use of a test meal consisting of 25 grammes bread and 250 c.c. tea, there was a flow of 106 c.c. of juice; whereas in another case an ordinary meal there was an output of practically 600 c.c. gastric juice.

Pawlow has shown that not only does the amount of juice secreted vary with the nature of the food ingested but that the digestive activity of the secretion also varies in the same way. He gives the following table:

**Quantities and Properties of Gastric Juice with Different Diets:**

<table>
<thead>
<tr>
<th>Hour</th>
<th>Quantities of Juice in c.c.</th>
<th>Digestive Power in mm.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flesh</td>
<td>Bread</td>
</tr>
<tr>
<td>1st</td>
<td>1:12</td>
<td>3:5</td>
</tr>
<tr>
<td>2nd</td>
<td>2:1</td>
<td>5:4</td>
</tr>
<tr>
<td>3rd</td>
<td>3:6</td>
<td>7:2</td>
</tr>
<tr>
<td>5th</td>
<td>2:8</td>
<td>3:3</td>
</tr>
<tr>
<td>6th</td>
<td>2:2</td>
<td>2:5</td>
</tr>
<tr>
<td>7th</td>
<td>1:8</td>
<td>2:3</td>
</tr>
<tr>
<td>8th</td>
<td>0:6</td>
<td>2:6</td>
</tr>
<tr>
<td>9th</td>
<td>0:9</td>
<td>3:0</td>
</tr>
<tr>
<td>10th</td>
<td>0:4</td>
<td>3:4</td>
</tr>
</tbody>
</table>

Thus each separate food gives rise to a definite hourly secretion of the juice and to a characteristic alteration in its properties. The meat diet brings about a very rapid flow, the maximum output taking place about the first two hours, after which the gastric juice becomes less and less. With bread the same result is obtained, but the maximum output is even earlier. With milk somewhat later. When the juice is examined as regards its digestive activity, it is found that with meat the most active juice is secreted within the first hour, with bread in the second and third hours, and with milk in the sixth hour.

According to the nature of the food, the stomach seems to be stimulated to form a secretion which will best serve its purpose and give the minimum of waste economy. The principal ferment found in the gastric juice is pepsin, a ferment which acts only in the presence of a mineral acid. The action proceeds best at a temperature of about 37° C. in an acid medium of pH 2 to 3. Pepsin is eluted in the pyloric part of the stomach, whereas the casein and fat are retained for further treatment. On a mixed diet, emptying of the stomach in mac processes very slowly, requiring about four hours. Cannon, by feeding with bismuth and X-rays, showed that carbohydrates leave most rapidly, then mixtures of carbohydrates and proteins, then proteins, then fats, and finally mixtures of fats and proteins. The diet which remains longest in the stomach is a mixture of fats and proteins—rich food, as it is popularly called. Here two factors enter to prevent rapid emptying: (1) the presence of much fat, and (2) the acid secretion engendered by the abundant proteins.

It is owing to the presence of hydrochloric acid that gastric juice can be kept for prolonged periods without undergoing putrefaction. There is no doubt that fats present in fine emulsion can be decomposed in the stomach. The action proceeds in a medium which is slightly acid or neutral, being entirely prevented by the presence of alkalies. Proteins and emulsions of fats are more likely to be of pancreatic or intestinal origin, and suppose that it gains entrance to the stomach by a reflux flow through the pylorus. Evidence of this is accumulating that this is the case.

By means of pepsin and gastroplastin proteins and fats are dealt with. No specific enzyme for carbohydrates has been found in the stomach in man. Certainly a small amount of polysaccharide decomposition takes place, but this is dependent (1) on the pepsin which comes from the mouth, and (2) on a certain amount of hydrolysis due to the action of the free hydrochloric acid. The secretion obtained from a fistula of the pancreatic duct varies in character according to whether the opening into the duct has been made recently or some time before the examination. It is a clear, usually thin fluid with a specific gravity of about 1008, and with an alkaline reaction. It contains a certain amount of protein and ash. The most important inorganic constituent is sodium carbonate, which gives the alkaline reaction (alkalinity is, as NaOH=0.47%). This alkaline salt, along with that contained in the intestinal juice, plays an important part in neutralizing the acid chyme.

**Digestion in the Intestine.**—The passage of food from the stomach to the intestine will be considered later. The food so far digested in the stomach is known as chyme, and it is passed on to undergo intestinal digestion under the influence of (1) the enzymes of the pancreas, and (2) of other enzymes present in the different secretions of the intestine. Digestion in the intestine may accordingly be described under these two heads.

(a) **Pancreatic Digestion.**—The pancreatic juice is the secretion from the pancreas and is discharged into the duodenum. The secretion obtained from a fistula of the pancreatic duct varies in character according to whether the opening into the duct has been made recently or some time before the examination. It is a clear, usually thin fluid with a specific gravity of about 1008, and with an alkaline reaction. It contains a certain amount of protein and ash. The most important inorganic constituent is sodium carbonate, which gives the alkaline reaction (alkalinity is, as NaOH=0.47%). This alkaline salt, along with that contained in the intestinal juice, plays an important part in neutralizing the acid chyme.

(b) **Intestinal Digestion.**—In the stomach, the juice of the pancreas contains at least three important enzymes, each with a definite action: (a) trypsin, the proteolytic enzyme which brings about the further breakdown of the food proteins; (b) lipase, which deals with the carbohydrates, and (c) a lipase which acts on the fats.

(a) **Trypsin.**—This ferment, in the form in which it is secreted—trypsinogen—is inert. Before it can exert its hydrolytic action it must be converted into trypsin by the enzyme pepsin. The reaction has been shown by the fact that another of the enzymes which is found in the intestinal tract—enterokinase. The version is brought about as soon as the trypsinogen comes into contact with the enterokinase, which is present in the intestinal juice. Trypsin acts on the protein just as pepsin does, by bringing about hydrolytic changes. It differs from the latter in acting best in an alkaline medium, and in being more rapidly inactivated by the presence of bile acids, so far as its hydrolytic action goes, than is the case with pepsin. However, as far as the splitting of the caseinogen of the milk is confined to the stomach, but has been found in various tissue extracts, and, indeed, wherever proteolytic enzymes are present.

The speed with which the stomach is emptied depends to a great extent on the nature of the food. Plain water leaves the stomach almost at once, salt and sugar solutions at a somewhat slower rate. Milk and milk curd act more slowly, the greater part of the food staying in the stomach, whereas the casein and fat are retained for further treatment.

4. **Digestion in the Intestine.**—The passage of food from the stomach to the intestine will be considered later. The food so far digested in the stomach is known as chyme, and it is passed on to undergo intestinal digestion under the influence of (1) the enzymes of the pancreas, and (2) of other enzymes present in the different secretions of the intestine. Digestion in the intestine may accordingly be described under these two heads.

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The character and properties of the products formed in such digestion depend on the nature of the protein acted upon. As will be seen from the following table these proteins vary fairly widely in the proportion of amino acids which they contain.

100 Grammes Protein yielded

<table>
<thead>
<tr>
<th>Protein</th>
<th>Caseinogen</th>
<th>Gelatine</th>
<th>Globine from Oxycyto-</th>
<th>Elastine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycocoll</td>
<td>16-5</td>
<td>4-19</td>
<td>25-75</td>
<td></td>
</tr>
<tr>
<td>Alanine</td>
<td>10-5</td>
<td>2-6</td>
<td>21-24</td>
<td>21-58</td>
</tr>
<tr>
<td>Leucine</td>
<td>3-1</td>
<td>5-2</td>
<td>2-34</td>
<td>1-74</td>
</tr>
<tr>
<td>Proline</td>
<td>3-2</td>
<td>0-4</td>
<td>2-34</td>
<td>3-89</td>
</tr>
<tr>
<td>Glutamic acid</td>
<td>1-2</td>
<td>0-56</td>
<td>1-43</td>
<td>0-76</td>
</tr>
<tr>
<td>Aspartic acid</td>
<td>1-2</td>
<td>0-56</td>
<td>1-43</td>
<td>0-76</td>
</tr>
<tr>
<td>Cystine</td>
<td>0-065</td>
<td>0-31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serine</td>
<td>0-23</td>
<td>0-56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxyproline</td>
<td>3-5</td>
<td>5-42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tyrosine</td>
<td>4-5</td>
<td>1-33</td>
<td></td>
<td>0-34</td>
</tr>
<tr>
<td>Lysine</td>
<td>5-80</td>
<td>2-75</td>
<td></td>
<td>4-28</td>
</tr>
<tr>
<td>Histidine</td>
<td>2-59</td>
<td>0-40</td>
<td>10-96</td>
<td></td>
</tr>
<tr>
<td>Arginine</td>
<td>4-84</td>
<td>7-42</td>
<td></td>
<td>0-34</td>
</tr>
<tr>
<td>Tryptophane</td>
<td>1-5</td>
<td>7-42</td>
<td></td>
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Whether any of the polypeptides found in digestion are further broken down in the course of normal pancreatic digestion is a moot point, but E. Fischer and E. Abderhalden have shown that many of the synthetic polypeptides prepared by them can be broken into their constituents by the action of trypsin. The further peptic digestion seems to play some part in the extent to which trypsin digestion is carried out, as one of these observers has demonstrated that protein digested first with pepsin and then with trypsin gives a yield of polypeptide and a larger yield of mononitrogenous acids than when digestion has been carried out with trypsin alone.

b. Diastase.—This ferment is found in the pancreatic juice apparently secreted in an active form, although some observers hold that it also is secreted in azymogen form. It is practically identical in its action with the ptyalin of the saliva, converting starch into maltose. It deals with all the starchy food which has escaped conversion into simple sugars by the ptyalin.

c. Lipase.—Most of this ferment, if not all, is apparently secreted in the form of a zymogen. There is evidence that the bile is the activating agent here, just as the enterokinase acts in the case of trypsin. Lipase can act in any medium acid, neutral, and alkaline, and both on emulsified and non-emulsified fats. It converts the fats by a process of hydrolysis into fatty acids and glycerin. Kastle and Lowenhart found that not only can this enzyme break up fats into their components, but that it also has the power to act in the reverse direction, and in this way bring about the union of fatty acids and glycerin so as to form fats, a process which occurs in the intestinal pas sage of the animal’s affections in the alimentary canal.

In addition to these three enzymes the pancreatic juice may contain traces of others, for example, a rennet-like ferment which curdles milk. This again, as in the case of the stomach rennet, is present in some form or other in the testes. Maltase is also said to be present in small amount, as is also lactase under certain conditions. In pancreatic, as in gastric digestion, the mixture of the food is said to play an important part in confusing the amount and the composition of the secretion with respect to its ferments. The action, if it does exist, is not very well defined.

b. Intestinal Digestion.—By this is meant the other digestive processes which go on in the intestine under the action of the secretion of Lieberkühn’s follicles—the succus entericus. This is a yellowish, often opalescent, strongly alkaline fluid. The alkalinity is due to the presence of sodium carbonate. It contains a small amount of protein, shed epithelial cells, etc. The succus entericus is present in 44 hours after it has been observed in a short loop of human intestine by H. S. Hamburger and E. Hekma, but it is almost impossible to get a measure of the actual amount of secretion from the whole gut. Most of the ferments are present in very small amount in the intestinal juice. They seem to be actually within the epithelial lining of the intestine, for extracts made from the intestinal mucous membrane are richer in ferments than the secretion.

Apprently the intestinal secretion contains no trace of a ferment acting on native protein, but a ferment—creatin—is present in fair amount in the intestinal mucous membrane and small amount in the secretion, which acts in an alkaline medium on proteins, peptones, and on casein, converting them into crystalline products of the nature of amino acids.

Another ferment, arginase, has been isolated from the intestinal mucous membrane by A. Kossel and H. D. Dakin, which splits the dianino acid arginino into urea and ornithin. A lipase has also been detected which is very similar to pancreatic lipase; it, however, attacks only emulsified fats.

Several carbohydrate hydrolysing enzymes have been described in the intestines. Invertin, the ferment which splits sucrose, is present in small amount in the secretion, more abundantly in the extract of mucous membrane. In all probability it deals with the saccharose after or in process of absorption. Maltase is also present in small amount, but, and according to some observers, more abundantly in the secretion. The presence of lactase has been much discussed, and it seems probable that suckling animals do possess this enzyme. Workers have stated that an intestinal diastase is to be found, but, if so, it is present in very small amount.

In the large intestine a small amount of erepsin has been discovered at the upper end. Any digestion which does take place is probably either bacterial in origin, or due to ferments which have originated in the lower end of the small intestine, and which have been carried down.

5. Bile.—This fluid, in all probability, has little direct action in ordinary digestion, although it contains substances which act indirectly. The bile salts act as solvents for fats and fatty acids, and as activators of pancreatic lipase. The salts also serve to keep cholestrin in solution. Bile is to be looked upon rather as the excretion, the result of the hepatic metabolism, than as a digestive juice. Various workers have shown that when bile is passed through the intestine, by ligating the duodenum after it has been made, the animal or patient may continue to enjoy good health, thus proving that this fluid is not essential to any of the digestive processes which normally take place.

Bile as secreted has an orange-brown colour, but the colour varies according to the pigment present. It is more or less viscous (not so viscous as bile taken from the gall bladder) and has a specific gravity of about 1010. It has a slightly alkaline reaction, a bitter taste and a characteristic smell. The daily output is, for a normal individual, over 500 c.c. On analysis it is found to have over 2% of solids, of which more than half are organic. It contains in addition to bile pigments, bile salts, bile acids, bile pigments, cholesterol, lecithin, fats, etc. The most abundant solids are the salts of the bile acids, of which in man the most important is sodium taurocholate, sodium taurocholate being present in very small amount. The bile acids are formed in the liver cells, and when the duct is ligatured they tend to accumulate in the blood.

The pigments amount to only about 0.2%. In human bile the chief pigment is bilirubin, whilst in herbivora biliverdin is more abundant. They are derived from the haemoglobin of the blood, but the pigments are iron-free. They may be regarded as purely products arising from the breakdown of the haemoglobin of effete blood corpuscles.

Cholestrin is a monatomic alcohol, and is probably a waste product, but its exact position in the alimentary canal is not known. There is evidence that it is not secreted by the liver cells but is added to the bile from the bile passages. Fats and lecithin are both derived from the liver cells. Of the inorganic constituents phosphate of calcium is the most abundant.

The secretion of bile is practically continuous, but it seems to enter the duodenum intermittently. The taking of food increases the flow of bile, the amount of the increase depending to a certain extent on the nature of the food. A protein meal has been found to have the greatest effect and a carbohydrate one the least. The entry of the acid chyme into the duodenum is the stimulus which brings about the ejection of the bile. Pressure on the liver also seems to cause a flow (see section 11.).

In connexion with bile secretion attention may be drawn here to a peculiar enterohepatic circulation which is stated to exist. The bile salts are partly absorbed by the intestine and are secreted again by the portal blood to the liver and to be again eliminated. By this circulation the entrance of various alkaloidal and ptomaine poisons into the alimentary canal may be prevented.

Faces.—The bulk of the waste matter arising from the foods along with the secretions from the alimentary canal form the faces. On an absorbable diet the faces are almost purely intestinal in origin. As a result of the excretion of nitrogenous metabolic waste products they are not very important, although the work of C. Voit indicates that they do play a certain part. The nature of the excreted nitrogenous substances has not been fully examined. Of the inorganic constituents phosphorus is probably the most partly excreted into the large intestine. It is, however, very difficult to come to any definite conclusion as to what is unabsorbed material and what excreted.

II. THE MODE OF FORMATION OF THE DIGESTIVE SECRETIONS

1. Salivary Glands.—The secretion from the various glands is generally evoked by nervous impulses, through the secretory
How far the flow is controlled by nervous action, and how far by hormone action, is not known.

III. Motor Mechanism of the Alimentary Canal

Mastication.—This is a purely voluntary act, and consists of a great variety of movements produced by the various muscles in connexion with the lower jaw. By the act of chewing the food is thoroughly broken up and intimately mixed with the saliva.

Deglutition.—The food after thorough mastication is collected on the surface of the tongue, principally by the action (voluntary) of the buccinator muscles, and by the contraction of the tongue muscles it is passed backwards. As soon as the food by the action of the tongue enters the pillars of the fauces the action becomes involuntary and reflex. The soft palate is raised to prevent the food entering the nasal cavity, and the larynx is shut off by closure of the glottis, and approximation of the arytenoid cartilages to one another and to the back of the epiglottis. The food is now passed on into the oesophagus proper by the constrictors of the pharynx. In the oesophagus the downward movement varies with the nature of the food swallowed. If it be fluid it reaches the lower end of the oesophagus in about three seconds and lies at the lower end of the gullet for two or three seconds before entering the stomach. When the consistency is firmer the progress downwards is much slower. Either by the force exerted by the wave of contraction passing down the gullet or by some inhibition of the sphincter, the cardia orifice opens and permits the food to enter the stomach.

Stomach Movements.—For our knowledge of these we are indebted principally to the work of Cannon, who studied them by feeding an animal with food containing bismuth and following the movements of the shadow of the food on a screen by means of the X-rays. Soon after food is taken it is found that a contraction begins somewhere about the middle of the stomach and slowly passes towards the pylorus. This is followed by others, in men at regular intervals of about twenty seconds, so that the pyloric part of the organ is soon in active peristalsis. The fundus of the stomach is not actively concerned in these movements; it simply acts as a reservoir. At certain periods, but not with each peristaltic wave, the pyloric sphincter relaxes and allows a portion of the fluid acid chyme to escape into the duodenum. If one fluid it reaches the lower end of the oesophagus in about three seconds and lies at the lower end of the gullet for two or three seconds before entering the stomach. When the consistency is firmer the progress downwards is much slower. Either by the force exerted by the wave of contraction passing down the gullet or by some inhibition of the sphincter, the cardia orifice opens and permits the food to enter the stomach.

Intestinal Movements.—The intestines owe their peculiar movements to the arrangement of their muscular coats, which are disposed in two layers, an inner circular, and an outer longitudinal. The movements are of two kinds, the so-called swaying myogenic contraction and the peristaltic waves. The former are rapid and have very little to do with the downward movement of the contents. Probably their action is to mix the contents, since Cannon has shown that these contents, in the lower animals at least, get divided into segments. From time to time the separated segments are caught in the course of a peristaltic wave and carried downward a short distance. Then again in their new situation the rhythmical contractions break up the contents anew.

The peristaltic movements are much more powerful. Under normal conditions they begin at the pylorus and passing downwards carry the intestinal contents onwards. The normal movement progresses slowly, although under abnormal conditions
peristaltic waves may become extremely violent and rapid, and may indeed run over the whole length of the intestine within a minute. The muscular coat in front of the contracting zone is relaxed, as is that behind the wave. The waves are probably due mainly to the circular fibres, the longitudinal pulling the gut up over the contents as they are forced onwards. The downward movement seems to be due to some definite arrangement within the intestinal wall, since it has been shown that, when a segment of bowel has been cut out and then the continuity of the canal made good by fixing the section so that the lower end of the divided portion is fixed to the upper divided end of the real gut, upward peristalsis takes place. This section in an anti-peristaltic has been described in which the movements are all towards the stomach. Under certain conditions the introduction of foreign substances, as hairs, &c., may evoke such anti-peristaltic waves.

The rhythmical movements are held by some to be purely myogenic in origin, as they still continue after section of all the nerves and when the intrinsic ganglia in the intestinal wall have been thrown out of action by the application of nicotine. But recent work, particularly that of Magnus, shows that the wave movements, which Magnus would tend to show that they are controlled by a system of nerves, which act upon the circular coats. On the other hand, according to W. Bayliss and E. Starling, although they continue and indeed may become more energetic after section of the extrinsic nerves, are prevented by the application of nicotine and cocaine; in other words, it is presumed that peristalsis is a complicated reflex action through the intrinsic ganglia.

The intestines are therefore not dependent for their movement on their connexion with the central nervous system, although of course their activity is more or less regulated by such a connexion.

As regards the movements of the large intestine, they resemble those of the small, although they are much less frequent. The forward movement is slow, thus permitting of the solidification of the contents by the removal of the water. In the first part of the large intestine anti-peristaltic movements are frequent, the regular peristaltic downward movements only becoming prominent when the descending colon is reached to carry contents to the rectum. The anti-peristalsis serves a useful purpose in giving time for the absorption of the fluid in the formation of faeces. The rate at which the contents travel along the intestine varies greatly. The whole movement from the mouth to the anus may be considered by some to take about 24 hours. The contents never reach the ileo-cæcal valve between the small and large intestine at about four to four and a half hours after a meal, while it takes nine hours to reach the splenic flexure of the colon.

Defaecation.—Food residues, cellular débris and substances derived from the various secretions of the gastro-intestinal tract are forced downwards by peristalsis, and eventually reach the rectum and accumulate there as the faeces. The pressure of the solid and semi-solid material in the sigmoid colon is sufficient to force a portion to be discharged in a complete defaecation, while in other cases the colon is unable to empty itself and the discharge is incomplete. The faeces are retained within the canal partly by the horizontal direction of the rectum before it opens into the anal canal, and partly by the action of two sphincter muscles. At the act of defaecation the strong internal sphincter is first of all relaxed, but unless the rectal stimulus is very strong, the external can be kept contracted, as it is to a certain extent, under the control of the will. The act of defaecation normally is partly voluntary and partly involuntary. The voluntary part consists in the contraction of the abdominal muscles, the closure of the glottis, and the relaxation of the external sphincter and of the levator ani muscle, thus allowing the horizontal part of the rectum to become more vertical; the involuntary in the energetic contractions of the muscular walls of the colon and rectum which sweep the contents of the whole colon downwards. There is a centre in the lumbar enlargement of the spinal cord which presides over the sphincter muscles and probably over the whole involuntary mechanism of defaecation.

Vomiting.—Sometimes the gastric contents are ejected through the oesophagus against the teeth, the palate and the hard palate, by a series of violent efforts with the glottis closed. The diaphragm is held firmly contracted, then a convulsive contraction of the abdominal muscles with a simultaneous opening of the cardiac orifice of the stomach brings about the expulsion of the contents. The wall of the stomach may also contract and press upon the contents. During the act the glottis is firmly closed, and at the same time, if the act be not too violent, the gastric contents are prevented from entering the nasal cavity by the contraction of the soft palate.

IV. Absorption

MOUTH.—No absorption of food-stuffs takes place here.

STOMACH.—Absorption from the stomach occurs only to a small extent. Water passes rapidly through the stomach and is practically unabsorbed. Salts are apparently absorbed in a limited amount from their watery solution, the extent of absorption depending to some extent on the concentration of the solution. Sugar is also absorbed to a small extent from its solutions, the greater the concentration the greater the amount of sugar taken up. Alcohol is readily absorbed from the stomach. A small amount of the products of protein digestion may be absorbed. There is no evidence that fats are absorbed under any conditions in the stomach.

INTESTINE.—The greatest absorption of the foods takes place in the intestine, especially in the small intestine. It has been shown that over 85% of the protein has disappeared before the lower end of the small intestine is reached. How does the absorption take place? The removal of the material from the intestine: (1) the blood capillaries spread in the villi, and (2) the lacteals also present in the villi. The foods may reach the blood direct or through the various lymph channels into the thoracic duct and finally into the blood. The lacteals of the villi are channels for the absorption of the fatty parts of the food. The products of the digestion of the proteins and carbohydrates reach the body directly through the capillaries via the portal system.

Can absorption be explained by the ordinary laws of diffusion and osmosis, or are there certain selective activities of the living epithelial lining? The work of R. Heidenheim, E. Weymouth Reid, and others shows clearly that whatever part the physical laws play in this exchange, there are other activities also at work. For instance, an animal’s own serum can be readily absorbed from its intestine, as can also salt and other solutions of higher concentration than that of the blood. Such absorption cannot be explained by ordinary physical laws. In all such cases absorption of the epithelial lining of the gut must be intact and uninjured. O. Cohnheim and others have shown that when the epithelial lining is damaged or destroyed, the intestinal wall can take up any other substance and, if the physical laws governing osmotic pressure come into play. Whether the nervous system plays any part in this absorption is not yet determined.

The form in which the various products resulting from digestion are absorbed must next be considered. 

Carbohydrates.—These reach the body, as already mentioned, by way of the blood, and in the form of monosaccharides or simple sugars. F. Rohmann found that the absorption of the disaccharides is a function of the intestinal absorption of the mono-saccharides. He injected solutions of various sugars, mono- and di-saccharides, and found that the simple sugars were retained, whereas the double sugars were excreted in the urine. The only di-saccharide which can be dealt with in the body is maltose, as there is a maltase present in the blood which splits it. Carbohydrates which are not absorbed from the intestine are disposed of by bacterial action, giving rise to various fatty acids, carbon dioxide, &c.

Lipids.—Fats are absorbed from the intestine in the form of fatty acids and glycerin; i.e. in the form in which they exist after the action of the lipase. That a resynthesis takes place in the epithelium is shown by the fact that fatty acids are of equal value with fat as a source of energy, and that as fat absorption goes on fat droplets are seen to grow in the protoplasm away from the free margin of the cell. As already mentioned, the fat is removed by the lacteals from the cells and is transferred to the blood. As the greater part of the small amount of the fat may pass into the body via the blood, but this is practically all retained by the liver. The amount of fat absorbed depends a good deal on the nature of the fat, especially with reference to its melting-point, fats of low melting-point being most readily taken up.

Protein.—The older workers held that the protein was absorbed in
the form of proteose and peptone. In support of this it was stated that both proteoses and peptones could be detected in the blood stream. The result of the most recent work tends to show that the material is absorbed in the form of the amino acids either simple or in complex groups, the polypeptides. What is important to note is that if proteoses or peptones are absorbed they are attacked by the intra-cellular enzyme erepin, which breaks them down into the simpler products as soon as they are within the body. It is possible that the various materials which are absorbed undergo no change; for instance, blood serum disappears from the intestine without apparently any change through zymin attack. This fact is made use of in practical medicine, as, when administrated by the mouth, by Jacoby and others, has frequently kept alive by the giving of nutrient enemata. That the food thus given is absorbed is shown by the increase of nitrogen excretion in the urine. In the large intestine very little absorption of nutrient matter takes place. Most of the nitrogenous substances, proteins, must be excreted as a part was kept there. Be that as it may, that the absorbed material is removed whilst the food is in the small intestine. That protein matter can be absorbed is shown by the above statement regarding nutrient enemata. The principal substance absorbed here is water; and thus the excreta become firm and formed.

V. Metabolism

In all living matter there is a constant cycle of chemical changes going on, a constant breaking down (catabolism), and a correspondingly constant building up (anabolism). Unless the former is covered by the latter wasting and finally death must supervene. These two changes together make up the metabolism, and the study of this involves a study of the fate of the food absorbed both when it is used immediately and after it has been stored in the tissues of the body. Protein matter is undoubtedly the main constituent of protoplasm, but in what form it exists there is absolutely unknown. One thing is certain, that for the maintenance of life a constant supply of protein matter is necessary from the fact it might be said that this is the essential food and keeps the body alive, fats and carbohydrates being merely subsidiary. In the mammalian organism with which we are specially concerned a supply of these latter substances is also necessary to yield the energy required. The amounts of these various food stuffs which should be present in a suitable diet are dealt with under DIETETICS (q.v.). Here we are only concerned with the part played by the different materials in the various chemical changes which are the basis of vital activity.

Not many years ago physiologists were very much in the position of unskilled labourers who saw loads of heterogeneous materials bringing "food" and asked for "what" it was. Now we know for what particular purpose each individual substance was used. Thanks, however, to the brilliant work of E. Fischer we are no longer in this position. Gradually our knowledge is being broadened by actual facts obtained by direct experiment, or by inference from previous experiments. But it is still far from complete. It is only possible to outline what is at present known about the part played by the different food constituents in metabolism.

Proteins.—Since these alone contain the nitrogen necessary for the building up and repair of the tissues they are essential and will be dealt with first. In considering the digestion of proteins it was shown that in all probability all protein food was reduced in the intestine to comparatively simple crystalline bodies. O. Löwenstern has shown that an animal can be maintained in health without loss of weight by feeding it on a diet consisting of amino acids obtained by prolonged pancreatic digestion in place of proteins. In addition to these amino acids the liver and the muscles were supplied with much more, and it has been shown that the presence of carbohydrate a certain amount of which is absolutely essential before utilization of the amino acids can take place. Furthermore, it has been demonstrated that only a mere fraction of the total amino acids resulting from pancreatic digestion is sufficient to supply the needs of the animal organism. Not only so, but, in spite of the attempt to insist on the polypeptides and proteins as the absolute food material upon which the living substance depends for its nourishment, the body, it has been shown that mixtures of amino acids from which the polypeptides have been removed can serve as the nitrogen supply.

What then does the body gain by breaking down food material to such simple bodies, if it is put to no use for the repair of the body? It has been shown that mixtures of amino acids from which the polypeptides have been removed can serve as the nitrogen supply.

It has also been shown that the presence of carbohydrate a certain amount of which is absolutely essential before utilization of the amino acids can take place. Furthermore, it has been demonstrated that only a mere fraction of the total amino acids resulting from pancreatic digestion is sufficient to supply the needs of the animal organism. Not only so, but, in spite of the attempt to insist on the polypeptides and proteins as the absolute food material upon which the living substance depends for its nourishment, the body, it has been shown that mixtures of amino acids from which the polypeptides have been removed can serve as the nitrogen supply.

In an experiment carried out by E. Abderhalden this was very clearly demonstrated. A protein gliadin absolutely different in constitution from the proteins of blood plasma was fed to an animal from which much of its blood had been removed, so that an active reformation had to take place. The question to be solved was whether by feeding with a protein so absolutely different in constitution the nature of the freshly forming serum protein could be radically changed. But the newly-formed serum was found to be exactly the same in constitution as the old serum. The only difference was that the nuclei of the gliadin which were required and had rejected the others.

In addition to this breakdown of protein in the intestine, another form of protein is important in the process of absorption. The volume of the gut the amino acids are not wholly conveyed as such by the portal blood to the liver. That the portal blood contains a greater amount of ammonia than the systemic blood has long been known, and Jacoby and others have shown that some of the amino acids among them the intestinal tissues, are able to split off from the amino acids their amino group NH₂. It would seem probable that any excess of the amino acids formed does not reach the liver or is destroyed by the liver, and is excreted in the urine. The ammonia split off is also conveyed to the liver and is excreted for the most part as urea, within the first few hours after a protein meal. Thus, in all probability very early after absorption and before the products of digestion enter into combination or any synthesis occurs, all excess of the absorbed nitrogen is disposed of. The rest of the products circulate in the blood, yielding to the cells the materials of which they are in need. On the other hand some investigators still hold that resynthesis into a neutral protein like serum albumin takes place in the intestinal wall immediately after absorption of the digest of proteins. What the role of the protein digestion in the production of the digestive enzymes and the part played by them in the digestion and absorption of protein foods. How they act, whether simply as carriers of the protein material or as digestive enzymes, and how they give the material to the tissues is unknown.

Carbohydrates are generally assumed simply to serve the purpose of yielding energy in their combustion to CO₂ and H₂O, and to act as sparing materials, i.e., they are able to maintain the blood sugar at a certain level. One indication of this is the fact that the human body is equipped with an insusceptible system of storage, which is an insoluble polysaccharide, and is only utilized according to the requirements of the body, especially during muscular exertion. Carbohydrates, when taken in excess, are also stored in the tissues in the form of fat. This was demonstrated by the feeding experiments of Lawes and Gilbert at Rothamsted. They took two young pigs of a litter, killed and analysed one, then fed the other for a month with a diet consisting of carbohydrates only. At the end of the month the amount of protein absorbed by analysing the urine and the faeces. They killed the pig and by analysis ascertained the amount of fat put on. They found that this was far in excess of the amount of protein that had been used for the formation of the growth of the pig. Furthermore, it was also shown that the excess of what could have been formed from the small amount of fat in the food. The fat must therefore have been formed from the carbohydrates. The carbohydrates have been shown to be more useful than fat as an energy yielding material, as they can be used or stored as glycogen results in its passing straight through the body and being excreted in the urine. This condition is known as alimentary glycosuria. The power of using and storing sugar varies greatly in different individuals and in the same individual at different times.

Fats.—The fats simply serve as stores of energy. After ingestion, if in small amount, they are, like carbohydrates, oxidized to the same final products, CO₂ and H₂O. If in larger amount they are stored as fat, to serve as a reserve in case of need, in the body tissues. Like the carbohydrates they serve as the sources of part of the energy yielding material, and spare the proteins and other sparsers of protein material, evidently in part at least because they are more easily digested and absorbed.

Factors which influence Normal Metabolism.

1. Fasting.—During fasting the body draws upon its own reserve 1 of stored material for the requirements in the production of energy, and the rate of breakdown varies with the energy requirements. An animal in a state of fasting will break down proteins faster than one who is compelled to take exercise in a cold place.

The breakdown of tissue during the early days of a fast is much greater than later, for as the fast progresses the body becomes more economical and some of its tissues are broken down. There is also a not all waste at an equal rate; those which are not essential are utilized at a much greater rate than those which are essential to the body. The muscles which are not utilized to any great extent during a fast the skeletal muscles may lose over 40% of their weight, whereas an essential organ like the heart loses only some 3%.

The essential tissues obtain their nourishment from the less essential probably by ferment action, a process which has been
termed autolysis. The autolytic products of the stored material in the tissues are practically identical with those which arise during the ordinary gastro-intestinal digestion.

Although the respiratory tissue plays the most important part in general metabolism. Not only is muscle the most abundant tissue present, but it is constantly active and is the great energy-liberating machine of the body. Formerly it was believed on the authority of Leeuwenhoek that a protein and carbohydrate result at the expense of the protein material, but it has been conclusively shown that the real source of energy in moderate work is the non-protein material, carbohydrates and fats; of these the former plays the greater role, although it is probable that there are certain parts of the body where the non-nitrogenous material be insufficient, then the energy has to be supplied by the protein and the output of nitrogen is thus increased. Very high rates of metabolism (both products of muscle metabolism) excerted have been described. In hard work it is sometimes found that there may be no immediate rise in the nitrogen output on the day of the work, but that an increase is manifest on the second or third day after. While the excretion of nitrogen shows no increase proportionate to the work done, the output of carbon dioxide produced by the combustion of the carbohydrates and of the fats is increased proportionately to the work done.

3. Internal Secretions.—Evidence is accumulating to show that the activities of the various tissues of the body are presided over and controlled not merely by the action of the nervous system but also by the chemical secretions of the various endocrine or other organs. To these chemical substances, as already stated, the name of hormones has been given.

The hormone which has been more thoroughly investigated is adrenaline (epinephrin). It is a chemical compound consisting of a secondary alcohol linked to a benzene ring. It is a product of the central or mediullary part of the suprarenal bodies. The medullary part of these organs is developed from the sympathetic part of the nervous system. The hormone is secreted by the small agencies of the sympathetic nerves which spring from the thoraco-abdominal region. These nerves control the small arteries, and the manner of their action is such as to cause a non-calcium contraction of these vessels, and as a result a great rise in the arterial blood pressure. For this purpose it is now largely used in medicine. The constant supply of adrenaline in small quantities seems to play an important part in the circulation of the blood vessels, and when, as a result of disease of the suprarenal, the supply is cut off a serious train of symptoms supervenes.

Allied to adrenaline is a hormone derived from the pituitary body. This is a secretion of the small arteries except those of the kidney, which it dilates. An increased flow of urine is produced. In the thyroid gland a substance, inodolkyrin, is constantly being produced, and this appears to exercise a stimulating action on the rate of chemical exchange in the various tissues. Under its administration the waste of both proteins and fats is increased. When the thyroid is removed or destroyed by disease a condition of depression occurs, which may cause a mental sluggishness, results, accompanied often by nervous tremors.

A difficulty in explaining these symptoms is caused by the fact that in the thyroid are imbedded four small parathyroids, and it is possible that these produce a special hormone. It is supposed that this exercise a particular influence upon the nervous system, but further evidence is needed.

The well-known effects of removal of the ovaries or testes on the development and character of an animal is due to the absence of the special hormones which are hormones of these structures. These hormones appear to be produced, in the case of the testes at least, not in the true genital cells, but in the intermediate cells, since it has been found that ligature of the duct, which leads to destruction of the genital cells, does not abolish the development of the sexual characters of the animal.

It is known that from the ovaries different hormones may be produced in varying amounts which play an important part in regulating the phenomena of sexual life.

The thymus gland is a structure lying in the front of the neck, which is removed from man and animals very slowly after birth, and atrophies when the age of puberty is reached. In castrated male animals it continues to grow and persists throughout life. There is some evidence that it may exercise some effect upon the growth of the testes only.

Pancreas.—Within recent years it has been shown that the internal secretion of this organ plays a very important part in the metabolism of carbohydrates. It is known that when the pancreas becomes diabetic, i.e. sugar appears in the urine and the animal emaciates. How the internal secretion affects the combustion of the sugar is not yet known. Some workers hold that the action of the liver is the chief in the transformation of the sugars into glycogen by the various sugar-forming organs, of which the liver is the chief, others that it dominates the utilization of sugar as a source of energy by the muscles. It is one of the best-known examples of the way in which the products of the activity of one organ modify the functions of other organs. In all probability many more examples of hormone action will be discovered, and it will be found that they play probably even a more important part than the nervous system in the co-ordination of functions in the animal.

Other factors, besides these already dealt with, play a part in modifying the various metabolic processes, as age, temperature, climate, &c. Very little, however, is definitely known about these factors.

Water and inorganic salts are quite as essential for the well-being of the body as the energy-yielding proteins, carbohydrates and fats. They, however, probably undergo little or no change in the body; they are merely transformed products of the various chemical compounds of which they are ingested. Although they are not subjected to any very great change, yet they are of immense importance. No animal tissue can carry on its work in the absence of water. In this respect the salts. Thus the salts have been carried out in which animals have been fed on food as free from salts as possible, and, although the food was much in excess of the energy requirements, yet all these animals died, whereas other animals living on the same diet, but with an addition of various inorganic salts, the most important acids are hydrochloric and phosphoric, and the most important bases sodium of potassium. Calcium and magnesium are also of importance, especially where bone formation is taking place.

Another element of really vital importance is iron, which is required for the formation of haemoglobin.

VI. EXCRETION

While we know comparatively little of the intermediate stages in the breakdown of the food constituents, and more particularly of the protein moiety, our knowledge of the final products of the metabolic changes excerted is fairly full. The urine is the main channel of excretion for the nitrogenous waste products. Carbohydrates and fats, is excreted mainly through the lungs. Water is excreted by the lungs, the kidneys and the skin.

So far no entirely satisfactory explanation has been given of how a fluid like urine, having an acid reaction and containing about one hundred times as much urea and generally more than twice as much asuric acid as the blood, is formed in the kidneys. The urine is a yellowish fluid which varies greatly in its depth of colour, from pale amber to a deep brown. It has a specific gravity of about 1020, varying with the percentage of solids in solution, and it usually has an acid reaction. It is a mixture of compounds that have already mentioned, practically all the waste nitrogen of the body.

Among the principal organic substances present are urea, ammonia, purins (uric acid and the so-called purin bases, xanthin, &c.), creatinin, conjugated sulphates, various aromatic bodies and many other substances in small amount, together with the water and inorganic salts.

The following table from Folin gives a good idea of the average composition of the urine as regards the nitrogen-containing constituents, and its variation according to the nature of the diet when this is free of creatinin and the precursors of the purins—:

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total nitrogen</td>
<td>14.8-18.2 gms. per day</td>
</tr>
<tr>
<td>Urea nitrogen</td>
<td>8.6-9.9 gms. of total</td>
</tr>
<tr>
<td>Asparagenine</td>
<td>3.3-4.5 gms.</td>
</tr>
<tr>
<td>Creatinin nitrogen</td>
<td>3.0-5.0 gms.</td>
</tr>
<tr>
<td>Uric acid nitrogen</td>
<td>0.1-1.0 gms.</td>
</tr>
<tr>
<td>Undetermined nitrogen</td>
<td>2.7-5.3 gms.</td>
</tr>
</tbody>
</table>

Urea, which forms the chief nitrogenous constituent, amounting on an ordinary diet to about 30 gms. per diem, is for the most part formed in the liver, from the ammonia of blood after absorption from the intestine, or resulting from the deamination of the amino acids. It may also arise in part from the amino acids and from uric acid. 

Creatinin is present in the form of ammonium salts, and forms about 4% of the total urinary nitrogen. It may exceed this amount under certain conditions, for the most part pathological. The ammonia is utilized by the body to neutralize acids which arise during the various metabolic processes.

Purins (uric acid, xanthin, hypoxanthin, &c.) are all members of a series which have as their common nucleus a body which E. Fischer calls purin. This is the nucleus around which are derived all the various chemical compounds in which they appear. It is formed from the various nitrogen-containing substances, and hence is the second as the endogenous. This acid is chemically known as tri-oxypurin, and may be regarded as the union of two urea molecules with a free carbon chain fatty acid. All the uric acid formed in the body is not excreted as such, part being, as already mentioned, converted into urea. The amount which is converted into urea varies
with the species of animal. In man, Burian and Schur state that one half of the total amount is so converted. Some workers, like Wiener, hold that uric acid may be synthesized in the body, but while this is undoubtedly so in the case of the bird, in the mammal it has not been definitely demonstrated. On the other hand, the presence of xanthin and hypoxanthin, purines less oxidized than uric acid; the first is a dihydroxypurine, and the second is a monohydroxypurine. The main source of these purines is thought to be purine nucleic substances or nucleins. These purine substances from which all are derived in the body are the nucleins. These complex bodies are apparently first broken down by enzyme action to aminopurines. In these their turn have their aminoglucides split off, and then, according to the degree of oxidation, the different purin bodies are formed.

**Creatinin.**—The physiological significance of this substance is as yet unknown. The daily excretion varies little with the characteristics of the individual, provided, of course, that the creatinin is not present in excess in the urine. It appears to be proportional to the muscular development and muscular activity of the individual. Hence it would seem to be derived from the creatin of muscle, a substance which is very readily changed into creatinin outside the body. In the body, the conversion of creatin into creatinin seems to be strictly limited, and hence when creatin is taken in flesh in the food it tends to appear as such in the urine. It would seem that it is either in great part decomposed in the body into what we do not at present know or that, as suggested by Folin, it may be used as a specialized food. Whatever its source, after urea and ammonia it is one of the most important nitrogenous substances excreted, the daily excretion being about 1.5 grms.

The sulphur excreted in the urine comes chiefly from the sulphur of the ordinary food. It is also derived from the ordinary preformed sulphates, that is, sulphur in the form of sulphuric acid combined with the ordinary bases. (2) As ethereal sulphates, that is, in combination with various aromatic substances like the indoles. In the latter case the excreted nucleus is a sulphur-containing one, which are intermediate products in the complete oxidation of sulphur.

Carbon, as carbonic acid, is added to the alkaline and alkaline earths as phosphoric acid. A very small part of the phosphoric acid may be eliminated in organic combination such as the glycerophosphates, &c.

Sodium (mostly as sodium chloride), potassium, calcium and magnesium are the common bases present in the urine.

The lungs are the important channel of excretion for the waste product of carbon metabolism CO2 (see Respiratory System); and also a very important channel for the excretion of water. As regards the amount of water carried off in the sweat, very little is known. In the case of athletes, the excretion of water is increased, but not excessive in amount. The lungs are the organ of excretion for the two gases which are of most importance. There is a small amount of CO2 excreted by this channel.

**NUTTALL, THOMAS** (1786-1859), English botanist and ornithologist, who lived and worked in America from 1808 until 1842, was born at Selborne in Hampshire on the 9th of January 1786, and spent some years as a journeyman printer in England. Soon after going to the United States he was induced by Professor B. S. Barton (1776-1815) to apply himself to the study of the plants of that country. In 1824-1834 he was curator of the botanic gardens of Harvard university. In 1834 he crossed the continent to the Pacific Ocean, and visited the Hawaiian Islands. Some property having been left him in England on condition of his residing on it during part of each year, he left America in 1842, and did not again revisit it except for a short time in 1852. He died at St Helens, Lancashire, on the 10th of September 1859.

Almost the whole of his scientific work was done in the United States, and his published works appeared there. The more important of these are, The Genera of North American Birds and a Catalogue of the Species to the year 1817 (2 vols., 1818); Journal of Travels into the Arkansas Territory during the year 1821 (1823); The Nests and Eggs of North American Birds (2 vols., 1824-1825); Manual of the Ornithology of the United States and of Canada (1832 and 1834); and numerous papers in American scientific periodicals.

**NUWARA ELIYA,** a town and sanatorium of Ceylon. Pop. (1901) 5026, with 1000 additional visitors during the season. It is situated 6240 ft. above sea-level, with the highest mountain in the island, Fedotrailagalla, towering over the plain for 2056 ft. mere. Nuwara Eliya is reached from Colombo by railway, eight hours to Namuoya, and thence, by a light 2½ ft.-gauge line, running up to the heart of the sanatorium. The average shade temperature for the year is 58° F.; the rainfall, 95 in. Considerable sums have been spent by the government in improving the place.

**Nux Vomica,** a poisonous drug, consisting of the seed of *Strychnos Nux-Vomica,* a tree belonging to the natural order Loganiaeae, indigenous to most parts of India, and found also in Burma, Siam, Cochin China and northern Australia. The tree is of moderate size, with a short, thick, often crooked, stem, and ovate entire leaves, marked with three to five veins radiating from the base of the leaf. The flowers are small, greenish-white and tubular, and are arranged in terminal corymbs. The fruit is of the size of a small orange, and has a thin hard shell, enclosing a brownish-black, thin-shelled, oval or oblong seed, from which, to 5 seeds are vertically embedded. The seed is disk-shaped, rather less than 1 in. in diameter, and about ½ in. in thickness, slightly depressed towards the centre, and in some varieties furnished with an acute keel-like ridge at the margin. The external surface of the seed is of a greyish-green colour and satiny appearance, due to a coating of pressed silky hairs. The interior of the seed consists chiefly of horny albumen, which is easily divided along its outer edge into halves by a fissure, in which lies the embryo. The latter is about ¾ in. long, and has a pair of heart-shaped membranous cotyledons.

The chief constituents of the seeds are the alkaloids strychnine (q.v.) and brucine, the former averaging about 0.4%, and the latter about half this amount. The seeds also contain an acid, strychnic or isaguric acid; a glucoside, loganin; sugar and fat.

The dose of the seeds is 1 to 4 grains. The British Pharmacopoeia contains three preparations of nux vomica. The liquid extract is standardized to contain 15% of strychnine; the extract is standardized to contain 5%; and the tincture, which is the most widely used, is standardized to contain 0.25%.

The American Pharmacopoeia recoends nux vomica as practically that of strychnine. The tincture is chiefly used in cases of atonic dyspepsia, and is superior to all other bitter tonics, in that, it is antiseptic and has a powerful action upon the most parts of the gastric wall. The extract is of great value in the treatment of simple constipation.

**NYACK,** a village of Rockland county, New York, U.S.A., in the town of Orangeart, on the western bank of the Hudson river, about 25 m. north of New York City. Pop. (1890) 4111; (1900) 4275, of whom 583 were foreign-born; (1905) 4441; (1910) 4619. Nyack is served by the Northern Railroad of New Jersey (a branch of the Erie), and is connected by ferry with Tarrytown, nearly opposite, on the eastern bank of the Hudson. The New York, New Haven & Hartford Railroad (old and new line) passes through West Nyack, a small village about 2 m. west. For about 2 m. above and 3 m. below Nyack the river expands into Tappan Zee or Bay, which is about 3 m. wide immediately opposite the village. The first grant of land within the present limits of Nyack was made by Governor Philip Carteret, of New Jersey, to one Claus Jansen, in 1671, but the permanent settlement apparently dates from about 1700. The adjacent villages of Upper Nyack, pop. (1905) 648, (1910) 591, and South Nyack, pop. (1910) 2068, form with Nyack practically one community. Nyack was named from a tribe of Algonquin Indians.


**NYANZA** (from the ancient Banntu root word anza, a river or lake), the Bantu name for any sheet or stream of water of considerable size; especially applied to the great lakes of East Central Africa. The word is variously spelt, and the form "Nyasa" has become the proper name of a particular lake. Nyanza is the spelling used in designating the great lakes which are the main reservoirs of the river Nile.

**NYASA,** the third in the list of the great lakes of Central Africa, occupies the southern end of the great rift-valley system which traverses the eastern half of the equatorial region from north to south. Extending from 9° 29’ to 14° 25’ S., or through nearly 5° of latitude, the lake measures along its major axis, which is slightly inclined to the west of north, exactly 350 m., while the greatest breadth, which occurs near the middle of its length, between 11° 30’ and 12° 20’°S., is 45 m. In the northern and southern thirds of the length the breadth varies generally from 20 to 30 m., and the total area may be estimated at 17,000 sq. m.
The lake lies at an altitude of about 1650 ft. above the sea. The sides of the valley in which Nyasa lies, which are somewhat irregular in outline, rise to about 300 ft. above the level of the lake. The banks of the lake are dotted with islands, which are usually of great size and sometimes separated by passes of great depth. The lake is divided into two parts, the northern and the southern. The southern part is known as Lake Malawi, and the northern part as Lake Nyasa. The latter is the larger of the two, and is the most extensive lake in southern Africa. It is about 250 miles long, and its maximum breadth is about 50 miles. The lake is surrounded by a continuous chain of mountains, which rise from its shores to a height of 7000 ft. The climate of the lake is mild and pleasant, and the vegetation is rich and luxuriant. The lake is inhabited by a large variety of fish, and is a valuable resource both for fishing and for navigation. The lake is connected with the sea by the Shire River, which flows into it from the west, and by a number of smaller streams, which drain the surrounding country. The lake is also connected with Lake Malawi by a number of canals, which are used for the transportation of goods and passengers. The lake is of great importance to the people who live around it, and is a centre of trade and industry. The lake is one of the most beautiful and picturesque in Africa, and is a place of great interest to visitors.
where he died on the 22nd of February 1896. His principal books are Bill Nye and Boomerang (1881); Forty Liars and Other Lies (1883); Nye and Riley's Railway Guide (1886), with James Whitcomb Riley; and two comic histories, Bill Nye's History of the United States (1894) and Bill Nye's History of England from the Druids to the Reign of Henry VIII. (1896).

NYEZHN or NEZHN, a town of Russia, in the government of Chernigov, 62 m. by rail S.E. of the town of Chernigov and 79 m. N.E. of Kiev, on the railway between Kursk and Kiev. The old town is built on the left bank of the (canalized) river Oster, and its suburbs, Novoye-Myesto and Mage-ki, on the right. It has an old cathedral, a technical school and a former high school (lyceum) of which N. V. Gogol and the novelist I. S. Turgenev were students; now transformed into a philologial institute. The inhabitants (33,000), are mostly Little-Russians and Jews; there are also some Greeks, descendants of those who immigrated in the 17th century at the invitation of the Cossack chieftain Bogdan Chmielnicki.

Unyezh, which is supposed to have been the former name of Nyezhn, is mentioned as early as 1147. At that time it belonged to the principality of Chernigov; afterwards it fell under the rule of Poland. It was ceded to Russia about 1500, but again became a Polish possession after the treaty of Deulina (1619) between Poland and Russia. In 1640 after the revolt of Little Russia and its liberation from the Polish rule, Nyiezhan was the chief town of one of the most important Cossack regiments. It was annexed to Russia in 1664.

NYIREGYHAZA, the capital of the county of Szabolcs, in Hungary, 169 m. E.N.E. of Budapest by rail. Pop. (1900) 31,875. It is a busy railway junction, and its inhabitants are engaged in agriculture, wine-growing and the manufacture of soda, matches and saltpetre. About 20 m. to the N.W. lies the famous wine-producing district of Tokaj (Tokay). Nytjogbing (a. New-Market, Latinized as Nicepia) begins to appear as a town early in the 13th century. Its castle was the seat of the kings of Sodermanland, and after those of Stockholm and Kalmar was the strongest in Sweden. The death of Waldermar in 1293, the starving to death of Dukes Waldemar and Eric in 1318, the marriage and the deaths both of Charles IX. and his consort Christina of Holstein, the birth of their daughter Princess Catherine and in 1622 the birth of her son Charles X. are the main incidents of which it was the scene. Burned down in 1665 and again damaged by fire in 1719, it still remained the seat of the regional authorities till 1760. The town was burned by Albert of Mecklenburg's party in 1789, by an accidental conflagration in 1665, and by the Russians in 1719.

NYLYSTROOM, a town of the Transvaal, South Africa, capital of the Waterberg district, and 81 m. N. of Pretoria by rail; altitude 4290 ft. Pop. (1904) 590. It was founded about 1860 and owes its name to the belief of the early Boer trekkers that the river which they had discovered was the head stream of the Nile. The Waterberg gold-fields are 20 m. N.N.E. of the town.

NYMPHAEAU (Gr. νυμφαεα, νυμφαεων), in Greek and Roman antiquities, a monument consecrated to the nymphs (q.v.), especially those of springs. These monuments were originally natural grottoes, which tradition assigned as habitations to the local nymphs. They were sometimes so arranged as to furnish a supply of water. Subsequently, artificial took the place of natural grottoes. The nymphæa of the Roman period were borrowed from the constructions of the Hellenistic east. The majority of them were rotundas, and were adorned with statues and paintings. They served the threefold purpose of sanctuaries, reservoirs and assembly-rooms. A special feature was their use for the celebration of marriages. Such nymphæa existed at Corinth, Athens, and other cities. A list of some twenty have been found at Rome and of many in Africa. The so-called exedra of Herodes Atticus (which answers in all respects to a nymphæum in the Roman style), the nymphæum in the palace of Domitian and those in the villa of Hadrian at Tibur (five in number) may be specially mentioned. The term nymphæum was also applied to the fountains of water in the arium of the Christian basilica, which according to Eusebius (x. 4) were symbols of purification.

NYMPHENBURG, formerly a village, but since 1899 an incorporated suburb of Munich, in the kingdom of Bavaria. It has a palace, built about the middle of the 17th century, on the model of that at Versailles, and long a favourite residence of the Bavarian elector, Maximilian Joseph. The famous china manufactury of Nympenburg, founded in 1754 at Neudeck by a potter named Niedermeyer, was shortly afterwards removed hither and, after being long under royal patronage, is now a private undertaking. The elector Charles Albert of Bavaria was reputed to have made a treaty with Louis XV. of France in May 1744 at the beginning of the War of the Austrian Succession for the division of Austria, and this was called the treaty of Nympenburg. It has, however, been conclusively proved a forgery. But a treaty was concluded here on the 28th of May 1741, between Bavaria and Spain, and another between Bavaria and the Rhenish Palatinate in 1766.

NYMPHS, in Greek mythology, the generic name of a large number of female divinities of inferior rank, personifications of the creative and fostering activities of nature. The word is possibly connected with the root of νυμφαω, νυμφαος ("cloud"), and originally meant "veiled," referring to the custom of a bride being led veiled from her home to that of the husband; hence, a married woman and, in general, the one of marriageable age. Others refer the word (and also Lat. nubere and the Ger. Knospe) to a root expressing the idea of "swelling" (according to Hesychius, one of the meanings of νυμφων is "rose-bud"). The home of the nymphs is on mountains and in groves, by springs and rivers, in valleys and cool grottoes. They are frequently associated with the superior divinities, the huntress Artemis, the prophetic Apollo, the reveller and god of trees Dionysus, and with rustic gods such as Pan and Hermes (as the god of shepherds).

The nymphs were distinguished according to the different spiritual communities with which they were connected. Sea nymphs were Oceanids or Nereids, daughters of Oceanus or Nereus. Neïades (from Gr. ναεων, ναεος, "stream") presided over springs, rivers and lakes. Oreïdes (οραος, mountain) were nymphs of mountains and grooves, one of the most famous of whom was Echo. Nymphææ (nymphaæ, dell) and Alisedæ (Aleos, grove) were nymphs of glens and groves. Dryades (dryo) or Hamadryades were nymphs of forests and trees.

The Greek nymphs, after the introduction of their cult into Latinus, gradually absorbed into their ranks the indigenous Italian divinities of springs and streams (Juturna, Egeria, Carmentis, Fons), while the Lymphe (originally Lumpae), Italian water-goddesses, owing to the accidental similarity of name, were identified with the Greek Nymphe. Among the Romans their sphere of influence was restricted, and they appear almost exclusively as divinities of the watery element.

The sixteenth letter of the Phoenician and early Greek alphabets, the fifteenth in English and the fourteenth in Latin. Between Ν and Ο the Phoenician and the Ionic Greek alphabet have a sibilant—OE [z]. The Western Greek alphabet had a different symbol, Ω, for the sound of z and placed it at the end, as did its descendant the Latin alphabet. The original form of Ω was a more or less roughly formed circle. The Aramaic, and Hebrew Ω, which seem so different, arise from a circle left open at the top, Ω, a form which can be traced in Aramaic from the 5th or 6th century B.C. In the Greek alphabets the circle appears sometimes with a dot in the centre, but in many cases it is doubtful whether this mark is, intentional, or is only the result of fixing a sharp point there while describing the circle. Sometimes Ω is a lozenge-shaped □ and rarely (in Arcadia and Elis) rectangular □. In many varieties of the Greek alphabet this symbol was used, as it always was in Latin, for the long as well as the short o-sound and also for the long vowel (in the Ionic alphabet written ω) which arose from contraction of two vowels or the loss of a consonant (ήδοσία = ηδόσια, αύς = αύκς). As early as the 8th century B.C. Ionic Greek had invented a separate symbol for the long o-sound, viz. Ω. This when borrowed by other dialects showed at first some variety of usage, though practically none in form. As this was placed at the end of the ordinary (i.e. the numeral) Greek alphabet, "alpha and omega" has become a proverbial phrase for first and last. The Greeks themselves, however, did not call Ω omega (great o) nor did they call Ω omicron (little o), though these names are given even in modern Greek grammars. The former was called simply ο and the latter u (ου, pronounced as oo in moon). The Hebrew and probably the Phoenician name for Ω was Ain (Ayn), and in the Semitic alphabet, which does not indicate vowels, the symbol stood for a "voiced glottal stop" and also for a "voiced velar spirant" (Zimmern). The most important feature of this vowel is the rounding of the lips in its production, which, according to its degree, modifies the nature of the vowel considerably, as can be observed in the pronunciation of the increasingly rounded series saw, no, who.

In Attic Greek Ω and Ω were not really a pair, for o + o became not o but ou, o being a close o an open sound. In Latin the converse was more nearly true. Though short o changed in the Latin of the last age of the Roman republic to u in unaccented syllables always (except after u whether vowel or consonant), and sometimes also in accented syllables, this was not equally true of vulgar Latin, as is shown by the Romance languages. In English also the short and the long o are of different qualities, the short in words like not, get being in Sweet’s phonetic terminology a low-back-wide-round, the long in words like no a mid-back-wide-round. The long vowel becomes more rounded as it is being pronounced, so that it ends in a u-sound, though this is not so noticeable in weak syllables like the final syllable of follow. The so-called modified o is a rounded e-sound found in several varieties. The sound heard in words like the German Götter is, according to Sweet, a low-front-wide-round, while Jespersen regards it as not low but middle. A mid-front-narrow-round vowel is found short in French words like peu, long in feteau, and in endings like that of konteuse. The Norse sound written o is of the same nature.

(P. G1.)

OAK (O. Eng., ac), a word found, variously modified, in all Germanic languages, and applied to plants of the genus Quercus, natural order Fagaceae (Cupuliferae of de Candolle), including some of the most important timber trees of the northern temperate zone. All the species are arboreous or shrubby, varying in size from the most stately of forest trees to the dwarfish bush. Monoecious, and bearing their male flowers in catkins, they are readily distinguished from the rest of the catkin-bearing trees by their peculiar fruit, an acorn or nut, enclosed at the base in a woody cup, formed by the consolidation of numerous involucral bracts developed beneath the fertile flower, simultaneously with a cup-like expansion of the thalamus, to which the bracteal scales are more or less adherent. The ovary, three-celled at first, but becoming one-celled and one-seeded by abortion, is surmounted by an inconspicuous perianth with six small teeth. The male flowers are in small clusters on the usually slender and pendent stalk, forming an interrupted catkin; the stamens vary in number, usually six to twelve. The alternate leaves are more or less deeply sinuated or cut in many species, but in some of the deciduous and many of the evergreen kinds are nearly or quite entire on the margin.

The oaks are widely distributed over the temperate parts of Europe, Asia, North Africa and North America. In the western hemisphere they range along the Mexican highlands and the Andes far into the tropics, while in the Old World the genus, well represented in the Himalayas and the hills of China, exists likewise in the peninsula of Malacca, in the Indian Archipelago and Malaya to the Philippine Islands and Borneo. On the mountains of Europe and North America they grow only at moderate elevations, and none approach the arctic circle. The multitude of species and the many intermediate forms render their exact limitation difficult, but those presenting sufficiently marked characters to justify specific rank probably approach 300 in number.

The well-known Q. Robur, one of the most valued of the genus, and the most celebrated in history and myth, may be taken as a type of the oaks with sinuated leaves. Though known in England, where it is the only indigenous species, as the British oak, it is a native of most of the milder parts of Europe, extending from the shores of the Atlantic to the Ural; its most northern limit is attained in Norway, where it is found wild up to lat. 63°, and near the Lindeasnes forms woods of some extent, the trees occasionally acquiring a considerable size.

In western Russia it flourishes in lat. 60°, but on the slope of the Ural the 56th parallel is about its utmost range. Its northern limit nearly coincides with that of successful wheat cultivation. Southwards it extends to Sardinia, Sicily and the Morea. In Asia it is found on the Caucasus, but does not pass the Ural ridge into Siberia. In Britain and in most of its Continental habitats two varieties exist, regarded by many as distinct species: one, Q. pedunculata, has the acorns, generally two or more together, on long stalks, and the leaves nearly sessile; while in the other, Q. sessiliflora, the fruit is without or with a very short peduncle, and the leaves are furnished with well-developed petioles. But,
though the extreme forms of these varieties are very dissimilar, innumerable modifications are found between them; hence it is more convenient to regard them as at most sub-species of *Quercus robur*. The British oak is one of the largest trees of the genus, though old specimens are often more remarkable for the great size of the trunk and main boughs than for very lofty growth. The spreading branches have a tendency to assume a tortuous form, owing to the central shoots becoming abortive, and the growth thus being continued laterally, causing a zigzag development, more exaggerated in old trees and those standing in exposed situations; to this peculiarity the picturesquc aspect of ancient oaks is largely due. When standing in dense woods the trees are rather straight and formal in early growth, especially the sessile-fruited kinds, and the gnarled character traditionally assigned to the oak applies chiefly to its advanced age. The broad deeply-sinuated leaves with blunt rounded lobes are of a peculiar yellowish colour when the buds unfold in May, but assume a more decided green towards midsummer, and eventually become rather dark in tint; they do not change to their brown autumnal hue until late in October, and on brushwood and saplings the withered foliage is often retained until the spring. The catkins appear soon after the young leaves, usually in England towards the end of May; the acorns, oblong in form, are in shallow cups with short, scarcely projecting scales; the fruit is shed the first autumn, often before the foliage changes.

Vast oak forests still covered the greater part of England and central Europe in the earlier historic period; and, though they have been gradually cleared in the progress of cultivation, oak is yet the prevailing tree in most of the woods of France, Germany and southern Russia, while in England the coppices and the few fragments of natural forest yet left are mainly composed of this species. The pedunculated variety is most abundant in the southern and midland counties; the sessile-fruited kinds in the northern parts and in Wales, especially in upland districts; the straighter growth and abundant acorns of this sub-species have led to its extensive introduction into plantations. The name of "durmast" oak, originally given to a dark-fruited variety of *Q. sessiliflora* in the New Forest, has been adopted by foresters as a general term for this kind of oak; it seems to be the most prevalent form in Germany and in the south of Europe. Many of the ancient oaks that remain in England may date from Saxon times, and some perhaps from an earlier period; the growth of trees after the trunk has become hollow is extremely slow, and the age of such venerable giants only matter of vague surmise. The celebrated Newland oak in Gloucestershire, known for centuries as "the great oak," was by the latest measurement 47½ ft. in girth at 5 ft. from the ground. The Cowthorpe oak, standing (a ruin) near Wetherby in Yorkshire, at the same height measures 38½ ft., and seems to have been of no smaller dimensions when described by Evelyn two centuries ago; like most of the giant oaks of Britain, it is of the pedunculate variety.

The wood of the British oak, when grown in perfection, is the most valuable produced in temperate climates. The heartwood varies in colour from dark brown to pale yellowish-brown; hard, close-grained, and little liable to split accidentally, it is, for a hard wood, easy to work. Under water it excels most woods in durability, and none stand better alternate exposure to drought and moisture, while under cover it is nearly indestructible as long as dry-rot is prevented by free admission of air. Its weight varies from 48 to about 55 lb. the cubic foot, but in very hard slowly-grown trunks sometimes approaches 60 lb. The sap-wood is lighter and much more perishable, but is of value for many purposes of rural economy. The relative qualities of the two varieties have been the frequent subject of debate, the balance of practical testimony seeming to establish the superiority of *Q. pedunculata* as far as durability in water is concerned; but when grown under favourable circumstances the sessile oak is certainly equally lasting if kept dry. The wood of the durmast oak is commonly heavier and of a darker colour, hence the other is sometimes called by woodmen the white oak, and in France is known as the "chêne blanc." The oak of Britain is still in demand for the construction of merchant shipping, though teak has become in some measure its substitute, and foreign oak of various quality and origin largely takes its place. Its great abundance of curved trunks and boughs rendered the oak peculiarly valuable to the shipwright when the process of bending timber artificially was less understood; the curved pieces are still useful for knees. The younger oaks are employed by the carpenter, wheelwright, wagon-builder and for innumerable purposes by the country artisan. The most durable of fences are those formed of small oaks, split lengthwise by the wedge into thin boards; the finely-grained heart-wood is sought by the cabinetmaker for the manufacture of furniture, and high prices are often given for the gnarled and knotted portions of slowly-grown trees, to be sawn into veneers. Oak was formerly largely used by wood-carvers, and is still in some demand for those artists, being harder and more durable than lime and other woods that yield more readily to the sculptor's tool. Oak was thus applied at a very early date; the shrine of Edward the Confessor, still existing in the abbey at Westminster, sound after the lapse of 800 years, is of dark-coloured oak-wood. The wood, of unknown age, found submerged in peat-bogs, and of a black hue, is largely used in decorative art under the name of "bog-oak." The oak grows most luxuriantly on deep strong clays, calcareous marl or stiff loam, but will flourish in nearly any deep well-drained soil, excepting peat or loose sand; in marshy or moist places the tree may grow well for a time, but the timber is rarely sound; on hard rocky ground and exposed hill-sides the growth is extremely slow and the trees small, but the wood

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From Kotschy, *op. cit.* Plate XXVII.

**FIG. 2.** *Q. pedunculata*; half natural size.

From Kotschy, *op. cit.* Plate XXXII.

**FIG. 3.** *Q. sessiliflora*; half natural size.
OAK 933

is generally very hard and durable. The oak will not bear exposure to the full force of the sea gale, though in ravines and on sheltered slopes oak woods sometimes extend nearly to the shore. The cultivation of this tree in Europe forms one of the most important branches of the forester's art. It is frequently raised at once by sowing the acorns on the ground where the trees are required, the fruit being gathered in the autumn as soon as shed, and perfectly ripe seeds selected; but the oak is less destructible by mice and other vermin is so great that transplanting from a nursery-bed is, in most cases, to be preferred.

The acorns should be sown in November on well-prepared ground, and covered to a depth of $\frac{1}{2}$ or $\frac{1}{4}$ in.; the seeds germinate in the spring, and the seedlings are usually transplanted when one or two years old. The sapling will, however, grow for two or three years before it is large enough to be transplanted. Some authorities recommend the tap-roots to be cut in the second year, with the view of increasing the bulk of fibre; but, if the trees are removed from the seed-bed sufficiently early, the root is best left to its natural development. The oak requires shelter in the early stages of growth; in England the Scotch pine is thought best for this purpose, though Norway spruce answers as well on suitable ground, and larch and other trees are sometimes substituted. The conifers are allowed to grow to a height of from 3 to 5 ft. before the young oaks are planted, and are gradually thinned out as the latter increase in size. The dishes of the developing spring internodes have a thinning effect on the young wood; usually they are placed from 8 to 12 in. apart, and the superabundant trees cut out as they begin to interfere with the growth of the others. A shorter method, but which requires greater care, is to ensure the formation of a tall straight trunk, and this operation should be performed before the superfluous shoots get too large, or the timber will be injured; but, as with all trees, unnecessary pruning is to be avoided, as every cut removes a small amount of vigour of growth. Where artificial copsewood is the object, hazel, hornbeam and other bushes may be planted between the oaks; but, when large timber is required, the trees are best without undergrowth.

The growth of the oak is slow, though it varies greatly in different trees; Loudon states that an oak, raised from the acorns of Quercus alba, grown by the Goldsmith Sett, produced twenty years 12 ft. in circumference; but the increase of the trunk is usually very much slower, and when grown for large timber oak can rarely be profitably felled till the first century of its growth is completed. The tree will continue to form wood for 150 or 200 years before showing any symptoms of decay. As firewood oak holds a high position, though in Germany it is considered inferior to beech for that purpose. It makes excellent charcoal, especially for metallurgical processes; the Sussex iron, formerly regarded as the best produced in Britain, was for a time obtained from the great woods of the adjacent Weald, until they became so thinned that the precious fuel was no longer obtainable.

An important product of oak woods is the bark that from a remote period has been the chief tanning material of Europe. The most valuable kind is that obtained from young trees of twenty to thirty years' growth, but the trunks and boughs of timber oaks also furnish a large supply; it is separated from the tree most easily when the sap is rising in the spring. It is then carefully dried by the free action of the air, and when dry built into long narrow stacks until needed for use. The value of oak bark depends upon the amount of tannin contained in it, which varies much, depending not only on the growth of the tree but on the care bestowed on the preparation of the bark itself, as it soon ferments and spoils by exposure to wet, which destroys much of the power derived from it. Secor's sweet or fruit-tined oak is richer in tannic acid than that yielded by Q. pedunculata, and the bark of trees growing in the open is more valuable than that of the dense forest of Norway. The bark of young oak branches has been employed in medicine from the days of Dioscorides, but is not used in modern practice. The astringent principle is a peculiar kind of tannic acid, called by chemists quercin or tannin. This acid acts in combination with gelatin and other forms, gives oak bark its high value to the tanner. According to Neubauer, the bark of young oaks contains from 7 to 10% of this principle; in old trees the proportion is much less.

In the event of the oak possessing a considerable economic importance as food for swine. In the Saxon period the " mast " seems to have been regarded as the most valuable productive of an oak wood; nor was it always watered to the proper extent. The limit of death oaks were boiled and eaten by the poor as a substitute for bread both in England and France, as the sweeter product of Q. Esculus is still employed in southern Europe. Large herds of swine in all the great oak woods of Germany depend for their autumn maintenance on acorns; and in the remaining royal forests of England the inhabitants of the neighbouring villages yet claim their ancient right of " pannage," turning their hogs into the woods in October and November. Some trees of the sessile-fruited oak bear fruit on their trunks, and in British and other countries, and the ancient Italians for their edible fruit. A peculiar kind of sugar called quercite exists in all acorns. A bitter principle to which the name of echinocarpum has been applied to the spines of the Tavolacci, is detected in the acorn of the common oak; the nutritive portion seems chiefly a form of starch. A spirit has been distilled from acorns in process of germination, when the saccharine principle is most abundant.

The British oak grows well in the northern and middle states of America; and, from the superiority of the wood to that of Q. alba and its more abundant production of acorns, it will probably be much planted as the natural forests are destroyed. The young trees require protection from storms and late frosts even more than in England; the red pine of the north-eastern states, Pinus resinosa, answers well as a nurse, but the pitch pine and other species may be employed. In the southern parts of Australia and in New Zealand the tree seems to flourish as well as in its native home.

The oak in Europe is liable to injury from a great variety of insect enemies: the young wood is attacked by the larvae of the small stag-beetle and several other Coleoptera, and those of the wood-leopard moth, goat moth and other Lepidoptera feed upon it occasionally; the foliage is devoured by innumerable larvae; indeed, it has been stated that half the plant-eating insects of England prey more or less upon the oak, and in some seasons it is difficult to find a leaf perfectly free from their depredations. The young shoots are chosen by many species of Cynipidae and their allies as a receptacle for their eggs, giving rise to a variety of gall-like excrescences, from which few oak trees are quite free.

Of the European timber trees of the genus, the next in importance to the British oak is Q. Cerris, the Turkey oak of the nurserymen. This is a fine species, having when young stronger branches than Q. petraea, but not so well adapted to the generation of acorns, and the tree acquires a wide spreading head; the bark is dark brown, becoming grey and furrowed in large trees; the foliage varies much, but in the prevailing kinds the leaves are very deeply sinuate, with pointed, often irregular lobes, the footstalk short, and furnished at the base with long linear stipules that do not fall with the leaf, but remain attached to the bud till the following spring, giving a marked feature to the young shoots. The large sessile acorns are longer than those of Q. Robur, and are dark-brown when ripe; the hemispherical cups are covered with long, narrow, almost bivoltine scales, giving them a mossy aspect; the fruit ripens at the same time, and the acorn is released without the benefit of any scar on the acorn, and is almost evergreen, and in Britain is retained long after the autumnal withering.

This oak abounds all over the Turkish peninsula, and forms a large proportion of the forest in the east of France, in Switzerland, and the south shores of the Black Sea; it is likewise common in Italy and Sardinia, and occurs in the south of France and also in Hungary. It was introduced into England by Philip Miller about 1758, and is now common in parks and plantations, where it is used to flourish in nearly all soils. The Turkey oak in southern England grows twice as fast as Q. Robur; in the mild climate of Devonshire and Cornwall it has reached a height of 100 ft. and a diameter of 4 ft. in eighty years, which is about the limit of its profitable growth for timber. The wood is hard, heavy and of fine grain, quite equal to the best British oak for indoor use, but of very variable durability where exposed to wear. Oak beams were hewn and not sawn even when the Romans were building. The oak oak trees have been largely built of it, but it has not always proved satisfactory in English dockyards. The heart-wood is dark in colour, takes a fine finish, is known to be free from the imported mollacryllary rays is valuable to the furniture maker; it weighs from 10 to 15 per cent. over that of oak. The comparatively rapid growth of the tree is its great recommendation to the planter; it is best raised from acorns sown on the spot, as they are very bitter and little liable to the attacks of vermin; the tree sends down a long tap-root, which should be curtailed by cutting or early transplanting, if the young trees are to be removed. It seems peculiarly adapted for the mild moist climate of Ireland.

In North America, where the species of oak are very numerous, the most important member of the group is Q. alba, the white oak, abounding all over the eastern districts to the continent from Lake Winnipeg and the St Lawrence counties of the Province of Quebec, and as far west as the Mississippi. In aspect it more nearly resembles Q. Robur than any other species, forming a tree with spreading base, and, when growing in glades or other open places, huge spreading boughs, less twisted and gnarled than those of
the English oak, and covered with a whitish bark that gives a marked character to the tree. The leaves are large, often irregular in form, usually with a few deep lobes dilated at the end; they are of a bright light green on the upper surface, but whitish beneath; they turn to a violet tint in autumn. The egg-shaped acorns are placed singly or two together on short stalks; they are in most years sparingly produced, but are occasionally borne in some abundance. On rich loams and the alluvial soils of river-valleys, when well drained, the tree attains a large size, often rivalling the giant oaks of Europe; trunks of 5 or 4 ft. in diameter are frequently found, and sometimes these dimensions are greatly exceeded. The wood is variable in quality and, though hard in texture, is less durable than the best oak of British growth; the heart-wood is of a light reddish brown varying to an olive tint; a Canadian specimen weighs 324 lb the cubic foot.

*Q. obtusifolia,* the post oak of the backwoodsman, a smaller tree with rough leaves and notched upper lobes, produces an abundance of acorns and good timber, said to be more durable than that of the white oak.

The pin oak, sometimes called the “hur-oak,” *Q. macrocarpa,* is remarkable for its large acorns, the cups bordered on the edge by a fringe of long narrow scales; the leaves are very large, sometimes from 10 in. to 1 ft. in length, with very deep lobes at the lower part, but dilated widely at the apex, and there notched. The tree is described by Prof. C. S. Sargent (*Silvis of North America*) as one of the most valuable timber trees of North America, its wood being superior in strength even to that of *Q. alba,* with which it is commercially confounded.

The over-cup oak, *Q. lyrata,* is a large tree, chiefly found on swampy land in the southern states; the lyrate leaves are dilated at the end; the globose acorns are nearly covered by the tuberculated cups.

In the woods of Oregon, from the Columbia river southwards, an oak is found bearing some resemblance to the British oak in foliage and in its thick trunk and widely-spreading boughs, but the bark is white as in *Q. alba*; it is *Q. Garryana,* the western oak of T. Nuttall. This tree acquires large dimensions, the trunk being often from 4 to 6 ft. in diameter; the wood is strong, hard and close-grained; the acorns are produced in great quantity, and are used by the Indians as food.

The red oak, *Q. rubra,* has thin large leaves on long petioles, the lobes very long and acute, the points almost bristly; they are pink when they first expand in spring, but become of a bright glossy green when full-grown; in autumn they change to the deep purplered which gives the tree its name. Common throughout the northern and middle states and Canada, the red oak attains a large size only on good soils; the wood is of little value, being coarse and porous, but it is largely used for cask-staves; the bark is a valuable tanning material.

A species nearly allied is the scarlet oak, *Q. coccinea,* often confounded with the red oak, but with larger leaves, with long lobes ending in several acute points; they change to a brilliant scarlet with the first October frosts, giving one of the most striking of the various glowing tints that render the American forests so beautiful in autumn. The trunk, though often of considerable size, yields but an indifferent wood, employed for similar purposes to that of *Q. rubra,* the bark is one of the best tanning materials of the country.

Both these oaks grow well in British plantations, where their bright autumn foliage, though seldom so decided in tint as in their native woods, gives them a certain picturesque value.

Nearly akin to these are several other forms of little but botanical interest; not far removed is the black or dyer’s oak, *Q. tinctoria,* a large and handsome species, with a trunk sometimes 4 ft. in diameter, not uncommon in most forests east of the Mississippi, especially in somewhat upland districts. The leaves are frequently irregular in outline, the lobes rather short and blunt, widening towards the end, but with seraceous points; the acorns are nearly globular. The wood is coarsely grained, as in all the red-oak group, but harder and more durable than that of *Q. rubra,* and is often employed for building and for flour-barrels and cask-staves. The bark, very dark externally, is an excellent tanning substance; the inner layers form the *quebracho* of commerce, used by dyers for communicating to fabrics various tints of yellow, and, with iron salts, yielding a series of brown and drab hues; the colouring property depends on a crystalline principle called *quebrachin,* of which it should contain about 8%. The cut-leaved oaks are represented in eastern Asia by several species, of which *Q. mongolica* is widely spread over Dahuria, north China and the adjacent countries; one of the Chinese silkworms is said to feed on the leaves.

The chestnut oaks of America represent a section distinguished by the merely serrated leaves, with parallel veins running to the end of the serrations. *Q. Prinus,* a beautiful tree of large growth, and its subspecies *castanea* and *meniana,* yield good timber. *Q. Chinquapin* or *prinoides,* a dwarf species, often only 1 ft. in height, forms dense miniature thickets on the barren uplands of Kansas and Missouri, and affords abundant sweet acorns; the tree is called by the hunters of the plains the “shin-oak.” *Q. castaneiformis,* represented in *fig. 6.*
is a native of the woods of the Transcaucasian region of western Asia.

Evergreen oaks with entire leaves are represented in North America by Q. virginiana, also known as Q. virginiana, the live oak of the southern states; more or less abundant on the Atlantic seacoast of the states of Maine and Florida, its true home is the country around the Mexican Gulf, where it rarely grows more than 50 or 60 m. inland. The oval leaves are dark-green above, and whitish with stellate hairs beneath, the margin entire and slightly recurved. The wood is one of the most valuable timber trees of the genus, the wood being extremely durable, both exposed to air and under water; heavy and close-grained, it is perhaps the best of the American timbers for furniture and is invaluable for water-wheels and mill-work. The tree in England is scarcely hardy, though it will grow freely in some sheltered places.

The evergreen oak of southern Europe is Q. ilex, usually a smaller tree, frequently of rather shrub-like appearance, with abundant glossy dark-green leaves, generally ovate in shape and more or less prickly at the margin, but sometimes with the edges entire; the under surface is hoary; the acorns are oblong on short stalks. The ilex, also known as the "holm oak" from its resemblance to the holm, abounds in all the Mediterranean countries, showing a partiality for the sea air. The stem sometimes grows 80 ft. in height, and is occasionally of large diameter; but it does not often reach a great size. In its native lands it attains a vast age; Pliny attributes to several trees then growing in Rome a greater antiquity than the city itself. The wood of the ilex is hard, and is used in Spain and Italy for furniture, and in the former country for fire-wood and charcoal. In Britain the ilex is common in sub-alpine localities, and is a valuable wood for the making of the ordinary wands; and, is useful to the ornamental planter from its capacity for resisting the sea gales; but it generally remains of small size. Q. Ballota, a closely allied species abundant in Morocco, bears large edible acorns, which form an article of trade from the north of Africa, and is used in medicine. The ilex, or holm oak, resembles in shape that of the olive, from which it is distinguished in being deciduous.

Q. ilex, var. Gramuntia, also furnishes a fruit which, after acquiring sweetness by keeping, is eaten by the Spaniards.

In America several oaks exist with narrow-lanceolate leaves, from which characteristic they are known as "willow oaks." Q. Phellodendron, a rather large tree found in Georgia, is a native of the west Mediterranean area. In Spain the wood is of some value, being hard and close-grained, and the inner bark is used for tanning. Q. Virginiana, a large deciduous oak, which, like the ilex, belongs to the Mediterranean region, and is a valuable timber tree, and furnishes a valuable wood for the American firmament. The acorns are often considerable in size, and are used as a substitute for honey or sugar in various confections (see MANNA).  

OAKHAM—OAMARU

OAKHAM, a market town, and the county-town of Rutland, England, 94 m. N. by W. of London by the Midland railway. Pop. (1901) 3204. The church of All Saints ranges in style from Early English to Perpendicular, belonging in appearance mainly to the latter style. Of Oakham Castle, founded in the reign of Henry II., the principal remnant is the notable Norman hall, used as the county hall. The manor came in the time of Henry II. into the hands of Walchelne de Ferrers, and subsequently passed, through many owners, to the duchy of Buckingham, where it remained, constructed of black bricks. A peculiarity of the custom attaching to the manor is to claim a horseshoe from every peer who, for the first time, passes through the town. Flore's House in the main street is an interesting building dating from the 13th century. Oakham school was endowed as a grammar school by Robert Johnson, archdeacon of Leicester, in 1584; it now has classical and modern sides. Not far from the town are the kennels of the Cottesmore hunt.

OAKLAND, a city and the county-seat of Alameda county, California, U.S.A., situated opposite and about 6 m. distant from San Francisco, on the eastern shore of San Francisco Bay. Pop. (1890) 48,682; (1900) 66,960, of whom 17,256 were foreign-born, 3197 being Irish, 27,42 German, 2026 English, 1544 English-Canadians, 1020 Portuguese and 904 Swedish; (1010 census) 150,174. It is the terminus of the Ogden branch of the Southern (formerly Central) Pacific, of the Coast Line of the Atchison, Topeka & Santa F, and of the Western Pacific railways. Passengers and freight from the East to San Francisco are transferred by ferry from Oakland. A branch of the bay (called Oakland Harbour) divides Oakland from Alameda, and the railway piers of Oakland run directly out into the bay for more than two miles. The city is in the valley of the Oakland estuary, a tributary of the San Francisco estuary. Lake Merritt, in the heart of the city, a favourite pleasure resort, is the centre of the city's park system. Oakland is the seat of California College (co-educational, Baptist, opened in 1870), and of St Mary's College (Roman Catholic, 1863) for men; and in the suburban village of Mills College, west of the city, is Mills College (non-sectarian, 1871) for women, an institution of high rank. Electric power for the city is derived from Colgate, on the Yuba river, 215 m. distant. Oakland has important manufacturing interests, the total value of total factory products in 1905 being $6,072,530, 66% more than in 1890.

The site of the present city (as well as that of Alameda and Berkeley) lay originally within the limits of a great private Mexican grant which was confirmed by the United States authorities. A settlement was begun—at first by "squatters" in defiance of the private claim—in 1850; in May 1852 this was incorporated as a town (the name being derived from a wood of oaks in the midst of which the first settlement was made), and in March 1854 it was chartered as a city. In 1865 it was selected as the western terminus of the Central Pacific, a choice which practically decided Oakland's pre-eminence. The city is 15 m. W. of San Francisco. The water front was recklessly given away in 1852, and the resulting disputes and litigation lasted for more than thirty years; in 1908 the water front reverted to the city. The population increased more than sixfold from 1860 to 1870, and doubled in 1900-1910. It became the county-seat in 1874. In December 1910 a commission form of government was adopted.

OAKUM (O. Eng. åcumbe or åcumbe, tow, literally "off-cumbings"), a preparation of tarred fibre used in shipbuilding, for caulking or packing joints of timbers in wood vessels and the deck planking of iron and steel ships. Oakum is made by preference from old tarry ropes and cordage of vessels, and its picking and preparation has been a common penal occupation in prisons and workhouses. White oakum is made from uncleaned materials.

OAMARU, a municipal borough on the east coast of South Island, New Zealand, in the county of Waitaki and provincial district of Otago; on the main railway between Christchurch (152 m. N.E.) and Dunedin (78 m. S.S.W.). Pop. (1906) 5971. It is the outlet of the largest agricultural district in New Zealand. A m. town and mole, constructed of blocks of concrete, enclose a commodious basin, forming one of the safest harbours in the colony. The export of frozen meat is important. The town is built of white Oamaru limestone. Brown coal is obtained at the entrance of Shag valley, 40 m. S. The district is famed for its stock, and the fine quality of its grain; also for the character of the English grasses laid down there, which flourish in a rich black loam on a limestone formation.

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Fig. 8.-Q. Vallonea; half natural size.

The valonia of commerce, one of the richest tannering materials, is the acorn of Q. Argiopla, a fine species indigenous to Greece and the coasts of the Levant, and sometimes called the "Oak of Bashan." The very large acorns are remarkable for their thick cups with long refracted scales; the leaves are large, oblong, with deep serrations terminating in a bristle-point. The cups are the most valuable portion of the valonia, abounding in tannin acid; immature acorns are sometimes exported under the name of "camatina." The allied Q. Vallonea of Asia Minor likewise yields valonia.

Some acorns are of indirect importance from products formed by their insect enemies. Of these the Aleppno galle (see GALLS) is yielded by Q. ilex, and Q. cocciifera, a small bush growing in Spain and many countries around the Mediterranean, furnishes the kermes dye (KERMES). Q. petraea, or according to some Q. marinifera, attacked by a kind of Coccus, yields a hard, brown exudation, and is used for the manufacture of maroon, or as a substitute for honey or sugar in various confections (see MANNA).
OANNES-OAR

OANNES, in Babylonian mythology, the name given by Berossus to a mythical being who taught mankind wisdom. He is identical with the god Ea (q.v.), although there may not be any direct connexion between the two names. Berossus describes Oannes as having the body of a fish but underneath the figure of a man. He is described as dwelling in the Persian Gulf, and rising out of the waters in the daytime and furnishing mankind instruction in writing, the arts and the various sciences. The culture-myth on which the account of Berossus rests has not yet been found in Babylonian literature, but there are numerous indications in hymns and incantations that confirm the identification with Ea, and also prove the substantial correctness of the conceptions regarding Oannes-Ea as given by Berossus.

(M. J.A.)

OAR (A.S. ar; M. Eng. ore; Lat. rēmus; Gr. ἱππόβος : Sans. arītra; Fr. rame; Ital. Span., Port. romo), the instrument used for propelling a boat in rowing (q.v.). The word "oar" is probably derived from an old root ar, meaning to drive, to force away (cf. ar-ar-e, araram, plough). Such an appellation would easily be suggested by the visible difference in the action of the power employed by means of the oar against a thwart, or rowlock, from the operation of the primitive paddle, where the power was gained by the action of one hand against the other. In the development of rowing from paddling the task of shaping the instrument of propulsion must have followed gradually the necessities indicated by use. In rowing, as well as in paddling, the leverage is of the second order, in which the weight lies between the power and the fulcrum. The point at which the power pressed the arm of the lever against the weight would soon attract attention by the frequent breakage of the paddle so employed. Experience would demand a thicker loom, and would soon teach the desirability of increasing the leverage where possible, and upon this would arise naturally the practical questions of the length of the oar, of the breadth of the blade, and of the right proportion of the parts of the oar, inboard and outboard, to each other. Then would also occur the problem of how to keep this proportion, which in practice would be liable to disarrangement by the slipping outward of the oar during the recovery from each stroke. Hence would arise the use of the thong (πρωτός, πρωτόρρη), familiar to ancient Egyptians, Levantine, and, in northern and western waters, the invention of the "button," with which in various shapes the rowing world is now provided. Other devices, such as a hole bored in a piece of wood attached to the oar, or even a metal ring, will, in different localities, be found answering the same purpose.

In the early stages of the transition from paddling to rowing, the oar would naturally be used at an acute angle vertically to the boat's side. In paddling the upper hand is used to push from you, the lower hand to pull towards you. But in rowing both hands are used to pull towards you. As long as the oar was used at an acute angle vertically to the boat's side, the power of the upper hand on the oar would have to be reversed, as it would more easily grasp the oar with the wrist turned inward towards the body. In many of the earlier representations of rowing this position of the upper hand seems to be indicated. This distinction should not be lost sight of, as the position of the hands on the oar affects not only the character of the stroke, but also the requirements as to the length of the oar and the breadth of the blade. The form of the oars given in the representations of early Egyptian ships is suggestive of paddles used as oars. Paddle-shaped also are the oars of the Phoenician ships shown on the Assyrian sculptures at Koyunjik (Layard), the date of which is about 700 B.C. The same form is seen on some of the early vases, but in some that are attributed to two centuries later the form is modified, and the oar blade proper begins to take shape.

The types exhibited in the representations of the Roman galleys are generally heavy and clumsy enough in appearance. Still they are veritable oars, not paddles. The material of which the ancient oars were usually made was pine, which then, as now, was most suitable for the purpose, being tough and comparatively light and easily shaped as regards loom and blade.

The oars of the Attic trireme were, if we may judge by those of which only we have the measurement recorded, not much longer for the upper bank than those of a modern racing eight, while those of the middle and lower banks could not have been much longer than those used now in the whalers and dinghies of the Royal Navy. As the oarsmen on either side probably sat in the same vertical plane, the inboard portion of the oars amidships was longer than the inboard of those fore and aft, having to conform to the curvature of the vessel's sides (cf. Aristotle, Mechanica, v). No doubt in vessels of larger size the upper tiers of oars would be longer, and, if we are to believe Callixenus, as cited by Athenaeus, in the great ship of Ptolemy the oars of the upper tier were over 50 ft. in length with handles leaded so as to equalize the weight inboard and outboard.

It is difficult to trace any detail of difference between the oars of the Roman period and those of the Byzantine and medieval galleys. In the medieval galley by the invention of the "apostis," a framework on which the thows were fixed, sufficient room was given for the play of longer oars, and, as the necessity of combining speed with greater carrying power in the galley became pressing, the arrangement alla scaloccio came into vogue, employing four or five or even seven men to each of the long

Table showing Oars used in Royal Navy.

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* Allowed spoon-blade oars.

Notes.—(1) Since 1893 some curved or spoon-bladed oars have been made at Devonport.
(2) There is no record of buttons being used, but on fir oars, which were covered with canvas on the loom, it was sometimes customary to work a Turk's head at the end of the canvas for ornament. (3) As regards sweeps, they are said to be made of ash and were 30 ft. long. They were used last in training brigs, but there is no record of them for the last twenty years.

Sweeps by which the galleys and gallasses were propelled. For these large oars we hear of ash and beech being used as well as pine.

In the Mediterranean the galley propelled by oars long remained the principal type of war vessel. In the Atlantic, and in the northern seas, it was otherwise.

The employment of artillery on board ship gradually determined a change in the method of propulsion. The use of sails
became necessary, and remained dominant until the introduction of steam (see Ship). But as late as the time of the Spanish Armada, and even later, large sea-going vessels were provided with long sweeps which came into use when sailing was not available. In our own time, in the lighters on tidal rivers, may be seen long oars, plied by one or two or more men, which recall the type of oars once in general use in large galleys three centuries ago.

The oars used by the Northmen were, to judge by the remains discovered along with old Viking ships 1 at Gokstad and elsewhere, very similar to those in use at the present time in the fishing boats around our coasts. Those of the large craft were, to judge by the length of one found whole, somewhat over 18 ft. in length with a 6 in. blade and a diameter of 1 in. halfway down the oar. Some smaller oars, evidently used for boats, measured 11 ft. with a 4-in. blade. The oars were of pine, and the looms of some of them showed a groove cut for a clamp at the place where the oar rested on the sill of the rowlock. Comparing these oars with the measurements given below of oars now in use in the Royal Navy, it is apparent that there is no great difference in type between them.

Passing on to oars used on rivers and fresh water generally, we find the type differs considerably from that of the oars used in sea-going craft. The chief difference consists in the shape of the blade. The blade is covered with leather for some inches above and below the loom in its expansion to its proper breadth, is fashioned in a curve calculated to offer a rigid resistance to the water during the stroke.2 The loom below the button is not rounded but is more of an oval to the front with a flat back. From the oval front a spine runs down into the blade, in some cases to nearly half its length. During the last few years the so-called "girder" oars, with much thicker looms but double grooved along their length, have been used for racing purposes. This invention gives additional strength and stiffness, without increasing the weight of the oar, which varies a little but is usually about 8 lb.

The blades vary much in breadth, as indeed do the oars in total length, and in proportion of inboard to outboard. The necessities of the sliding seat in racing boats have given rise to much difference of opinion among rowing men as to the right proportion. In the middle of the 19th century the use of square looms inboard, and of a button to turn inside and against the thwart, was common, and most oars had a small slab of hard wood let in below the button, so as to save the oar from wear and tear at the rowlock. But since round looms came into vogue the round leather head has taken the place of the old square button, and the loom is covered with leather for some inches above and below for this so as to protect it from abrasion.

Of late the introduction of swivel rowlocks for racing boats has caused a further modification in the form of buttons. Swivel rowlocks have come into general use for sculling boats, pair oars and coxswainless fours. But as yet they do not appear to have captured the racing eight, except in a few instances. Neither crews nor coaches in English waters seem inclined to part with the time-honoured rhythmic music of the oar in the rowlock, which from the days of antiquity even until now has, to practised ears, held its own tale as to the crew being together or not in the stroke.

In the case of racing eights, when the round loom oars superseded the square loom, the early patterns were common (e.g. in 1837) 12' 6" over all, 3' 8" inboard, with a long blade 4½' to 5' in breadth. These were succeeded by a pattern 12' 5" over all, 3' 6" inboard, with a much shorter blade 6" broad.

Since sliding seats came in the average oar has been 12' 4" over all, 3' 8½" inboard, with 5½' to 6½' blades. The modern racing oar may be instead of continuing the straight line of the old and Harvard race at Putney. Until very lately no material alteration had taken place in this pattern, except in the matter of width of blade. Some authorities, however, are, as has been

1 See Viking Ship, Nicolaysen (Christiania, 1882).
2 Since 1890 the curved blade seems to have been adopted in some cases in the oars made at Devonport for the Royal Navy.

said above, far from satisfied with the present average oar, and are using shorter patterns, 11' 10¾' or 12' 6" over all, 3½' inboard, and 7½' blades.

Single grooved oars were first made in America. But with the single groove a side weakness is often developed in the loom, and hence the double girder, invented by G. Aylings, has generally superseded the single groove, though many oarsmen prefer the box loom by the same inventor.

It is clear, however, that no finality has been reached in the making of oars. Tubular oars, first introduced at Henley by the Belgian crew in 1906, are now being tried, with circular or quadrangular bores, strengthened by the insertion of an aluminium shell.

For much of the information above given respecting the recent developments in oar-making for racing purposes and river work, the writer is indebted to Messrs Aylings & Sons of Putney, whose patented inventions and improvements are well known to rowing men.

OASIS (Gr. ὄασις, the name given by Herodotus to the fertile spots in the Libyan desert: it probably represents an Egyptian word, cf. Coptic ṣauk, oušu, to dwell, from which the Egyptian Arabic عوشي is derived), a fertile spot surrounded by desert. For example, where the high plateau of the Libyan desert descends into a longitudinal valley between Syrtis and the Nile delta there are a few spots where the water comes to the surface or is found in shallow wells. It may come to the surface in springs, upon the artesian principle, or it may collect and remain in mountain hollows. These areas are of small extent and are closely cultivated, and support thick forests of date-palms. All kinds of tropical vegetables, grains and small fruits grow under cultivation, and land is so precious in these limited areas of great richness and fertility that very narrow pathways divide each owner's plot from his neighbour's. Wherever oases are found they present similar features, and are naturally the halting-places and points of departure of desert caravans.

OAST (Oat, cf. Dutch oet, "klin"). The Teutonic root is *aideh- "to burn"; the pre-Teutonic *iadeh- is seen in Lat. acetum, "heat," aetas, "summer," Gr. αἰών, "burning heat"), a kiln, particularly one used for drying hops; the word usually appears in the term "oast-house," a building containing several of such kilns (see Hop). "Oast" is also sometimes-used of a kiln for drying tobacco.

OASTLER, RICHARD (1789—1861), English reformer, was born at Leeds on 20th of December 1789, and in 1820 succeeded his father. As steward of the Thornhills' extensive Fitzroy estates at Huddersfield, Yorkshire. In 1830 John Wood, a Bradford manufacturer, called Oastler's attention to the evils of child employment in the factories of the district. Oastler at once started a campaign against the existing labour conditions by a vigorous letter, under the title "Yorkshire Slavery," to the Leeds Mercury, Public opinion was eventually aroused, and, after many years of agitation, in which Oastler played a leading part, the Ten Hours Bill and other Factory Acts were passed, Oastler's energetic advocacy of the factory-workers' cause procuring him the title of "The Factory King." In 1838, however, owing to his opposition to the new poor law and his resistance of the commissioners, he had been dismissed from his stewardship at Fitzby; and in 1840, being unable to repay £2000 which he owed his late employer, Thomas Thornhill, he was sent to the Fleet prison, where he remained for over three years. From prison he published the Fleet Papers, a weekly paper devoted to the discussion of factory and poor-law questions. In 1844 his friends raised a fund to pay his debt, and on his release he made a triumphant entry into Huddersfield. Oastler died at Harrogate on the 22nd of August 1861. A statue to his memory was erected at Bradford in 1888.

OAT (O. Eng. âete; the word is not found in cognate languages; it is allied with Fr. cétel, knot, nodule, cf. Gr. aíðos swelling), a cereal (Avena sativa) belonging to the tribe Aveneae of the order Gramineae or grasses. The genus Avena contains about fifty species mostly dispersed through the temperate regions of the Old World. The spikelets form a loose panicle,
familiar in the cultivated oat (fig. 1), the flowering glume having its dorsal rib prolonged into an awn (fig. 2), which is in some species twisted and bent near the base.

The origin of the cultivated oat is generally believed to be A. *fatua*, or "wild oat," or some similar species, of which several exist in southern Europe and western Asia. Professor J. Buckman succeeded in raising the "potato-oat type" and the "white Tatarian oat" from grain of this species. A. *strigosa*, Schreb., the bristle-pointed oat, is the origin of the Scotch oat, according to Buckman. The white and black varieties of this species were cultivated in England and Scotland from remote times, and are still grown as a crop in Orkney and Shetland. A. *strigosa* is probably only a variety of the cultivated oat. The "naked oat," A. *nuda*, was found by Bunge in waste ground about Peking; it was identified by the botanist Lindley with the pil-corn of the old agriculture, and we see from Rogers that it was in cultivation in England in the 13th century. Both this and the "common otes," A. *vesca*, are described by Gerard. Parkinson tells us that in his time (early in the 17th century) the naked oat was sown in sundry places, but "nothing so frequent" as the common sort. The chief differences between A. *fatua* and A. *sativa*, are, that in the former the chaff-scales which adhere to the grain are thick and hairy, and in the latter they are not so coarse and are hairless. The wild oat, moreover, has a long stiff awn, usually twisted near the base. In the cultivated oat it may be wanting, and if present it is not so stiff and is seldom bent. The grain is very small and worthless in the one, but larger and full in the other. There are now many varieties of the cultivated oat included under two principal races—common

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**OATES**

the remains of the Swiss lake-dwellings perhaps not earlier than the bronze age, while Pliny alludes to bread made of it by the ancient Germans. Pickering also records Galen’s observations (De Alim. Fac. i. 14), that it was abundant in Asia Minor, especially Mysia, where it was made into bread as well as given to horses.

Besides the use of the straw when cut up and mixed with other food for fodder, the oat grain constitutes an important food for both man and beast. The oat grain (excepting the naked oat), like that of barley, is closely invested by the husk. Oatmeal is made from the kiln-dried grain from which the husks have been removed; and the form of the food is the well-known "porridge." In Ireland, where it is sometimes mixed with Indian-corn meal, it is called "stirabout." Groats or grits are the whole kernel from which the husk is removed. Their use is for gruel, which used to be consumed as an ordinary drink in the 17th century at the coffee-houses in London. The meal can be baked into "cake" or biscuit, as the Passover cake of the Jews; but it cannot be made into loaves in consequence of the great difficulty in rupturing the starch grains, unless the temperature be raised to a considerable height. With regard to the nutritious value of oatmeal, as compared with that of wheat flour, it contains a higher percentage of albuminoids than any other grain, viz. 12.6—that of wheat being 10.8—and less of starch, 58.4 as against 66.3 in wheat. It has rather more sugar, viz. 5:4—while having 4:2—and a good deal more fat, viz. 5:6, as against 2:0 in flour. Lastly, salts amount to 3:0% in oat, but are only 1:7 in wheat. Its nutritious value, therefore, is higher than that of ordinary seconds flour.

**OATES, TITUS** (1649–1705), English conspirator, was the son of Samuel Oates (1610–1663), an Anabaptist preacher, chaplain to Pride, and afterwards rector of All Saints’ Church, Hastings. He was admitted on the 11th of June 1665 to Merchant Taylors’ School in London, but was soon afterwards removed to Osbourn. There he remained a year, more or less, and "seems afterwards to have gone to Sedlescombe school in Sussex, from whence he passed to Caius College, Cambridge, on the 29th of June 1667, and was admitted a sizar of St John’s, on the 2nd of February 1668–1669, aged 18." Upon very doubtful authority he is stated to have been also at Westminster school before going to the university. On leaving the university he apparently took Anglican orders, and officiated in several parishes, Hastings among them. Having brought malicious accusations in which his evidence was disallowed, he was convicted and committed to prison for perjury. He next obtained a chaplaincy in the navy, from which he appears to have been speedily dismissed for bad conduct with the reputation of worse. He now, it is said, applied for help to Dr Israel Tonge, rector of St Michael’s in Wood Street, an honest half-crazy man, who even then was exciting people’s minds by giving out quarterly "treatises in print to alarm and awake his majesty’s subjects." Oates offered his help, and it was arranged that he should pretend to be a Roman Catholic so as the better to unearth the Jesuit plots which possessed Tonge’s brain. Accordingly he was received into the church by one Berry, himself an apostate, and entered the Jesuit College of Valladolid as Brother Ambrose. Hence he was soon expelled. In October 1677 he made a second application, and was admitted to St Omer on 10th December. So scandalous, however, was his conduct that he was finally dismissed in 1678. Returning in June 1678 to Tonge, he set himself to forge a plot by piecing together things true and false, or true facts falsely interpreted, and by inventing treasonable letters and accounts of preparations for military action. The whole story was written by Oates in Greek characters, copied into English by Tonge, and finally told to one of Charles II’s confidential servants named Kirkby. Kirkby having given the king his information, Oates was sent for (13th August), and in a private interview gave details, in forty-three articles, of the plot and the persons who had engaged to assassinate Charles. The general improbability of the story was so manifest, and the discrepancies were so glaring, that neither then nor at any subsequent time did Charles express anything but amused

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1 Rarer Kinds of Grain, ii. 173.
2 *Herball*, p. 68 (1597).
3 *Origin of Cultivated Plants*, p. 373.
incredibly. To bolster up the case a fresh packet of five forged letters was concocted (31st August); but the forgery was transparent, and even Sir William Jones, the attorney-general, though a violent upholder of the plot, dared not produce them as substantial.

Oates now (6th September) made an affidavit before Sir Edmond Berry Godfrey (q.v.) to an improved edition of his story, in eighty-one articles. Among the persons named was Coleman, secretary to the duchess of York, whom Godfrey knew, and to whom he sent word of the charges. Coleman in turn informed the duke, and he, since the immediate exposure of the plot was of the utmost consequence to him, induced Charles to compel Oates to appear (28th September) before the privy council. Here Oates delivered himself of a story the falsity of which was so obvious that the king was able to expose him by a few simple questions. At this moment an accident most fortunate for Oates took place. Amongst the papers seized at his request were Coleman's, and in them were found copies of letters written by the latter to Père le Chaise, suggesting that Louis should furnish him with money, which he would use in the French and Catholic interest among members of parliament. Among them, too, were these passages: "Success will give the greatest blow to the Protestant religion that it has received since its birth"; "we have here a mighty work upon our hands, no less than the conversion of three kingdoms of Europe by the opening the eyes, and depriving the people of the power, which has so long domineered over great part of the northern world." The credit of Oates was thus, in the eyes of the people, re-established, and Coleman and others named were imprisoned. Charles was anxious for his brother's sake to bring the matter to a conclusion, but he dared not appear to stifle the plot; so, when starting for Newmarket, he left orders with Danby (see Leeds, Duke of) that he should finish the investigation at once. But Danby purposely delayed; an impeachment was hanging over his head, and anything which took men's minds off that was so obvious the king was able to expose him by a few simple questions.

On the 12th of October occurred the murder of Godfrey, and the excitement was at its highest pitch. On the 21st of October parliament met, and, though Charles in his speech had barely alluded to the plot, all other business was put aside and Oates was called before the House. A new witness was wanted to support Oates's story, and in November a man named William Bedloe came forward. At first he remembered little; by degrees he remembered everything that was wanted. Not even so, however, did their witness agree together, so, as a bold stroke, Oates, with great circumstantiality, accused the queen before Charles of high treason. Charles both disbelieved and expatriated him, whereupon Oates carried his tale before the House of Commons. The Commons voted for the queen's removal from court, but, the Lords refusing to concur, the matter dropped. It was not, however, until the 18th of July 1679 that the slaughter of Jesuits and other Roman Catholics upon Oates's testimony and that of his accomplices was to some extent checked. Sir George Wakeman, the queen's physician, was accused of poisoning the king, and the queen was named as being concerned in the plot. The refusals of Charles to credit or to convey judgment on his testimony was an episode in his life. Scroggs had intimation that he was to be lenient. Sir Philip Lloyd proved Oates to have perjured himself in open court, and Wakeman was acquitted. On the 26th of June 1680, upon Oates's testimony, the duke of York was presented as a recusant at Westminster. But the panic had now worn itself out, and the importance of Oates rapidly declined; so much so that after the dissolution in 1682 he was no more heard of during Charles's reign, but enjoyed his pension of £600 or £600, it is uncertain which, in quiet. Shortly before the death of Charles, James sought, and won, a civil action against Oates, with damages of £200,000; in default of payment Oates was taken to prison; while there he was indicted for perjury, and was tried in May 1685, soon after the accession of James II. He was convicted and received a severe sentence, with repeated floggings, the execution of which was expected to kill him, and which was rigorously carried out; but to the astonishment of all he survived.

Oates was in prison for three and a half years. Upon the flight of James, and during the excitement against the Catholics, he partially gained his liberty, and brought an appeal against his sentence before the Lords, who, while admitting the necessity to be unjust, confirmed it by a majority of thirty-five to twenty-three. The Commons, however, passed a bill annulling the sentence; and a conference was held in which the Lords, while again acknowledging that legally they were wrong, adhered to their former determination. The matter was finally settled by Oates receiving a royal pardon, with a pension of £300 a year. The remainder of his life was spent in retirement, varied by a good deal of sordid intrigue. In 1691 he became acquainted with William Fuller, whom he induced to forge another plot, though not with the success he had himself attained. He married a wealthy widow in 1693, but his extravagance soon brought him into straits. In 1696 he dedicated to William III. a book called Eikon Basilike, an elaborate tissue of invection against "the late king James." In 1698 he obtained admission as a member of the Baptist Church, and used to preach at Wapping; but in 1701, as the result of a financial scandal, he was formally expelled from the sect. He died on the 12th of July 1705.

OATH. Oathes, as the word was afterwards defined and used, was a promise or engagement. The word is found throughout the Teutonic languages (Goth. Mod. Ger. Edd.) (svaran, Schwören); diese trouthe (Ger. schwören); this word, too, is not clear in original meaning, but is in some way connected with the notion of answering—indeed it still forms part of the word answer, O. Eng. and-swarian; it has been suggested that the swearer answered by word or gesture to a solemn formula or act. Among other terms in this connexion, the Lat. jurare, whence English law has such derivatives as jure, seems grounded on the metaphorical idea of binding (root ju, as in jungo); the similar idea of a bond or restraint may perhaps be traced in Gr. ἰπές. It may be worth notice that Latin sacramentum and sacrament also gives an exhaustive and precise account of the Popish terror and its victims; and the chief incidents in Oates's career are graphically described by Macaulay. On the question of the place of his education see Notes and Queries (22nd December 1883). See also T. Seccombe's essay in Twelve Bad Men (1894), where a bibliography is given.

OATH (O. Eng. əʊθ), a term which may be defined as an avowal or promise made under non-human penalty or sanction. The word is found throughout the Teutonic languages (Goth. Mod. Ger. Edd.) (svaran, Schwören); this word, too, is not clear in original meaning, but is in some way connected with the notion of answering—indeed it still forms part of the word answer, O. Eng. and-swarian; it has been suggested that the swearer answered by word or gesture to a solemn formula or act. Among other terms in this connexion, the Lat. jurare, whence English law has such derivatives as jure, seems grounded on the metaphorical idea of binding (root ju, as in jungo); the similar idea of a bond or restraint may perhaps be traced in Gr. ἰπές. It may be worth notice that Latin sacramentum and sacrament also gives an exhaustive and precise account of the swearer answered by word or gesture to a solemn formula or act. Among other terms in this connexion, the Lat. jurare, whence English law has such derivatives as jure, seems grounded on the metaphorical idea of binding (root ju, as in jungo); the similar idea of a bond or restraint may perhaps be traced in Gr. ἰπές. It may be worth notice that Latin sacramentum and sacrament also gives an exhaustive and precise account of the Popish terror and its victims; and the chief incidents in Oates's career are graphically described by Macaulay. On the question of the place of his education see Notes and Queries (22nd December 1883). See also T. Seccombe's essay in Twelve Bad Men (1894), where a bibliography is given.

Writers viewing the subject among civilized nations only have sometimes defined the oath as an appeal to a deity. It will be seen, however, by some following examples, that the harm or penalty consequent on perjury may be considered to result freely, without any spirit or deity being mentioned; indeed it is not usually that these mere words involved in the oaths by the swearer may be more primitive than the invocation of divinities to punish. Examples of the simplest kind of curse-oath may be seen among the Nagas of Assam, where two men will lay hold of a dog or a fowl by head and feet, which is then chopped in two with a single blow of the dao, this being emblematic of the fate expected to befall the perjurer. Or a man will stand within a circle of rope, with the implication that if he breaks his vow he may rot as a rope does, or he will take hold of the barrel of a gun, a spear-head or a tiger's tooth, and solemnly declare, "If I do not faithfully perform this my promise, may I fall by this" (Butler in Journ. Asiatic Soc. Bengal, 1875, p. 310). Another stage in the history of oaths is that in which the swearer calls on some fierce beast to punish him if he lies, believing that it has the intelligence to know what he says and the power to
interferes in his affairs. In Siberia, in lawsuits between Russians and the wild Ostiaks, it is described as customary to bring into court the head of a bear, the Ostiak making the gesture of eating: and calling several witnesses to devour him, all in the same manner if he does not tell the truth (G. A. Erman, *Travels in Siberia*, i. 492, London, 1848). Similar oaths are still sworn on the head or skin of a tiger by the Santals and other indigenous tribes of India. To modern views, a bear or a tiger seems at any rate a more rational being to appeal to than a river or the sun, but in the earlier stage of nature-religion these and other great objects of nature are regarded as animate and personal. The prevalence of river-worship is seen in the extent to which in the old and modern world oaths by rivers are most sacred. In earlier ages men might inevitably by Styx or Tiber, and for this day an oath on water of the Ganges is to the Hindu the most binding of pledges, for the goddess will take awful vengeance on the children of the perjuror. The Tungus brandishes a knife before the sun, saying, "If I lie may the sun plunge sickness into my entrails like this knife." The natural transition from swearing by these great objects of nature to invoking gods conceived in human form is well shown in the treaty-oath between the Macedonians and the Carthaginians recorded by Polybius (vii. 9): here the sun and moon and earth, the rivers and meadows and waters, are invoked side by side with Zeus Hera and Apollo and the gods of the Caunitian. The heathen attempt, as so to speak, to smite the perjuror with his lightning, was invoked by the Romans, when a hog was slain with the sacred flint representing the thunderbolt, with the invocation to Jove so to smite the Roman people if they broke the oath (Liv. i. 24; Polyb. iii. 25). Another form of this Aryan rite was preserved by the old Slavonic nation of Prussia, where a man would lay his right hand on his own neck and his left on the holy oak, saying, "May Perkun (the thunder-god) destroy me!" The oaths of the lower culture show a remarkable difference from those of later stages. In the apparent present to the regions beyond the grave, as is evident from any collection of customary oaths. A single instance will show at once the combination of retributions in and after the present life, and the tendency to heap up remote penalties in the vain hope of securing present honesty. The Siamese Buddhist in his oath, not content to call down on himself various kinds of death if he breaks it, desires that he may afterwards be cast into hell to go through innumerable tortures, among them to carry water over the flames in a wicker basket to assuage the thirst of the infernal judge, then that he may migrate into the body of a slave for as many years as there are grains of sand in four seas, and after this that he may be born a beast through five hundred generations and an hermaphroditic five hundred more.

The forms of oath belonging to all nations and ages, various as they are in detail, come under a few general heads. It may be observed that two hands between the hands of another in token of homage, are sometimes treated as of the nature of oaths, but wrongly so, they being rather of the nature of ceremonies of compact. The Hebrew practice of putting the hand under another's thigh is usually reckoned among oath-rites, but it may have been merely a ceremony of covenant (Gen. xxiv. 2, xvii. 29; see Joseph. Ant. i. 16). Even the covenant among many ancient and modern nations by the parties mixing their blood or drinking one another's is in itself only a solemn rite of union, not an oath proper, unless some such ceremony is introduced as dipping weapons into the blood, as in the form among the ancient Scythians (Herod. iv. 70); this, by bringing in the idea of death befalling the covenant-breaker, converts the proceeding into an oath. Again, in India, the ritual of the vow strengthened by the Brahman's having his hand, in the consecrated weapons and greater on the Gospels (see Du Cange, s. r. "Juramenta super arma"); Grimm, *Deutsche Rechtsalterth. p. 896. Stretching forth the hand towards the object or deity sworn by is a natural gesture, well shown in the oath of Agamemnon, who with uplifted hands (Δις χειρας ανασαγωνισ) takes heaven to witness to Sun and Earth and the Erinyes who below the earth wreak vengeance on the perjuror ( Homer Il. xix. 254; see also Pindar, Olymp. v. 120). The gesture of lifting the hand towards heaven was also an Israelite form of oath: "I lift up my hand, as the witness Jehovah Himself is represented as so swearing, "For I lift up My hand to heaven, and say, I live for ever" (Gen. xiv. 22; Deut. xxxii. 40; see Dan. xii. 7; Rev. x. 5). This gesture established itself in Christendom, and has continued to modern times. In England, for example, in the parliament at Shrewsbury in 1398, when the Lords took an oath on the cross of Canterbury never to suffer the transactions of that parliament to be changed, the members of the Commons held up their hands to signify their taking upon themselves the same oath (J. E. Tyler, *Oaths*, p. 203). In Ionian law, his hand, saying, "Jehovah!" The Scottish judicial oath is taken by the witness holding up his right hand uncovered, and repeating after the usher, "I swear by Almighty God, and as I shall answer to God at the great day of judgment, that I will," etc.

In the ancient world sacrifice often formed part of the ceremony of the oath; typical examples may be found in the Homeric poems, as in Agamemnon's oath already mentioned, or the compact between the Greeks and Trojans (II. iii. 276), where wine is poured out in libation, with prayer to Zeus and the immortal gods that the perjurer's brains shall, like the wine, be poured on the ground; the rite thus passes into a symbolic curse-oath of the ordinary barbaric type. Connected with such sacrificial oaths is the practice of laying the hand on the victim or the altar, or touching the image of the god. A classic instance is in a comedy of Plautus (Ecdanes, v. 2, 45), where Cius says, "Tange arma bane Veneris," and Labrax answers "Tango" (Greek instance, Thucyd. v. 47; see justin xxiv. 2). Thus Livy (xxi. 1) introduces the phrase "touching the sacred objects" (faete pezriz) into the picturesque story of Haman's oath. In the old Scandinavian ritual in Iceland in the Landnámabók (Islendinga Sögur, Copenhagen, 1843); a bracelet (baug) of two rings or more was to be kept on the altar and on the court as an amulet, and the sacrifices were things held by him, and should reded in the blood of the bullrock sacrificed, the witness pronouncing the remarkable formula: "I name to witness that I take oath by the ring, law-cath, so help me Frey, and by the hand also by the three rings also, and the latter oath by ok hinn almáttaki Ass," etc. This was doubtless the great oath on the holy ring or bracelet which the Danes swore to King Alfred to quit his kingdom ("on tham halgan beage," Anglo-Sax. Chron.; in corum arma sacra," Ethelwred, *Chron. iv.*). An oath, though not necessarily expressed in words, is usually so. In the Homeric
instances the prayer which constitutes the oath has a somewhat conventional form, and in the classical ages we find well-marked formulas. These are often references to deities, as "by Zeus!" "I call Zeus to witness" (viv mi: &vri: Z6crri: Z6crrv); "by the immortal gods!" "I invoke the gods," or "I invoke the deities," or "I invoke the witnesses," or "I invoke the sworn witnesses," or "I invoke the accessory witnesses," or "I invoke the stoners, or the swearer, that he may perish if he fail to keep his oath, as 'the gods destroy me,' 'let me perish if,' &c. (dil me perdant, dis-persam si). An important class of Roman oaths invokes the deities to favour or preserve the swearer in so far as he shall fulfil his promise "as the gods may preserve me," "as I wish the gods to be propitious to me" (me fia diu servent; id est, Phil. iv. 19; Religionum; De Formulis et Solemnibus Populi Romani Verbis (Paris, 1853)). Biblical examples of these classes of oaths are "as the Lord liveth" (2 Cor. i. 23; Phil. i. 8; Gal. i. 20). Thus Athanasius writes: "I stretch out my hand, and as I have learned of the apostle, I call God to witness on my soul" (Apol. ad Imp. Const.; see Augustine, De Mend. 28; Epist. cl. iii. 9; cl. iv. 250; Enarr. in Psalm. lxxviii. 4; Serm. 307, 310). This argument is the more forcible from Paul's expressions being actually oaths in accepted forms, and it has also been fairly adduced that Christ, by answering to the adjuration of the high priest, took the judicial oath in solemn form (Matt. xxvi. 63). The passages here referred to will give an idea of the theological grounds on which the practice of taking oaths is defended. In the New Testament, the Quakers have refused to take even judicial oaths, while, on the other hand, the laws of Christendom from early ages have been only directed against such swearing as was considered profane or otherwise improper, and against perjury. Thus from the 3rd or 4th century we find oaths taking much the same place in Christian as in non-Christian society. In the 4th century the Christian military oath by God, Christ, the Holy Spirit, and the majesty of the emperor is recorded by Vegetius (Rer. Mili. Inst. ii. 5). Constantine's laws required every witness in a cause to take oath; this is confirmed in Justinian's code, which also in some cases requires also the parties and advocates to be sworn (Cod. Theod. xi. 39; Justin. Cod. iv. 20, 59). Bishops and clergy were called upon to take oath in ordination, monastic vows, and other ecclesiastical matters (see details in Bingham, Antiq. of Chr. Church. xvi. 7). By the middle ages oaths had increased and multiplied in Christendom far beyond the practice of any other age or religion. The Reformation made no change in principle, as is seen, for instance, in Art. xxxix. of the church of England: "As we confess that vain and rash swearing is forbidden Christian men by our Lord Jesus Christ, and James His apostle, so we judge, that Christian Religion doth not prohibit, but that a man may swear when the Magistrate requireth, in a cause of faith and charity, so it be done according to the Prophet's teaching, in justice, judgement and truth." The history of swearing in early Christendom would lead us to expect that the forms used would be adopted with more or less modification from Hebrew or Roman sources, as indeed proves to be the case. The oath introduced in the body of one of Constantine's laws—"As the Most High Divinity may ever be propitious to me" (ita mihi summa Divinitas semper propitius sit)—follows an old Roman form. The Roman oath by the genius of the emperor being objected to by Christians as recognizing a demon, they swore by his safety (Tertull. Apol. 32). The gesture of holding up the hand in swearing has been already spoken of. The Christian oath on a copy of the Gospels seems derived from the late Jewish oath taken holding in the hand the scroll of the law (or the phylacteries), a ceremony itself possibly adapted from Roman custom (see treatise "Shebubah" in Gemara). Among the various mentions of the oath on the Gospel, in early Christian times, an example of Chrysostom in a sermon to the people of Antioch: "But do thou, if nothing else, at least reverence the very book thou holdest forth to be sworn by, open the Gospel thou takest in thy hands to administer the oath, and, hearing what Christ therein saith of oaths, tremble and desist." (Serm. ad pop. Antioch. Hom. xv. i.). The usual mode was to lay the hand on the Gospel, as is often stated in the records, and was kept up to a modern date in the oath in the university of Oxford, "tacit sacrosancti Evangelii"; the practice of kissing the book, which became so well established in England, appears in the middle ages (J. E. B. Fast. Lit. vol. ii. pp. 110, 115). The book was often laid on the altar, or (after the manner of ancient Rome) the swearer laid his hand on the altar itself, or looked towards it; above all, it became customary to touch relics of saints on the altar, a ceremony of which the typical instance is seen in the representation of Harold's oath in the Bayeux tapestry. Other objects, as the cross, the bishop's crozier, &c., were sworn by (see Du Cange, s.v. "Jurare"). An oath ratified by contact or inspection of a sacred object was called a "corporal" or bodily oath, as distinguished from a merely spoken or written oath; this is well seen in an old English charter oath, "to hold me God, and these holy evangelists by me bodily touched ypon this hoo ly waver." The English word signifying the "sacred object" on which oath is taken is halidome (A.S. hældigdæm; Ger. Heiligthum); the halidome on which oaths are now sworn in England is a copy of the New Testament. Jews are sworn on the Old Testament; the sacred books of other religions are used in like manner, a Mohammedan swearing on the Koran, a Hindu on the Vedas.

Among the oath-formulas used in Christendom, that taken by provincial governors under Justinian is typical of one class: "By the power of God Almighty and of the Church of Christ, I swear, and profess with all my heart and conscience, that I will, by the command of the most Christian emperor, perform eagerly and faithfully that which I promise, and I take on me to perform, and to do, to observe, and to keep, the said laws and ordinances, and in everything to conform to the teaching of the Lord Jesus Christ, and the Holy Ghost, and the Most Holy Glorious Mother of God and ever Virgin Mary, and by the Four Gospels which I hold in my hand, and by the Holy Archangels Michael and Gabriel," &c. The famous oath of the kings Louis and Charles at Strassburg in 842 (A.D.) runs: "By God's love and the Christian people and our common salvation, as God shall give me knowledge and power," &c. Earlier than this, as in the oath of fealty in the capitularies of Charlemagne in 802, is found the familiar form "Sic me adjutet Deus," closely corresponding to above-mentioned formulas of pre-Christian Rome. This became widely spread in Europe, appearing in Old French "S i m'al t D ex," German "So mir Gott helfe," English "So help me God." A remarkable point in its history is its occurrence in the "So help me F r y e," &c., of the old Scandinavian ring-oath already described. Among the curiosities of the subject are quaint oaths of kings and other great personages: William Rufus swore "by that and that" (per hoc et per hoc), William the Conqueror "by the splendour of God," Richard I. "by God's legs," John "by God's teeth;" other phrases are given in Du Cange (i.e., as "per omnes gentes," or "per coronam," or "la salutare figure de Deo," or "la morti Dieu," &c. Profane swearing, the trifling or colloquial use of sacred oaths, is not without historical interest, formulas being used apt to keep up traces of old manners and extinct religions. Thus the early Christians were reproved for continuing to say "mercerel!" some of them not knowing that they were swearing by Hercules (Tertull. De idol. 20). Oaths by deities of pre-Christian Europe
OATH

After this the king, laying his hand upon the holy Gospels, shall say: "The things which I have here before promised I will perform and keep; so help me God," and then shall kiss the book.

The chief officers of state take an "official" oath well and truly to serve his majesty. Special oaths are taken by privy councillors, archbishops and bishops, peers, baronets and knights, recruiters and others. The old oath of allegiance, as administered (says Blackstone) upwards of 600 years, contained a promise of a true and faithful allegiance to the king and his heirs, and truth and faith to bear of life and limb and terrane honour, and yet to know or hear of any ill or damage intended him without defending him therefrom." (Blackstone, Commentaries, book i. chap. x.). In the reign of William III. it was replaced by a shorter form; and it now runs: "I . . . do swear that I will be faithful and bear true allegiance to His Majesty . . . , his heirs and successors, according to law." Statutes of Charles II. and George I. enacted that no member should vote or sit in either house of parliament without having taken the several oaths of allegiance, supremacy and abjuration. The oath of supremacy in the reign of William III. was: "I A B swear that I do from my heart abhor detest and abjure as impious and heretical this damnable doctrine and position that princes excommunicated or deprived by the pope or any authority of the see of Rome may be deposed or murdered by their subjects or any other whatsoever. And I do declare that no foreign prince person prelate state or potentate hath or ought to have any jurisdiction power superiority preeminence or authoritive ecclesiastical or spiritual within this realm. Soe," &c. The oath of abjuration introduced in the time of William III. recognizes the king's rights, engages the jury to support him and discloses all traitorous conspiracies against him, promises to maintain the Hanoverian Protestant succession, and expressly renounces any claim of the descendants of the late Pretender. This oath was not only taken by persons in office, but might be tendered by two justices to any person suspected of disaffection. In modern times a single parliamentary oath was substituted for the three, and this was altered to enable Roman Catholics to take it, and Jews were enabled to sit in parliament by being allowed to omit the words "on the true faith of a Christian." In its present form the parliamentary oath consists of an oath of allegiance and promise to maintain the crown as limited and settled in the reign of William III.

The "judicial" oath taken by judges of the court of appeal or of the High Court of Justice, and by justices of the peace, is "to do right to all manner of people after the laws and usages of this realm, without fear or favour, affection or ill-will."

Jurors are sworn, whence indeed their name (juratores), in felonies the oath administered is: "You shall well and truly try and true deliverance make between our sovereign lord the king and the prisoner at the bar whom you shall have in charge, and a true verdict give according to the evidence." In misdemeanours the form is: "Well and truly try the issue joined between our sovereign lord the king and the defendant, and a true verdict," &c. The oath of the jurors in the Scottish criminal courts is: "You [the jury collectively] swear in the name of Almighty God and as you shall answer to God at the great day of judgment that you will truth say and no truth conceall so far as you are to pass upon this assize." The oldest trace of this form of oath in Scotland is in Reg. maj. 1. cap. 11, copied from Glanvill, which points to an origin in the Norman inquest or "recognition." In the ancient custom of commoratio, once prevalent in Europe, the accused's oath was supported by the oaths of a number of helpers or compurgators who swore to their belief in its validity.

Witnesses in English law courts must give their evidence under the sanction of an oath, or of what is equivalent to an oath, and the ordinary form of oath adapted to Christians is: "The evidence you shall give . . . shall be the truth, the whole truth, and nothing but the truth. So help you God." Many alterations of the English law as to oaths have been made in relief of (1) those Christians who object on conscientious grounds
to the taking of an oath, and (2) of those persons who refuse to admit the binding force of an oath. Special provision was first made for Quakers, Moravians and Separatists; then followed general enactments relating to civil and criminal proceedings respectively, till finally the law was embodied in the Oaths Act 1888, which enacted that "every person upon objecting to being sworn, shall state, as the ground of such objection, either that he has no religious belief, or that the taking of an oath is contrary to his religious belief, shall be permitted to make his solemn affirmation instead of taking an oath in all places and for all purposes where an oath is or shall be required by law, which affirmation shall be of the same force and effect as if he had taken the oath; and if any person making such affirmation shall willfully, falsely and corruptly affirm any matter or thing which, if deposed on oath, would have amounted to wilful and corrupt perjury, he shall be liable to prosecution, indictment, sentence and punishment in all respects as if he had committed wilful and corrupt perjury." The form of affirmation prescribed by the Oaths Act was as follows: "I, A. B., do solemnly, sincerely, and truly declare and affirm," &c. Under s. 5 of the same act a person might swear in the Scottish form, with uplifted hand (no book of any kind being used) and if he desired to do so "the oath shall be administered to him in such form and manner without question." With the desire of making universal this method of administering the oath the Oaths Act 1909 was passed. It enacted that any oath might be administered and taken in the following form: The person taking the oath shall stand or sit, the thumb being placed between the fingers of the left hand, and holding the Bible of the Old Testament, in his uplifted hand, and shall say or repeat after the officer administering the oath the words 'I swear by Almighty God that . . . .' followed by the words of the oath prescribed by law." The officer also is directed by the act to administer it in this fashion, unless the person about to take it voluntarily objects or is physically incapable of taking it so. To a person who is neither a Christian nor a Jew the oath may be administered in any way in which it was previously lawful.

The form of affirmation given above is that used for Quakers, Moravians and Separatists in the witness-box: "I, A. B., being one of the people called Quakers (one of the United Brethren called Moravians), do, &c." A Christian swears on the Gospels, holding a copy of the New Testament in his right hand (the hand being uncovered), and his head being also uncovered. A witness may elect to be sworn on any version of the Bible which he considers most binding on him, as a Roman Catholic on the Douai Testament or Bible. A Jew is sworn on the Pentateuch, holding a copy thereof in his right hand, the head being covered. A Mahomedan is sworn upon the Koran. He places his right hand flat upon the book and puts the other hand upon his forehead, bringing his head down to the book and in contact with it. He then looks at the book for some moments. Buddhists are sworn on the Buddhist doctrines, Sikhs upon the Granth, Parsees upon the Zend Avesta, Hindus upon the Vedas, or by touching the Brahmin's foot, and, according to caste custom, Indian witnesses sometimes insist upon the oath being administered by a Brahmin; but in India witnesses now generally affirm. Kaffir witnesses swear by their own chief, and a Kaffir chief by the king of England. When a Chinese witness is to be sworn, a saucer is handed to him, which he takes in his hand and kneeling down breaks into fragments. The colonial legislatures generally make provision for receiving unsworn evidence of barbarous and uncivilized people who have no religious belief. The great number of oaths formerly required was much reduced by the Promissory Oaths Act 1868, which prescribed the forms of oath of allegiance, the official oath and the judicial oath. The right to affirm in lieu of taking the parliamentary oath in the case of atheists was first raised in the case of Charles Bradlaugh (q.v.).

Proflane swearing and cursing is punishable by the Profane Oaths Act 1475, any labourer, sailor or soldier being liable to forfeit 1s. on every other person under the degree of a gentleman 2s., and every gentleman or person of superior rank 5s., to the poor of the parish.

The administering or taking of unlawful oaths is criminal in English and Scots law. Statutes relating to the offence were passed in 1797, 1798 and 1811. Oaths used by ecclesiastics to the prelate of the latter act (Unlawful Oaths Act 1812) that they were aimed at those societies in the United Kingdom at the time of the French Revolution which required or permitted their members to take an unlawful oath. Some statutes were passed in 1832, 1825 and 1827. Children of tender years, who, in the opinion of the court, have not sufficient intelligence to understand the nature of an oath, may give evidence by oath. In the United States an oath is required in practically every case in which it is required in the United Kingdom, and with the same latitude as to affirmation. The formula or details may vary in different states of the Union. The same may be said generally of every civilized country, with the reservation that an affirmation is not so usually accepted as in English-speaking countries. In Germany an oath is compulsory on a witness in criminal cases, except in the case of certain sects, whose tenets forbid the taking of an oath.

AUTHORITIES.—Coke's Institutes; Book of Oaths (1680); Stephen's Commentaries; Stringer's Oaths and Affirmations; Tyler, Oaths; Origin, Nature, History (1835); Ford, On Oaths.

OAXACA, or OAJACA (officially OAXACA DE JUAREZ), a southern state of Mexico, lying partly on the southern slope of the great Mexican plateau and covering the southern and larger part of the Isthmus of Tehuantepec, bounded N. by Puebla, N.E. and E. by Vera Cruz, S.E. by Chiapas, S. by the Pacific and W. by Guerrero. Pop. (1900) 948,633, a large majority of whom are Indians. The state has an area of 35,872 sq. m., broken by mountain ranges into numerous broad fertile valleys, chiefly lying in the tierra templada region. The isthmus districts, however, have lower elevations and are distinctly tropical. The coast line is 329 m. long; behind it is a narrow strip of lowlands lying within the tierras colientes. In places this strip nearly disappears, the sierras rising almost immediately from the seashore. The culminating points within the state are Zempoalpetit (11,145 ft.) above sea-level, standing on the eastern margin of the beautiful Oaxaca Valley, and the Cerro del Leone, south-west of Tehuantepec, the highest summit in the Sierra Madre del Sur. Tributaries of the Mescala drain the western quarter of the state, among which is the Ayocac or headstream of the Mescala, which rises in Tlaxcala, and flows across the state of Puebla. The streams flowing northward to the Gulf coast are the Coastzacoalcos and Papalopam with their tributary, the San Juan, all flowing across the state of Vera Cruz. The Papalopam is navigable up to the town of Tuxtepec, in the state of Oaxaca. The largest of the Pacific coast streams is the Tehuantepec, which with its many tributaries has an aggregate length of 182 m. The Rio Verde has its source farther inland and drains the Oaxaca Valley, but its tributaries are small and less numerous. The only ports on the coast open to foreign trade are Salina Cruz, Papelopam, and Tuxtepec. The Pacific terminus of the Tehuantepec railway, with a spacious artificial harbour, and the second a deep but narrow natural harbour, the projected coast terminus of the Mexican Southern railway. The greater part of the state has a sub-tropical climate, with high sun temperatures, moderate rainfall and mild, healthful conditions. The less healthful regions include the isthmus districts, the coastal area on the Pacific and the low country on the border of Vera Cruz. Agriculture is the principal occupation of the people; the chief products are Indian corn, wheat, coffee, sugar, rubber, cotton, cacao, tobacco, indigo and a great variety of tropical fruits. Among the manufactured products are cotton, woolen and "pita" fibre fabrics, sugar, rum, mescal, beer, furniture, pottery, soap, candles, leather, matches, chocolate, flour and cigarettes. Two important railway lines traverse the state—the Tehuantepec (trans-isthmus) line between the ports of Salina Cruz and Coatzaocoalcos (Puerto Mexico), and the Mexican Southern line (narrow-gauge) from Puebla to Oaxaca, with branches to San Gerónimo on the Tehuantepec line with the Guatemalan frontier as its destination, and toward Puerto Angel on the coast. Two of the most progressive Indian races of Mexico are the Papalopam and Mixtecan descendents. It is believed that some of the prehistoric races who built the remarkable cities where the ruins of Mitla and Monte Alban (see CENTRAL AMERICA:
The Arabic 'Abdallah, Taimallah, 'Abd Manat, &c., the Hebrew Abdil and Obad Edom, and many Phoenician forms.1 "The vision of Obadiah" bears no date, or other historical note, nor can we connect Obadiah the prophet with any other Obadiah of the Old Testament,1 and our only clue to the date and composition of the book lies in internal evidence.

The prophecy is directed against Edom. Yahweh has sent a messenger forth among the nations to stir them up to battle against the proud inhabitants of Mount Seir, to bring them down from the rocky fastnesses which they deem impregnable. Edom shall be not only plundered but utterly undone and expelled from his borders, and this he shall suffer (through his own folly) at the hand of trusted allies (vers. 1-9). The cause of this judgment is his cruelty to his brother Jacob. In the day of Jerusalem's overthrow the Edomites rejoiced over the calamity, grasped at a slavager of the spoil, failed to lay that Joel used the earlier (vers. 10-14).

But now the day of Yahweh is near upon all nations, Edom and all the heathen shall drink full retribution for their banquet of carnage and plunder on Yahweh's holy mountain. A rescued Israel shall dwell in Mount Zion in restored holiness; the house of Jacob shall regain their old possessions; Edom shall be burned up before them as chaff before the flame; they shall spread over all Canaan, over the mountain of Edom and the south of Judah, as well as over Gilead and the Philistines and Phoenician coast. The victorious Israelites shall come up on Mount Zion to rule the countenance of Edom, and the kingdom shall be Yahweh's (vers. 15-21).

The most obvious evidence of date lies in the cause assigned for the judgment on Edom (vers. 10-14). The calamity of Jerusalem can only be the sack of the city by Nebuchadrezzar (586 B.C.); the malevolence and cruelty of Edom on this occasion are characterized in similar terms by several writers of the exile or subsequent periods, but by none with the same circumstance and vividness of detail as here (Ezek. xxv. 8, 12 f., xxxv. ; Lam. iv. 21; Psalm cxxxvii. 7). The prominence given to Edom, and the fact that Obadiah is not mentioned at all, make it probable that the passage was not written in Babylon. On this evidence, taken alone, we should be justified in saying that the prophecy was written at some time after 586 B.C., at a period when misfortunes incurred by Edom were interpreted as a Divine judgment on its unforgotten treachery in that year of tragedy.

The critical problem is, however, complicated by certain phenomena of literary relationship.2 Obad. 1-6, 8 agree so closely and in part verbally with Jer. xlix. 14-16, 9, 10, 7 that the two passages cannot be independent; nor does it seem possible to divide the original into two fragments and to regard one or both of them as the work of a later author. The parallelism used in Jer. and Obad. is a well-known and characteristic feature of Biblical prophecy, and the parallel passages in Is. xlvii. 1 f., xlix. 16, xvi., and the prophecy of Balaam. Scholars who do assign to Jeremiah the prophecy to Edom (Jer. 604 B.C. (e.g. Driver, L.O.T. chap. vi. § 4), explain this relationship by assuming with Ewald (Propheten, i. 489 f.), Graf (Jeremia, p. 538 f.), Robertson Smith and others, that Jeremiah and our book of Obadiah alike quote from an older oracle. Others, however, who do not regard Jer. xlix. as Jeremiahic, explain the relationship as one of dependence on Obadiah. This explanation, simpler in itself, is not discredited by the fact that in some details (cf. Obad. 2 and Jer. xlix. 15) the text

1 An early Hebrew tradition recorded by Jerome (Comm. in Obb.) identified the prophet with the best-known Obadiah of the historical books, the protector of the prophets in the reign of Ahab (1 Kings xvii).

2 Between Joel and Obadiah there are points of material and verbal agreement close to those of the Babylonian Joel (Joel iii. 19—Ob. 10, 14; Joel iii.5—Ob. 11; Joel ii. 32, iii. 7—Ob. 17),
of the dependent passage may be preferable to that of the original. On this latter, and more probable, view (taken by Wellhausen, Nowack and Marti) there is no need to separate Obad. 1-7 from 10-14. The immediate occasion of the prophecy I was doubtless the pressure of Nebuchadnezzar against Tyre and the "men of thy peace," "the men of my covenant," "the men of thy peace," v. 7 upon Edom, which had resulted, by 312 B.C. at latest, in the occupation by Arabs of Petra, the chief city of the Edomites (Wellhausen, p. 214). But the desolation of Edom has already been accomplished in the time of Malachi i. 1-5, a passage belonging to the earlier half of the 5th century. We may, therefore, with Wellhausen, Nowack and Marti, assign Obadiah 1-14 to the same period.

The remainder of the book, vers. (15) 16-21, must belong to a later date. That the book of Obadiah, short as it is, is a complex document might have been suspected from an apparent change of theme in the last verse. It is in the former verses Edom is destroyed by his allies, and they occupy his territory, but in the latter he perishes with the other heathen in the day of universal retribution, he disappears before the victorious advance of Israel, and the southern Judaeans occupy his land. The ideas of this passage belong to the eschatological outlook of later centuries, but afford no data for chronology. The conceptions of the "rescued ones" (R.V. "those that escape," v. 17), of the sanctity of Zion, of the kingship of Yahweh, are the common property of the post-exilic writers. The restoration of the city of Sion is mentioned, and the scene of action is in the kingdom of Judah. The Philistines are ideas as old as Amos ix., Isa. xi. 14; but such passages represent this conquest as a suzerainty of Israel over its neighbours, as in the days of David, while in Obadiah, as in other later books, the intensified antithesis—religious as well as political—between Judah and the surrounding heathens finds its expression in the idea of a consuming judgment on the latter—the great "day of Yahweh." The chief interest of the book of Obadiah lies in its references to the historical relations between Israel and Edom. From the point of view of religion, we may notice the emphasis on the doctrine of strict retribution (vers. 12, 15), which remains applicable to other peoples, even when its inadequacy as a complete theory of providence has been slowly and painfully discovered in the case of Israel itself.

LITERATURE.—Wellhausen, Die kleinen Propheten (1898); Nowack, id. (1897, 2nd ed., 1904); C. A. Smith, The Book of the Twelve, vol. ii. (1898); J. A. Selbie, art. "Obadiah," in Hastings' Dict. of the Bible, iii. 577-580 (1900); Cheyne, id. in Ency. Biblica, iii. c. 3455-3462 (incorporating the article of W. Robertson Smith in the 9th edition of the Ency. Brit.) (1902); Marti, Dodekapropheton (1900); see also the articles in the Smaller Dodekapropheton, see the latter for other commentaries, etc. The "Edom" in the Ency. Biblica (W. R. S.; H. W. R.).

OBAN, a municipal and police burgh and seaport of Argyllshire, Scotland. Pop. (1901) 5374. It is situated 113 m. N.W. of Glasgow by the Caledonian railway via Stirling and Callander, and about the same distance by water via the Crinan Canal. The fine bay on which it lies is screened from the Atlantic gales by the island of Kerrera (44 m. long by 2 m. broad), which practically converts it into a land-locked harbour. Being also sheltered from the north and east by the hills at the foot of which it nestles, the town enjoys an exceptionally mild climate for its latitude. The public buildings include the Roman Catholic pro-cathedral, erected by the 3rd marquis of Bute, the county hall, and the hospital. 1 Wellhausen and Nowack regard vers. 8, 9 as a later addition, intended to apply vers. 1-7 to the future; so Marti, who groups with these verses vers. 15, 16, because of the common reference to "the day of Yahweh." The Judaeans are addressed in vers. 16 ("as ye have drunk

drink") not the Edomites. Verse 20 anticipates that the exiles from northern Israel will occupy Phenician territory, whereas all but "which are in Sepharad" will occupy the southern districts in the Messianic restoration. Sepharad has been connected with various places, but now, as the nearest t. next to the West, Marti, in his Smaller Dodekapropheton, adopts Darius in the Behistun inscription (Robertson Smith); whilst, according to Winckler (K.A.T. i. 301), it is the name, from the Persian period onwards, for Asia Minor. Many of the Jews were doubtless familiar with the name, and the idea was strong, but Sepharad is a large geographical term of uncertain area, and Asia Minor was a chief seat of the Diaspora at an early date (comp. Gutschmidt, Neue Beitrdge, p. 77), so that "Sepharad" in itself does not supply ground for Hitzig's argument that Obadiah was written in the second century B.C., when a good many Jews were transplanted to Asia Minor (Jos. Anti. xii. 3). Buildings and two hospitals. It is the centre of tourist traffic for western Argyllshire and the islands. Oban was a small village at the date of Johnson's visit during his Hebridean tour; in 1786 it became a government fishing station; it was made a burgh of barony in 1811 and a parliamentary burgh in 1832. With Ayr, Campbeltown, Inveraray and Irvine (the Ayr burghs) it unites to send one member to parliament.

At the north end of the bay stands the ruin of Dunolly Castle, the old stronghold of the Macdougalls of Lorne, whose modern mansion adjoins it. In the grounds is a huge conglomerate rock called the Dog Stone (Clock-a-choin), from the legend that Fingal used to fasten his favourite dog Bran to it. About 3 m. N.E. are the ruins of Dunstaffnage Castle. It was here that the "Stone of Destiny," now contained in the base of the coronation oath, was deposited at the instance of its removal to Scone. At the south end of the island of Kerrera stood the ruins of Gylen Castle, an old fortalice of the Macdougalls.

OBLIGATO, or Obligato, in the modern sense, a musical term (adopted from the Italian, and strictly meaning obligatory or binding) for an instrumental accompaniment to a musical composition which, while in one way independent, is included by the composer on purpose and in a prescribed form, instead of being left to the discretion (ad libitum) of a performer.

OBEISL (Gr. ὁμιλεσθις, diminutive of ὁμιλέω, a spire), a form of monumental pillar; and also the term for a bibliographical reference-mark in the form of a dagger. The typical Egyptian obelisk is an upright monolith of nearly square section, produced in diameters in height, the sides slightly convex, tapering upwards very gradually and evenly, and terminated by a pyramid whose faces are inclined at an angle of 60°. Obtelisks were usually raised on pedestals of cubical form resting on one or two steps, and were set up in pairs in front of the entrance of temples. Small obelisks have been found in tombs of the age of the Old Kingdom. The earliest temple obelisk still in position is that of Senwosri I. of the XIth Dynasty at Helipolis (68 ft. high). A pair of Rameses II. (77 and 75 ft. high respectively) stood at Luxor until one of them was taken to Paris in 1831. Single ones of Tethmosis I. and Hatshepsut (109 ft. high) still stand at Karnak and remains of others exist there and elsewhere in Egypt. Colossal granite obelisks were erected by only a few kings, Senwosri I. in the Middle Kingdom and Tethmosis I., Hatshepsut, Tethmosis III. and Rameses II. of the Empire. Smaller obelisks were made in the Saite period. The Romans admired them, and the emperors carried off some from their original sites and caused others to be made in imitation (e.g. that for Antinous at Benevento) twelve are at Rome, one in Constantinople, and two, originally set up by Tethmosis III. at Heliopolis, were taken by Augustus to adorn the Caesareum at Alexandria: one of these, "Cleopatra's Needle," was removed in 1877 to London, the other in 1879 to New York. Such obelisks were probably more than mere embellishments of the temples. The pyramids were sheathed in bright metal, catching and reflecting the sun's rays as if they were Thrones of the sun. They were dedicated to solar deities, and were especially numerous at Heliopolis, where there was probably a single one sacred to the sun of immemorial antiquity. The principal part of the sun-temple at Abu sir built by Neueserrê of the Vth Dynasty several centuries before it have been removed to the Pyramids of Giza on a vast scale, only the base now remains, but hieroglyphic pictures indicate this form. The hieroglyph of some other early sun-temples shows a disk on the pyramidion. The material employed for the great obelisks was a pink granite from the quarries of Syene, and in these quarries there still remains, partially detached, an example 70 to 80 ft. long. The largest obelisk known is that in the piazza of St John Lateran at Rome; this had been set up by Tethmosis III. at Helipolis in the 18th century B.C., was brought over from Egypt by Constantine the Great and erected in the Circus Maximus, being ultimately re-erected in 1552 by Pope Sixtus V. It was 45 ft. 9 in., including the pyramidion, and its sides measured 9 ft. 10 in. and 9 ft. 8 in. respectively. On the base of the magnificent
OBERAMMERGAU—OBERLIN, J. F.

obelix of Hatshepsut at Karnak, 97 ft. 6 in. high, there is an inscription stating that it and its fellow were made within the short space of seven months. In consequence of the breaking away of the lower part of "Cleopatra's Needles" when removed to Alexandria and re-erected, the Roman engineers supported the angles on bronze crabs, one of which with three repose actions now supports the angles of the obelix on the Thames Embankment.

There was another form of obelix, also tapering, but more squat than the usual type, with two of the sides narrow and terminating in a rounded top. One such of Senwosri I., covered with sculpture and inscriptions, lies at Esqig in the Fayum. Stelae, inscribed with the names of the kings, occurred in pairs in the royal tombs of the Ist Dynasty at Abydos, and pairs of small obelisks are said to have been found in private tombs of the IVth Dynasty. The origin of the obelix may be sought in sacred upright stones set up in honour of gods and dead, like the mehirs, and the Semitic Massebahs and bethels.

In Abyssinia, at Axum and elsewhere, there is a marvellous series of obelisk-like monuments, probably sepulchral. They range from rude mehirs a few feet high to elaborately sculptured monoliths of 100 ft. The loftiest of those still standing at Axum is about 60 ft. high, 8 ft. 7 in. wide, and about 18 in. thick, and is terminated by a rounded apex united by a necking to the shaft. The back of the obelix is plain, but the front and sides are subdivided into stories by oblong panels, each story having half a circle sunk into it, which seem to represent windows with mullions and transom. These architectural decorations are derived from a style of building found by the recent German expedition extant in an ancient church; courses of stone here alternate in the walls (both inside and out) with beams of wood held by circular clamps. In front of the best-preserved obelix is a raised altar with holes sunk in it apparently to receive the blood of the sacrifice to the ancestors. Most of these must date before the adoption of Christianity as the state religion in the 6th century.


OBERAMMERGAU, a village of Bavaria, Germany, district of Upper Bavaria, situated amongst the foot-hills of the Alps in the valley of the Ammer, 64 m. S.S.W. of Munich. Pop. about 1,000. It is remarkable for its gaily painted houses, alpine toys, and carving crucifixes, rosaries and images of saints.

The place is famous for their representation of a Passion Play every tenth year (e.g. in 1910), to which thousands of visitors flock. This dramatic representation of the sufferings of Christ is not a survival of a medieval mystery or miracle-play, but took its rise from a vow made by the inhabitants in 1633, with the hope of staying a plague then raging. The original text and arrangements were probably made by the monks of Ettal, a monastery a little higher up the valley; but they were carelessly remodelled by the parish priest at the beginning of the present century, when the Oberammergau play obtained exemption from the general suppression of such performances by the Bavarian government. The music was composed by Rochus Dedler, schoolmaster of the parish in 1814. The performances take place on the Sundays of summer, in a large open-air theatre holding 6000 persons, and each lasts about nine hours, with a short intermission at noon. Each scene from the history of Christ is prefaced by a tableau of typical import from the Old Testament. About 700 actors are required, all belonging to the village. The process of the performances are devoted to the good of the community, after defrayal of the costs and payment of a small remuneration to the actors. The villagers regard the Passion Play as a solemn act of religious worship, and the performances are characterized by the greatest reverence.

The principal parts are usually hereditary in certain families, and are assigned with regard to moral character as well as dramatic ability. It is considered a disgrace not to be allowed to take part in the play, and the part of Christ is looked upon as one of the greatest honours.

Edward Devrient (in 1856) was among the first to direct general attention to Oberammergau; and numerous accounts have since appeared. An English version of the text of the Passion Play has been published (1861). (B. H. 1868.)

OBERHAUSEN, a town in Germany, in the Prussian Rhine province. It is situated 5 m. from the east bank of the Rhine, 20 m. N.E. of Düsseldorf, on the main line of railway to Hanover and Berlin, and at the centre of an important network of lines radiating hence into the extensive Westphalian coal and iron fields. Pop. (1905) 52,006. The town possesses large ironworks, coal-mines, rolling-mills, zinc smelting-works, railway workshops and manufactures of wire-rope, glass, chemicals, porcelain and soap. The first houses of Oberhausen were built in 1845, and it received its municipal charter in 1874.

OBERLÄNDER, a town of Germany, in the Prussian province of Hesse-Nassau, on the right bank of the Rhine, at the confluence of the Lahn 4 m. above Coblenz, on the railway from Cologne to Frankfort-on-Main. Pop. (1905) 8472. It still retains parts of its ancient walls and towers, and possesses a castle, the Schloss Martinsburg, formerly the residence of the electors of Mainz, and the chapel, Marien Kapelle, in which the German king Wenceslaus was deposed by the electors in 1400. Near the town is the castle of Lahneck, built about 1290, destroyed by the French in 1689, and restored in 1834. In the neighbourhood are lead and silver mines. See J. Wegeler, Lahnw. und Oberlånderstein (Trier, 1881).

OBERLÄNDER, ADAM ADOLF (1845— ), German caricaturist, was born at Ratisbon, but after 1847 lived in Munich. He studied painting at the Munich Academy under Piloty, and soon discovered that the true expression of his genius was in the field of caricature and comic drawings. He joined the staff of the Fliegende Blätter, to which he became a constant contributor. Unlike Busch, whose aim was the utmost simplicity of line and whose drawings form a running commentary to the legend, Oberländer's work is essentially pictorial, and expressive in itself, without the extraneous aid of the written line. Among his best drawings are his parodies on the style of well-known painters, such as the "Variations on the Kissing Theme." His works have been collected in the Oberländer-Album, published by Braun and Schneider in Munich.

OBERLIN, JEAN FRÉDÉRIC (1740-1826), German Protestant pastor and philanthropist, the son of a teacher, was born on the 31st of August 1740 at Strassburg, where he studied theology. In 1766 he became Protestant pastor of Waldbach, a remote and even regional town (B. 1782, 206), a task he held on the Vosges on the borders of Alsace and Lorraine. He set himself to better the material equally with the spiritual condition of the inhabitants. He began by constructing roads through the valley and erecting bridges, inviting the prosperity to the enterprise by his personal example. He introduced an improved system of agriculture. Substantial cottages were erected, and various industrial arts were introduced. He founded an itinerant library, originated infant schools, and established an ordinary school at each of the five villages in the parish. In the work of education he received great assistance from the founder of the Oberlin Institute, Ezra影视 (1745-1835). He died on the 1st of June 1826, and was interred with great manifestations of honour and affection at the village of Urbach.

Among the many accounts of the labours of Oberlin, mention may be made of Thomas Sims, Brief Memorials of Oberlin (London, 1830); Memoirs of Oberlin, by the Notice of Louis Schepper (London, 1838, 2nd ed. 1852); H. Ware, Biography of Oberlin (Boston, 1845); L. Spach, Oberlin le Pasteur (Strassburg, 1865, 2nd ed. 1868); F. W. Bodemann, J. F. Oberlin (3rd ed., 1879); K. F. Riff, Drei Briefe und einem dem Leben von Pastor Oberlin (Strassburg, 1840); Josephine Butler, Life of J. F. Oberlin (1882); G. H. von Schubert, Züge aus dem Leben Oberlins (11th ed., 1890); Armin Stein, Johann Friedrich Oberlin, ein Lebensbild (1891). See also the article on Hermann Hauck, Restauraevölubidei. The collected writings of Oberlin were published by Burkhardt at Stuttgart in 1843 in 4 vols.
OBERLIN, J. J.—OBIT

OBERLIN, JÉRÔME JACQUES (1735-1806), Alsatian philologist and archaeologist, brother of Jean Frédéric Oberlin, was born at Strasbourg on the 8th of August 1735. While studying theology at the university he devoted special attention to Biblical archaeology. In 1755 he was chosen professor at the gymnasium of his native town, in 1763 librarian to the university, in 1770 professor of rhetoric, and in 1782 of logic and metaphysics. Oberlin published several manuals on archaeology and ancient geography, and made frequent excursions into different provinces of France to investigate antiquarian remains and study provincial dialects, the result appearing in Essai sur le patois Lorrain (1753); Discours sur les Minnesinger (1782-1790); and Observations concernant le patois et les mœurs des gens de la campagne (1791). He also published several editions of Latin authors. He died on the 10th of October 1806.

OBERLIN, a village of Lorraine county, Ohio, U.S.A., 34 m. W.S.W. of Cleveland. Pop. (1890) 4376; (1900) 4082 (614 negroes); (1910) 4365. It is served by the Lake Shore & Michigan Southern railway, and by the Cleveland & South-Western (electric) railway, which furnishes connections directly with Cleveland and Elyria, and at the village of Wellington (about 17 m. S.) with the Cleveland and Cincinnati, St Louis, and the Wheeling & Lake Erie railways. Oberlin is primarily an educational centre, the seat of Oberlin College, named in honour of Jean Frédéric Oberlin, and open to both sexes; it embraces a college of arts and sciences, an academy, a Theological Seminary (Congregational), which has a Slavic department for the training of clergy for Slavic immigrants, and a conservatory of music. In 1906 it had twenty buildings, and a Memorial Arch of Indian buff limestone, dedicated in 1903, in honour of Congregational missionaries, many of them Oberlin graduates, killed in China in 1899. Its libraries contained a 1906 98,000 bound volumes and an equal number of pamphlets, and the college had a faculty numbering 113 and a student enrolment of 1944. The resources of the college in 1909 were about $3,500,000. Under the editorship of a professor emeritus is published the Bibliotheca Sacra, a quarterly founded in 1843, and for many years the organ of the Andover Theological Seminary.

The village was founded as Oberlin College in 1833 (in 1846 it was incorporated as the village of Oberlin), by the Rev. John J. Shipherd (1803-1844), pastor of a church in Elyria, and the Rev. Philo Penfield Stewart (1798-1868), professor of missions to the Chocotaws of Mississippi, as a home for Oberlin College Institute, which was chartered in 1834; the name Oberlin College was adopted in 1850. To the Theological Seminary, opened in 1835, there came in the same year forty students from Lane Theological Seminary in Cincinnati, after the discussion of slavery there had been forbidden by its board of trustees. A former member of the board, Asa Mahan (1800-1880), who had strongly disapproved of the action of the trustees, came to Oberlin, and became the first president of the college. Oberlin was the first American college to adopt coeducation of sexes. Oberlin was a pioneer in America (1835) in the coeducation of the white and black races.1 The village became a station on the Underground Railway, and an important centre of anti-slavery sentiment. Manual labour was adopted at first as a means for students to defray their college expenses. As late as 1906 it was estimated that nearly two-thirds of the men were to a greater or less degree self-supporting, as were many of the young women. What is known as the "Oberlin Theology" (no longer identified with the college) centred in the teaching of Charles Grandison Finney (1792-1875), who became professor of theology in 1835 and was Mahan's successor in 1851-1856. He was a powerful preacher and teacher, who broke from Calvinism in denying imputation and teaching perfect freedom of the will, by which perfect holiness might be attained. Finney carried on remarkable revival services in Western New York, in Philadelphia (1828), in New York City (1829-1830 and 1832), the New York Evangelist being founded to carry on his work, in Boston (1831, 1842-1843, 1856-1857), in London (1840-1850) and throughout England and Scotland (1858).

James Harris Fairchild (1817-1902) was president from 1866 to 1889; William Gay Ballantine (b. 1843), a distinguished Hebrew scholar, was president in 1891-1896, and John Henry Barrows (1847-1902) from 1896 to 1899, when he was succeeded by John Churchill King (b. 1858).

The modern theological position of Oberlin college is reflected in the writings of President King and of Dean Edward L. Bosworth (b. 1861) of the Theological Seminary, especially in President King's Reconstruction in Theology (1901); and Theological and the Social Consciousness (1902); The Seeming Unreality of the Spiritual Life (1908) and The Synagogue and the Church.

See Finney's autobiographical Memoirs (New York, 1876); J. H. Fairchild, Oberlin, the College and the Colony (Oberlin, 1883); D. L. Fairchild, The Story of Oberlin (Boston, 1898); and A. T. Swing, Life of J. H. Fairchild (New York, 1907).

OBERON (Fr. Alberon, Auberon, Ger. Alberich, i.e. rich, Goth. reiks, "ruler"—cf. Lat. rex—and O.H. and M.H. Ger. pl. elbe, elbe, "elves," pl. alp), king of the elves. In the legendary history 2 of the Merovingian dynasty he figures as a magician, and is the brother of Merowech (Mérovide). He wins for his eldest son Walbert the hand of a princess of Constantinople. In the Nibelungenlied he guarded the treasure of the Nibelungs, but was overcome by Sigfried. In the German medieval poem Orfei, the hero is aided in his wooing by his father Alberich, the dwarf who guards the dwarf-king's domain, and who possesses a similar rôle in Huon of Bordeaux (q.v.). The fairy element in the romance provided Shakespeare with the fairy scenes of the Midsummer Night's Dream, and Wieland with the subject of his epic Oberon (1780). Ben Jonson wrote a masque of Oberon, or the Fairy Prince (Works, 1616). Weber's opera, Oberon, to the words of J. R. Planché, was first produced at Covent Garden on the 12th of April 1826. In the Wagner dramas Alberich is the Nibelung who steals the magic gold from the Rhine maidens. He is there the father of Hagen, and has in the character of guardian of the treasure should be compared Andvari, the dwarf of Scandinavian legend, who, in the shape of a pike, was seized by Loki and made to give up his treasure and the magic ring by which the dwarfs create more gold. This ring, the Andvaranaut, with the curse of Andvari upon it, caused the misfortunes of the Volsungs and the Burgundian Nibelungs, and is known in German romance as the Ring of the Nibelungs.


OBERSTEIN, a town of Germany, in the principality of Birkenfeld, belonging to the grand duchy of Oldenburg, on the River Nahe, c. S.W. of Kreuznach, by the railway to Müllersam-Stein. Pop. (1905) 6660. It is famous for the cutting and setting of agates and other precious stones, an industry which has been established here, and in the neighbouring township of Idar, since the 16th century. The Evangelical church, built in the 12th century and restored in 1482, is partly hewn out of the solid rock. On the hills above the town are the ruins of two castles.

See Hinschirch. Die Idar-Obersteiner Industrie (Oberstein, 1894).

OBIT (through O. fr., from Lat. obitus, death, obire, to go down, to die, a term for death, formerly used for the account of the reign of a Pope). The last history of Pope Hadrian (12th century) was the authority of John of Huesey (14th century) in his Annales historiae til. principis, Honononie (Mon. Germ. xxx), where there is an account (bk. ix. ch. 6) of Alberich.

1 A runaway slave. Littlejohn, taken at Oberlin in September 1858 by a United States marshall, but was rescued at Wellington. Several of the rescuers, notably Professor Henry Everard Peck of Oberlin College, were arrested and were imprisoned in Cleveland for several months. This was a famous fugitive slave case.
OBJECTIVE or OBJECT GLASS, the lens of any optical system which first receives the light from the object viewed; in a compound system the rays subsequently traverse the eye-piece. The theoretical investigations upon which the construction of an optical system having specified properties is based, are treated in the article aberration, and, from another standpoint, in the article DIFFRACTION. Here we deal with the methods by which the theoretical deductions are employed by the practical optician. It should be noted that the mathematical calculations provide data which are really only approximations, and consequently it is often found that a system constructed on such data requires modification before it fulfils the practical requirements. For example, take the case of a photographic objective. Calculations of the paths of two extreme rays in the meridional section of an oblique pencil of large aperture may prove that the rays intersect on a plane containing the axial focus, but similar calculations of many other rays would be necessary before the mean point of intersection could be settled with precision. Suppose, however, that the optician has accurately realized the results of the mathematician, he can then determine the divergence of the practical from the theoretical properties by measuring the positions and conformation of the most distinct or mean foci, and, if sufficiently acquainted with the theory of the construction, he can modify one or more curvatures or thicknesses and so attain to a closer agreement with the ideal. Theory and practice co-operate in the realization of an original system. The order is not always the same, but generally the mathematician, by the laborious calculations, supplies the data which are at first closely followed by the constructor and afterwards modified in accordance with experimental observations. In addition to the problem of constructing an original system, the optician has to deal with the reproduction of a realized system in different sizes. Two questions then arise: (1) To what degree of accuracy the radii of curvature can, or should, be repeated, and (2) to what degree of uniformity the surfaces can, or should be figured. With regard to the first point there is no great difficulty in working the requisite iron or brass tools of any curvature to within an error of \( \frac{1}{10} \)th% of the radius; male and female templates being used for very deep curves, and the spherometer for tools of longer radii (by appropriate grinding together, the radii are alterable at will within narrow, but sufficient, limits). The accuracy attained in the grinding, however, is open to very perceptible modification by the subsequent polishing and figuring processes. This is particularly undesirable in the case of deep curves and large apertures. A variation in a radius of curvature may occasion a little spherical aberration at the axial focus, but if the amount be small it may be neutralized by imparting to the lens a parabolic form approximately.

With optical systems which transmit large pencils with considerable obliquity (such as wide angle photographic objectives) the curves are very deep, and a departure from the true radius which would be tolerated in a telescope cannot be permitted here. Such lenses are usually tested by means of a master curve worked in glass. The master curve is fitted to the experimental lens, and an inspection of the interference fringes shows the quality of the fit—whether it be perfect, or too shallow or too deep. In general, workmanship here may be minimized, and the optician is led to correct the divergence. Flat surfaces are tested similarly. This test by contact has been strongly advocated and has been regarded as sufficient to detect all irregularities of any moment. This claim, however, is not justified, for the test is not sensitive to errors sufficient in amount to render a telescope objective almost valueless; but such errors are easily discernible by other optical devices. In general, accuracy in the radii of curvature is of primary importance and trueness of figuring is of secondary importance in photographic objectives, while the reverse holds with telescopic objectives; in wide angle photographic objectives, in fact, the accuracy of the radii of curvature is of the utmost importance.

Eye pieces do not require the same degree of accuracy either in the curvature or the figuring. A rough idea of the exactitude to which the figuring of the finest telescope objectives must be carried out is readily deduced. If two slips of paper, bearing printed letters \( \frac{1}{2} \) of an in. high be placed in almost exact alignment, one 31-2 in. from the eye and the other 39 in., and viewed in moderate daylight with the eye having a pupillary aperture of \( \frac{1}{4} \) of an in., one set of the letters will be legible while the other is not. In this case the difference of convergence or refracting power exercised by the eye in transferring its focus from one slip to the other is \( \frac{1}{4} \) or one quarter dioptr. If an image on the retina is \( \frac{1}{4} \) dioptr out of focus, then each point of the object is represented by a circle of the focus in \( \frac{1}{4} \) of the correct radius of curvature. If the pupil be 5 in. in diameter, the focal length of the eye being assumed to be 0-5 in. and the pupillary aperture \( \frac{1}{4} \) of an in. If the effective aperture of the eye be 1 in., then the real size of the object is \( \frac{1}{4} \) the size of the disk of confusion. With this standard, the size of the disk of confusion will be the same (viz. 0-0004 in.) if the retinal image be \( \frac{1}{4} \) dioptr out of focus. In general, for a constant size of the circle of confusion or, in other words, the same amount of visual blurring, the apertures of the pencil traversing the pupil and the focussing errors (expressed in quarter dioptries) vary inversely.

If a portion of a figured surface of a telescope objective differs in curvature from the major portion of the lens so as to form a circle of confusion on the retina of a diameter not less than \( 2'45 \)", it is clear that the lens is faulty, the image formed by the perfect portion being correct, and what is more, that formed by the imperfect portion blurred to the extent above determined, and to a greater extent if we allow for the effect of diffraction in the formation of the image. For example, a protuberance 1 in. in diameter at the centre of an objective glass of 13 in. in diameter, refracting to a separate focus would theoretically form a spurious disk of about 5 seconds diameter, which would subtend a diameter of 50 minutes at the retina under a power of 600. If the protuberance is \( 2'45" \) as the maximum diameter of a geometric circle of confusion permissible in a telescopic object glass, we proceed to determine the heights of the protuberance or depression which causes it. For the equation \( \frac{1}{4} \) th of the square of the radius of the objective (the back focal length in the case of the microscope) the linear error at the focus of the eye-piece is \( 1,1/45 \), or, expressed as a variation of \( 1/F, 1/45(f/F)^2 \), or \( (A/A')2 \). If a lens has one side plane and is worked to a mathematically sharp edge, its thickness \( t \) at the centre is (approximately) \( A'8r \), where \( A \) is the whole aperture and \( r \) the radius; and if \( g \) be the equivalent focal length and \( m \) the refractive index, we may write \( g = m(\mu - 1) \) and obtain:

\[
\text{obturator} = \frac{1}{2} (1 - \frac{1}{A})
\]
OBJECTIVISM—OBLIGATION

It is clear that for lenses in which the focal length is large compared with the aperture, the thickness is independent of the shape of the lens so long as the focal length and aperture remain constant. Consequently, any polisher may be regarded as a thin lens with unusually sharp edges accurately fitted to a perfectly regular spherical surface. Substituting for \( t \) the \( \frac{1}{F} \) of \( f \) obtained above it follows that:

\[
A^2 = \frac{t}{8(n-1) f^2}
\]

(2).

The effective aperture of the eye has been supposed to be \( \frac{1}{2} \) in.; calling this \( P \), it is then obvious that since \( F = \frac{F}{P} \) is the theoretical aperture of objective requisite to support an average pen-point. Substituting \( \frac{F}{P} \) for \( A \) in equation (2) we obtain:

\[
t^2 = \frac{P^2}{8(n-1)} \times 156
\]

(3).

This relationship gives the thickness of a meniscus protuberance fitted to an objective (assumed to have an unlimited aperture) which fills the aperture and allows the maximum permissible. If \( F = 1 \), \( t \) is equal to \( 1/2 \). If the thickness \( F \) corresponds to the aperture \( A \), and then for another \( A \) to produce the same blur we must have \( A^2 = \frac{A^2}{F^2} \), i.e., the focal length of the protuberance, and therefore the thickness \( t \) must vary as \( A \). Consider a telescope of 12 in. aperture, focal length of objective (f) = 180 in., focal length of eye-piece (f) = 36 in., and magnifying power = 1000. The theoretical requisite to transmit the pupillary pencil of \( 1 \) in. aperture is \( 4 \times 1000 = 75 \) in. If the permissible protuberance cover the entire aperture of 75 in., its thickness would be \( 1/3939.3 \) in. as above, but if we calculate the maximum permissible, the thickness would be \( 1/75 \times 13939.3 \) in. = \( 1/3939.3 \) in. of the latter protuberance is assumed to fill only \( \frac{A}{2} \) of the aperture of the objective, the required thickness is formed to 75 quarter dioptrers or \( \frac{75}{4} \). If we take the power of the eye-piece to be \( 1/3 \) in. and subtract from it 75/156, we obtain \( 1/35 \), so that \( \frac{A}{2} \) is.

Either the knife-edge test, or the more usual method of testing by examining the out-of-focus disks formed on the retina when the eye-piece is inside and outside its correct focus, would certainly show the effect of this protuberance, but it is a spot when inside focus, and a dark central patch when outside: a practised eye can detect one-half the above error, and a quarter when the power is 1200 instead of 600. It may be noticed that, unless the eye of the observer is truly at the focal plane of the telescope, it is only one quarter of that admitted in the refractor. In the case of a microscope objective of 10 in. back focal length-used with a 1 in. eye-piece, the aperture required to transmit the pupillary pencil of 1 in. aperture is \( 1/3 \) in. Moreover, the support of the protuberance or depression as \( \frac{A}{2} \) in. diameter, its thickness must be more than \( 1/3939.3 \) in. over the average level by more than the above defined amount is commonly practised, but much technical knowledge is necessary for success. It is a \( sine qua non \) that the material of the polisher should be as plastic and inelastic as is consistent with a moderate degree of hardness. The best material for large work is Stockholm pitch from which the greater part of the turpentine has been removed by evaporation, and the abrasive used is the finest brown and water. For small work certain preparations of fine sand in the form of powder, are used. Water is used as the lubricant. During delicate figuring temperature changes must be carefully avoided, otherwise burnishing or a figure for a large objective may be ruined by a polisher less than an inch in diameter worked at 200 to 300 deg. A mirror up to 5 in. in diameter in about a minute. Great care is required, for if the process be carried too far, the whole surface must be re-figured. Local retouching serves to remove those conspicuous zones of aberration to which a certain photographic lens of large relative aperture are necessarily liable. An annular channel is polished out at a mean distance equal to \( \frac{A}{2} \) of the semi-aperture from the centre of the lens, and this is carefully shaded off towards the centre and also towards the edge; this corrects the zone of rays which focus at a point short of the focus of the centre and edge rays. This correction is particularly necessary in the case of certain lenses designed for stellar photography. (H. D. T.)

OBJECTIVISM, in philosophy, a term used, in contradistinction to Subjectivism, for any theory of knowledge which to a greater or less extent attributes reality (or the source and necessary pre-requisite of knowledge) to the external world. The distinction is based upon the philosophical antithesis of the terms Object and Subject, and their respective adjectival forms: objective and subjective. In common use these terms are opposed to one another in a subjective-objective field, with "physical" and "imaginary," "practical" and "theoretical," "physical" and "psychic." A man "sees" an apparition; was there any physical manifestation, or was it merely a creation of his mind? If the latter the phenomenon is described as purely subjective. Subjectivism in its extreme form denies that mind can know more than its own states. Objects, i.e. things-in-themselves, may or may not exist: the mind knows only its own sensations, perceptions, ideal constructions and so forth. In a modified form "subjectivism" is that theory which attaches importance to the part played by the mind in the accumulation of experience. See PSYCHOLOGY; RELATIVITY OF KNOWLEDGE.

OBLATION, an offering (Late Lat. oblatio, from Offerre, oblatum, to offer), a term, particularly in ecclesiastical usage, for a solemn offering or presentation to God. It is thus applied to certain parts of the Eucharistic service in the Roman Church. There are "two oblations," the "lesser oblation," generally known as the "offertory," in which the bread and wine yet consecrated are presented, and the "greater oblation," the "oblation" proper, forming the latter part of the prayer of consecration, when "Body and Blood" are ceremonially presented. The word "oblate" is an ecclesiastical term for persons who have devoted themselves or have been dedicated as children by their parents to a monastic life. "Oblate" is more familiar in the Roman Church as the name of a religious congregation of secular priests, the Oblate Fathers of St Charles. They are placed under the absolute authority of the bishop of the diocese in which they are established and can be employed by him on duties he may think fit. This congregation was founded in 1578 under the name of Oblates of the Blessed Virgin Mary of St Charles Borromeo by (see BORROMEO, CARLO). There is a similar congregation of secular priests, the Oblates of Mary the Immaculate, founded at Marseilles in 1815.

OBLIGATION, in law, a term derived from the Roman law, in which obligation signified a tie of law (vinculum juris) whereby one person is bound to perform or forbear some act for another. The obligation of Roman law arose either from voluntary acts or from circumstances to which legal consequences were annexed. In the former case it was said to arise ex contractu, from contract, in the latter quasi ex contractu, ex delicto, or quasi ex delicto—(1) any duty imposed by law: (a) the special duty created by a vinculum juris; (3) not the duty, but the evidence of the duty—that is to say, an instrument under seal, otherwise called a bond; (4) the operative part of a bond. The third use of the word is chiefly confined to the older writers. Simplex and duplex obligation were the old names for what are now more commonly called a single and a double or conditional bond. The party bound is still called the obligor, the party in whose favour the bond is made the obligee. The
fourth, like the third, is a use scarcely found except in the older writers. The word "bond" is of course a mere translation of obligatio. Obligations may be either perfect or imperfect. A perfect obligation is one which is directly enforceable by legal proceedings; an imperfect or moral obligation (the naturalis obligatio of Roman law) is one in which the vinculum juris is in some respects incomplete, so that it cannot be directly enforced, though it is not entirely destitute of legal effect. 

A perfect obligation may become imperfect by lapse of time or other means, and, conversely, an imperfect obligation may under certain circumstances become perfect. Thus a debt may be rendered collateral by limitations and so cease to be enforceable. The obligation, however, remains, though imperfect, for if there be a subsequent acknowledgment by the debtor, the debt revives, and the imperfect obligation becomes again perfect. At one period there was some doubt among English lawyers whether a moral obligation could be regarded as sufficient consideration for a contract; it has now, however, been long decided that it cannot be so regarded.

American law is in general agreement with English, except in the case of Louisiana, where the terms obligor and obligee are used. The former is taken as the debtor and the latter as the creditor of Roman law. For art. 5522 of the Louisiana civil code obligor or debtor means the person who has engaged to perform some obligation, obligee or creditor the person in favour of whom some obligation is contracted, whether such obligation be to pay money or to do or not to do something. The term obligation is important in America from its use in art. i. s. r of the constitution of the United States, "No state...shall pass any...law...impairing the obligation of contracts." This does not affect the power of Congress to pass such a law. Contracts between private individuals are of course within the provision. So are private conveyances, charters of private corporations and statutory and other grants by a state. On the other hand, marriage and divorce, and arrangements which are political in their nature, such as charters of municipal corporations, licences to carry on particular trades or regulations of police are not within the provision. In order to fall within it, the law must act upon the terms of the agreement, and not merely upon the mode of procedure. If it act not upon the terms but upon the remedy, it impairs the obligation if it purport to be retrospective, but it is valid so far as it applies to subsequent contracts.

**OBNOXIOUS** (Lat. obnoxiosus, from ob, over, against, and nox, a word originally meaning "exposed to harm or injury," but now "exciting aversion or dislike." The current use dates from the later 17th century.

**OBOE**, or Hautboy (Fr. hautbois, Ger. Hocho, Ital. oboe), the treble member of the class of wood-wind instruments, having a conical bore and a double reed mouthpiece. The oboe consists of a conical wooden tube, composed of three joints, upper, middle and bell, and of a short metal tube to which are bound by many turns of waxed silk the two thin pieces of cane that form the mouthpiece. These pieces of cane are so bevelled and thinned at the ends which is taken into the mouth that the gentlest stream of compressed air suffices to set them vibrating. Practice has demonstrated that the reed stalk of which the double reed mouthpiece is made, should not be of narrower internal diameter than the pipe containing the column of air upon which it is destined to act. The player breathes gently into the aperture, which has the form of a very narrow ellipse, managing his breath as for singing. The vibrations of the double reed produce in the stream of compressed air issuing from the player's lips the rhythmical series of pulses necessary to generate sound waves in the stationary column of air within the main tube of the instrument.

In the upper and middle joints are the rings and keys covering lateral holes bored through the tube, by means of which the column of air, and consequently the wave length, may be shortened at will; the bell joint contains one or two keys normally open, which when closed extend the lowest register by lengthening the air column. These holes and keys produce the fundamental scale of the oboe, which possesses notes sufficient for an octave with all chromatic intervals. The next octaves are obtained by means of cross fingering (Fr. doigt fourche, Ger. Gabelgriff), and of the octave keys, which do not give out an independent note of their own, but determine a node in the column of air, whereby the latter divides and vibrates in two half sections producing the second harmonic overtone or octave. In order to obtain this result the player increases the pressure of his breath and also the tension of his lips against the reed.

The compass of the oboe is from $\text{\textit{G}}$ to $\text{\textit{F}}$, with all chromatic semitones. The G clef is used in notation and all notes are sounded as written.

The quality of tone or timbre depends primarily on the configuration of the sound waves (see Horn), which is influenced by the special characteristics of the mouth-piece: the musical tone of an instrument may be said to be due more directly to the presence or relative strength of the many harmonics which go to make up a composite tone or clang. The quality of the oboe tone resembles that of the E string of the violin, but is more nasal, more melismatic and shrillier. The lower register is thin and somewhat sweeter, approximating to the upper register of the cor anglais. But the timbre does not vary appreciably in the different registers, and to this want of variety in tone colour is due the unpopularity of the oboe as a solo instrument, although it is invaluable as a melody-leading instrument in the orchestra, balanced by clarinets and flutes.

The oboe lends itself admirably to pastoral music. The technical capabilities of the instrument are very varied. It is possible to play on it diatonic and chromatic scale and arpeggio passages, legato and staccato; leaps; cantabile passages; sustained notes, crescendo and diminuendo, grace notes and shakes (with reservations). The keys having many sharps and flats are the most difficult for the oboist.

The double reed is the most simple, as it is probably the oldest, of all reed contrivances. It is sufficient to flatten the end of a wheat straw to constitute an apparatus capable of setting in vibration by the breath conveyed. The column of air contained in the rudimentary tube; the invention of this reed is certainly due to chance. An apparatus for sonorous disturbance thus found, it was easy to improve it; for the wheat stalk a reed stalk was substituted, and in the extremity of its pipe another reed stalk much shorter in length was inserted, pared and flattened at the end; and then came the lateral holes, probably another discovery of the great inventor chance. For the reed tube a wooden one was substituted, still preserving the rudimentary tube, and in this form, after having played an important part amongst the sonorous contrivances of antiquity, that we find the ancestor of the oboe playing a part no less important in the 16th century, in which it formed the interesting families of the cromornes, the corhollis and the cernvels. All these families have disappeared from the instrumental combinations of Europe, but they are still to be found in Eastern wind instruments, such as the Caucausian salamart, the Chinese kwantse, and the hitshirishi of Japan.

It is impossible to say when it was that man first employed the phenomena of double reeds and conical pipes, but the knowledge of them must at least have been later than that of the cylindrical pipe, which we may regard as directly furnished by nature. That antiquity made use of them, however, has been proved by Gevaert in his admirable Histoire de la musique dans l'antiquite; but this learned author states that the double-reed pipes held an insignificant place in the instrumental music of ancient Greece and Rome, a statement which is open to challenge (see AULOS).
The first appearance of the instrument we call oboe in a musical work occurs in Sebastian Virdung’s Musikae getutscht und ausgesogen (1511). It bears the name of Schalmei, and is associated with an instrument of similar construction called Bombarde.

There exists, however, much earlier evidence, in the illuminated MS BNF, 7999, in the Library of the Escorial. The oboe was known during the early middle ages as Calamus, Chalumeau (France), Schalmei (Germany), Sazum (England). It is mentioned in the Roman de Brut (12th century) (line 16,922 seq.) “Lyre of Calamus, which produces such a sweet and pleasant sound of this kind, but a special cornemuse, used in the 17th century in concert with the hautbois de Poitou, had double reeds throughout in chalumeau and drone. The hautbois de Poitou was a primitive oboe, formed in a bulb, forming a transverse reed slit at the top through which the performer breathed in compressed air; as the reed could not be controlled by the lips, it was impossible to play with expression on the hautbois de Poitou or to obtain the harmonic octaves; the compass was therefore limited. The kind of bagpipe (g.z.) known as Musette, inflatated by bellows, also had double reeds throughout in spite of having a cylindrical chanter.

The manufacture of musical instruments could not remain unaffected by the great artistic movements known as the Renaissance; accordingly, we find them not only improved and purified in form in the 16th century, but also ranged in complete families from the soprano to the bass. Praetorius, in his Syntagma Musicum (1615-1620), gives us the full nomenclature of the family with which we are concerned, composed of the following individuals: (1) The little Schalmei, rarely employed, measured about 17 in. in length, and had six lateral holes. Its deepest note was C2. (2) The descant Schalmei (fig. 2), the primitive type of the modern oboe; its length was about 26 in., and its deepest note C3. (3) The alto Pommer (fig. 3), 30 in. long, with its deepest note C4. (4) The tenor Pommer (fig. 4), measuring about 4 ft. 4 in.; besides the six lateral holes of the preceding numbers there were four keys which produced the notes G4 to F4. (5) The bass Pommer, having a length of nearly 6 ft.; it had six lateral holes and four keys which produced C5 to A5. (6) The great double quint Pommer, measuring about 8 ft. 8 in. in length; its four keys permitted the production of the notes C6 to B6. These instruments, and especially numbers (2), (3), (4) and (5), occupied an important place on the continent of Europe in the instrumental combination of the 16th-17th centuries. Fig. 5, borrowed from a picture painted in 1616 by Van Alsloot, represents six musicians playing the following instruments indicated in the order of their appearance in the picture from left to right: a bass ob, bent over and become the bassoon, an alto Pommer, a cornet (German “zink”), a descant Schalmei, a second alto Pommer and a trombone.

The 17th century saw no great changes in the construction of the four smaller instruments of the family. Michel de la Barre writing in 1740 states that in the archives of the Chambre des Comptes are 4 charges for hautbois and musette de Poitou created by King John (14th century). Extensively used in France, there were there called hautbois or beri Hautbois, to distinguish them from the two larger instruments which were designated by the words “gros bois.” Hautbois became hautbois in French, and oboe in English, German and Italian; and the term is now used to distinguish the smallest instrument of the family.

During the 17th century some of the most important names connected with instrumental music in France are to be found amongst the Grandes Hautbois of the Grande Ecurie du Roi, such as Hotterelle (Jean, Louis, and Nicholas), Philidor (Jacques and André), Gilles Allain, Destouches, &c. In Germany the Schalmei was represented in the orchestra, as a solo instrument, as a chamber, as a band instrument, and in the Court and the Church orchestras, and later in that of the Opera. In 1680 it is recorded that the Grand Orchestre de la Chambre of Brandenburg included Schalmei and Bombarts. In the Orchestre of the Elector of Brandenburg in 1680 included Schalmei and Bombarts. In the Orchestra of the Elector of Brandenburg in 1680 included Schalmei and Bombarts.

The Paris Opera (1689) was the first Opera in Germany, at Dresden, used two fifis or early oboes in 1629 in one of his works.

The little Schalmei and the tenor Pommer seem to have disappeared amongst the Grandes Hautbois, though the descant Schalmei and the alto Pommer which by improvement have become two important members of the modern orchestra. The oboe, such as, was employed for the first time in 1671 in the orchestra of the Paris opera in Pomone by Cambert. The first two keys of the oboe date from the end of the 17th century. It is not known who added the first keys to the oboe; there is, however, a drawing of a French Hoboy in an English MS by the third Randle Holme, which formed part of his Academy of Armoury known to have been written before 1688, in which the two keys are shown. The instrument must have been well known in England at the time, and Randle Holme’s rough little drawing fixes the date of the transformation approximately as not later than 1680, probably earlier, since the oboe was used in Pomone in 1671. According to the flautist Quantz the transformation of Schalmei into oboe took place when the keys for C sharp and D sharp were added, at about the same time as they were added to the flute.

In 1737 Gerhard Hoffmann of Rastenberg added the keys G3 to F3.

A Parisian maker, Deluse, furnished at the end of the 17th century.

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1 See Gaz. Archiol. (Paris, 1886), xi, pp. 70 et seq. Pl. X.; also 1885, pp. 288-296.
2 A facsimile in colours of part of the Cantigas containing figures of 52 instrumentalists has been published by the Real Academia Española (Madrid, 1889), and can be seen in that Museum. A reproduction in black and white is included in Juan F. Riaño’s Critical and Bibliographical Notes on Early Spanish Music (Quaritch, 1886).
3 The miniature is reproduced in Naumann’s History of Music, i. p. 249, fig. 151.
5 See Mattheson, Opern, i. p. 268 and Eisen, Musikalisch-ästhetische Betrachtungen, p. 96.


the 18th century much-appreciated improvements in the boring of the instrument. The Méthode de Selanner, published at Vienna in 1825, shows nine keys, and one, the octave key, which, when opened, establishes a loop or ventral segment of vibration in the column of air, facilitating the production of sounds in the octave higher. Mendelssohn of Paris owes his great reputation to the numerous improvements he introduced in the construction of the oboe.

The alto Pommer was but slowly transformed: it was called in French "hautbois de chasse," in Italian "obo di caccia." In the 18th century we find it more elegant in form, but with all the defects of the primitive instrument. The idea of bending the instrument into a half circular form to facilitate the handling is usually attributed to an oboe of Bergamo, one Jean Ferlendis, who was established at Salzburg at about 1760. This is obviously incorrect, since Ferlendis would then have been five years old. It has been suggested that the fact of the instrument's resembling a kind of hunting horn used at that time in England probably for it the name of "coro inglesi," which it still retains in French "cor anglais." The first employment of it in the orchestra is referred to Gluck, who had two "cors anglais" in his Alcesta, as played at Vienna in 1767. But it was not until 1808 that the cor anglais was first heard in the Paris opera; it was played by the obbligato Vogt in Alexandre les Apollos by Catel. The improvements in manufacture of this instrument closely followed those introduced in the oboe. The 18th century produced an intermediate oboe between (2) and (3), which was called hautbois d'amour, and was frequently employed by J. S. Bach. It was a third lower than the ordinary oboe, and was characterized by the pear-shaped bell with narrow aperture common to all wind instruments known as d'amour to which is due their veiled sweet quality. In the Spanish Cantigas there are two Schlalmeny with pear-shaped bells. This is in all probability the doucaine mentioned in the 13th and 14th-century romances. The oboe d'amore fell into disuse after the death of the great German composer. It has been resuscitated by the firm of C. Mahillon of Brussels, and reconstructed with the improvements of modern manufacture. A similar timbre was artificially produced in the oboe by means of mutes or sordini composed of hollow cones of wood, balls of paper, and pieces of sponge.

After the 16th century we find the instruments which were designated by the name of "gros bois," the (5) and (6) of Praetorius, transformed into shorter instruments, the Fagott and Contrafagott, having a column of air of the same length and form as the Pommers, but the instrument itself consisted of two conical tubes communicating at the lower part of the instrument; they were pierced in a single piece of wood. It is probably owing to the aspect of this double pipe that the satirical name of fagot was given, preserved in Italian as fagotto, and in German as Fagott. A canon of Ferrara named Afranio has been named as the author of the transformation, about 1539, of the bass Pommer, but Count Valdrighi, the curator of the Estense library, and Wasielwski, who has reproduced the drawing of Afranio's invention, deprive him of the merit of the innovation. The fagottino was transformed in the same fashion.

If in the 16th century of Nuremberg acquired a great reputation in the 16th century for making the "basson," a French word substituted for the old fagot, and adopted in England as bassoon. His instrument had only two keys. We cannot tell when the bassoon gained its present form, but it was probably at the end of the 17th century. It was used in the orchestra in 1764 by H. Schütz in 1619 (cf.), and in 1625, 5 fagotti were in use.

Cesti, in his grand opera il Pomo d'Oro, which was performed with the utmost brilliancy at the court of the emperor Leopold in Vienna, 1661, and printed editions of 1667 and 1668 are preserved, used fagotti combined with two cornets, three trombones and a regal to suggest the terrors of Hades.

Michael Praetorius (1618) expressly mentions the fagotto as an orchestral instrument.

In France it was used with the oboe in 1671 in Cambert's Pomone in the newly founded French Opera, for which Cambert & Perrin had received in a Royal Privilege expiring in 1672, and thereafter granted to Lully.

It had three keys then. The B flat key rendering a lengthening of the instrument necessary, we may suppose it took its modern form at that epoch. The fourth key is found in a bassoon stamped Stanesby Junior, London, 1747, and also in one without maker's name, obviously earlier, to judge by the very early pattern of the keys. The bassoon appears with four keys in the Encyclopédie of Diderot and d'Alembert (Paris, 1751-1765). The number of keys increased by the beginning of the present century to eight, viz.: and two keys to facilitate the production of acute harmonics. It was improved by Almenrider, and reproduced in 1810 by Triebert and Goumas, Paris, and C. Mahillon, Brussels. (See also Bassoon.)

The reform in the construction of the flute due to Theobald Boehm of Munich about 1840, a reform which principally consisted in the rational division of the tube by the position of the lateral holes, prompted Triebert to try to adapt the innovation to the oboes and bassoons; but he failed, because the application of the system denaturalized the timbre of the instruments, which it was necessary, before all things, to preserve, but further improvements made upon the same lines by Barret and later by Rudall Carter, have transformed the oboe into the most delicate and perfect of reed instruments. In 1856 a French bandmaster, M. Sarrus, thought out the construction of a family of brass instruments with conical tubes pierced at regular distances, which, by diminishing the length of the air column has rendered series of fundamental sounds easier, more equal and free in timbre than that of the oboe family. Gautrot of Paris realized the inventor's idea, and, under the name of "arrusphones," has created a complete family, from the soprano in C to the contrabass in B flat, of which his firm preserves the monopoly.

In order to replace the old double-bassoon of wood, the firm of C. Mahillon, Brussels, produced in 1868, a reed contrabass of metal, since much used in orchestras and military bands. The first idea of this instrument goes back to 1839, and is attributed to Schollnast & Son of Pressburg. It is a conical brass tube of very large proportions, with lateral holes placed as theory demands, in geometrical relation, with a diameter almost equal to the section of the tube at the point where the hole is cut. From this it results that for each sound one key only is required, and the seventeen keys are the player almost the facility of a keyboard. The compass written for this contrabass is comprised between and but sounds an octave lower. See Contrafagottto.
OBOK—OBSERVATORY

OBOK, a seaport on the north shore of the Gulf of Tafjura, N.E. Africa, acquired by France in 1862. It gave its name to the colony of Obok, now merged in the French Somali coast protectorate (see SOMALILAND: French). The port is separated from the open sea by coral reefs, but is only partially sheltered from the winds. This led to the practical abandonment of the town by the French, who in 1896 transferred to Jibuti, on the opposite shore of the Gulf of Tafjura, the seat of government of the colony. Obok is connected with Jibuti by submarine cables. Population about 500.

OBRA, a river of Germany, in the Prussian province of Posen, a left-bank tributary of the Warthe. It rises near Obra, N.W. from Koschin, and forms in its course marshes, lakes and the so-called Great Obraubruch (ten). The latter, 50 m. long and about 5 m. broad, is a deep depression in the undulating country of south-west Posen. The river is here dammed in and canalized and affords excellent water transit for the agricultural produce of the district.

O'BRIEN, WILLIAM SMITH (1803-1864), Irish revolutionary politician, son of Sir Edward O'Brien, a descendant of Brian Boroeimhe (d. 1014), king of Ireland (see CLARE), was born in Co. Clare on the 17th of October 1803, and received his education at Harrow and at Cambridge. He took the additional name of Smith on inheriting his maternal grandfather's estates in Limerick. He entered parliament in 1828 as member for Ennis, and from 1835 to 1848 represented the county of Limerick. Although he spoke in 1828 in favour of Cathoic emancipation, he for many years continued to differ on other points from the general policy of the Irish Church. In 1841 he opposed the Irish Arms Act of 1843, and became an active member of the Repeal Association. Though he was destitute of oratorical gifts, his arrangement of the English government of Ireland secured him enthusiastic attachment as a popular leader. In July 1846 the "Young Ireland" party, with Smith O'Brien and Gavan Duffy at their head, left the Repeal Association, and in the beginning of 1847 established the Irish Confederation. In May 1848 he was tried at Dublin for sedition, but the jury disagreed. In the following July he established a war directory, and attempted to make a rising among the pressantry of Ballingarry, but although he was at first joined by a large following the movement wanted cohesion, and the vacillating crowd dispersed as soon as news reached them of the approach of the dragoons. O'Brien was arrested at Thurles, tried and sentenced to death. The sentence was, however, commuted to transportation to Tasmania for life. In February 1854 he received his liberty on condition of never revisiting the United Kingdom; and in May 1856 he obtained a full pardon, and returned to Ireland. In 1856 he published Principles of Government, or Meditations in Exile. He died at Bangor, north Wales, on the 18th of June, 1864. His two earlier works, which were The life of Lord Lucius, became 13th Baron Inchinquin in 1855, as heir male to the 3rd marquis of Thomond, at whose death in 1853 the marquisate of Thomond and the earldom of Inchinquin became extinct. (See INCHINQUIN, 1ST EARL OF.)

OBSCENITY (from the adjective "obscene," Lat. obscenus, evil-looking, filthy). By English law it is an indictable misdemeanour to show an obscene exhibition or to publish any obscene matter, whether it be in writing or by pictures, effigy or otherwise. The precise meaning of "obscene" is, however, decidedly ambiguous. It has been defined as "something offensive to modesty or decency, or expressing or suggesting unchaste or lustful uses or being impure, indecent or lewd." But the test of criminality as accepted in England and Canada is whether the exhibition or matter complained of tends to deprave and corrupt those whose minds are open to immoral influences and who are likely to visit the exhibition, or to see the matter published. If the exhibition or publication is calculated to have this effect, the motive of the publisher or exhibitor is immaterial. Even in the case of judicial proceedings, newspapers are not privileged to publish evidence which falls within the definition. In dealing with writings alleged to be obscene, the court and jury have to consider the effect of the whole work and not merely the particular extract challenged as improper; and in practice it is difficult to induce juries to convict the publishers of well-known and old-established works of real literary quality on the ground that they contain passages offensive to modern notions of propriety. In the case of exhibitions of sculpture and pictures some difficulty is found in drawing the line between representations of the nude and works which fall within the definition of "obscene." In such cases a distinction is drawn in a somewhat acute form before the London County Council in 1907 by theatrical representations of "living statuary."

Besides the remedy by indictment there are statutory provisions for punishing as vagabonds persons who expose to public view in public streets or adjacent premises obscene prints, pictures or other indecent exhibitions. These are supplemented by similar provisions, applicable to the metropolis and to county towns, and (by a statute of 1880) for suppressing certain kinds of indecent advertisements. By an act of 1857owers are given for searching premises on which obscene books, &c., are kept for sale, distribution, &c., and for their destruction, and the post office authorities have power to seize postal packets containing such matter and to prosecute the sender. In 1906 the London publisher of a weekly comic paper was punished for inserting advertisements inviting readers to acquire by post from abroad matter of this kind.

The use of obscene or indecent language in public places is punishable as a misdemeanour at common law, but it is usually dealt with summarily, under the Metropolitan Police Act 1839, or the Town Police Clauses Act 1847, or under local by-laws.

The two Passengers. In British law an obscene publication, exhibitions, &c., are punished under articles 292, 293 and 294 of the Penal Code. Special exception is made for representations in temples or cars used for conveyance of idols or kept or used for religious purposes. In those British possessions whose law is based on the common law the offences above dealt with are offences at common law or under colonial statutes embodying the common law, e.g. Queensland Code, 1859, ss. 172, 227, 228, 374 (3); Western Australian Code, 1901, ss. 203, 204, 352 (3); Canadian Criminal Code, r. 179. In New South Wales and Western Australia, by acts of 1901 and 1902, provisions have been made for dealing summarily with indecent and obscene publications based to some extent on the English legislation of 1880 against indecent advertisements. In the Colonial acts no penalty is incurred if the defence can prove that the incriminated publication was for a work of recognized literary merit, or that Aristophanes or Boccaccio's Decameron, is a bonâ-fide medical work circulated in the manner permitted by the statutes.

United States.—Under the Federal law (Revised Statutes, s. 3654) offenders are liable to a fine of not more than $5,000 and to imprisonment not exceeding 3 years. The law also applies to U.S. mails; see U.S. v. Wales (1892), 51 Fed. Rep. 41. (W. F. C.)

OBSEQUENS, JULIUS, a Latin writer of uncertain date, generally placed about the middle of the 4th century A.D. He is the author of a small extant work De prodigii, taken from an epitome of Livy, and giving an account of the prodigies and portents that occurred in Rome between 249-12 B.C.

The edicta princeps was published by Aldus (1508); later editions by F. Oudendorp (1720) and O. Jahn (1853, with the periodica of Livy).

OBSEQUIES (Med. Lat. obsequiae, formed after class. Lat. esequiae), a term for funeral rites and ceremonies, especially such as are carried out with great ceremony. The Lat. obsequium (from obsequi, to follow close after) produced the obsolete English "obsequy," in the sense of ready compliant service, especially of an inferior to a superior, still found in the adjective "obsequious."

OBSEQUIARY. Up to a comparatively recent date an "obsequary" was a place exclusively devoted to the taking of astronomical observations, although frequently a rough account of the weather was kept. When the progress of terrestrial magnetism and meteorology began to make regular observations necessary, the duty of taking these was often thrown on astronomical observatories, although in some cases separate institutions were created for the purpose. In this article the astronomical observatories will be chiefly considered.

Up to about 300 B.C. it can scarcely be said that an observatory existed anywhere, as the crude observations of the heavens then taken were only made by individuals and at intervals, employing the simplest possible apparatus. Thus, according to Strabo.
OBSERVATORY

Eudoxus had an observatory at Cnidus. But, when philosophical speculation had exhausted its resources, and an accumulation of facts was found to be necessary before the knowledge of the construction of the universe could advance farther, the first observatory was founded at Alexandria, and continued in activity for about four hundred years, or until the middle or end of the 2nd century of the Christian era. Hipparchus of Rhodes, the founder of modern astronomy, by repeating observations made at Alexandria, discovered the precession of the equinoxes, and investigated with considerable success the motions of the sun, moon and planets. His work was continued by more or less distinguished astronomers, until Ptolemy (in the 2nd century A.D.) gave the astronomy of Alexandria its final development. When science again began to be cultivated after the dark ages which followed, we find several observatories founded by Arabian princes; first one at Damascus, next one at Bagdad built by the caliph Al-Mamun early in the 9th century, then one on the Mohkattam near Cairo, built for Ibn Yunis by the caliph Hakim (about 1000 A.D.), where the Ikhimate tables of the sun, moon and planets were constructed. The Mongol khans followed the example; thus arose the splendid observatory at Maragha in the north-west of Persia, founded about A.D. 1260 by Hulagu Khan, where Nasir Uddin constructed the Ikhhanic tables; and in the 15th century the observatory at Samarkand was founded by Ulugh Beg, and served not only in the construction of new planetary tables but also in the formation of a new catalogue of stars.

With the commencement of scientific studies in Europe in the 15th century the necessity of astronomical observations became at once felt, as they afforded the only hope of improving the theory of the motions of the celestial bodies. Although astronomy was taught in all universities, the taking of observations was for two hundred years left to private individuals. The first observatory in Europe was erected at Nuremberg in 1472 by a wealthy citizen, Bernhard Walther, who for some years enjoyed the co-operation of the celebrated astronomer Regiomontanus. At this observatory, where the work was continued till the founder's death in 1504, many new methods of observing were invented, so that the revival of practical astronomy might be dated from its foundation. The two celebrated observatories of the 16th century, Tycho Brahe's on the Danish island of Hven (in activity from 1576 to 1597) and that of Landgrave William IV. at Cassel (1561–1597), made a complete revolution in the art of observing. Tycho Brahe may claim the honour of having been the first to see the necessity of carrying on for a number of years an extensive and carefully-planned series of observations with various instruments, worked by himself and a staff of assistants. In this respect his observatory (Uraniborg) at Cassel formed the model of the modern observatories. Although the work of Tycho Brahe, who died in 1601, was never completed, yet the intellectual work of many assistants under the general superintendence of a director. This applies principally to the great observatories, where the sun, moon, planets and a limited number of fixed stars are without interruption being observed, but even among these institutions hardly two can be conducted on the same principles. Thus in Greenwich the instruments and observations are all treated according to strict rules laid down by the astronomer-royal, while in Washington or Pulkowa each astronomer has to a certain extent his choice as to the treatment of the instrument and arrangement of the observations. The same is the case with the smaller institutions, in most of which these arrangements vary very much with change of personnel.

The way in which the results of observations are published depends principally on the size of the institutions. The larger observatories issue their "annals" or "observations" as separate periodically-published volumes, while the smaller ones chiefly depend on scientific journals to lay their results before the public, naturally less fully as to details.

Subjoined is a catalogue of public and private observatories still in activity in 1910 or in existence within the past hundred years. (*" = 1" of long)
reflector; refr, refractor; s.g., silvered glass; vis., visual; univ., university.
Where the names of two manufacturing firms are given, the first is responsible for the optical, the second for the mechanical part of the instrument.

GREAT BRITAIN AND IRELAND
A. Public Observatories.

Greenwich, royal obs., lat. +51° 28′ 38″. Founded in 1675 for the propagation of navigation and by deputation of the Savilian professorship and theinstead of the Greenwich - observatory was discontinued, in 1848; the last person in charge was W. Professor s. In 1873 the instruments were removed to Blackford Hill, and in 1875 they were also the 2-ft. refl. The old obs. on Calton Hill now belongs to the city and is used for instruction; a 21-in. refl. by Wragge has been erected.

Oxford, univ. obs., lat. +55° 52′ 42″ s. l. c. 17 m. 10″ s. 6 W. Organized in 1850 by subscription, aided by subsidies from the univ. and the state. Meridian circle by Ertel of 6-in. ap.; 9-in. refl. by Grubb. The observatory is now electrically controlled; the buildings are erected on Blackford Hill 1892-1893 for the instruments presented by Lord Crawford; 15-in. refl. by Grubb, transit circle by Sims of 8-in. ap., 2-ft. s.g. refl. by Cooke; and a 26-in. s.g. refl. with spectrophotometer. Two catalogues of stars were published by the late director, Lord John George Beresford in 1827, when a mural circle and a Transit by Jones were provided, with which meridian obs. were then made in 1827, published in 1899, 10-in. s.g. refl. by Grubb (1850) used for micrometer work.

B. Principal Private Observatories in 1908.

Mr. W. Coleman's obs., Buckland, Dover, lat. +51° 8′ 12″, long. o. h. m. 11 s. 1 W. Cooke 8-in. refl. used for obs. of double stars.

Mr. J. Franklin–Adams's obs., Mervel Hill, Hambledon, Surrey, lat. +51° 5′ 26″, long. o. h. m. 30″ 2 s. W. Erected 1902; twin equatorially mounted Cooke 7-foot s.g. refl. of 6-in. ap., and 6-in. lens, used for photo. survey of the heavens with special reference to the Milky Way. The former instrument was used at the Cape in 1894.

R. E. Espin's obs., Tow Law, Darlington, lat. +54° 43′ 30″, long. o. h. m. 7 s. 14″ 2 s. W. 17-in. refl. by Calver, used since 1888 for spectroscopy and obs. of double stars.

Mr. H. M. Ellis's obs., Keswick, lat. +52° 30′ 28″ s. W. long. o. h. m. 40″ 4 W. 6-in. refl. by Cooke (1886). Also at Outwood, Surrey, lat. +51° 11′ 38″, long. o. h. m. 23″ 7 W. 8-in. refl. by Cooke; both used for obs. of double stars.

Sir Wilfred Peck's obs., Dunsford, near Lyne Regis, lat. +56° 42′ 38″, long. o. h. m. 11 s. 59″ 0 W. Erected by the late Sir Cuthbert Peck in 1885; 6-in. refl. by Merz used for obs. of variable stars.

Mr. James's obs., Calver, near Prime, lat. +54° 54′ 37″, long. o. h. m. 11 s. 49″ 9 W. In 1839 the early made and mounted a refl. of 3-ft. ap. (remounted as equat. in 1876), and in 1845 he completed the celebated refl. of 6-ft. ap. and 34-ft. focal length. This instrument, the last one of the 19th century, was removed by obs. of nebulae, and revealed many new features in these bodies; results published in the Phil. Trans. and collected systematically in the Trans. Roy. Dubl. Soc. (1879-80). Experiments were made by the present earl to determine the amount of heat radiat-ed from the moon.

Rugby School (Temple Obs.), lat. +42° 22′ 7″, long. o. h. m. 5 s. W. Founded in 1872; 9-in. refl. by Clark, used for obs. of double stars and of stellar spectra.

Stonyhurst College obs., Lancashire, lat. +53° 50′ 40″, long. o. h. m. 9 s. 52″ 7 W. An 8-in. refl. by Troughton and Sims, mounted in 1862, used for obs. of spectral lines. The late Professor Drury erected a memorial refl. by Grubb mounted in 1893, used chiefly for solar work.

C. Private Observatories now discontinued.

Mr. G. Garland's obs., Leyton, Essex, lat. +57° 34′ 34″, long. o. h. m. 5 s. 9 W. Activity from 1862 till 1886, 10-in. refl. by Cooke; chiefly devoted to double stars.

Mr. G. Barbey's obs., South Villa, Regent's Park, London, lat. +51° 31′ 29″ 9″, long. o. h. m. 37″ 5 W. In activity from 1836 to 1871, then in 1871 was removed to Twickenham, and disinvested in 1874; had a 7-in. refl. by Dollond, with which Mr. J. R. Hind discovered ten minor planets and several comets, and constructed maps of stars near the ecliptic.

Carrington's obs., Redhill, lat. +51° 14′ 25″ 3″, long. o. h. m. 41″ 3 W. Established in 1854; had a 41-in. refl. and transit circle of 5-in. ap. (now at Radcliffe Obs.). With the later a catalogue of the positions of 7375 stars within of the pole, with the former a regular obs. of sun-spots, were made from 1853 to 1861.

OBSERVATORY 955
Dr Isaac Roberts’s obs., Crowborough, Sussex, lat. +5° 37’ 7”, long. o. h. o. m. 37° 2. E. 20-in. s.g. refr. by Grubb (with 7-in. refr.) used for phot. of nebulae and clusters 1890-1904.

Captain W. H. Smyth’s obs., Bedford, lat. +5° 8’ 27” 6”, long. o. h. o. m. 55° 8’ 27” S. 2-in. s. g. refr. by Blakiston, and 6-in. ref. by W. W. Gordon used to discover a 6-in. ref. by Tulley, and observed the double stars and nebulae contained in his “Bedford Catalogue” (1844).

Sir James South’s obs., from 1816 to 1824 at Blackman Street, Sligo, Ireland. lat. +5° 37’ 3”, long. o. h. o. m. 11° 9’ W., and procured a 12-in. g. ap. from Cauchoix. As Troughton, however, failed to make a satisfactory mounting, the glass was never used till it had been presented to Dublin obs. in 1862.

Sir William Huggett’s obs. at Mill Park, Ipwich, lat. +5° 0’ 33”, long. o. h. m. 55° 8’ 27” S. 10-in. ref. by Merz, used for obs. of comets from 1874 to 1889.

Mr. E. Wilson’s (d. 1908), obs., Daramona, Streetw. Co. Westmeath, Ireland, lat. +5° 41’ 12”, long. o. h. 29° 59’ 58” S. 2-ft. ref. by Grubb, and other instruments for phot. and solar work.

Lord Wrottesley’s obs., from 1829 to 1841 at Blackheath, lat. +5° 8’ 49”, long. o. h. o. m. 2° 7’ E., where a catalogue of the ascensions of 1318 stars was formed from obs. with a transit instrument by Jones. In 1842 a new obs. was built at Wrottesley Hall, lat. +5° 37’ 2-3”, long. o. h. 8° 53-6’ W., where the transit and a 6-in. s. g. ap. by Dooland were mounted. Obs. were here devoted for 50 stars.

FRANCE

Paris, national obs., lat. +48° 50’ 11’ 2”, long. o. h. 9° 20’ 9” E. Founded in 1667, when the construction of a large and monumental building was commenced by the architect Claude Perrault. J. D. D. Cassini, and later J. B. Biot, were the most eminent of the astronomers. The building was restored in 1784, and the ref. was used for double-star obs. till 1892.

Rey W. D. Bessel’s obs., first at Ormskirk (1830-1839), lat. +5° 43’ 18”, long. o. h. 11° 36’ S. W.; afterwards at Cranbrook, Kent (1840-1850), lat. +5° 6’ 31”, long. o. h. 2° 10’ 8” E.; then at Watlingbury, near Maidstone, lat. +5° 15’ 12”, long. o. h. 2° 8’ 14” E., till 1871; and then at Blackheath, lat. +5° 45’ 54”, long. o. h. 3° 43’ S. W., till Mr Dawes’s death in 1868. Possessed at first only small instruments, then successively a 6-in. ref. by Merz, a 7-in. ap. and an 8-in. ref. by Clark, and an 8-in. ap. by Cooke, with all of which a great many measures of double stars were made.

Mr W. De La Rue’s obs., Cranford, Middlesex, lat. +5° 28’ 47” 8’, long. o. h. 2° 24’ 9” E., was first opened in 1870, and erected several 6-in. ref. (of 18-in. ap.), and in 1879 his 40-ft. ref. of 4-ft. ap. The latter was comparatively little used (two satellites of Saturn were discovered with it), while the former served to discover about 2500 nebulae and clusters, 800 double stars, and two satellites of Uranus, as also to make the innumerable other obs. which have made the name of Herschel so celebrated. Sir J. Herschel used a 20-ft. ref. at Slough from 1825 to 1833, and from 1834 to 1838 at the Cape of Good Hope. It was 6’ 5”, long., and mounted on an iron stud and a plane of the visible heavens, discovering 2100 new nebulae and 5500 new double stars.

Sir William and Sir John Herschel’s obs. at Slough near Windsor, lat. +5° 30’ 20”, long. o. h. 2° 24’ S. W. William Herschel settled at Datchet, near Slough, in 1756, and erected several 6-in. ref. (of 18-in. ap.), and in 1789 his 40-ft. ref. of 4-ft. ap. The latter was comparatively little used (two satellites of Saturn were discovered with it), while the former served to discover about 2500 nebulae and clusters, 800 double stars, and two satellites of Uranus, as also to make the innumerable other obs. which have made the name of Herschel so celebrated. Sir J. Herschel used a 20-ft. ref. at Slough from 1825 to 1833, and from 1834 to 1838 at the Cape of Good Hope. It was 6’ 5”, long., and mounted on an iron stud and a plane of the visible heavens, discovering 2100 new nebulae and 5500 new double stars.

Rey T. J. Hussey’s obs., Hayes, Kent, lat. +4° 56’ 28” 38”, long. o. h. o. m. 27’ 7” S. W. Founded in 1866; furnished with an 8-in. ref. (by Clark and Cooke). In 1870 he erected an equat. mounting with a 15-in. ref. and a Cassgrain ref. of 18-in. ap., both of which were used for photog. observations in 1870-71. Sir W. Huggins has made his well-known spectroscopic observations and photographs of stellar spectra. The instruments were transferred to the Cambridge obs. in 1898.

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Mr G. Knott’s obs., Cuckfield, Sussex (from 1860 to 1873 at Woodcote, lat. +5° 0’ 41”, long. o. h. o. m. 34’ W., afterwards at Knowles Lodge, Cuckfield); 7-in. ref. by Clark, used for observing double stars till 1873.

Mr W. Lassell’s obs., from 1840 to 1861 at Starfield near Liverpool, lat. +5° 35’ 25” 28’, long. o. h. 11° 38’ 5’ S. W.; contained ref. of 9- and 24-in. ap.; employed for obs. of the satellites of Uranus, of Mars, and of the satellites of Neptune. The 2-ft. ref. was used at Malta in 1852-1853, and a 4-ft. ref. was mounted in 1861, also at Malta, and used till 1864 for obs. of satellites and nebulae. The eighth satellite of Saturn, the two inner satellites of Uranus and the satellite of Neptune were discovered at Starfield by Mr Lassell.

Dr J. Lee’s obs., Hartwell, Bucks, lat. +5° 48’ 36”, long. o. h. o. m. 55° 14’ 59’ S. long. o. h. 23° 51’ 57” S. E. Opened 1884: 8-in. ref., 12-in. equat. coude, 7-in. transit circle, all by Gautier.

 Lyons, obs. lat. in alt. +45° 45’ 46” S. long. o. h. 19° 18” W. E., at the Jesuit college. A new obs. was erected in 1877 at St Gérons-Laval, at some distance from the city, lat. +4° 51’ 41” N., long. o. h. 19° 08” S. E. Transit circle by Eichens (6-in. o. g.), 12-in. equat. coude by Gautier, 12-in. sidereal.

Marseille, obs. lat. 43° 18’ 17” 5’, long. o. h. 21° 54’ 34” S. E. Originally belonging to the Jesuits, taken over by the ministry of the navy in 1749. It was here that J. L. Pons made his numerous discoveries of comets. New buildings erected in 1869; 9-in. Merz. ref., 32-in. ap. by Foucault, 7-in. transit circle.
Germany

Altona, lat. +53°32'45"3"., long. o. h. 39 m. 46.1 s. Founded in 1823 by the Danish government to assist in the geodetic operations in Holstein. A meridian circle by Reichenbach (of 4-in. ap.) was procured, to which in 1858 was added a 43-in. equat. by Repsold. The observatory has since then been chiefly used for the construction of small instruments. The "rez. ickten", the principal astronomical journal, was published here from 1821 (by H. C. Schumacher up to 1850, by C. F. W. Peters from 1854). The observatory was moved to Kiel in 1874.

Bamberg, lat. +49°53'6"0", long. o. h. 43 m. 33.6 s. Founded and endowed by the late Dr K. Remels, completed 1889; 71-in. heliometer by Merz and Repsold, 101-in. refr. by Schröder.

Breslau, obs. lat., +52°30'16"9"., long. o. h. 53 m. 24.9 s. E. Erected in 1795 as part of the building of the Academy of Sciences (lat. +52°31'12.5"., long. o. h. 53 m. 35.3 s. E.), a very unsuitable locality. A new observatory was built in the southern part of the city, finished in 1854, by K. v. Eltz and B. W. Ramsden. The old observatory (used chiefly for obs. of minor planets), a meridian circle by Pistor and Martins of 4-in. ap., another by the same makers of 7-in. ap.

Berlin, obs. of Urania Society for diffusing natural knowledge, lat. +52°21'41"1", long. o. h. 13 m. 58.3 s. E. Surveyed and provided with a 27-in. ref. by Schott. In the Trepтов Chaussée is a popular obs. with a 27-in. ref. by Schott and Steinheil.

Bremerhaven, lat. +53°45'5"0", long. o. h. 28 m. 23.2 s. E. Finished in 1845; meridian circle by Pistor of 43-in. ap., heliometer by Merz of 6-in. ap. The observatory was founded by the late F. W. A. Argelander for observing the stars contained in his three great catalogues. This observatory is chiefly known by the zone obs., made from 1829 to 1859, with a small comet-seeker, on which Argelander's great atlas of 324,198 stars between the north pole and +9° decl. is founded, continued with a 6-in. ref. from -2° to +31° decl. by Schönheld. A meridian circle of 6-in. ap. by Repsold was mounted in 1882.

Bolkamp, F. G. von Bölow's obs., lat. +54°2'9"6"., long. o. h. 46 m. 31.2 s. E. Situated a few miles from Kiel, founded in 1870. With a 11-in. ap. by Schröder, Dr K. H. Vogel obtained valuable results in 1871-1874; since then it has only been used occasionally.

Bremerhaven, sith. and the house of his landlord in Sandstrasse, H. W. M. Olbers (d. 1840) had his obs., lat. +53°'4"38", long. o. h. 35 m. 10.s. E.; though the principal instrument was only a 32-in. ref. by Dollond, many comets and the planets Pallas and Vesta were discovered and observed there.

Brest, univ. obs., lat. +51°6'55"8", long. 1 h. 8 m. 87.5 s. E. Founded 1790. In a small and unsuitable locality; 8-in. ref. by Clauss, 6-in. ref. by Capt. A. C. K. 30-in. heliometer by Merz and Repsold, finished in 1858.

Dresden, Baron von Engelhardt's obs., lat. +51°42'16"6", long. o. h. 54 m. 54.8 s. E. A 12-in. ref. by Grubb (mounted 1880), used for obs. of comets and double stars, presented to Kasan obs. in 1897. Dr G. H. C. Blum (M. 53.8 s. E. with a 23-in. ref. of the city), lat. +51°12'25"0", long. o. h. 27 m. 5.5 s. E. Founded and endowed by Professor J. F. Benzenberg (d. 1860), best known by the discovery of twenty-one minor planets by K. T. R. Luther; 43-in. ref. by Merz, 77-in. ref. by Merz and Bamberg.

Gotha.—In 1791 an obs. was founded by Duke Ernest II. at Seelberg, lat. +50°56'5"2", long. o. h. 42 m. 55.8 s. E., on a hill a few miles from the city; 5-in. ref. and transit instrument by Ramsden. Through the labours, principally theoretical, of F. X. Zach, B. A. von Lindenu, J. F. Encke and P. A. Hansen, the institution ranked with the first. A new obs. was built by K. H. Heinrich, long. o. h. 42 m. 55.8 s. E., which received the instruments from Seelberg, including a small transit circle by Ertel (made in 1824), also a new equat. by Repsold of 44-in. ap.

Göttingen, univ. obs., lat. +52°31'48"2", long. o. h. 39 m. 46.2 s. E. An obs. had existed here since 1751, when Tobias Mayer worked. In 1811 a new building was constructed. Besides his mathematical works Mayer used this observatory to test the important geodetic and magnetic obs.; meridian circle by Repsold (41-in. ap.), another by Reichenbach (43-in.), 6-in. heliometer by Repsold (1888).

Hamburg, lat. +53°33'7"0", long. o. h. 39 m. 5.3 s. E. Built in the late 1790's by W. B. Ramsden. K. L. C. Rümker observed the places of 12,000 stars. A ref. of 10-in. ap. by Merz and Repsold was mounted in 1888. A new obs. is now being built 20 km. south-east of the city, lat. +53°28"46", long. o. h. 39 m. 46.2 s. E. With a 7-in. transit circle by Steinheil and Repsold, 7-in. transit circle by Repsold, and a 39-in. refr.
Observatory

25.

Given is the text in natural language: "OBSERVATORY 25'.

Finished is J-in. E.

E. Founded 1871.

instruments.

or meteorological instruments. Twenty-eight minor planets were discovered here from 1871 to 1885.

Cracow, vic. obs., lat. +50° 30' 0", long. 1 h. 19 m. 51 ' E. Founded 1871.

C. Fotherby, used for observations.

Kis Kertal (north-east of Budapest), private obs. of Baron Pannonv, lat. +47° 11' 54", long. 1 h. 18 m. 17 ' E. Founded 1871.

Merz and Cooke.

O'Gyalla (near Komorn, Hungary), lat. +47° 52° 7', long. 1 h. 12 m. 45 ' E. It was founded in 1760, after 1775; handed over to the Polytechnic School in 1855; new building erected in 1863. A 6-in. refr. by Merz and Kern with two photo telescopes, two transit instruments. &c. Sun-spots are regularly observed, but the institution is chiefly devoted to educational purposes. Neuchâtel, lat. +46° 59° 51", long. 0 h. 27 m. 49 ' E. Erected in 1858; meridian circle of 41-in. ap. by Ertel; 61-in. refr. by Mez.

Geneva, lat. +46° 11° 53", long. 0 h. 24 m. 36 ' E. Founded in 1773; a new building erected in 1830. The observatory was then the centre of the Swiss geodetic operations carried on in Switzerland since 1861. An 11-in. refr. (o.g. by Mez.) was presented by the director E. Plantamour in 1880; 4-in. transit circle.

Spain and Portugal

Madrid, royal obs., lat. +40° 24° 29', long. 0 h. 14 m. 45 ' E. 101-in. refr. by Mez; 81-in. refr. by Grubb; 6-in. transit circle by Reipold.

Barcelona, obs. of Acad. of Science, lat. +41° 25° 18', long. 0 h. 8 m. 25 ' E. Opened 1904; 15-in. refr. -phot. and vis. by Mez.

Cadiz, naval obs., at San Fernando, lat. +36° 27° 42', long. 0 h. 24 m. 49' 3" W. Founded in 1797; 11-in. refr. by Brünn; 13-in. refr. -phot. by Henry and Gautier; 8-in. transit circle by Simms.

Lisbon, naval obs., lat. +38° 14° 43", long. 0 h. 36 m. 46' 7" W. Founded 1801; 15-in. refr. by Mez and Reipold, transit circle by Reipold.

Coimbra, univ. obs., lat. +40° 12° 25' 5", long. 0 h. 33 m. 42 ' 1" W. Founded 1792; 61-in. transit circle by Reipold, 16-in. refl. by Secretan.

Italy

Turin, univ. obs., lat. +45° 4° 7", long. 0 h. 30 m. 47 ' 2" E. Founded in 1790 by the Academy of Science; rebuilt in 1802 on a tower of the Palazzo Madama, 41-in. transit circle by Reichenbach, 12-in. refr. by Mez; handed over to the univ. in 1865. A new obs. is being erected.

Milan, originally obs. of Brera College, now royal obs. of Brera, lat. +45° 27° 59' 2", long. 0 h. 36 m. 45' 5" E. Founded in 1763. The publication of an annual ephemeris from 1775 to 1875 and important theoretical works absorbed most of the time of the directors B. Oriani and F. Carlini, and the instruments were rather insufficient. In 1875 an 8-in. refr. by Mez was mounted, with which C. F. Schiaparelli has made valuable obs. of Mars; 18-in. refr. by Mez.

Padua, univ. obs., lat. +45° 24° 1' 0", long. 0 h. 47 m. 29 ' 2" E. Founded in 1797. In 1837 a meridian circle by Starke of 4-in. ap. was mounted, with which stars from Bessel's zones were reobserved; the results were published in five catalogues; 41-in. refr. by Mez and Starke (1885); Dembowski's 7-in. refr. mounted in 1881.

Gallarate, near Lago Maggiorre, from 1860 to 1879, 19-in. refr. and 5-in. photo. obs. founded in 1852. Dembowski had observed double stars at Naples with a 5-in. diolyte by Ptuggel and a small transit circle by Starke. From 1860 he used a 7-in. refr. by Mez.

Bologna, univ. obs., lat. +44° 2' 47' 5" E. long. 0 h. 45 m. 24 ' 5" E. Founded in 1724 on a tower of the univ. building. Obs. have been made occasionally. A 34-in. meridian circle was mounted in 1846.

Braun's...—In 1774 a museum of science and natural history was established, part of which was used as a obs., but very few obs. were made; a new obs. built 1872 at Arcetri, lat. +43° 45° 14' E. long. 0 h. 45 m. 13 ' 4" E. 11-in. and 91-in. refrs. by Amici.

Padua, univ. obs., lat. +44° 39° 27', long. 0 h. 45 m. 56 ' 6" E. 135-in. refr. by Cooke.

Rome, obs. of the Roman College, lat. +41° 53° 56', long. 0 h. 49 m. 56 ' E. Founded in 1848; belongs to the univ.; small transit circle and a 44-in. refr. by Mez. The latter was used by L. Respighi for obs. of solar prominences.

Rome (Vatican), papal obs., lat. +41° 54° 4' 8", long. 0 h. 49 m. 49 ' 38" E. Founded 1800; 104-in. refr. by Mez; 13-in. phot. and 8-in. vis. refr. and 53-in. photoheliograph by Henry.

Naples royal obs., situated at Capo di Monte, lat. +40° 31° 45', long. 0 h. 45 m. 56 ' E. Founded 1837; 41-in. transit circle by Reichenbach, 61-in. refr. by Reichenbach and Fraunhofer, 6-in. refr. by Merz.

Tenerife royal obs., lat. +28° 46° 4' 5", long. 0 h. 53 m. 25 ' E. Erected in 1790 on a tower of the royal palace. The principal instruments were a reversible vertical circle by Ramsden of 5-ft. diameter with a 3-in. telescope, and a transit instrument of 3-in. ap. With this M. G. Piazzi observed the first comet contained in his famous Catalogue of 7641 Stars (1814); this work led him to the discovery of the first minor planet, Ceres, on the 1st of January 1801. The activity was revived in 1857, when a meridian circle by Pistor and a 36-in. photo. was mounted; a 41-in. refr. by Mez has been used for spectroscopic work.

Catania, lat. +37° 30° 13 ' 3", long. 1 h. 0 m. 20 ' 6" E. Founded 1888; 13-in. phot. refr. by Henry and Gautier; a 13-in. refr. transit circle by the same.

Helsingfors (Finland), univ. obs., lat. +60° 42° 6', long. 0 h. 18 m. 16 ' 6" E. Finished in 1839. Was under the direction of S. S. Svedberg. The observatory is now reorganized.

The staff consists now of the director, five astronomers, six assistants and computers. The principal instruments are: a transit instrument by Ertel of 6-in. ap., a vertical circle by Ertel of 6-in. ap. (the circle of 34-ft. diameter has been redivided by Reipold); these two instruments are for determining standard places of stars; a meridian circle by Reipold (6-in. ap., 4-f. circles), used since 1841 to observe all stars north of +15° decl. down to the 6th mag., and others observed by Brandes; a prime vertical transit by Reipold with 63-in. ap., used for determining the constant of aberration; a 74-in. heliometer by Mez; a refr. by Mez of 14-in. ap. (remounted 1882), used in 1892 for the use of the 80-in. double stars; 30-in. refr. by Clark and Reipold, erected 1884, chiefly used for spectrographic work; 13-in. phot. refr. See also Odessa.
Ann Arbor (Michigan), lat. +42° 16' 48"-8', long. 8 h. 34 m. 55-2 s. W. Detroit obs. of the Univ. of Michigan; erected in 1874; meridian circle by Ertel; and 3.5-in. refr. by Repsold.

Berkeley (Cal.), Students' obs. of Univ. of California, lat. +37° 32' 23"-6', long. 8 h. 9 m. 2-7 s. W.; 8-in. refr. owned by E. Pickering for extensive photometrical and spectroscopical researches on stars, planets, and meteors.

Boston (Mass.), lat. +42° 27' 46"-5', long. 4 h. 44 m. 31-0 s. W. Erected in 1839. Refr. of 15-in. ap. by Merz, with which W. C. Bond discovered a satellite of Saturn (Hyperion) in 1845, employed by E. C. Pickering for extensive photometrical and spectroscopical researches on stars, planets, and meteors.

Bromfield (near Boston, Mass.), lat. +42° 27' 46"-5', long. 4 h. 44 m. 31-0 s. W. Erected in 1839. Refr. of 15-in. ap. by Merz, with which W. C. Bond discovered a satellite of Saturn (Hyperion) in 1845, employed by E. C. Pickering for extensive photometrical and spectroscopical researches on stars, planets, and meteors.

Cincinnati (Ohio). In 1842 an obs. was founded by subscription, lat. +38° 48' 2-6" s. W. Established 1854; 7-in. transit circle by Cooke.

Colorado (Colo.).) obs. of Univ. of Colorado, lat. +43° 3' 16"-5', long. 1 h. 5 m. 37-4 s. W. Erected by subscription 1852-1855; refr. of 13-in. ap. by Spencer, employed by C. H. F. Peters for the reduction of the position of the pole of the heavens, and for the construction of charts of the stars and the planets.

Columbia (Mo.), Laws obs. of Univ. Missouri, lat. +38° 50' 61"-7', long. 6 h. 19 m. 18-3 s. W. Founded 1853; 7-in. refr. by Merz.

Delaware (Wiss.), Southw. Coll. obs., lat. +39° 40' 36"-6', long. 7 h. 5 m. 32-10 s. W.; 12-in. refr. by Brashear and Warner & Swasey.

Denver (Col.), Univ. of Denver obs., lat. +39° 40' 36"-6', long. 6 h. 16' 18-5 s. W. Erected in 1844; 12-in. refr. by Merz.

Erlangen (Germany), Pickering Obs., lat. +49° 6' 15'-8", long. 51° 57' 38-3 s. W. Erected in 1852; 6-in. phot. zenith telescope by Brashear.

Glasgow (Missouri), Morrison obs., lat. +39° 16' 18-5", long. 6 h. 11 m. 18' 1-1 W. Founded in 1876; attached to Pritchett College; 12-in. refr. by Clark; meridian circle by W. D. Simms; 6-in. refr. by C. O. Griffis.

Hanover (New Hampshire), Shattuck obs. of Dartmouth College, lat. +43° 43' 15'-3", long. 4 h. 39 m. 7-9 s. W. Founded in 1853; 7-in. refr. by Merz.

Hastings (New York), Professor Henry Draper's obs., lat. +40° 59' 25", long. 4 h. 55 m. 29-7 W. Built in 1860; 28-in. refr. by the owner, 11-in. refr. with (photo. lens) by Clark, both used up to 1870; 36-in. refr. by Community of Observatories, 22-in. refr. by E. M. Simms; 12-in. refr. by Common, several phot. telescopes, a second 3-ft. s.g. refr. by Brashear with spectrophotograph.

Haverford (Pa.), Haverford Coll. obs., lat. +40° 40'-1", long. 5 h. 1 m. 12-7 s. W.; 10-in. refr. by Clark.

New York (N.Y.), Smith's obs., lat. +40° 59'-36", long. 51° 57' 38-3 s. W. Erected at the expense of Governor Washington in 1788; belongs to the Univ. of Wisconsin; meridian circle by Repsold; 13-in. ref. ap.; 15-in. ref. by Clark.

Mount Wilson (Cal.), Solar obs. of the Carnegie Institution, lat. +34° 12' 59'-5", long. 7 h. 52 m. 14-3 s. W. Erected 1904; 60-in. ref. by J. E. Pickering for the construction of solar spectra.

Northern (Mich.), Goodsell obs. of Carleton College, lat. +44° 27' 41-6", long. 6 h. 12 m. 35-8 s. W. Erected in 1878; 16-in. ref. byClark with phot. o.g.; 16-in. ref. by Brashear, 44-in. transit circle by Repsold.
Philadelphia. Flower Obs. of Univ. of Pennsylvania, lat. +39° 58' 21", long. 5° 1m. 6-6's. W. Founded 1862; 18-in. refr., 4-in. altazimuth, and 4-in. zenith telescope, all by Braseher & Warner & Swasey.

Poughkeepsie (N.Y.). Vassar College Obs., lat. +41° 41' 18", long. 74° 55m. 37-7's. W. Founded 1865; 12-in. refr. by Fitz & Clark; and a transit circle by Clark.

Princeton (New Jersey). Attached to Princeton Univ. are two obs.—the "Observatory of Instruction," lat. +40° 20' 57-8", long. 74° 49m. 21-9's. W.; and the "Observatory of Science," lat. +40° 20' 55-8", long. 74° 48m. 39-4's. W., in which a 23-in. refr. by Clark was mounted in 1883.


Washington (D.C.). U.S. naval obs., lat. +38° 53' 38-8", long. 77° 7m. 2-5's. W. Organized in 1872; obs. begun in 1845 with a mural circle by Troughton & Simms of 4-in., a transit instrument by Ertel of 5-3-in. ap., and a 9-6-in. refr. by Merz. A meridian circle by Pistor & Martins of 8-5 in. ap., mounted in 1855, and used for observing standard stars and planets; a 26-in. refr. by Clark, mounted in 1873—with this instrument A. Hall discovered the satellites of Mars in 1877. A new obs. on Georgetown Heights was opened in 1893, lat. +38° 55' 14-0", long. 78° 5m. 14-6's. W.; in addition to the old instruments there is a 40-ft. photophotograph of 5-in. ap., 6-in. transit circle built of steel by Warner & Swasey, 5-in. steel altazimuth by same, 12-in. refr. by Clark.

Washington (Philadelphia). Smithsonian Institution, lat. +38° 53' 17-4", long. 78° 8m. 6-2's. W. Founded 1890 for the study of solar radiation; 20-in. siderostat, spectrophotometer, &c.

Williams Bay (Wis.).—Yerkes Obs. of Univ. of Chicago, lat. +42° 34' 12-6", long. 88° 5m. 3-1's. W. Opened 1897; 40-in. refr. by Clark and Warner & Swasey; also a 12-in. refr., 24-in. ref!. 16-in. phot. refr.

Windsor (Mass.).—Hale Obs. of Harvard College, lat. +42° 42' 49", long. 74° 52m. 33-8's. W. Founded in 1836; 71-in. refr. by Clark; meridian circle of 44-in. ap. by Repsold, mounted in 1882 in the Field Memorial obs., lat. +42° 42' 30", long. 49° 52m. 50's. W.

Canada

Ottawa, Dominion Obs., lat. +45° 23", long. 76° 3m. 3-w. Founded 1902; 15-in. refr. by Braseher; 8-in. transit circle by Simms; 16-in. celeostat.

Mexico

Tecuahuy.—National obs. erected 1882, lat. +19° 24' 17-5", long. 6° 36m. 46-7's. W. 1760 ft. above sea-level; 15-in. refr. by Grubb, 13-in. phot. refr. by Henry & Gautier, 8-in. transit circle by Simms.

South America

Santiago (Chile), national obs., lat. -33° 26' 42-5", long. 4° 42 m. 42-8's. W. In 1849 the U.S. government sent an astro- nautical mission to South America. When Capt. J. W. Davidson returned to Washington he stated that the government of Chile bought the instruments—a 6-in. meridian circle by Pistor and Martins, a 64-in. refr. by Fitz, &c. New building erected 1860; 93-in. refr. by Merz and Repsold, 13-in. phot. refr. by Gautier.

Arequipa (Peru).—Branch of Harvard College obs., lat. -16° 24', long. 4° 45 m. 30-6's. W., 8606 ft. above sea-level; 24-in. Bruce refr. by Clark; and 13-in. Boyden telescope for photo. charts and spectra of the stars. The 24-in. light photometer extends the Harvard photometry to the south pole.

Rio de Janeiro (Brazil), national obs., lat. -22° 54' 23-7", long. 4° 16 m. 45-1's. W. Erected in 1871 under the direction of B. A. Gould till 1883. With a meridian circle by Repsold of 5-in. ap. 105,000 zone obs. of stars between -23° and -80° decl. have been made in a 111-in. phot. refr. by Clarke; 5-in. phot. refr. by Henry & Gautier.

Cordoba (Argentina), national obs., lat. -31° 35' 15-4", long. 6° 14 m. 40-5's. W. Erected in 1853; 18-in. circum. circle by B. F. Polk till 1883. With a meridian circle by Repsold of 5-in. ap. 105,000 zone obs. of stars between -23° and -80° decl. have been made in a 111-in. phot. refr. by Clarke; 5-in. phot. refr. by Henry & Gautier.

La Plata (Argentina), univ. obs., lat. -34° 54' 30-3", long. 3° 51m. 37-o' s. W. Founded 1883; 18-in. equat. coudeé, 13-in. phot. refr. and transit circle, all by Henry & Gautier.

Africa

Cape of Good Hope, royal obs., lat. -33° 56' 3-5", long. 1° 13 m. 5-8's. E. Founded in 1820; erected in 1825-1829, about 34 ft. from Cape Town. Obs. were begun in 1829 with a transit instrument by Troughton & Simms; 4-in. altazimuth circle by Merz & Gautier. Maclear undertook to verify and extend the arc of meridian measured by N. L. de Lacaille in 1711-1753, which work occupied the obs. staff for a number of years. In 1849 a 7-in. refr. by Merz was mounted, and in 1853 a new meridian circle, a facsimile of the one at Greenwich, superseded the older instruments. Maclear was succeeded by E. J. Stone (1870 to 1879), who devoted himself and the staff to the work already in progress. The observatory is in possession of the Cape government and is used for research of a general character. Under Sir David Gill (1879-1906) a 7-in. heliometer by Repsold has been used since 1887 for researches on solar parallax and annual parallax of stars, while a complete review of the heavens has been made south of -23° decl. with a 6-in. phot. Dallmeyer refr. by Sir Thomas Macdougall Brisbane in 1821, and more recently with 8-in. refr. and Grubb refr. and 6-in. priism, and a 6-in. transit circle by Simms have also been mounted.

Besides the obs. of L'Aber in Cape Town (lat. -33° 55' 16-2", long. 1° 13 m. 41-o' E.), there are temporary obs. at Feldhausen, lat. -33° 58' 56-6", long. 1° 13 m. 51-o' E. 6 m. from Feldhausen to desire to be mentioned. It was here that Sir John Herschel observed nebulae and double stars from 1834 to 1836 with a refl. of 18-in. ap.
OBSIDIAN, a glassy volcanic rock of acid composition. A similar rock was named obsidian by medieval writers, from its resemblance to a rock discovered in Ethiopia by one Obsius. The early printed editions of Pliny erroneously named the discoverer Obsius, and the rock obsidians. Rhyolitic lavas frequently are more or less vitreous, and when the glassy matter greatly predominates and the crystals are few and inconspicuous the rock becomes an obsidian. The chemical composition is essentially the same as that of granite; the difference in the physical condition of the two rocks is due to the fact that one consolidated at the surface, rapidly and under low pressures, while the other cooled slowly at great depths and under such pressures that the escape of the steam and other gases it contained was greatly impeded. Few obsidians are entirely vitreous; usually they have small crystals of felspar, quartz, biotite or iron oxides, and when these are numerous the rock is called a porphyritic obsidian (or hyalo-lapicite). These crystals have, as a rule, a cryptocrystalline form. In the quartz and felspar are often filled with enclosures of glass.

All obsidians have a low specific gravity (about 2.4) both because they are acid rocks and because they are non-crystalline.

Even when conspicuous and well formed crystals are not visible in the rock there is nearly always an abundance of minute imperfect crystallizations (microlites, &c.). They are often so small that high magnifications may be necessary to ascertain their presence. Some are globular and others are rod-shaped; they may be grouped in clusters, stars, rosettes, rows, chains or swarms of indefinite shape. In banded obsidians these microlites may be numerous in some parts but few or absent in others. The larger ones polarize light, have angular outlines like those of crystals, and may even show twinning and definite optical properties by which they can be identified as belonging to felspar, augite or some other rock-forming mineral. The variety of their shapes is endless. Some are black, very thin and curved like threads or hairs (trichites); often a group of these is seated on a small crystal of augite or magnetite and spreads outwards on all sides. Others have hollow or funnel-shaped ends and are constricted at the middle like a dice cup. In some rocks small rod-like microlites are grouped together in a regular way to form growths which resemble fir branches, fern leaves, brushes or networks, in the same manner as minute needles of ice produce star-like snow crystals or the frost growths on a window pane.

These crystallites (q.v.) show that the glassy rock has a tendency to crystallize which is inhibited only by the very viscous state of the glass and the rapidity with which it was cooled. Another type of incipient crystallization which is excessively common in obsidians is spherulites (q.v.), or small rounded bodies which have a radiating fibrous structure. They are of globular shape, less frequently irregular or branching, and may be elongated and cylindrical (axiolites). In some obsidians from Teneriffe and Lipari the whole rock consists of them, so closely packed together that they assume polygonal shapes like the cells of a honeycomb. In polarized light they it may a weak to medium colored and interference figure. A very thin section of this kind of glass is very fine-grained that its constituents cannot be directly determined even with the aid of the microscope, but chemical analysis leaves little doubt as to the real nature of the minerals of which they are composed. Many obsidian rocks show alteration of this type in certain parts where either the glass has been of unstable nature or where agencies of change such as percolating water have had easiest access (as along joints, perlitic cracks and the margins of cushions and rinds). Obsidians from Lipari often
have felsitic bands alternating with others which are purely glassy. In Arran there are pitchstone dikes, some of which are very completely vitreous, while others are changed to spherulitic felsites more or less completely. Pitchstone of the Scuir of Eigg is also vitreous, characterized by a dull semi-opaque matrix which seems to be the result of secondary devitrification.

In Europe the best-known localities for them are the Lipari Islands, Pantelleria, Iceland and Hungary. Very fine obsidians are also obtained in Mexico, at the Yellowstone Park, New Zealand, Ascension and in the Caucasus. Included in this group are some rocks which are more properly to be regarded as vitreous forms of trachyte than as glassy rhyolites (Iceland), but except by chemical analyses they cannot be separated. It is certain, however, that most obsidians are very acid or rhyolitic. The dark, semi-opaque glassy forms of the basic igneous rocks are known as tachylytes. The typical obsidians exhibit the chemical peculiarities of the acid igneous rocks (viz. high percentage of silica, low iron, lime and magnesia, and a considerable amount of potash and soda).

The chemical composition of typical obsidians is shown by the following analyses:

<table>
<thead>
<tr>
<th></th>
<th>SiO₂</th>
<th>Al₂O₃</th>
<th>FeO</th>
<th>Fe₂O₃</th>
<th>CaO</th>
<th>MgO</th>
<th>K₂O</th>
<th>Na₂O</th>
<th>H₂O</th>
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<tr>
<td>I. Yellowstone Park</td>
<td>74.70</td>
<td>7.32</td>
<td>0.62</td>
<td>0.61</td>
<td>0.78</td>
<td>0.14</td>
<td>0.02</td>
<td>0.02</td>
<td>0.23</td>
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<td>II. Iceland</td>
<td>75.28</td>
<td>10.22</td>
<td>4.24</td>
<td>1.81</td>
<td>0.25</td>
<td>2.44</td>
<td>5.53</td>
<td>0.22</td>
<td></td>
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<tr>
<td>III. Mexico</td>
<td>73.63</td>
<td>14.25</td>
<td>1.80</td>
<td>0.30</td>
<td>0.12</td>
<td>4.39</td>
<td>4.61</td>
<td>0.23</td>
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Obsidian, when broken, shows a conchoidal fracture, like that of glass, and yields sharp-edged fragments, which have been used in many localities as arrow-points, spear-heads, knives and razors. For such purposes, as well as as ornaments and labrets, it was extensively employed, under the name of *stilly*, by the ancient Mexicans, who quarried it at the Cerro de las Navajas, or "Hill of Knives," near Timapan. The natives of the Admiralty Islands have used it for the heads of spears. By the ancient Greeks and Romans obsidian was worked as a gem-stone; and in consequence of its having been often imitated in glass there arose among collectors of gems in the 18th century the practice of calling all antique pastes "obsidians." At the present time obsidian is sometimes cut and polished as an ornamental stone, but its softness (H=5 to 5.5) detracts from its value. Certain varieties, notably some from Russia, possess a beautiful metallic sheen, referable to the presence of either microscopic fissures or enclosures. The substance known as moldavite, often regarded as an obsidian, and the so-called obsidian bombs, or obsidians, are described under Moldavite. (J. S. F.)

**OBSTETRICS**, the science and art of midwifery (Lat. obstetriz, a midwife, from obstare, to stand before). Along with Medicine and Surgery, Obstetrics goes to form what has been called the Tripos of the medical profession, because every person desiring to be registered under the Medical Acts must pass a qualifying examination alike in medicine, surgery and midwifery. The term Gynaecology (q.v.), which has come to be applied to the study of the diseases of the female generative system, in its primary sense includes all that pertains to women both in health and disease. Obstetrics, or midwifery, is more specially that part of the science of gynaecology which deals with the care of a pregnant woman and the ushering of her child into the world.

**Tolokology**—the doctrine of parturition—is the most distinctive sphere of interest for obstetricians, and here their activities bring them into a closer approximation to the work of surgeons. As a science it demands a study of the phenomena of labour, which in their ordered succession are seen to present three distinct stages: one of preparation, during which the uterus dilates sufficiently to allow of the escape of the infant; a second, of progress, during which the infant is expelled; and a third, of the extinction of the after-birth or placenta. In each of the stages analysis of the phenomena reveals the presence of three elements which are known as the factors of labour, viz. the powers or forces which are engaged in the expelling of the uterus; the passages or canals through which the ovum is driven; and the passenger or body that is being extruded. The mechanism of labour depends on the balance of these factors as they become adjusted to each other in the varying phenomena of the several stages. The diversities that are met with in different labours even of the same woman have led to their being classified into different groups. A natural labour is commonly defined as one where the child presents by the head and the labour is terminated within twenty-four hours. From this it is obvious that no case of labour can be defined at its onset. The relation of the factors may represent an ideal of perfect accommodation; but until the labour is completed, and completed within a reasonably safe period, it cannot be classed as natural. The element of time has this importance, that it is found that, apart from all accidents and interferences, the mortality both to mother and child becomes greater the longer the duration of the labour. Hence lingering or tedious labours, in which the child still presents with the head, but is not expelled within twenty-four hours after the onset of labour-pains, are properly grouped in a separate class, although they are terminated without operative interference. In the class of preternatural labours, where the head comes last (as first, there are two subjects of care. The uterine, or child during its nine months' evolution had been increasing enormously in all its elements, has in six weeks to undergo an involution that will restore it to its pregnavant condition. The allied organs share in their measure in the change, all the systems of the body feel the influence, and especially the mammary glands take on their function of providing milk for the nutriment of the new-born infant. A patient with some latent flaw in her constitution may pass the test of pregnancy and labour with success, only to succumb during the puerperium. Of patients who become insane in connexion with child-bearing, a half manifest their cases mental disorder first during the days or weeks immediately preceding their confinement, and numbers more whilst they are suckling their infants. A woman may have had an easy labour, and may have been thankful at the time for help from a hand that she did not know to be unclean; three days later germs left by that hand may have so multiplied within her that she is in mortal danger from septicaemia. The management of the puerperal patient requires not only the warding off of deleterious influences, but the watching of the normal processes, because slight deviations in these, undetected and unchecked now, may become later a source of lifelong invalidism. It remains further to be noted that to obstetricians belong the earliest stages of pediatrics in their care of the new-born child. In some old works practitioners of this branch of the profession are described as δύσωποιοι, because their first business was to cut the umbilical cord. The causes of the high death-rate among infants, whether due to ante-natal, intra-natal or neo-natal conditions, come under their observation. They have charge of the whole wide field of the hygiene, pathology and therapeutics of infancy.
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Historical Sketch.—The origin of midwifery is lost in the mists of human origins. The learned Jean Astruc, who gave a lead to higher critics in their analysis of the Pentateuch by pointing out the presence of Elohist and Jehovistic elements, exercised his imagination in fancying how the earliest pair comport themselves at the birth of their first child, and especially how the husband would have to learn what to do with the placenta and umbilical cord. His speculations are not in the least illuminative. The Mosaic writings let us see women of some experience and men of authority, a sort of a Rotterdam in Jewish society giving birth to twins, and superintending the easy labours of Hebrew slaves in Egypt. The Ebers Papyrus (1550 B.C.), which Moses may have studied when he grew learned in all the wisdom of the Egyptians, is the oldest known medical production. It contains prescriptions for causing abortion, for promoting labour, for curing displacements of the uterus, &c. But there is no indication as to how labours are to be managed, and with regard to the child there are only auguries given as to whether it will live or die, according, e.g. as its first cry after it is born sounds like dø or bå.

The story of the rise and progress of midwifery is intimately bound up with the history of medicine in general. The obstetrician, looking for the dawn of his science, turns like his fellow-workers in other medical disciplines to the Hippocratic writings (400 B.C.). Now the father of medicine was not an obstetrician. As with Egyptians and Hebrews, the skilled attendants on women in labour among the Greeks were also women. But since nothing that concerned the ailments of humanity was foreign to Hippocrates, there are indications in the writings that are accounted genuine of his interest in the disorders of females—in their menstrual troubles, in their sterility, in their abortion symptoms, and in their puerperal diseases; his oath forswears the use of abortificants, and he recommends the use of sternutatories to hasten the expulsion of the after-birth. In the Hippocratic writings that are supposed to be products of his followers, some of these subjects are more fully dealt with; but whilst the physician is sometimes called in to give advice in difficult labours, so that he can describe different kinds of presentation and can speak of the possibility of changing an unfavourable into a favourable lie of the infant, it is usually only with cases where the child is already dead that he has to deal, and then he tells how he has to mutilate and extract it. So these writings furnish us with the earliest account of the accoucheur's armamentarium, and let us see him possessed of a ἄκραιβον—knife or perforator for opening the head; a πιέστρων—a comminutor for breaking up the bones; and a ἄλεκτρηρ—an extractor for hooking out the infant. The classical writers of Greece give the same impression as to the primitive stage of obstetrics. Women, like the mother of Socrates, have the charge of parturient women. Where divine aid is sought, goddesses are invoked to facilitate the labour. Gods or men are only called in where graver interference is required as, when Apollo rescued the infant Asclepius by a Caesarean section performed on the dying Semele. Some midwives are known to history, and extracts from the writings of one Aspasia are embedded in the works of later authors. In the great medical school of Alexandria, when the science of human anatomy began to take shape, Herophilus rendered a service to obstetrics in giving a truer idea of the anatomy of the female than had previously prevailed; other physicians give evidence of their interest in midwifery and the diseases of women, and some experience was gradually being acquired and transmitted through the profession until we find from Celsus (in the reign of Augustus) that when surgeons were called in to help the attendant woman they could sometimes bring about the delivery without destroying the infant, by the operation of turning. In the 2nd century Soranus wrote a work on midwifery for the guidance of midwives, in which for the first time the uterus is differentiated from the vagina and instruction is given for the use of a speculum. A contemporary, Moschion, wrote a guide for midwives which, with that of Soranus, may be said to touch the high-water mark of archaic midwifery. It is written in the form of question and answer, was much prized at the time of the Renaissance, and was used as the basis of the first obstetric work that issued from a printing-press. Philumenos wrote a treatise of some value at the same epoch, but it is only known from the free use made of it by subsequent writers, such as Aétius in the beginning of the 6th century. Like Orisbasius, who preserved in his compilation the work of Soranus, Aétius draws largely on preceding writers. His treatises on female diseases constitute an advance on previous knowledge, but there is no progress in midwifery, though he still makes mention of turning. From the operation of turning in hospital wards as practised by Aegina, an 8th-century author, the last to treat at length of obstetrics and gynaecology the state of the dark ages settled down on the Roman world, and it is not heard of again till a millennium had passed. During the centuries when the progress of medicine was dependent on the work of the Arabian physicians, the science of obstetrics stood still. We are curious to know what Rhazes and Avicenna in the 9th and 10th centuries have to say on this subject. But they know little but what they have learned from the Greek writers, and they show a great tendency to relapse to the rudest procedures and to have recourse to the intervention of the child. Interest attaches to the work of Albucasis in the 12th century, in that he is the first to illustrate his pages with figures of the knives, crushers and extractors that were employed in their gruesome practices, and that he gives the first history of a case of extrauterine pregnancy.

We come down to the 16th century before we begin to see any indication of the development of obstetrics towards a place among the sciences. Medicine and surgery profited earlier by the intellectual awakenings of the Renaissance and the Reformation. In anatomical theatres and hospital wards as associated with universities great anatomists and clinicians began to discard the dogmas of Galen, and to teach their pupils to study the body and its diseases with unprejudiced minds. But the practice of midwifery was still among all people in the hands of women, and when in 1513 Eucharius Roesslin of Frankfurt published a work on midwifery, it bore the title Der schwangeren Frauen und hebbamen Rosengarten. Translated into English by Thomas Raynald with the altered title, The Birth of Mankynd, it is mainly compiled from Moschion, and the Soranus and Philumenos fragments of Orisbasius and Aétius, and is intended as a guide to parturient women and their attendants.

It was illustrated with fanciful figures of the foetus in utero that were reproduced in other works of later date—as in the Rosengarten of Walter Reiff of Strassburg in 1546 and the Hebammenbuch of Jacob Rueff of Zurich in 1554, the latter of which appears in English dress as The Expert Midwife. The greatest impulse to the progress of midwifery was given in the middle of the 16th century by the famous French surgeon Ambroise Paré, who revived the operation of podalic version, and showed how by means of it surgeons could often rescue the infant even in cases of head presentation instead of breaking it up and extracting it piecemeal. He was ably seconded by his pupil Guillemeau, who translated his work into Latin, and at a later period himself wrote a treatise on midwifery, an English translation of which was published in 1612 with the title Child-Birth; or, The Happy Deliverie of Women. The close of the 16th century is rendered further memorable in the annals of midwifery by the publication of a series of works specially devoted to it. Three sets of compilations, containing extracts from the various writers on obstetrics and gynaecology from the time of Hippocrates onwards, were published under the designation of Gynaeciae or Gynaecologia—The first edition by W. Wolff of Zurich in 1566, the second by Caspar Bauhin of Basel in 1586, and the third by Israel Spach of Strassburg in 1597. Spach includes in his collection not only Paré's obstetrical chapters, but the Latin translation of the important Traitte nouveau de l'hysterotomotie, published by the French surgeon Francis Rousset in 1581, which is the first distinct treatise on an obstetric operation, and advocates the performance of Caesarean section on living women with difficult labours. From this time onwards evidence accumulates of the growing interest.
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of members of the medical profession, and more especially of surgeons, in the practice of midwifery, and after the middle of the 17th century they began to publish the records of their experiences in special works. The part most important of their lives was that of surgeons—as Mauriceau, Viardel, Paul Portal, Peu and Dionis. The work of Mauriceau, which first appeared in 1668, is especially interesting from its having been translated into English in 1672 by Hugh Chamberlen, who in his preface made the then incredible statement that his father, his brothers, and himself had long attained to and practised a way to deliver women in difficult labours without hooks, where other artists used them, and without prejudice to mother or child. Many years had still to elapse before the secret of the Chamberlenes leaked out. In the course of this century some women who had midwifery knowledge in midwifery appeared as authors. Thus in England Jane Sharp in 1671 wrote The Midwives' Book, or the whole art of Midwifery discovered; in Germany, Justine Siegemund, in 1690, Die Chir-Brandenburgische Hoff-Wehmutter; and earlier and better than either, in France, Louise Bourgeois in 1626 published Observations sur la sterilité et maladies des femmes. Perhaps they were beginning to feel that there was some need to assert their power, for it was during this century that parturient ladies began to call in men to attend them in natural labours. According to Astruc, Madame de la Valliere wished her confinement to be attended by a physician of the 17th, in June 1663, sent for Jules Clement, the court surgeon, to superintend the delivery. This was accomplished successfully. The king gave him the title of accoucheur. Clement afterwards attended the dauphiness and other court ladies, and went thence to Madrid to assist at the confinement of the queen of Philip IV. Up till this epoch physicians and surgeons had only been summoned to the lying-in room by midwives who found themselves at the end of their resources, to give help in difficult cases where the child was usually dead and the mother often moribund. Nothing that came out simultaneously with the Dutch had a title to confinements to be under the surveillance of a physician, it became possible for men with their scientific training to study the normal phenomena of natural labour, and through the medium of the printing-press to communicate the results of their observation and experience to their professional brethren. Hence the books of the men already referred to, and of others that appeared later, such as the Traité complet des accouchements de la Motte, 1721, which is a storehouse of acute observations and wise discussion of obstetric measures. In other countries than France physicians and surgeons began to take a part in the management of midwifery, as part of a state of society. The term obstetrician, of which they were somewhat ashamed (je Bon, one of the writers whose work is found in Baunin's Gynaecia, says: "Haece ars viros dedeect"). and it was in Holland that a work was produced that has earned for its author the designation of the Father of Modern Midwifery. Heinrich van Deventer, who practised as an obstetrician at the Hague along with his wife (a Vroedvrouw, as he was a Vroedmeester), published in 1606 a preliminary treatise called Dageraad (Aurora) der Vroedvrouwen, and in 1701 he followed it up by a more complete second volume, of which the Latin edition that came out simultaneously with the Dutch has a title beginning Operationes Chirurgiae Novum Lumen Exhibentes Obstetricantibus. It has the supreme value of being the first work to give a scientific description of the pelvis, and to take some steps towards the development of the mechanism of labour. The "obstetricantes" for whom Deventer wrote are both men and women. In the early part of the 18th century women had still the main and often the sole charge of their parturient sisters; but the practice of having a doctor to superintend or to supersede the midwife had kept spreading among the classes who could afford to pay the doctor's fee; and by the time Deventer's treatise was doing its educational work in an English translation, as The Art of Midwifery Improved, in 1716, the doctors were getting into their hands the "harmless forceps" with which a living child could be extracted without detriment to the mother, in conditions where formerly her child's life was sacrificed and her own endangered. This life-saving instrument was invented in London, but by a man not of English birth. The Huguenot, William Chamberlen, fled from Paris to escape the St Bartholomew massacre, carrying with him to Southampton his wife, his two sons, and his daughter. William Chamberlen himself, as a surgeon, and his descendants through four generations had large and lucrative practices in London. The eldest son Peter, who was old enough when he came to England to be able to attest the birth and baptism of a younger brother, is, on good grounds, credited with being the inventor of the forceps, which for a good century was kept a secret among brothers, sons and grandsons. Hugh, indeed, a great-grandson of William, and the translator of Mauriceau, had offered to sell the family secret for 10,000 crowns; but his failure to effect delivery in a test case that Mauriceau put to him led the profession to believe he was a boastful quack. Palluy of Ghent, when in Paris in 1723, putting a work on anatomy through the press, laid before the Academy of Science a pair of forceps, which was figured in Heister's surgery in 1724. He has thus the honour of first laying before the profession a midwifery forceps. But his implement was ill-constructed, and never came into general use. Meanwhile the knowledge that the Chamberlenes were really possessed of a serviceable instrument must have stimulated other practitioners. Perhaps a colleague with a keen eye may have got sight of it on some occasion, or an intelligent midwife had been able to make a satisfying "to the life" model, and thus he was enabled to apply. In 1734 Dr Edward Hody published a record of Cases in Midwifery that had been written by Mr William Giffard, "surgeon and man-midwife." The dates range from January 1724 to 1731. Amongst the cases are several where he effected the delivery by means of the forceps—"extractor," he calls it—of which a figure is given; and when Edmund Chapman, who practised first at Halstead and afterwards in London, published his Treatise on the Improvement of Midwifery in 1733, he speaks of the use of the forceps as "now well known to the principal men of the profession both in town and country." In the course of the 18th century the development of midwifery in the hands of medical men made greater strides than in all the preceding ages. The progress was accelerated by the establishment of chairs of midwifery in the universities of various countries, Edinburgh taking the lead in the appointment of a professor in 1726, and Strassburg coming closely after in 1728. In Strassburg the chair had the advantage of being at once associated with a clinical service. Lecturing was carried on, moreover, by both men and women, aspiring to be specialists in midwifery and the diseases of women and infants, and were succeeding in developing lying-in institutions for the benefit of poor women in labour that became schools of instruction both for midwifery nurses and for medical students. Two new operations came during this epoch to enhance the powers of the obstetrician, viz. symphysiotomy, first introduced by Sigault in Paris; and the induction of premature labour, first carried out by Macaulay in London in circumstances described by Demman in the preface to his Midwifery. William Hunter in London, Sir Fielding Ould in Dublin, Röderer in Göttingen, Camper in Amsterdam, Baedelouque in Paris, Saxtorph in Copenhagen, and many other authors contributed to progress by their atlases and their books. But there are three whose names stand out pre-eminently because of the influence they exerted on the whole obstetric world—Leveret, Smellie and Boër. Kilian, in his vindictus of the history of midwifery, calls Leveret "one of the greatest masters in the department that ever lived." Of Smellie he says: " Inferior to Leveret in nothing, he excels him in much." Boër characterizes as "the most meritorious and important of German obstetricians." Leveret improved the construction of the forceps, and widened the sphere of their applicability; Smellie worked in the same direction, and furnished, moreover, descriptions and illustrations of natural and morbid labours that are of classical value; and Boër first clearly placed pregnancy (which Mauriceau, e.g. had spoken of as "a nine months' disease") and parturition in the category of physiological processes that might be hindered rather than
helped by the pragmatical interferences of meddlesome midwives.

Throughout the 19th century midwifery continued to advance, gynaecology grew into a special department with an extensive literature, the mechanism of labour developed under the clinical observations of men like Nägele and the study of such frozen sections of cadaver as were made by Braune, the indications for interference became more clear and the methods of interference more simple and safe, and a whole realm of antenatal pathology and teratology was added to the domain of science, while practitioners learned the art of saving premature and delicate infants by the use of the incubator and proper alimentation. Every advance in all the cognate sciences was appreciated and applied for the advancement of obstetrics. But there are two achievements which will make the 19th century for ever memorable in the annals of midwifery—the abolition of the pains of labour and the arrest laid on mortality from the so-called puerperal fever. In February 1847 Sir J. Y. Simpson, choosing a case where he had to deliver by turning, put the patient asleep with ether. Seeing that the uterine contractions continued, though the attendant pain was abolished, he proceeded to administer ether in cases of natural labour, and in November of the same year demonstrated the virtues of chloroform, and so furnished the most serviceable anaesthetic, not only to the obstetrician in the lying-in room, but to the surgeon on the battlefield, and to the general practitioner in his everyday work. Ignaz Philipp Semmelweis, assistant in the maternity hospital of Vienna, was struck and saddened with the appalling mortality that attended the delivery of the women under his care, as many as one (in some months three) out of every ten of the puerperae being carried out dead. He observed that the mortality was much higher in the wards allotted to the tuition of students than in those set apart for the training of nurses. In the spring of 1847 he saw at the post-mortem examination of a young colleague who had died of a poisoned wound, that the appearances were the same as he had too often had occasion to see at the post-mortem examinations of his puerperae. He ordered that every student who assisted a woman in her labour must first wash his hands in a disinfectant solution of chloride of lime, and in 1848 already the mortality was less in the students' than it was in the nurses' wards. Thus the first light was shed on the nature of the mischief of which multitudes of puerperal patients perished, and the first intelligent step was taken to lessen the mortality. When, some twenty years later, Lister had applied the bacteriological principles of Pasteur with beneficial results to surgery, obstetricians gladly followed his lead, and the 19th century beheld added to the comfort of anaesthetic midwifery the confidence of midwifery antiseptic and even aseptic.

The most exhaustive treatise on the earlier history of midwifery is von Siebold, Versuch einer Geschichte der Geburtskille (Berlin, 1839).

OCALA (A Seminole word for green or fertile land), a city and the county-seat of Marion county, Florida, U.S.A., in the N. central part of the state, about 100 m. S.W. of Jacksonville. Pop. (1900) 33,800, (1905) 44,093, of whom 24,672 were negroes, (1910) 43,700. It is served by the Seaboard Air Line and the Atlantic Coast Line railways. About 6 m. E. is Silver Springs, the largest and best known of the springs of Florida. Its basin is circular, about 1,000 ft. in diameter. Its waters are remarkable for their transparency and refractive powers. According to the estimate of Dr D. G. Brinton, the spring discharges more than 300,000,000 gallons of water daily, its outflow forming what is known as Silver Spring Run, 9 m. long, emptying into the Ocklawaha river and navigable by small river steamers. For the drainage and sewerage of the city a subterranean river whose source and mouth are unknown is utilized. The city is the seat of the Emerson Memorial and Industrial Home (Methodist Episcopal) for negro girls. Ocala was settled in 1845, but its development dates from 1880, when it was first chartered as a city. In December 1860 it was the meeting-place of the National Convention of the Farmers' Alliance, which promulgated a statement of political principles generally known as the "Ocala Platform." (See Farmers' Movement.)

OCAÑA, a town of central Spain, in the province of Toledo; on the extreme north of the tableland known as the Mesa de Ocaña, with a station on the railway from Aranjuez to Cuénta. Pop. (1900) 6616. The town is surrounded by ruined walls, and is the remains of an old castle. In one of its parish churches is the chapel of Nuestra Señora de los Remedios, in which Ferdinand and Isabella were married in 1466. Ocaña is the Vicus Cumianarius of the Romans, and was the dowry that El Matamid of Seville gave his daughter Zaida on her marriage with Alphonso VI. of Castile (1072-1109). Near Ocaña, on the 19th of November 1809, the Spanish under their Irish general Lacy were routed by the French under Joseph Bonaparte and Marshal Soult.

OCARINA, a wind instrument invented in Italy, which must be吹used with musical toy or freaks, although concerted music has been written for it. The ocarina consists of an earthenware vessel in the shape of an egg with a pointed base and a tube like a spout in the side, which contains the mouthpiece. There are usually 16 holes in the front surface of the instrument, nine for fingers and thumb and a vent hole; the newer models have 8 holes and two keys. By half covering the holes the semitones are obtained.

O'CAROLAN (or CARolan), TURLOGH (1670-1738), Irish bard, son of John O'Carolan, a farmer, was born at Newtown, near Nobber, in the county of Meath. The family is said to have come down to them from MacMahons of Derrynane, and the grandfather of the great-grandfather was a chieftain. The O'Carolans forfeited their estates during the civil wars, and Turlough's father settled at Alderford, Co. Roscommon, on the invitation of the family of M'Dermott Roe. In his eighteenth year he became blind from smallpox. He received special instruction in music, and used to wander with his harp round the houses of the surrounding gentry, mainly in Connaught. The famous song "Receipt for Drinking" may be responsible for the allegation that he was addicted to intemperate drinking, but Charles O'Conor (1710-1791) the antiquary, who had personal knowledge of him, gives him as a good character in private life. The number of Carolan's musical pieces, to nearly all of which he composed verses, is said to exceed two hundred. He died on the 25th March 1738, and was buried at Kilrnan.

His poetical Remains in the original Irish, with English metrical translations by Thomas Furlong, were printed in Hardiman's Irish Miscellany (1831). Many of his songs were preserved among the Irish MSS. in the British Museum.

OCCAM, WILLIAM OF (d. c. 1340), English schoolman, known as Doctor vitriculus and Venerabilis inceptor, was born in the village of Ocam, Worcestershire, towards the end of the 14th century. Unattested tradition says that the Franciscans persuaded him while yet a boy to enter their order, sent him to Merton College, Oxford (see G. C. Brodick, Memorials of Merion College, p. 194), and to Paris, where he was first the pupil, afterwards the successful rival, of Duns Scotus. He probably left France about 1314, and there are obscure traces of his presence in Germany, in Italy, and in England during the following seven years. It has generally been held that in 1322 he appeared as the provincial of England at the celebrated assembly of the Franciscan order at Perugia, and that there he headed the revolt of the Franciscans against P. P. John XXII.; but, according to Little (English Historical Rev. v. vi. 747), the provincial minister on this occasion was William of Nottingham. Probably, however, Occam was present at the assembly. His share in this revolt resulted in his imprisonment, on the charge of heresy, for seventeen weeks in the dungeons of the papal palace at Avignon. He and his companions—Michael of Cesena, general of the order, and Bonagratia—managed to escape, and found their way to Munich, where they aided Louis IV. or V. (q.v.) of Bavaria in his long contest with the papal curia. It was for Occam's share in this controversy that he was best known in his lifetime. Michael of Cesena
died in 1342, and Occam, who had received from him the official seal of the order, was recognized as general by his party. The date of his death and the place of his burial are both uncertain. He probably died at Munich in 1349.

William of Occam was the most prominent intellectual leader in an age which witnessed the disintegration of the old scholastic realism, the rise of the theological scepticism of the later middle ages, the great contest between pope and emperor which laid the foundations of modern theories of government, and the quarrel between the Roman curia and the Franciscans which showed the long-concealed antagonism between the spirit of the Councils of Hildesheim and Francis of Assisi; and he shared in all these movements.

The common account of his philosophical position, that he reintroduced nominalism, which had been in decadence since the days of Roscellinus and Abelard, by teaching that universals were only *flatus vocis*, is scarcely correct. The expression is nowhere found in his writings. He revived nominalism by collecting and uniting isolated opinions upon the meaning of universals into a compact system, and popularized his views by associating them with the life and person of the Wycliffite leader with whom he had sympathized in the universities. He linked the doctrines of nominalism on to the principles of the logic of Psellus, which had been introduced into the West in the *Summule* of Peter of Spain, and made them intelligible to common understandings.

The fundamental principles of his system (see SCHOLASTICISM) are that "Essentia non sunt multiplicanda praeter necessitatem" ("Occam's Razor"), that nouns, like algebraical symbols, are merely denotative terms whose meaning is conventionally agreed upon (*suppositio*), and that the destructive effect of these principles on theological matters does not arise from a rejection of *principia*.

In the *Opus nonaginta dierum* (1330) (written in reply to John XXII.'s libellus against Michael of Cesena, and in its successors, the *Tractatus de dogmatibus Johannis XXII. papae* (1333-1334), the *Commentarium erroris Johannis XXII. papae* (1335-1338) and in the *Defensorum contra errores Johannis XXII. papae* (1339)), Occam once incidentally expresses his views as a publicist; the books are mainly, some of them entirely, theological, but they served the purpose of the emperor and of his party, because they cut at the root of the spiritual as well as of the temporal supremacy of the pope. In his writing *Super potestate summi pontificis octo quasitiones* (1339-1342) on the temporal supremacy of the pope, the idea of the independent of kingly authority, which he maintains is as much an ordinance of God as is spiritual rule, and discusses what is meant by the state. His views on the independence of the church are even more distinctly expressed in the *Tractatus de jurisdicione imperatoris in causis matrimonialibus*, in which, in spite of the medieval idea that matrimony is a sacrament, he defends the right of the civil power to dispose of it and to state the prohibited degrees. By 1343 there was in circulation his great work the *Dialogus* (see Goldast ii. 368-957), in which he attempted to present his views in a complete summary. It consists of three parts. The first is the *De falso ambitur heresierum*, and deals with the pope as arbiter in the matter of heresy. The second part is the refutation of the doctrines of John XXII. (see above treatises). The third was to be in nine sections, of which the first two and second sections alone remain to us. It is probable that the *Opus nonaginta dierum* and the *Compendium errorum* were intended to form part of the work. His last work, *De Electione Caroli IV.*, repeats his opinions upon temporal authority and adds little that is new.

In all his writings against Pope John XXII. (q.v.), Occam inveighs against the pope's opinions and decisions on the value of the life of poverty, with which he unhesitatingly united the guilds, which involved a declaration against evangelical poverty, and insists that they are full of heresy. Occam was a sincere Franciscan, and believed with his master that the institution of monasteries and nunneries, of any kind, was wrong. He was won through rigid imitation of Jesus in His poverty and obedience, and they could not have been possible for Franciscans to follow the rules of their founder within his order. John XXII., however, condemned the life of poverty as the main root of heresy. Occam, some of his followers, were so convinced of the necessity of evangelical poverty for a truly Christian life that they denounced the pope when he refused them letters of license to remove to Aquitaine (the Antichrist). After Occam's days the opinions of Francis prevailed in the Franciscan universities, and no one had posited in them. The church had no place within the church. They were Fraticelli, Beghards, Lollards or other confraternities unrecognized by the church and in steady opposition to her government.

Aside from the theological and political works above quoted, Occam wrote *Summa Logicae* (Paris, 1388, Oxford, 1675) commentaries on Porphyry's *Isagoge*, on the *Categoriae*, *De Interpretatione* and *Elenchos* of Aristotle. These latter were printed in 1406 at Bologna, and entitled *Expositio diversorum excerptorum litterarum veterem; Questions in quattuor libros sententiarum* (Lyons, 1495).

There is no good monograph on Occam. For an account of his logic, see Prantl, *Historie der Logik* (1855-1870); for his philosophy, see S. H. Gardiner, *Geschichte der Philosophie*, (1864-1866), vol. ii.; for his publicist writings, see Riezler, *Die literarischen Werke* of John of Ruensi, the *Praxis reformatorum*, in the *Brit. Quat. Review* (July, 1872). Among ancient documents consult Dienne and Chatelain's *Chartularium Universitatis Parisiensis*, vol. ii. pt. i. (Paris, 1887); Wadding's *Annalen* (ed. Pirenne), vol. ii. (Brussels, 1887); for an list of Occam's works, see Little's *Grey Friars*, pp. 225-232. (T. M. L.)

**OCCASIONALISM** (Lat. *occasion*, an event), in philosophy, a term applied to that theory of the relation between matter and mind which postulates the intervention of God to bring about in the one a change which correspons with a similar change in the other. The theory thus denies any direct interaction between matter and mind. It was expounded by Guinleix and Malebranche to avoid the difficulty of Descartes's dualism of thought and extension, and to explain causation. Thus mind and matter are to Guinleix only the "occasional" causes of each other's changes, while Malebranche, facing further the epistemological problem, maintains that mind cannot even know what, which is merely the "occasion" of knowledge.

**OCCLEVE** (or HOCCLEVE), THOMAS (1368-1430), English poet, was born in 1368/9, for, in writing in 1421/2 he says he was fifty-three years old (Dialog, i. 225), like his more voluminous and better known contemporary Lydgate, among those poets who have a historical rather than intrinsic importance in English literature. Their work rarely if ever rises above mediocrity; in neither is there even any clear evidence of a poetic temperament. Yet they represented for the 15th century the literature of their time, and kept alive, however faintly, the torch handed on to them by their "maister" Chaucer, to whom Occleve pays an affectionate tribute in three passages in the *De Regimine Principum*. What is known of Occleve's life has to be gathered mainly from his works. At eighteen or nineteen he obtained a clerkship in the Privy Seal Office, which he retained on and off, in spite of much grumbling, for about thirty-five years. He had hoped for a benefice, but none came; and in 1399 he received instead a small annuity, which was not always paid as regularly as he would have wished. "The Letter to Cupid," his first poem to which we can affix a date, was translated from L'Epistre au Dieu d'Amours by Christine de Pisan in 1402, evidently as a sort of antidote to the moral of *Trovil* and *Cressida*, to some of which he attaches a verse in *The Game and Playe of Chesse*, "Medieval Writers." His most readable poems, written about 1406, gives some interesting glimpses of his "misrule" youth. But about 1410 he settled down to married life, and the composition of moral and religious poems. His longest work, *The Regement of Princes or De Regimine Principum*, written for Prince Hal shortly before his accession, is a tedious homily on the virtues and vices, imitated from Aegidius de Colonna's work of the same name, from the supposed epistle of Aristotle, known as the *Secreto secretorum*, and the work of Jacques de Cessoles (fl. 1300) (ed. later by Caixton as *The Game and Playe of Chesse*). It is relieved by a poem, about a third of the whole, containing some further reminiscences of London tavern and club life, in the form of dialogue between the poet and a beggar. On the accession of Henry V. Occleve turned his muse to the service of orthodoxy and the Church, and one of his poems is a remonstrance addressed to Oldcastle, calling upon him to "rise up, a manly knight, out of the slough of heresy." Then a long illness was followed for a time, as he tells us, by insanity. His "Dialog with a Friend," written after his recovery, gives a naïve and pathetic picture of the poor poet, now fifty-three, with sight and mind impaired, but still with life left of writing a tale he once knew, "The Story of Humphry of Gloucester, and of translating a small Latin treatise, *Scolle Mor*, before he dies. His hopes were fulfilled in
his moralized tales of "Jeroslaus' Wife" and of "Jonathas," both from the Gesta Romanorum, which, with his "Learn to die," belong to his old age. After finally retiring from his private seal clerkship, he was granted in 1422 sustenance on the priory of Southwick, Hants, on which, with his former annuity, he appears to have lived till about the middle of the century. A "Balade to my gracious Lord of Yorke" probably dates from 1448 or later.

The main interest for us in Occleve's poems is that they are characteristic of his time. His hymns to the Virgin, balades to patrons, complaints to the king and the king's treasurer, versified homilies and moral tales, with warnings to heretics like Oldcastle, are illustrative of the blight that had fallen upon poetry on the death of Chaucer. The nearest approach to the realistic touch of Shakespearian tragedy is to be found in Occleve's "Male Regle." But these pictures of 15th-century London are without even the occasional flash of humour that lightens up Lydgate's London Lackpenny. Yet Occleve has at least the negative virtue of knowing the limits of his powers. He says simply what he means, and does not affect what he does not feel. A Londoner, to whom the country was evidently a bore, he has not afflicted us with artificial May mornings; and it is doubtful whether a single reference to nature can be found among his poems. He has yet another distinction among his contemporaries: he has not a allegory. Whether we ascribe it to his lack of "ongtine," or to the influence of Chaucer when in his later years he had discovered the limitations of this poetic form, we cannot but be grateful to the poet who has spared us. As a metrist Occleve is also modest of his powers. He confesses that Fader Chaucer fayl wold ban me taught, but I was dul and learned lite or naught.

and it is true that the scansion of his verses seems occasionally to require, in French fashion, an accent on an unaccented syllable. Yet his seven-line (or rime royale) and eight-line stanzas, to which he limited himself, are perhaps more frequently reminiscent of Chaucer's rhythm than are those of Lydgate.

A poem, "Ad bestam Virginem," generally known as the "Mother of God," and once attributed to Chaucer, is copied among Occleve's works in MS. Phillips 8151 (Cheltenham), and may thus be regarded as his work. Occleve found an admirer in the 17th century in William Browne, who included his "Jonathas" in the Shepheardes Pipe (1614). Browne added a eulogy of the old poet, whose works he intended to publish in their entirety (Works, ed. W. C. Hazlitt, 1869, ii. 956-958). In 1706 George Mason printed six Poems by Thomas Hesley, one of De Rerum Promissiore, "which was printed for the Roxburgh Club in 1880, and by the Early English Text Society in 1897. See Dr F. J. Furnivall's introduction to Hesley's Works, "The Minor Poems, in MS. Phillips 8151, and the Durham MS. III. 9 (Early English Text Society, 1892." (W. S. M.)

**OCCULTATION (from Lat. occultare, the frequentative of occultare, to hide), in astronomy, the hiding of one celestial body by another passing in front of it; commonly the passage of the moon or of a planet between the observer and a star or another planet.**

**OCEAN AND OCEANOGRAPHY.** "Ocean" is the name applied to the great connected sheet of water which covers the greater part of the surface of the Earth. It is convenient to divide the subject-matter of physical geography into the atmospheric sphere, hydrosphere and lithosphere, and in this sense the ocean is less than the hydrosphere in so far as the latter term includes also the water lying on or flowing over the surface of the land. The conception of an encompassing ocean bounding the habitable world is found in the creation myths of the most ancient civilizations. The Babylonians looked on the world as a vast round mountain rising from the midst of a universal sheet of water. In the Hindus, the world was the watery mass, another food, in place, the "Ocean," where the word of God, and the dry land appeared. The Indian geographers looked on the circular disk of the habitable world as surrounded by a mighty stream named Oceanus, the name of the primeval god, father of gods and men, and thus the bond of union between heaven and earth. The Greek word Ὠκεανός is related to the Sanskrit oṣāyana, "the encompassing." Philologists do not know of any related word in Semitic languages.

Pictet, however, recognizes allied forms in Celtic languages, e.g. the Irish oisín and Cymric eifin.

Since the Pythagorean school of philosophy upheld the spherical as against the disk-shaped world, some of the ancient geographers, including Eratosthenes and Strabo, looked upon the hydrosphere as forming two belts at right angles to each other, one belt of ocean following the equator, the other surrounding the earth from pole to pole as in the terra quadrifida of Macrobius; while others, including Aristotle and Ptolemy, looked upon the inhabited land, or oikumene, as occupying the greater part of the earth's surface, so that the Indian Ocean was an enclosed sea and India (i.e. eastern Asia) was only separated from Europe by the Atlantic Ocean. It was the work of the Arab geographers of the middle ages, so that until the discovery of America and of the Pacific Ocean the belief was general that the land surface was greater than the water surface, or that at least the two were equal, as Mercator and Varenus held. Thus it was that a great South Land appeared on the maps, the belief in the prodigious extension of which certainly received a severe shock by Abel Tasman's voyage of circumnavigation, but was only overthrown after Cook's great voyages had proved that any southern land which existed could not extend appreciably beyond the selected of the southern continent had been demonstrated within the modest limits of Antarctica.

**Oceanography** is the science which deals with the ocean, and since the ocean forms a large part of the earth's surface oceanography is a large department of geography. The science is termed talassographia by the Italians, and attempts have been made without success to introduce the name "thalassography." Of recent years the use of "hydrography" as the equivalent of physical oceanography has acquired a certain currency, but as the word is also used with other than the oceanographic meaning (see Surveying) it ought not to be used for oceanography.

Like geography, oceanography may be viewed in two different ways, and is conveniently divided into general oceanography, which deals with phenomena common to the whole ocean, and special oceanography, which has to do with the individual characteristics of the various divisions of the ocean. This article is restricted to general oceanography in its physical aspects, the closely-related meteorological, biological and economic aspects being dealt with elsewhere.

**Methods of Research.** When research in oceanography began, the conditions of the sea were necessarily observed only from the coast and from islands, the information derived from mariners as to the condition of parts of the sea far from land being for the most part mere anecdotes bearing on the marvellous or the frightful. In recent times, especially since the rapid increase in the study of the exact sciences during the 19th century, observations at sea with accurate instruments have become common, and the ships' logs of to-day are provided with headings for entering daily observations of the phenomena of the sea-surface. The contents of the sailors' scientific logs were brought together by the American enthusiast in the study of the sea, Matthew Fontaine Maury (1806-1873), whose methods and plans were discussed and adopted at international congresses held in Brussels in 1853 and in London in 1873. By 1904 more than 6800 of these meteorological logs with 7,000,000 observations had been accumulated by the Meteorological Office in London; 20,000 with 10,000,000 observations by the German Marine Observatory at Hamburg; 4700 with 3,300,000 observations by the Central Institute of the Netherlands at de Bilt near Utrecht. The Hydrographic Office of the United States had collected 3800 meteorological logs with 5,000,000 entries before 1888; but since that time the logs have contained only one observation daily (at Greenwich noon) and of these 2,380,000 entries had been received by 1904. In the archives of the French Marine in Paris there were 3300 complete logs with 830,000 entries and 11,000 abstract logs from men-of-war. The contents of these logs, it is true, refer more to maritime meteorology than to oceanography properly so-called, as their main purpose is to
promote a rational system of navigation especially for sailing ships, and they are supplied by the voluntary co-operation of the sailors themselves.

While the sailors' logs supply the greater part of the scientific evidence available for the study of the surface phenomena of the ocean, they have been supplemented by the records of numerous scientific expeditions and latterly by publications embodying systematic observations on a permanent basis. Valuable observational data in oceanography during the expedi-
tions of Captain James Cook and the polar explorers, especially those of Sir John Ross in the north and Sir James Ross in the south, but the voyage of H.M.S. "Challenger" in 1872-1876 formed an epoch marking the end of the older order of things and the begin-
ning of modern oceanography as a science of precision. The telegraph cable companies were quick to apply and to extend the oceanographical methods useful in cable-laying, and to their practical acuteness many of the most important improve-
ments in apparatus are due. A second epoch comparable to that of the "Challenger" and resulting like it in a leap forward in the precision of the methods previously employed was marked by the institution in 1900 of the International Council for the Study of the Sea. This council was nominated by the govern-
ments of Norway, Sweden, Denmark, Finland, Russia, Germany, Great Britain, Holland and Belgium, with headquarters in Copenhagen and a central laboratory at Christiania, and its aim was to furnish data for the improvement of the fisheries of the North Sea and surrounding waters. In the course of investigating this special problem great improvements were made in the methods of observing in the deep sea, and also in the representa-
tion and discussion of the data obtained, and a powerful foundation was given to the study of oceanography in all the countries of Europe. The efforts of individual scientific workers cannot as a rule produce such results in oceanography as in other sciences, but exceptions are found in the very special services rendered by the prince of Monaco, who founded the Oceanographical Institute in Paris and the Oceanographical Museum in Monaco; and by Professor Alexander Agassiz in the investigation of the Pacific.

Extent of the Ocean.—The hydrosphere covers nearly three-
quarters of the earth's surface as a single and continuous expanse of water surrounding four great insular land-masses known as the continents of the Old World (Europe, Asia, Africa), America, Australia and Antarctica. As we are still ignorant of the propor-
tions of land and water in the polar regions, it is only possible to give approximate figures for the extent of the ocean, for the position of the coast-lines is not known exactly enough to exclude possible errors of perhaps several hundred thousand square miles in estimates of the total area. Speaking generally, we may say with confidence that water predominates in the unexplored northern polar area, and that it is very unlikely that new land of any great extent exists there. On the other hand, recent Antarctic ex-
ploration makes it practically certain that a great continent is sur-
rounds the south pole with a total area considerably more than Sir John Murray's estimate in 1894, when he assigned to it an area of 9,000,000 sq. km. (3,500,000 sq. statute miles). It is probable that the Antarctic continent measures about 13,000,000 sq. km. (5,000,000 sq. statute miles); and thus if we accept Bessel's figure of 300,900,000 sq. km. (106,000,000 sq. m.) for the whole surface of the sphere, there is a total land area of 14,8,8,20,000 sq. km. (57,6,460,000 m.), and a total water area of 36,1,130,000 sq. km. (130,455,000 sq. m.), 67% of land and 33% of water, or a ratio of 1:2.413.

Divisions of the Ocean.—The arrangement of the water surface on the globe is far from uniform, the ocean forming 61% of the total area of the northern and 81% of that of the southern hemisphere. Of the whole ocean only 43% (154,490 million sq. km.) lies in the northern hemisphere and 57% (206,2 million sq. km.) in the southern. If the globe is divided into hemispheres by the meridians of 20° W. and 160° E., as is usual in atlases, the eastern hemisphere, to which the Old World belongs, has 62% of the total area, and the western hemisphere, containing America, has 38%. The great circle can be drawn upon a terrestrial globe in such a way as to divide it into two hemispheres, one of which contains the greatest amount of land and the other the greatest amount of sea of any possible hemispheres. The centre of the so-called land-hemisphere lies near the mouth of the Loire (47° 30' N. and 2° 30' W.), while the centre of the so-called water-hemisphere lies to the S.E. of New Zealand and eastward of Antipodes Island. Even in the land hemisphere the water area (134,5 million sq. km.) is in excess of the land area (221 million sq. km.), while in the water-hemisphere the amount of land (14,5 million sq. km.) is in excess of the water area (134,5 million sq. km.) compared with 230,5 million sq. km. of water.

The outline of the water surface depends on the outline of the basins in which it is contained. The four great continental masses therefore give the ocean a distinctly tripartite form, the three great divisions being known as the Atlantic, the Indian, and the Pacific Oceans, all three running together into one around Antarctica. Thus the connecting belt of water is narrow as compared with the extent of the oceans from north to south—Drake Strait south of South America is barely 400 m. wide, while Cape Carlsberg to Enderby Land, 2,000 m., and from Tasmania to Wilkes Land, 1,550 m., while the meridional extension of the Indian Ocean is 6,000 m., of the Pacific, 43,000 m., and of the Atlantic, 12,000 m., measuring across the North Pole to Bering Strait. These proportions are not readily grasped from a map of the world on Mercator's projection, and must be studied on a globe. A simple, practical boundary between the three oceans can be obtained by prolonging the meridian of the southern extremity of each of the three southern continents to the Anti-
artic circle. A committee of the Royal Geographical Society—
the deliberations of which were interrupted by the departure of Dr. John Hay in 1903, and by the loss of the ship—suggested these meridians as boundaries; the north and south boundaries of the Atlantic and Pacific Oceans being the polar circles, leaving an Arctic and an Antarctic Ocean to complete the hydrosphere. We now know, however, that the Antarctic circle runs so close to the coast of Antarctica that the Antarctic Ocean may be left out of account. It has been found more convenient to take as northern boundaries the narrowest part of the straits near the Arctic circle, Bering Strait on the Pacific side, and on the Atlantic side the narrowest part of Davis Strait, and of the Antarctic, the shortest line from Iceland to the Færoes, thence to the most northerly island of the Shetlands and thence to Cape Statdahl in Norway. It has also been found convenient to take the boundary between the Atlantic and Pacific, as the shortest line across Drake Strait, from Cape Horn through Snow Island to Cape Gunnar, instead of the meridian of Cape Horn. Possibly ridges of the sea-bed running southward from the southern continents may yet be discovered which would form more natural boundaries than the meridians. The com-
mittee of the Royal Geographical Society settled the existing nomenclature of the three great oceans. Some authors include the Arctic Sea in the Atlantic Ocean, and some prefer to consider the southern part of the Atlantic, Indian and Pacific Oceans as a Great Southern Ocean. Sir John Herschel took as the northern boundary of the southern ocean the greatest circle which could touch the southernmost extremities of the three southern con-
tinents. Such a circle, however, runs so near the coast of Antarctica as to make the southern ocean very small. Others, like Malte Brun (1803) and Supan (1903), take the loxodromes between the two capes and call the ocean to the south the Antarctic Ocean. G. v. Bogułaski suggested the parallel of 50° S. and Latzsch the parallel of 40° S. as limiting lines. None of these schemes has the coast of Antarctica been adequately considered, and they have all been too much influenced by the Mercator map. Each of the three oceans, Atlantic, Indian and Pacific, possesses an Antarctic facies in the southern part and a tropical facies between the tropics, and the Atlantic and Pacific an Arctic facies in their northern parts.

Where the ocean touches the continents the margin is in places deeply indented by peninsulas and islands marking off portions of the water surface which from all antiquity to the present moment are all called "sea." These seas are entirely dependent on the ocean for their regime, being filled with ocean water, though subject to
influence by the land, and the tides and currents of the ocean affect them to a greater or less extent. They owe their origin to depressions of the earth’s crust of no very wide extent and not running very far into the continental mass, and geologically they are of recent age and still subject to change. In these respects they contrast with the great oceans which owe their origin to the most extensive and the profoundest depressions of the crust, date back at least to Mesozoic times, and have perhaps remained permanently in their present position from still remoter ages.

Seas may be classified according to their form either as "enclosed" or as "partially enclosed" (or "fringing"). Enclosed seas extend deeply into the land and originate either by the breaking through of the ocean or by the overflowing of a subsiding area. They are connected with the ocean by narrow straits. The salinity of the water contained in them differs in a marked degree from that of the ocean, and the tidal waves are of small amplitude. Four great intercontinental enclosed seas are included between adjacent continents—the Arctic Sea, the Central American or West Indian Sea, the Australo-Asiatic or Malay Sea and the Mediterranean Sea. There are also four smaller continental enclosed seas each with a single channel of communication with the ocean, viz. the Baltic Sea and Hudson Bay with very low salinity, the Red Sea and Persian Gulf with very high salinity.

The fringing or partially enclosed seas adjoin the great land masses and are only separated from the oceans by islands or peninsulas. Their tidal conditions are irregular. The though their salinity is usually rather lower than that of ocean water. The four fringing seas of eastern Asia, those of Bering, Okhotsk, Japan and East China, are arranged parallel to the main lines of dislocation in the neighbouring land-masses, and so are the Andaman Sea and the Gulf of California. On the contrary, the North Sea, the British fringing seas (English Channel, Irish Sea and Minch), and the Gulf of St Lawrence cross the main lines of dislocation.

In addition to these seas notice must be taken of the subordinate marginal features, such as gulfs and straits. Gulfs may be classified according to their origin as due to fractures of the crust or overflowing of depressed lands. The former are either the extensions of oceanic depressions, e.g. the Arabian Sea, Bay of Bengal and Gulf of Arica, or such caldron-depressions as the Gulfs of Genoa and Taranto, or rift-depressions like the Gulfs of Aden and Akaba. Compound gulfs are formed by fracture and landward by the overflowing of depressed land, e.g. the Bay of Biscay, Gulf of Alaska and Gulf of the Lion. Gulfs formed by the overflowing of depressed lands lie upon the continental shelf, e.g. the Gulf of Maine, Bay of Fundy, Bay of Oman, Gulf of Maribo, or by volcanic activity.

Straits have been formed {1} by fracture across isthmuses, and such may be by longitudinal fracture as in the Strait of Bab-el-Mandeb, or transverse fracture as in the Strait of Gibraltar or Cook Strait; {2} by erosion, e.g. the Strait of Dover, the Dardanelles and Bosphorus; {3} by overflowing through the subsidence of the land, as in the straits of Bering, Torres and Formosa.

Surface of the Ocean.—If the whole globe were covered with a uniformly deep ocean, and if there were no difference of density between one part and another, the surface would form a perfect ellipsoid of revolution, that is to say, all the meridians would be exactly equal ellipses and all parallels perfect circles. At any point a sounding line would hang in the line of the radius of curvature of the water surface. But as things are the water-surface is broken by land, and the mean density of the substance of the land is 2-6 times as great as that of sea-water, so that the gravitational attraction of the land must necessarily cause a heaping up of the sea around the coasts, forming what has been called the continental wave, and leaving the sea-level lower inland. Hence the geoid or figure of the sea-surface is not part of an ellipsoid of rotation but is irregular. If differences of level between different parts of the geoid have been greatly overestimated in the past; F. G. Helmert has shown that they cannot exceed 650 ft. and are probably much less. Recent pendulum observations have shown that it is incorrect to assume a uniform density of 2-6 in the elevated part of the earth’s crust, that on the contrary there are great local differences in density, the most important being a confirmation of Airy’s discovery that there is a marked deficiency of mass under high mountains and a marked excess under the bed of the ocean. The intensity of gravity at the surface of the seas far from land has been measured on several occasions. During Nansen’s expedition on the “Fram” in 1894–1895, Scott Hansen made observations with a Sterneck’s half-seconds pendulum on the ice where the sea was more than 1600 fathoms deep and found only an insignificant deviation from the number of swings corresponding to a normal ellipsoid. In 1901 O. Hecker took the opportunity of a voyage from Hamburg to La Plata, and in 1904 and 1905 of voyages in the Indian and Pacific Oceans to determine the local attraction over the ocean by comparing the atmospheric pressure measured by means of a mercurial barometer and a boiling-point thermometer, and obtained results similar to Scott Hansen’s. The inequalities of the geoid in no case exceed 300 ft. Distortion of the ocean surface may also arise from meteorological causes, and be periodic or aperiodic in its occurrence, but it does not amount to more than a few feet at the utmost. Solar radiation warms the tropical more than the polar waters, but, assuming equal salinity, this cause would not account for a difference of level of more than 20 ft. between tropical and polar seas. The annual temperatures, and their irregularities, are largely a matter of evaporation and precipitation and must account for differences of surface layer of water about 25 fathoms thick in the Baltic is as much as 20° F., but this only corresponds to a difference of level of 12 in. due to expansion or contraction.

Atmospheric precipitation poured into the sea by the great rivers must necessarily create a permanent rise of the sea-level at their mouths, and from this cause the level round the coasts of rainy lands must be greater than in mid-ocean. H. Mohn has shown how the inequalities of what he terms the density-surface can be found from the salinity and temperature; and he calculates that the level of the Skagerrak should be about 2 ft. higher than that of the open Norwegian Sea between Jan Mayen and the Lofoten Islands. The level of the Gulf of Finland at Kronstadt and of the Gulf of Bothnia at Haparanda should similarly be 15 in. higher than that of the Skagerrak. Recent levellings along the Swedish and Danish coasts have confirmed the higher level of the Baltic; and the level of the Mediterranean has also been determined by exact measurements to be from 13 to 24 in. lower than that of the Atlantic on account of evaporation. Apart from the effects of varying precipitation and evaporation the atmosphere affects sea-level also by its varying density. The difference between the barometric pressure at the level of the sea and the barometric pressure at an equal altitude on the land is called the geostrophic difference, and is due to the pressure of air above and the tension of water below the level of the sea. The differences between two given points being thirteen times as great as the difference between the corresponding readings of the mercurial barometer. In the north tropical belt of high pressure south of the Azores the atmospheric pressure in January is 0-87 in. higher than in the Irminger Sea; hence the sea-level near the Azores is almost 1 ft. lower than in the northern sea. In the monsoonal region, where the barometer rises 0-38 in. between July and January, the level of the sea falls in consequence by 5 in. Wind also gives rise to differences of level by driving water against it. Rain falls to the level of the sea, as it must, and so drives the level of the sea up. If the falling water is driven westwards by a wind from the Gulf of St Lawrence, the level of the sea in Nova Scotia is raised by 0-5 in. lower than at Arkona on Rügen. Periodic variations of level due to meteorological causes account for the Baltic being fuller in the time of the summer rains than in winter, when the rivers and lakes are frozen and most of the precipitation on the land is in the form of snow. The range on the Arkona gauge is from 3-5 in. below mean level in April to 2-75 in. above the mean level in August. A similar range occurs on the Dutch coast in the North Sea, where the maximum level is reached in October, the month of highest rainfall, and there is a range of 0-15 in. between the highest and the lowest level in spring. In the monsoon regions the half-yearly change from on-shore to off-shore winds produces noticeable differences in
level; thus fifteen years' observations at Aden show a maximum in May at the end of the north-east monsoon, and a rapid falling off after the beginning of the south-west monsoon to a minimum in August, the total range being 64 ft. The influence of wind on water-level is most marked in heavy storms on the flat coastal areas of the North Sea and Baltic, when the rise may amount to very many feet. In the region of tropical hurricanes the converging wind system of a circular storm causes a heaping up of water capable of devastating the low coral islands of the Pacific. On the 1st of November 1876 a cyclone acting in this way submerged a great area of the level plain of the Ganges delta to a depth of 46 ft.; here the influence of the difference of pressure within and without the cyclone acted in the same direction as the wind. The old explorations of the Southern seas are made of marked importance at the Mediterranean and the Red Sea, and on the two sides of the Isthmus of Panama, which hindered the projects for canals connecting those waters, have been proved by modern levelling of high precision to be totally erroneous.

*Deep-sea Soundings.*—The hand-lead attached to a line divided into fathoms was a well-known aid to navigation even in high antiquity, and its use is mentioned in Herodotus (ii. 5) and in the Acts of the Apostles (xxvi. 29). Greater depths than those usually sounded by a hand-line may possibly not have been beyond the reach of the earlier navigators, for Strabo says of measured soundings, "one thousand fathoms" (i. 3, p. 53 Cas.). Yet we find that the great discoverers of the modern period were only familiar with the hand-lead, and the lines in use did not exceed 200 fathoms in length. Ingenious devices had indeed been tried in the 17th century and earlier, by which a lead thrown into the sea without a line detached a float on striking the bottom, and it was proposed to calculate the depth by the time required for the float to reappear. The earliest deep-sea sounding on record is that of Captain Phipps on the 4th of September 1775 in the Norwegian Searock together all the sounding-lines on board, and with a weight of 150 lb attached he found bottom in 683 fathoms and secured a sample of fine soft blue mud. He detected the moment of the lead touching the bottom by the sudden slackening in the rate at which the line ran out. Polar explorers frequently repeated those experiments in deep-sea soundings, both William Scoresby and Sir John Ross obtaining notable results, though not reaching depths of more than 1200 fathoms. The honour of first sounding really oceanic depths belongs to Sir James Clark Ross, who made soundings in the excellent measurements of "the Russian ship "Kommader" on the 29th of May 1841, in 12,440 fathoms, while in a few instances he overestimated the depth by failing to detect at the moment which the lead touched bottom. The pursuit of these isolated investigations received a great impetus from the enthusiasm of the great American oceanographer Captain Matthew Fontaine Maury, U.S.N., who directed the whole impetuous strength of his character to the task of compelling the silent depths of the ocean to tell their tale. Instead of the expensive mile-long stout hemp lines used by Ross, Maury introduced a ball of strong twine attached to a cannon shot, which ran out rapidly; when the bottom was reached the twine was cut and the depth deduced from the length of string left in the ball on board. The time of touching bottom was judged by timing each 100-fathom mark and noting the sudden increase in the time interval when the shot reached the bottom. Maury, however, recognized that in great depths the surest guarantee of bottom having been reached was to bring up a sample of the deposit. To do this with a heavy lead attached required a very strong hemp line, and the twine used in the American method was useless for this purpose. In 1854 J.M. Brooke, a midshipman of the U.S.N., invented the principle already foreshadowed by Niccolò Conti. In the 15th century in "Navigazione," and by Robert Hooke in the 17th, of using a heavy weight so hung on the sounding-tube that it was automatically released on striking the bottom and left behind, while the light brass tube containing a sample of the deposit was easily hauled up. This principle has been adopted universally for deep soundings, and is now applied in many forms. In 1855 Maury published the first chart of the depths of the Atlantic between 52° N. and 10° S. At this period an exact knowledge of the depths of the ocean assumed an unlooked-for practical importance from the daring project for laying a telegraph cable between Ireland and Newfoundland. Deep soundings were made in the U.S.N. for this purpose by vessels both of the British and of the American navies, while in the Mediterranean and in the Indian Ocean many soundings were made in connexion with submarine cables to the East. Another stimulus came from the biologists, who began to realize the importance of a more detailed investigation of the life conditions of organisms at great depths in the sea. The lead in this direction was taken by British biologists, beginning with Edward Forbes in 1859, and in 1868 a party on board H.M.S. "Lightning" pursued researches in the waters to the north of Scotland. In 1869 and 1870 this work was extended to the Irish Sea and Bay of Biscay in H.M.S. "Porcupine," and to the Mediterranean in H.M.S. "Shearwater." The last-named vessel secured 157 trustworthy deep soundings, with samples of the deposits, and also observations of temperature and salinity in different depths, as well as dredgings for the collection of the organisms of the deep sea.

These preliminary trips of scientific marine investigation were followed by the greatest purely scientific expedition ever undertaken, the voyage of H.M.S. "Challenger" round the world in 1872-76, which, according to the plan of Captain Robert Whytlaw-Scott, was fitted out as a purely scientific expedition without any desire to make war or a naval command of Sir George Nares. This epoch-making expedition lasted from Christmas 1872 to the end of May 1876, and gave the first wide and general view of the physical and biological conditions of the ocean as a whole. Almost simultaneously with the "Challenger," a German expedition in S.M.S. "Gazelle" conducted observations in the South Atlantic, Indian and South Pacific Oceans; and the U.S.S. "Tuscarora" made a cruise in the North Pacific, sounding out lines for a projected Pacific cable. The successor of Sir Wyville Thomson in the "Challenger," Professor Murray, was often correctly said that since the days of Columbus and Magellan no such revelation regarding the surface of our planet had been made as in that eighth decade of the 19th century. Since that time the British cable-ships have been busy in all the oceans making sections across the great expanses of water with ever-increasing accuracy, and in that work the government surveying ships have also been engaged, vast stretches of the Indian and Pacific Oceans having been opened up to knowledge by H.M.S.S. "Egeria," "Waterwitch," "Dart," "Penguin," "Stork," and "Midget." These scientific enterprises, under the guidance of Professor Alexander Agassiz, have been active in the North Atlantic and especially in the Pacific Ocean, where very important investigations have been made. The eastern part of the North Atlantic has been the scene of many expeditions, often purely biological in their purpose, amongst which there may be mentioned the cruises of the "Travaveur" and "Talisman " under Professor Milne-Edwards in 1880-85, and since 1887 those of the prince of Monaco in his yachts, as well as numerous Danish vessels in the sea between Ireland and Greenland, conspicuous amongst which were the expeditions of 1896-1898 on board the "Ingolf." The Norwegian Sea was studied by the Norwegian expedition on board the "Vöringen" in 1876-1878, and the north polar basin by Nansen and Sverdrup in the "Fram" in 1893-1896, the Mediterranean by the Italians on the "Washington" and by the Austrians on the "Pola" in 1896-1893, the latter carrying the investigations to the Red Sea in 1893-1898, while the Russians investigated the Black Sea in 1890-1893. For high southern latitudes special value attaches to the soundings of the German deep-sea expedition on the "Valdivia" in 1898-1899, and to those of the "Gauss," and the "Gauss" and the "Scolopi" in 1903-1904. The soundings of the Dutch expedition on the "Siboga" during 1899-1900 in the eastern part of the Malay seas and those of the German surveying ship "Planet" in 1906 in the South Atlantic, Indian and North Pacific Oceans were notable, and Sir John Murray's expedition on the "Michael Sars" in the Atlantic in 1910 obtained important results.
Modern surveying ships no longer make use of hempen lines with enormously heavy sinkers, such as were employed on the "Challenger," but they sound instead with steel piano wire not more than \( \frac{3}{8} \) to \( \frac{5}{8} \) of an inch in diameter and a detachable lead seldom weighing more than 70 lb. The soundings are made by means of a special machine fitted with a brake so adjusted that the revolution of the drum is stopped automatically the instant the lead touches the bottom, and the depth can then be read directly from an indicator. The line is hauled in by a steam or electric winch, and the sounding-tube containing a sample of the bottom deposit is rapidly brought on board. The sounding machines most frequently employed are those of Admiral C. D. Sigsbee, U.S.N., of Lucas, which was perfected in the Telegraph Construction and Maintenance Company's ships, and of the Prince of Monaco, constructed by Leblanc of Paris. All attempts to dispense with a lead and line and to measure the depth by determining the pressure at the bottom have hitherto failed when applied to depths greater than 200 fathoms; a new hydraulic manometer has been tried on board the German surveying ship "Planet." A. Siemens has pointed out that a profile of the sea-bed can be delineated by taking account of the varying strain on a submarine cable while it is being laid, and the average depth of a section can thus be ascertained with some accuracy. All deep-sea measurements are subject to uncertainty because the sounding machine merely measures the length of wire which runs out before the lead touches bottom, and this agrees with the depth only when the wire is perpendicular throughout its run. It is improbable, however, that the smooth and slender wire is much influenced by currents, and the best deep-sea soundings may be taken as accurate to within 5 fathoms.

Relief of the Ocean Floor.—Recent soundings have shown that the floor of the ocean on the whole lies some 2 or 3 m. beneath the surface, and O. Krümmel has calculated the mean depth to be 2010 fathoms (12,050 ft.), while the mean elevation of the surface of the continents above sea-level is only 2300 ft. Viewed from the floor of the ocean the continental block would thus appear as a great plateau rising to a height of 14,350 ft. Nevertheless, the greatest depths of the ocean below sea-level and the greatest heights of the land above it are of the same order. The summit of Mount Everest rising to 29,000 ft. above the sea-level, while the Nero Deep near Guam sinks to 31,600 ft. (5268 fathoms) below sea-level. Of course the area at great heights is very much less than the area at corresponding depths. Above the height of 15,000 ft. there are 800,000 sq. km. (310,000 sq. m.), and below the depth of 15,000 ft. there are 120,000,000 sq. km. (46,300,000 sq. m.); above the height of 20,000 ft. there are on the whole surface of the earth only 33,000 sq. km. (12,800 sq. m.), while below the depth of 20,000 ft. there are no less than 5,400,000 sq. km. (2,100,000 sq. m.). According to Krümmel's calculation the areas of the ocean beyond various depths are as follows:

<table>
<thead>
<tr>
<th>Fathoms</th>
<th>sq. km.</th>
<th>sq. st. m.</th>
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<tbody>
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<td>More than</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>350,500,000</td>
<td>135,300,000</td>
</tr>
<tr>
<td>500</td>
<td>319,500,000</td>
<td>123,400,000</td>
</tr>
<tr>
<td>1000</td>
<td>304,000,000</td>
<td>117,400,000</td>
</tr>
<tr>
<td>1500</td>
<td>270,500,000</td>
<td>106,300,000</td>
</tr>
<tr>
<td>2000</td>
<td>215,000,000</td>
<td>83,000,000</td>
</tr>
<tr>
<td>2500</td>
<td>120,000,000</td>
<td>46,300,000</td>
</tr>
<tr>
<td>3000</td>
<td>22,000,000</td>
<td>8,300,000</td>
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<td>3500</td>
<td>3,000,000</td>
<td>1,200,000</td>
</tr>
<tr>
<td>4000</td>
<td>1,200,000</td>
<td>460,000</td>
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</tbody>
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On the whole the floor of the ocean is very smooth in its contours, and great stretches can almost be called level. Modern ometry has introduced the calculation of the mean angle of the slope of a given uneven surface provided that maps can be prepared showing equidistant contour lines. If the distance between the contour lines is \( h \) and the length of the individual contour lines \( l \), the sum of their lengths \( \Sigma l \), and \( A \) the area of the surface under investigation, then the mean angle of slope is obtained from the equation

\[
\tan \alpha = \frac{\Sigma l}{A}
\]

Calculating from sheet A I of the Prince of Monaco's Atlas of Ocean Depths,1 Krümmel obtained a mean angle of slope of \( \alpha \) 27° 44' or an average fall of 1 in 124 for the North Atlantic between 0° and 47° N., the enclosed seas being left out of account. In the same way a mean angle of slope of approximately half a degree was found for the Adriatic and the Black Sea. Large angles of slope may, however, occur on the flanks of oceanic islands and the continental borders. On the submarine slopes leading up to isolated volcanic islands angles of 15° to 20° are not uncommon, at St. Helena the slopes run up to 38° and even 40°, at Tristan d'Acunha to 33°. E. Hull found a mean angle of slope of 13° to 14° for the edge of the continental shelf off the west coast of Europe, and off Cape Toriñana (43° 4' N.) as much as 34°. Where the French telegraph cable between Brest and New York passes from the continental shelf of the Bay of Biscay to the depth of the Atlantic a distinct relief of slope is from 30° to 41°. Such gradients are of a truly mountainous character, the angle of slope from the Elisee to the Zugspitze is 30°, and that from Alpigen station to the summit of the Eiger is 42°. Particularly steep slopes are found in the case of submarine domes, usually incomplete volcanic cones, and there have been cases in which after such a dome has been discovered by the soundings of a surveying ship it could not be found again as its whole area was so small and the deep floor of the ocean from which it rose to such a flat that an error of 2 or 3 m. in the position of the ship would prevent any irregularity of the bottom from appearing. While such steep mountain walls are found in the bed of the ocean it must be remembered that they are very exceptional, and except where there are great dislocations of the submarine crust or volcanic outbursts the forms of the ocean floor are incomparably gentler in their outlines than those of the continents. Being protected by the water from the rapid subaerial erosion which sharpens the features of the land, and subjected to the regular accumulation of deposits, the whole ocean floor has assumed some approach to uniformity. Still there are everywhere gentle inequalities on the smoothest ocean floor which give rise to local phenomena.

In spite of the increase of deep-sea soundings in the last few decades, they are still very irregularly distributed in the open ocean, and the attempt to draw isobaths (lines of equal depth) on a chart of the world is burdened with many difficulties which can only be evaded by the widest generalizations. Bearing this caution in mind the existing bathymetrical charts, amongst which that of the prince of Monaco stands first, give a very fair idea of the great features of the bed of the oceans. A definite terminology for the larger forms of sub-oceanic relief was put forward by the International Geographical Congress at Berlin in 1899 and adopted by that at Washington in 1904. Equivalent terms, which are not necessarily identical or literal translations, were adopted for the English, French and German languages, the equivalence being closest and most systematic between the English and German terms.

The larger forms designated by special generic terms include the following. The continental shelf is the gentle slope which extends from the edge of the land to a depth usually about 100, though in some cases as much as 300 fathoms, and is there demarcated by an abrupt increase in the steepness of the slope to varying depths. In the deep sea two types of feature are recognized under the general names of depression and elevation. The depression is distinguished according to form and slope as (1) a basin when of a roughly round outline, (2) a trough when wide and elongated, or (3) a trench when narrow and elongated lying along the edge of a continent. The extension of a basin or trough stretching towards the continent is termed an embayment when relatively wide and a gully when narrow. The elevation includes (1) the gently swelling rise which separates

1 Carte générale bathymétrique des océans dressée par ordre de S.A.S. le Prince Albert de Monaco, 24 sheets (Paris, 1904).
troughs and basins in the middle of the ocean, (2) the steeply sloping ridge which interposes a narrower barrier between two depressions, and (3) the plateau or wide elevation rising steeply on all sides from a depression. The deepest part of a depression is termed a deep, and the highest part of an elevation when not reaching the surface a bank or height. In addition to these larger forms a few minor forms must be recognized. Amongst these are the dome, an isolated elevation rising steeply but not coming within 100 fathoms of the surface; the bank, an elevation coming nearer the surface than 100 fathoms, but not so near as 6 fathoms; and finally the shoal or reef, which comes within 6 fathoms of the surface, and so may constitute a danger to shipping. Similarly we may note the caldron or small steep depression of a round outline, and the furrow or long narrow groove in the continental shelves.

According to the resolutions of the International Geographical Congress the larger individual forms which have been described by generic terms shall have specific names of a purely geographical character; but in the case of the minor forms the names of ships and persons are considered applicable. In 1890 A. Supan published a chart of the oceans with a suggested nomenclature based on these principles; and the larger forms in the Prince of Monaco's great chart also are named in accordance with the rule. Although put forward by the highest international authority recognized by geographers the system of nomenclature has not been adopted by the hydrographers. Sir John Murray considers that only deeps exceeding 3000 fathoms in depth should be named, and in his charts he has named these deeps after persons whether the individuals thus honoured had themselves discovered or explored the deeps in question or not. Some of the "deeps" to which names have been given disappear or are divided into two or three smaller deeps when the contour lines representing hundreds of fathoms are translated into contour lines representing hundreds of metres. A similar change in the contour lines may result from the subsidence of lines in fathoms for those originally drawn in metres, and hence it is extremely desirable that specific names should only be given to such features as are pronounced enough to appear on maps drawn with either unit. For the sake of uniformity it is to be hoped that the system of nomenclature recommended by the International Geographical Congress will ultimately be adopted.

The continental shelves are parts of the great continental blocks which have been covered by the sea in comparatively recent times, and their surface consequently presents many similarities to that of the land, modified of course by the restless and constructive work of the waters. In particular the currents produce their full effects in that region, and in high latitudes the effect of transport of materials by ice is very important; while in the warm water of the tropics the reef-building animals and plants (corals and calcareous algae) carry on their work most effectively there. The continental shelves include not only the oceanic border of the continents but also great areas of the enclosed seas and particularly of the fringing seas, the origin of which through secular subsidence is often very clearly apparent, as for instance in the North Sea and the tropical Pacific around the edges of the Farallon Rises. Observations and investigations have revealed that the continental shelf is composed of fragments of rock abraded and transported by tidal currents and storms in the same way that the chalk and limestone worn off from the eastern continuation of the island of Heligoland during the last two centuries has been reduced to the coarse gravel of the off-lying Düne. Numerous old river valleys and furrows entrenched in the continental shelf bear witness to its land origin. Such valleys are very clearly indicated in the belts of the western Baltic by furrows a thousand yards wide and twenty to thirty fathoms deeper than the neighbouring sea-bed. Amongst the best known of the furrows of the continental shelf are the Cape Breton Deep in the Bay of Biscay, the Hudson Furrow, southward of New York, the so-called Congo Cañon, the Swatch of No Ground off the Ganges delta, the Bottomless Pit off the Niger delta, and numerous similar furrows on the west coast of North America and outside the fjords of Norway, Iceland and the west of Scotland, as well as in the Firth of Forth and Moray Firth.

The seaward edge of the continental shelf often falls steeply to the greatest depths of the ocean, and not infrequently forms the slope of a trench, a form of depression which has usually a steep slope towards a continent or an island-bearing rise on one side and a gentler slope towards the general level of the ocean on the other. All the greatest depths of ocean, i.e., all soundings exceeding 4000 fathoms, occur in trenches, and there are only a few small trenches known (on the west coast of Central America) in which the maximum depth is less than 3000 fathoms. Most trenches are narrow, but of considerable length, and their steeper edge is believed to occur in lower as it goes to the ocean's crust. Strong evidence of this is afforded by the association of some of the depressions, notably the Japan Trench and the Atacama Trench, with the origin of frequent submarine earthquakes. Troughs and rises are features of more frequent occurrence and are best described as they occur in the particular oceans.

In the Atlantic the prevailing meridional direction of the shore lines extends to the submarine features also. Captain Sherard Osborn in 1870 was the first to recognize that the North Atlantic Basin was divided by a central rise running generally from north to south and parallel to the North American American coasts, and that a second and smaller rise obtained in the Bay of Biscay between 30° and 40° S. between the depths are between 1500 and 2000 fathoms, and then it rises again to about 1500 fathoms and runs eastward under the name of the Equatorial Ridge. Crossing the equator in 15° W. the rise resumes a southerly direction and from Ascension to Tristan d'Acunha, the depth is in many places less than 1500 fathoms. The soundings of Bruce's Antarctic expedition in the "Scotia" showed that the rise cannot be traced beyond 55° S. where the depths increase rapidly to over 2000 fathoms. The whole length of the rise which divides the Atlantic into an eastern and a western basin is 55 700 nautical miles, as 3° 50' of the Firth of Firth, in the depression, the depth is over 1500 fathoms, and to 12° N. the depth of the depression is over 2200 fathoms. The whole length of the rise which divides the Atlantic into an eastern and a western basin is as 3° 50' of the Firth of Firth, in the depression, the depth is over 1500 fathoms, and to 12° N. the depth of the depression is over 2200 fathoms. The existence of the latter, which extends to the African continent, was announced by Sir Wyville Thomson in 1876 as a result of his discussion of the deep-sea temperature observations of the "Challenger" expedition, though the fact was not confirmed by soundings until many years later.

The West Atlantic Trough lying on the western side of the Cape Risc Rises and extending inland from the north into the North American basin, and its greatest depths appears to be in the Porto Rico Trench, where in 1832 Capt. W. H. Brownson, U.S.N., obtained a sounding of 4515 fathoms in 10° 36' N., 66° 26' W. The Brazilian Basin has also a large area lying at a depth greater than 2500 fathoms and culminates in the Romanch de Deeps close to the Equatorial Ridge in 1° 11' S., 18° 15' W. with a depth of 4560 fathoms. The Eastern Atlantic Trough cannot boast of such great depths though the Peake Deep with 3284 fathoms sinks abruptly from the Azores Plateau in 45° 6' N., 16° 45' W., and several soundings exceeding 4000 fathoms have been obtained in the Bay of Biscay east of the meridian of 5° E. The North African Basin has several deeps with more than 3500 fathoms to the north-west and the south-west of the Cape Verde Islands, but the South African Basin is less deep. In the South Atlantic there is no connexion between the Central Rise and the Antarctic Shelf,
for the Indo-Atlantic Antarctic Basin stretches from near the South Sandwich Islands towards Kerguelen with depths exceeding 2500 fathoms and reaching in places 3100. The Cape Trough runs northward from this basin. It was long believed on the strength of a sounding of "4000 fathoms, no bottom" reported by Sir James Ross in 68° 29' S., 12° 40' W., that the Indo-Atlantic Basin was of enormous depth, but W. S. Bruce, in the "Scotia," showed in 1904 that the real depth at that point is only 700 fathoms.

In the Indian Ocean the Kerguelen Rise stretches broadly southward, east of the island which gives it a name, to the Antarctic Shelf with the greatest depths upon it usually less than 2000 fathoms, and it stretches northward beyond New Amsterdam to 30° S. This rise is separated from the Crozet Rise by a depression extending to 2675 fathoms, through which the Kerguelen Trough (which lies north of Kerguelen) is brought into free communication with the Indo-Atlantic Antarctic Basin. The greater part of the Indian Ocean is occupied by the great Indian Basin, which covers 23,500,000 sq. m.(13,500,000 sq. m.) and extends from the Chagos Islands eastward to Australia and south-eastward to Tasmania. The Australian Shelf rises steeply as a rule from depths of 2500 to 3000 fathoms. A broad depression with depths of from 3300 to 3500 fathoms lies to the east of the Cocos Islands and extends into the angle between the Malay Archipelago and Australia. On the north this depression sinks into the long and narrow Sunda Trench south of Java, and here in 10° 15' S., 108° 2' E., the German surveying-ship "Planet" obtained a sounding of 3828 fathoms in 1906. The Sunda Trench is distinguished by the wave-like configuration of its floor, and the wave-like character is continued to the westward of Sumatra with islands rising from the higher portions. The western part of the Indian Ocean has been shown by the surveys of H.M.S. "Sealark" and the German surveying-ship "Planet" to have somewhat a complicated configuration, the island groups and banks of atolls which occur there rising abruptly as a rule from depths of about 2000 fathoms or more. Between the Seychelles and Sokotra (6°-9° N.) there are great stretches of the ocean floor forming an almost level expanse at a depth of 2900 fathoms. The Arabian Gulf and Gulf of Aqaba are also very deep, 3500 to 3900 fathoms of about 1900 fathoms, while the floor of the Bay of Bengal rises very gradually northwards and is 1000 fathoms deep close up to the Ganges Shelf.

The Pacific Ocean consists mainly of one enormous basin bounded on the west by New Zealand and the Tonga, Marshall and Marianne ridges, on the north by the festoons of islands marking off the North Pacific fringing seas, on the east by the coast of North America and the great Easter Island Rise and on the south by the Antarctic Shelf. The total area of this basin is about 80,000,000 sq. km. (30,000,000 sq. m.), its surface being almost twice that of Asia. Half of this basin lies deeper than 2750 fathoms, and the greater part of it belongs to the northern hemisphere. From the floor of this vast and profound depression numerous isolated volcanic cones rise with abrupt slopes, and even between the islands of the Hawaiian group there are depths of more than 2000 fathoms. The Society Islands and Tahiti crown a rise coming within 1500 fathoms of the surface, two similar rises form the foundation of the Paumotu group where Agassiz found soundings of 2187 fathoms between Marokau and Hao. This greatest of ocean basins contains also the largest and deepest trenches. The Tucurara Deep of the Japan Trench (4655 fathoms in 49° 55' N., 152° 26' E.) was famed for many years as the deepest depression of the earth's crust. This great trench is continued along the Luchu Islands where the cable-steamer "Stephan" sounded in 4080 fathoms, and through the Bonin Trench (with a maximum of 3595 fathoms) to the famous Marianne Trench in which the U.S.S. "Nero" in 1899 found 5260 fathoms in 12° 43' N., 145° 40' E., the greatest depth yet measured. The northern part of the Marianne Trench leads to a wave-like configuration of the ocean floor, the depth to the east of Salpan being over 4300 fathoms, followed by a rise to 1089 fathoms and then a descent to 3167 fathoms.

The trenches of Yap (4122 fathoms) and Palau (Peleu) (4450 fathoms) are not immediately connected with that of Marianne. To the east of the Philippines a sounding of 3400 fathoms is found close to the Strait of St Bernardino and north-east of Talaut there is a trench with 4648 fathoms. To the north-east the Japan Trench adjoins the Aleutian Trench, where a depth of 4938 fathoms has been found south-west of Attu. Trenches of great size also occur south of the equator. The Tonga and Kermadec trenches, both deeper than 4000 fathoms, which stretch from the Samoa Islands southwards toward New Zealand for a distance of 1600 nautical miles. The deepest sounding obtained in the Tonga Trench is 5022 fathoms in 23° 39' S., 175° 4' W., and in the Kermadec Trench, 5155 fathoms, 36° 27' S., 176° 30' W. The steep western sides of these trenches often show an angle of slope of 9°.

The south-western part of the Pacific Ocean has a very rich and diversified submarine relief, abounding in small basins separated by ridges and rises. There are no depths, however, of greater size that occur south of the equator. The south-eastern part of the Pacific is mainly occupied by the Easter Island Rise with depths rarely so great as 2000 fathoms; but close to the continent of South America the Atacama Trench is a typical example of the deepest form of depression culminating with 4175 fathoms in 25° 42' S., 71° 31' 5" W. The Pacific Antarctic Basin occupies the vast region south of 50° S. right up to the Antarctic Shelf, with depths ranging down to 3500-3000 fathoms, and communicating with the main Pacific Basin to the east of New Zealand.

The ice-covered polar continental seas, the Arctic, comes nearest to oceanic conditions in the extent and depth of its depressions. The soundings of Nansen and Sverdrup on the " Fram " expedition indicate that northward from the Siberian Shelf the great North Polar Basin has an area of about 4000,000 sq. km. (1,500,000 sq. m.) with depths down to 2200 fathoms. A rise between Spitsbergen and Greenland separates the Norwegian Trough (greatest depth 2005 fathoms in 68° 21' N., 9° 5' W.) which in turn is divided from the Atlantic by the Wyville Thomson Ridge which runs between the Faeroe and Shetland Islands and is covered by only 314 fathoms of water at the deepest point. The troughs amongst these depressions of the south-eastern part of the Pacific is mainly occupied by the Easter Island Rise with depths rarely so great as 2000 fathoms; but close to the continent of South America the Atacama Trench is a typical example of the deepest form of depression culminating with 4175 fathoms in 25° 42' S., 71° 31' 5" W. The Pacific Antarctic Basin occupies the vast region south of 50° S. right up to the Antarctic Shelf, with depths ranging down to 3500-3000 fathoms, and communicating with the main Pacific Basin to the east of New Zealand.

The Central American Sea communicates with the Atlantic through the channels between the Antilles, none of which is quite 1000 fathoms deep, and it sinks to a depth of 2843 fathoms in the Caribbean Basin, 3428 fathoms in the Cayman Trench and 2080 fathoms in the Gulf of Mexico.

The Austral-Asian or Malay Sea is occupied by a great shelf in the region west of Borneo and north of Java, while in the east there are eight abruptly sunk basins of widely different size. The China Sea on the north has a maximum depth of 2715 fathoms off the Philippines, the Sulu Basin reaches 2550 fathoms, and the Celebes Basin 2795 fathoms. Some of the channels between the islands are of very great depth, Macassar Strait exceeding 1000 fathoms, the Molucca Passage exceeding 2000 fathoms, and the Halmahera Trough sinking as deep as 2275 fathoms. The deepest of all is the Banda Basin, a large area of which lies below 2500 fathoms and reaches 3557 fathoms in the Kei Trench. A depth of 2780 fathoms also occurs north of Flores. The borders of the Malay Sea are everywhere shallower on the side of the Indian Ocean than on that of the Pacific, and consequently water from the Pacific preponderates in the depths.

The Mediterranean Sea, the best-known member of the intercontinental class, is separated from the Atlantic Ocean by a ridge running from Cape Spartel to Cape Trafalgar on which
the greatest depth is only 175 fathoms. The depth increases so rapidly towards the east that soundings exceeding 500 fathoms occur off Gibraltar. The Balearic Basin, between Spain and the rise bearing Corsica and Sardinia, has a maximum depth of 1742 fathoms, and the Tyrrhenian Basin between that rise, Italy and Sicily deepens to 2040 fathoms. The larger Eastern Mediterranean Basin stretches eastward from Sicily with large tracts more than 2000 fathoms below the surface, and the greatest depth ascertained during the detailed researches of the Austrian expedition on board the "Pola" was 2046 fathoms in 35° 44' 8" N., 21° 46' 8" E. The Adriatic Sea though very shallow in the north deepens southward to about 500 fathoms, and the Aegean Sea has a maximum depth of 1230 fathoms north of Crete. The Black Sea, connected with the Mediterranean by long and narrow channels, is occupied in the north by an extensive shelf on which lies the extremely shallow Gulf of Azov; but the greater part of the sea consists of a deep basin, the central part of which is an almost flat expanse at a uniform depth of 1220 fathoms.

The smaller enclosed seas are for the most part very shallow. The Persian Gulf nowhere exceeds 50 fathoms, the southern part of Hudson Bay does not exceed 100 fathoms except at one spot, though in the less-known fjords of the northern part depths up to 200 fathoms have been reported. The Baltic Sea exceeds 50 fathoms in few places except the broad central portion, though small caldron-like depressions here and there may sink below 200 fathoms. The Red Sea on the other hand, though shut off from the Indian Ocean by shallows of the Strait of Bab-el-Mandeb with little more than 100 fathoms, sinks to a very considerable depth in its central trough, which reaches 1209 fathoms in 20° N.

The fringe seas as a rule show little variety of submarine relief. The Bass Sea (Bass Strait), Irish Sea and North Sea lie on the continental shelf. In the North Sea the depth of 100 fathoms is only exceeded to any extent in the Norwegian gully, which has a maximum depth of 383 fathoms in the Skagerrak.

<table>
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<tr>
<th>Name</th>
<th>Depth, Fathoms</th>
<th>Area, sq. km</th>
<th>Area, sq. st. m</th>
<th>Volume, cb. km</th>
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<td>139,495,660</td>
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</table>

Most of the other seas of this class are formed on a common plan. Towards the continent there is a broad shelf, and just before the chain of islands separating them from the ocean runs a narrow and deep trough. In the Bering Sea the trough north of Buldur in the Aleutian Islands sinks to 2337 fathoms, and in the Sea of Okhotsk, north-west of the Kuriles, to 1839 fathoms. Similar conditions prevail in the East China Sea and the Andaman Sea. The Sea of Japan has a wide shelf only in the north, the central part forms a broad basin with depths of 1650 fathoms. The Laurentian Sea (Gulf of St Lawrence) has a narrow branching gully running between wide shelves, in which a depth of 312 fathoms is found south of Anticosti.

The area, general depth and total volume of the oceans and principal seas have been recalculated by Krümmel, and the accompanying table presents these figures.

**Oceanic Deposits.**—It has long been known that the deposits which carpet the floor of the ocean differ in different places, and coasting sailors have been accustomed to time immemorial to use the lead not only to ascertain the depth of the water, but also to judge by its character the nature of the soil below. In depths down to 100 fathoms the old-fashioned hand-lead, hollow below and "armed with" tallow, suffices to bring up a sample large enough to be recognizable. Captain Phipps in 1773 secured samples of soft blue clay in this manner from a depth of 683 fathoms, but as a rule when sounding in great depths the sample is washed off the tallow before it can be brought on board. Various devices have consequently been attached to leads intended to catch and hold the material when soft enough to be penetrated. One of the most effective early forms was the snapper or "deep-sea clam." Sir John Ross, a pair of powerful spring jaws held by an arrangement which when released on striking the bottom allowed the jaws to close, biting out and holding securely a substantial portion of the ground. A simpler form of collector, now almost universally used, is a plain brass tube which is driven into the bottom of the sea by the weight of the sounder, and in which the deposit may be retained by a valve or other contrivance, though in many cases friction alone suffices to hold the punched-out core. Larger quantities of deposit may be conveniently collected by means of the dredge, which can be worked in any depth and brings up large stones, concretionary nodules or fossils, of the existence of which a sounding-tube could give no indication.

The voyage of the "Challenger" supplied for the first time the nucleus of a collection of deep-sea deposits sufficient to serve as the basis for comprehensive classification and mapping. The "Challenger" collections supplemented by those of other expeditions and of many telegraph and surveying-ships were studied in detail by Sir John Murray and Professor A. Renard, whose monograph, published in 1891, laid the foundations and

1"Challenger Reports," Deep Sea Deposts."
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rear the greater part of the structure of our present knowledge on the subject. The classification adopted was a double one, taking account both of the origin and of the distribution in depth of the various deposits, thus:

I. DEEP SEA DEPOSITS (beyond 100 fathoms)

1. Red Clay
2. Radiolarian Ooze
3. Diatom Ooze
4. Globigerina Ooze
5. Pteropod Ooze
6. Blue Mud
7. Red Mud
8. Green Mud
9. Volcanic Mud
10. Coral Mud

A. PELAGIC DEPOSITS (formed in deep water remote from land)

II. SHALLOW WATER DEPOSITS (in less than 100 fathoms)

1. Sands, gravels, muds, &c.

B. TERRIGENOUS DEPOSITS (formed in deep or shallow water close to land)

III. LITTORAL DEPOSITS (between high and low-water marks)

1. Sands, gravels, muds, &c.

Krummel prefers to simplify this by grouping the deposits in a single category arranged according to their position into:

(a) Littoral (including Murray and Renard's littoral and shallow water deposits [II. and III.]).

(b) Hemipelagic (including Nos. 6-10 of Deep Sea Deposits).

(c) Eupelagic (including Nos. 1-5 of Deep Sea Deposits).

As so defined the hemipelagic deposits are those which occur in general on the slope from the continental shelves to the ocean depths and also in the deep basins of enclosed and fringing seas. The eupelagic deposits are subdivided by Krummel into two main groups: (a) epipelagic, including the pteropod, globigerina and diatom oozes occurring on the rises and ridges and in the less deep troughs. (b) Abyssal, including the radiolarian ooze and red clay of the deepest abysses.

The littoral deposits include those of the actual shore on the wash of the waves and of the surface of the continental shelf.

Shore Deposits are the product of the waste of the land arranged and bedded by the action of currents or tidal streams. On the rocky coast of high latitudes blocks of stone detached by frost fall on the beach and becoming embedded in ice during winter are often drifted out to sea and so carry the shore deposits to some distance from the land. Similar effects are produced along the boulder-clay cliffs of the Baltic. Where the force of the waves on the beach produces its full effect the coarser material gets wound down to gravel, sand and silt, the finest particles remaining long suspended in the water to be finally deposited as mud in quiet bays. A particularly fine-grained mud is formed on the low coasts of the eastern boundary of the North Sea by a mixture of the finest sediment carried down by the slow-running rivers with the calcareous or siliceous remains of plankton. Pure calcareous sand and calcareous mud are formed by wave action on the shores of coral islands where the only material available is coral and the accompanying calcareous algae, crustacea, molluscs and other organisms secreting carbonate of lime. Recent limestones are being produced in this way and also in some places by the precipitation of calcium carbonate by sodium or ammonium carbonate which has been carried into the sea or formed by organisms. The precipitated carbonate may agglomerate on mineral or organic grains which serve as nuclei, or it may form a sheet of hard deposit on the bottom as occurs in the Red Sea, off Florida, and round many coral islands in the Pacific. Only the sand and the finest-grained sediments of the shore zone are carried outwards over the continental shelf by the tides or by the reaction-currents along the bottom set up by on-shore winds. The very finest sediment is kept in a state of movement until it drops into the gulleys or furrows of the shelf, where it can come to rest together with the finer fragments of the remains of littoral or bank vegetation. Thus are formed the "mud-holes" of the Hudson Funnel so welcome as guides telling their position to ship captains making New York harbour in a fog. Sand may be taken as the predominating deposit on the continental shelves, often with a large admixture of remains of calcareous organisms, for instance the deposits of maerl made up of nullipores off the coasts of Brittany and near Belle Isle. Amongst the most widely distributed of the deposits actually formed on the continental shelf are phosphatic nodules; these are especially abundant on the east coast of the United States and on the Agulhas Bank, where the amount of calcium phosphate in the nodules is as much as 50%. Sir John Murray finds the source of the phosphatic acid to be the decomposition of large quantities of animal matter, and he illustrates this by the well-known circumstance of the death of vast shoals of fish when warm Gulf-Stream water displaces the cold current which usually extends to the American coast. Glacial drift naturally plays a great part in the deposits on the polar continental shelves.

Hemipelagic deposits are a mixture of deposits of terrigenous and pelagic origin. The most abundant of the terrigenous materials are the finest particles of clay and calcium carbonate as the Nannofragments derived from land vegetation, of which twigs, leaves, &c., may form a part. It is largely mixed with the shells of the bottom-living foraminifera Biloculina. Max Weber states that blue mud occurs in the deep basins of the eastern part of the Malay Sea. In the form of volcanic mud it is common round the high volcanic islands of the South-Western Pacific.

Red mud may be classed as a variety of blue mud, from which it differs on account of the larger proportion of ochrous substance and the absence of sufficient organic matter to reduce the whole of the ferric oxide. This variety surrounds the deposits of the deep-sea coral and sponge shelves of South America, South Africa and eastern China.

Green mud differs to a greater extent from the blue mud, and owes its characteristic nature and colour to the presence of glauconite, which is formed inside the cases of foraminifera, the spines of echinid and the spicules of sponges in a manner not yet understood. It occurs in such abundance in certain geological formations as to give rise to the name of green-sand. Green mud abounds off the east coast of North America seawards of Cape Hatteras, also to the north of Cuba, and on the west off the coast of South America. The Challenger expedition found it on the Agulhas Bank, on the eastern coasts of Japan, and on the west coast of Portugal. When the proportion of calcium carbonate in the blue mud is considerable there results a calcareous ooze, which when found on the continental slope and in enclosed seas is largely composed of remains of deep-sea corals and bottom-living foraminifera, pelagic organisms including pteropods being less frequently represented. The floors of the Caribbean, Cayman and Mexican Basins in the Central American Sea are covered with a white calcareous ooze, which is clearly distinguished from the eupelagic pteropod and globigerina oozes by the presence of abundant large mineral particles and the remains of land plants. In this deposit the occurrence of calcareous concretions is very characteristic, as L. F. de Pourtalés pointed out in 1870; they consist of remains of deep-sea corals, serpulae, echinoderm and mollusca united
by a calcareous cement. Similar formations are found in the Mediterranean, where a dark mud predominates in the western part, passing into a grey, marly slime in the Tyrrenian Basin and replaced by a typical calcareous ooze in the Eastern Basin. The bottom of the Black Sea is covered by a stiff blue mud in which Sir John Murray found much sulphide of iron, 1 grains or needles of pyrites making up nearly 50% of the deposit, and there are also grains of amorphous calcium carbonate evidently precipitated from the water. A calcium carbonate mud is largely aided by the putrefaction of organic matter, and as a result the water deeper than 120 fathoms is extraordinarily deficient in dissolved oxygen and abounds in sulphuretted hydrogen, the formation of which is brought about by a special bacterium, the only form of life found at depths greater than 120 fathoms in the Black Sea.

In the Red Sea the "Pola" expedition discovered a calcareous ooze similar to that of the Mediterranean, and the formation of a stony crust by precipitation of calcium and magnesium carbonates may be recognized as giving origin to a recent dolomite.

The terrigenous ingredients in the deposits become less and less abundant as one goes farther into the deep ocean and away from the continental margins. Still, according to Murray and Irvine, finely divided colloidal clay is to be found in all parts of the ocean however remote from land, though in very small amount, and there is less in tropical than in cooler waters. A minute fraction is always separating out of the water, and as a prodigious length of time may be accepted for the accomplishment of all the chemical and physical processes in the deep sea, we must take account of the gradual accumulation of even this infinitesimal precipitation. As well as the finest of terrigenous clay there is present in sea-water far from land a different clay derived from the decomposition of volcanic material. Volcanic dust thrown into the air settles out slowly, and some of the products of submarine and littoral volcanoes, like pumice-stone, possess a remarkable power of floating and may drift into any part of the ocean before they become waterlogged and sink. To this inconceivably slowly-growing deposit of inorganic material over the ocean floor there is added an overwhelmingly more rapid contribution of the remains of calcareous and siliceous planktonic and benthonic organisms, which tend to bury the slower accumulating material under a blanket of globigerina, pteropod, diatom or radiolarian ooze. When those deposits of organic origin are wanting or have been removed, the red clay composed of the mineral constituents is found alone. It is a remarkable geographical fact that on the rises and in the basins of moderate depth of the open ocean the organic oozes preponderate, but in the abyssal depressions below 2500 or 3000 fathoms, whether these lie in the middle or near the edges of the great ocean spaces, there is found only the red clay, with a minimum of calcium carbonate, though sometimes with a considerable admixture of the siliceous remains of radiolarians. Thus red clay and radiolarian ooze are distinguished as abyssal deposits in contradistinction to the epilgal calcareous oozes.

Globigerina ooze was recognized as an important deposit as soon as the first successful deep-sea soundings had been made as late as 1853 by Bailey of West Point and Ehrenberg in Berlin. Murray and Renard define globigerina ooze as containing at least 30% of calcium carbonate, in which the remains of pelagic (not benthonic) foraminifera predominate and in which remains of pelagic mollusca such as pteropods and heteropods, ostracodes and also coeloliths (minute calcareous algae) may also occur. Not more than 25% of the deposit may consist of bottom-dwelling foraminifera, echinor or worm-tubes, and as a rule these make up only from 9 to 10%. These peculiarities, combined with the striking absence of mineral constituents, distinguish the epilgal globigerina ooze from the hemipelagic calcareous mud.

Out of 175 samples of globigerina ooze obtained by the "Challenger" expedition 134 came from depths of 1500 to 2500 fathoms, 13 from depths of 1000 to 1500 and only 16 from depths greater than 2500 fathoms. Viewed as a whole this deposit may be taken as a partial precipitation of the plankton living in the upper waters of the open sea. A small proportion of organic matter including the fat globules of the plankton is mixed with the calcium carbonate, the amount according to Gümöl's analysis being about 1 part in 1000. Secondary products, such as glauconite, phosphatic concretions and manganeese nodules, occur though less frequently than in the hemipelagic deposits. Globigerina ooze is the characteristic deposit of the Atlantic Ocean, where it covers not less than 44,000,000 sq. km. (17,000,000 sq. statute m.). In the Indian Ocean the area covered is 31,000,000 sq. km. (12,000,000 sq. m.) and in the huge Pacific Ocean only 30,000,000 sq. km. (11,500,000 sq. m.).

Pteropod ooze is merely a local variety of globigerina ooze in which the comparatively large but very delicate spindle-shaped shells of pteropods happen to abound. These shells do not retain their individuality at depths greater than 1400 or 1500 fathoms, and in fact pteropod ooze is only found in small patches on the ridges near the Azores, Antilles, Canaries, Sokotra, Nicobar, Fiji and the Faamotu islands, and on the central rise of the South Atlantic between Ascension and Tristan d'Acunha.

Diatom ooze was recognized by Sir John Murray as the characteristic deposit in high latitudes in the Indian Ocean, and later it was found to be characteristic also of the corresponding parts of the Indian and Pacific covering a total area of about 22,000,000 sq. km. (8,500,000 sq. m.). It has been found sporadically near the Aleutian Islands, between the Philippines and Marianne Islands, and between the Galapagos group. It is made up to a large extent of the siliceous frustules of diatoms. It is usually yellowish-grey and often straw-coloured when wet, though when dried it becomes white and mealy.

Red clay was discovered and named by Sir Wylie Thomson on the "Challenger" in 1873 when sounding in depths of 2700 fathoms on the way from the Canary Islands to St Thomas. The reddish colour comes from the presence of oxides of iron, and particles of manganese also occur in it, especially in the Pacific region, where the colour is more that of chocolate; but when it is mixed with globigerina ooze it is grey. Red clay is the deposit peculiar to the abyssal areas; 70 carefully investigated samples collected by the "Challenger" came from an average depth of 2730 fathoms, 97 specimens collected by the "Tuscarora" came from an average depth of 2860 fathoms, and 26 samples obtained by the "Albatross" in the Central Pacific came from an average depth of 2620 fathoms. Red clay has not yet been found in depths less than 2200 fathoms. The main ingredient of the deposit is a stiff clay which is plastic when fresh, but dries to a stony hardness. Isolated gritty fragments of minerals may be felt in the generally fine-grained homogeneous mass. The depth often brings up large numbers of nodules formed upon sharks' teeth, the ear-bones of whales or turtles or small fragments of pumice or other volcanic ejecta, and all more or less encrusted with manganese oxide until the nodules vary in size from that of a potato to that of a man's head. A very interesting feature is the small proportion of calcium carbonate, the amount present being usually less as the depth is greater; red clay from depths exceeding 3000 fathoms does not contain so much as 1% of calcareous matter.

Murray and Renard recognize the progressive diminution of carbonate of lime with increase of depth as a characteristic of all epilgal deposits. The whole collection of 231 specimens of deep-sea deposits brought back by the "Challenger" shows the following general relationship:—

Proportion of Calcium Carbonate in Deep-Sea Deposits.

<table>
<thead>
<tr>
<th>Proportion (%)</th>
<th>Samples</th>
<th>Fathoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>68%</td>
<td>64</td>
<td>2000-2500</td>
</tr>
<tr>
<td>66%</td>
<td>11</td>
<td>2500-3000</td>
</tr>
<tr>
<td>64%</td>
<td>9</td>
<td>3000-3500</td>
</tr>
<tr>
<td>62%</td>
<td>11</td>
<td>more than 3500</td>
</tr>
</tbody>
</table>

In deep water there is a regular process of solution of the calcareous shells falling from the surface. Murray and Renard ascribe this to the greater abundance of carbonic acid in the
deeper water, which aided by the increased pressure adds to the solvent power of the water for carbonate of lime. It is, however, a curious question how, considering the increase of carbonic acid by the decomposition of organic bodies and possible submarine exhalations of volcanic origin, the water has not in some places become saturated and a precipitate of amorphous calcium carbonate formed in the deepest water. The whole subject still requires investigation.

Amongst the foreign material found embedded in the red clay are globules of meteoric iron, which are sometimes very abundant. Derived products in the form of crystals of phillipite are not uncommon, but the most abundant of all are the incrustations of manganese oxide, as to the origin of which Murray and Renard are not fully clear. The manganese nodules afford the most ample proof of the prodigious period of time which has elapsed since the formation of the red clay began; the sharks' teeth and whales' ear-bones which serve as nuclei belong in some cases to extinct species or even to forms derived from those familiar in the fossils from the seas of the Tertiary period. This fact, together with the extraordinarily rare occurrence of such remains and meteoric particles in globigerina ooze, although there is no reason to suppose that at any one time they are unequally distributed over the ocean floor, can only be explained on the assumption that the rate of formation of the epilithic deposits through the accumulation of pelagic shells falling from the surface is rapid enough to bury the slow-gathering material which remains uncovered on the spaces where the red clay is forming at an almost infinitely slower rate. Sir John Murray believes that no more than a few feet of red clay have accumulated in the deepest depressions since the close of the Tertiary period. The red clay is the characteristic deposit of the Pacific Ocean, where about 101,000,000 sq. km. (39,000,000 sq. m.) are covered with it, while only 15,000,000 sq. km. (5,800,000 sq. m.) of the Indian Ocean and 14,000,000 sq. km. (5,400,000 sq. m.) of the Atlantic are occupied by this deposit; it is indeed the dominant submarine deposit of the water-hemisphere just as globigerina ooze is the dominant submarine deposit of the land-hemisphere.

Radiolarian ooze was recognized as a distinct deposit and named by Sir John Murray on the “Challenger” expedition, but it may be viewed as red clay with an exceptionally large proportion of siliceous organic remains, especially those of the radiolarians which form part of the pelagic plankton. It does not occur in the Atlantic Ocean at all, and in the Indian Ocean it is only known round Cocos and Christmas Islands; but it is abundant in the Pacific, where it covers a large area between 5° and 15° N., westward from the coast of Central America to 165° W., and it is also found in patches north of the Samoa Islands, in the Marianne Trench and west of the Galapagos Islands.

The total areas occupied by the various deposits according to the latest measurements of Krümmel are as follows:

<table>
<thead>
<tr>
<th>Area of Submarine Deposits.</th>
<th>Sq. km.</th>
<th>Sq. st. m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Littoral deposits</td>
<td>33,000,000</td>
<td>12,700,000</td>
</tr>
<tr>
<td>II. Hemipelagic</td>
<td>55,700,000</td>
<td>21,500,000</td>
</tr>
<tr>
<td>III. Epipelagic</td>
<td>272,700,000</td>
<td>105,300,000</td>
</tr>
<tr>
<td>1. Globigerina ooze</td>
<td>105,600,000</td>
<td>40,800,000</td>
</tr>
<tr>
<td>2. Pteropod ooze</td>
<td>1,400,000</td>
<td>500,000</td>
</tr>
<tr>
<td>3. Diatom ooze</td>
<td>23,200,000</td>
<td>8,900,000</td>
</tr>
<tr>
<td>4. Red clay</td>
<td>130,300,000</td>
<td>50,300,000</td>
</tr>
<tr>
<td>5. Radiolarian ooze</td>
<td>12,200,000</td>
<td>4,700,000</td>
</tr>
</tbody>
</table>

Geologists are agreed that littoral and hemipelagic deposits similar to those now forming are to be found in all geological systems, but the existence in the rocks of epipelagic deposits and especially of the abysmal red clay, though viewed by some as probable, is totally denied by others. There is even some hesitation in accepting the continuity of the chalk with the globigerina ooze of the modern ocean. From the obvious rarity of true abysmal rocks in the continental area Sir John Murray deduces the permanence of the ocean, which he holds always remained upon those portions of the earth’s crust which they occupy now, and both J. Dana and Louis Agassiz had already arrived at the same conclusion. This theory accords well with the enormous lapse of time required in the accumulation of the red clay.

**Salts of Sea-water.**—Sea-water differs from fresh water by its salt and bitter taste and by its unsuitability for the purposes of washing and cooking. The process of natural evaporation in the salinae or salt gardens of the margin of warm seas made the composition of sea-salt familiar at a very early time, and common salt, Epsom salts, gypsum and magnesium chloride were recognized amongst its constituents. The analyses of modern chemists have now revealed the existence of 32 out of the 80 known elements as existing dissolved in sea-water, and it is scarcely too much to say that the remaining elements also exist in minute traces which the available methods of analysis as yet fail to disclose. Many of the elements such as copper, lead, zinc, nickel, cobalt and manganese have only been found with the 50 samples, and Dittmar, who made complete analyses of 77 samples obtained on the “Challenger” expedition, Dittmar showed that the average proportion of the salts in ocean water of 35 parts salts per thousand was as follows (calculated as parts per thousand of the sea-water, as percentage of the total salts and per hundred molecules of magnesium bromide):

<table>
<thead>
<tr>
<th>The Salts in Ocean Water.</th>
<th>Per 1000 Parts Water.</th>
<th>Per cent. Total Salts.</th>
<th>Per 100 Molecules MgBr₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common salt, sodium chloride (NaCl)</td>
<td>27-215</td>
<td>77-758</td>
<td>112,793</td>
</tr>
<tr>
<td>Magnesium chloride (MgCl₂)</td>
<td>3-607</td>
<td>10-878</td>
<td>9,690</td>
</tr>
<tr>
<td>Magnesium sulphate (MgSO₄)</td>
<td>1-658</td>
<td>4-737</td>
<td>3,339</td>
</tr>
<tr>
<td>Gypsum, calcium sulphate (CaSO₄)</td>
<td>1-260</td>
<td>3-500</td>
<td>2,399</td>
</tr>
<tr>
<td>Potassium sulphate (K₂SO₄)</td>
<td>0-863</td>
<td>2-465</td>
<td>1,200</td>
</tr>
<tr>
<td>Calcium carbonate (CaCO₃) and residue</td>
<td>0-123</td>
<td>0-345</td>
<td>298</td>
</tr>
<tr>
<td>Magnesium bromide (MgBr₂)</td>
<td>0-076</td>
<td>0-217</td>
<td>100</td>
</tr>
</tbody>
</table>

As Marcut had foreshadowed from the analysis of 14 samples in 1819, the larger series of exact analyses proved that the variations in the proportion of individual salts to the total salts are very small, and all analyses since Dittmar’s have confirmed this result. Although the salts have been grouped in the above

1 Comptes rendus, Acad. Sciences (Paris, 1859), 49, 463, 536.
2 Chemical News (1870), vol. 22, pp. 25, 44; (1872) vol. 26, p. 159.
table it is not to be supposed that a dilute solution like sea-water contains all the ingredients thus arbitrarily combined. There must be considerable dissociation of molecules, and as a first approximation it may be taken that of 10 molecules of most of the constituents about 9 (or in the case of magnesium sulphate 8) have been separated into their ions, and that it is only during slow concentration as in a natural saline that the ions combine to produce the various salts in the proportions set out in the above table. One can look on sea-water as a mixture of very dilute solutions of particular salts, each one of which after the lapse of sufficient time fills the whole space as if the other constituents did not exist, and this interdiffusion accounts easily for the uniformity of composition in the sea-water throughout the whole ocean, the only appreciable difference from point to point being the salinity or degree of concentration of the mixed solutions.

The origin of the salt of the sea is attributed by some modern authorities entirely to the washing out of salts from the land by rain and rivers and the gradual concentration by evaporation in the oceans, and some (e.g. J. Joly) go so far as to base a calculation of the age of the earth on the assumption that the ocean was originally filled with fresh water. This hypothesis, however, does not accord with the theory of the development of the earth from the state of a sphere of molten rock surrounded by an atmosphere of gaseous metals by which the first-formed clouds of aqueous vapour must have been absorbed. The great similarity between the salts of the ocean and the gaseous products of volcanic eruptions at the present time, rich in chlorides and sulphates of all kinds, is a strong argument for the ocean having been salt from the beginning. Two other facts are totally opposed to the origin of all the salinity of the oceans from the concentration of the washings of the land. The proportions of the salts of river and sea-water are quite different, as Julius Roth shows thus:

<table>
<thead>
<tr>
<th>Carbonates</th>
<th>Sulphates</th>
<th>Chlorides</th>
</tr>
</thead>
<tbody>
<tr>
<td>River water</td>
<td>80</td>
<td>13</td>
</tr>
<tr>
<td>Sea water</td>
<td>0.2</td>
<td>10</td>
</tr>
</tbody>
</table>

The salts of salt lakes which have been formed in the areas of internal drainage in the hearts of the continents by the evaporation of river water are entirely different in composition from those of the sea, as the existence of the numerous natron and bitter lakes shows. Magnesium sulphate amounts to 4-7% of the total salts of sea-water according to Dittmar, but to 23-6% of the salts of the Caspian according to Lebedineff; in the ocean magnesium chloride amounts to 10-9% of the total salts, in the Caspian only to 4.5%; on the other hand calcium sulphate in the ocean amounts to 3.6%, in the Caspian to 6.7%. This disparity makes it extremely difficult to view ocean water as merely a watery extract of the salts existing in the rocks of the land.

The determination of salinity was formerly carried out by evaporating a weighed quantity of sea-water to dryness and weighing the residue. Forchhammer, however, pointed out that this method gave inexact and variable results, as in the act of evaporating to dryness hydrochloric acid is given off as the temperature is raised to expel the last of the water, and Tornøe found that carbonic acid was also liberated and that the loss of both acids was very variable. Tornøe vainly attempted to apply a correction for this loss by calculation; and subsequently S. P. L. Sørensen and Martin Knudsen after a careful investigation decided to abandon the old definition of salinity as the sum of all the dissolved solids in sea-water and to substitute for it the weight of the dissolved solids in 1000 parts by weight of sea-water on the assumption that all the bromine is replaced by its equivalent of chlorine, all the carbonate converted into oxide and the organic matter burnt. The advantage of the new definition lies in the fact that the estimation of the chlorine (or rather of the total halogen expressed as chlorine) is sufficient to determine the salinity by a very simple operation. According to Knudsen the salinity is given in weight per thousand parts by the expression $S = 0.030 + 1.8050$ where $S$ is the salinity and CI the amount of total bromine in a sample. Such a simple formula is only possible because the salts of sea-water are of such uniform composition throughout the whole ocean that the chlorine bears a constant ratio to the total salinity as newly defined whatever the degree of concentration. This definition was adopted by the International Council for the Study of the Sea in 1902, and it has since been very widely accepted.

Besides the determination of salinity by titration of the chlorides, the method of determination by the specific gravity of the sea-water is still often used. In the laboratory the specific gravity is determined by a hydrometer or by actual weighing, or is the temperature of the mixed solution. Three types of areometer are in use: (1) the ordinary hydrometer of variable weight with a direct reading scale, a set of from five to ten being necessary to cover the range of specific gravity from 1.000 to 1.031 so as to take account of sea-water of all possible salinities; (2) the "Challenger" type of areometer designed by J. Y. Buchanan, which has an arbitrary scale and can be varied in weight by placing small metal rings on the stem so as to depress the scale to any desired depth in sea-water of any salinity, the specific gravity being calculated for each reading by dividing the total weight by the immersed volume; (3) the total immersion areometer, which has no scale and the weight of which can be adjusted so that the instrument can be brought so exactly to the specific gravity of the water sample that it remains immersed, neither floating nor sinking; this has the advantage of eliminating the effects of surface tension and in Frédéric Nansens's pattern is capable of great precision.

In all areometer work it is necessary to ascertain the temperature of the water sample under examination with great exactness, as the volume of the areometer as well as the specific gravity of the water varies with temperature. All determinations must accordingly be reduced to a standard temperature for comparison. Following the practice of J. Y. Buchanan on the "Challenger" it has been usual for British investigators to calculate specific gravities for sea-water at 60°F. compared with pure water at the maximum density point (39°2') as unity. On the continent of Europe it has been more usual to take both at 17.5°C. (63.5°F.), which is expressed as "S 4.8"; but for pyknometer work in all countries where the sample is cooled to 32° F. before weighing and pure water at 39.2° taken as unity the expression is "S 4.1". On the first meeting of the International Conference for the Study of the Northern European Seas at Stockholm in 1890 Martin Knudsen, assisted by Karl Forch and S. P. L. Sørensen, carried out a careful investigation of the relation between the amount of chlorine, the total salinity and the specific gravity of sea-water of different strengths including an entirely new determination of the thermal expansion of sea-water. The results are published in his Hydrographical Tables in a convenient form for use.

The relations between the various conditions are set forth in the following equations where $e_{0}$ signifies the specific gravity of the sea-water in question at 0°C., the standard at 4° being taken as 1000, S the salinity and CI the chlorine, both expressed in parts by weight per mile.

\[(1) e_{0} = 0.093 + 0.8149 S - 0.0000682 S' + 0.0000066 S''\]
\[(2) e_{0} = 0.093 + 0.8050 C_{I} - 0.0000682 S' + 0.0000066 S''\]
\[(3) S = 0.030 + 1.8050 C_{I}\]

The temperature of maximum density of sea-water of any specific gravity was found by Knudsen to be given with sufficient accuracy for all practical purposes by the formula $\theta = 39.5 - 0.2664 S$, where $\theta$ is the temperature of maximum density in degrees centigrade. The temperature of maximum density is lower as the concentration of the sea-water is greater, as is shown in the following table:

**Maximum Density Point of Sea-Water of Different Salinities.**

<table>
<thead>
<tr>
<th>Salinity per mile</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>35</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature °C</td>
<td>39.5°</td>
<td>38.6°</td>
<td>37.8°</td>
<td>37.1°</td>
<td>36.5°</td>
<td>36.0°</td>
</tr>
<tr>
<td>Density g/cm³</td>
<td>1.006</td>
<td>1.018</td>
<td>1.029</td>
<td>1.039</td>
<td>1.049</td>
<td>1.059</td>
</tr>
</tbody>
</table>
Further Physical Properties of Sea-water.—The laws of physical chemistry relating to complex dilute solutions apply to sea-water, and hence there is a definite relation between the osmotic pressure, freezing-point, vapour tension and boiling-point by which when one of these constants is given the others can be calculated.

The most easily observed is the freezing-point, and according to the very careful determinations of H. T. Hansen the freezing-point \( r^* \) C. varies with the degree of concentration according to the formula

\[
\tau = -0.0086 - 0.00046330 + 0.00010556
\]

According to the investigations of Svante Arrhenius the osmotic pressure in atmospheres may be obtained by simply multiplying the temp rate of freezing \( r^* \) by the factor -12.08, and it varies with temperature \( t \) according to the law which holds good for gaseous pressure.

\[
P_t = Pa(1 + 0.003667)
\]

can thus be reduced to its value at 0° C. Sigurd Stenius has calculated tables of osmotic pressure for sea-water of different degrees of concentration. The relation of the elevation of the boiling-point \( b^* \) to the osmotic pressure \( P_b \) is very simply derived from the formula \( 1 = 0.020277fa \), while the reduction of vapour pressure proportional to the concentration can be very easily obtained from the elevation of the boiling-point, or it may be obtained directly from tables of vapour tension.

Physical Properties of Sea-Water.

<table>
<thead>
<tr>
<th>Salinity per mille</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>35</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freezing-point (( C^* ))</td>
<td>-0.53</td>
<td>-1.07</td>
<td>-1.63</td>
<td>-1.91</td>
<td>-2.20</td>
</tr>
<tr>
<td>Osmotic pressure ( P_b )</td>
<td>6.4</td>
<td>13.0</td>
<td>19.7</td>
<td>23.1</td>
<td>26.6</td>
</tr>
<tr>
<td>Elevation of boiling-point (( b^* ))</td>
<td>0.16</td>
<td>0.31</td>
<td>0.47</td>
<td>0.56</td>
<td>0.64</td>
</tr>
<tr>
<td>Reduction of vapour pressure (mm.)</td>
<td>4.2</td>
<td>8.5</td>
<td>13.0</td>
<td>15.2</td>
<td>17.6</td>
</tr>
</tbody>
</table>

The importance of the osmotic pressure of sea-water in biology will be easily understood from the fact that a frog placed in sea-water loses water by osmosis and soon becomes 20% lighter than its original weight, while a true salt-water fish suddenly transferred to fresh water gains water by endosmosis, swells up and quickly succumbs. The elevation of the boiling-point is of little practical importance, but the reduction of vapour pressure means that sea-water evaporates more slowly than fresh water, and the more slowly the higher the salinity. Unfortunately no observations of evaporation from the surface of the open sea have been made and very few comparisons of the evaporation of salt and fresh water are on record. The fact that sea-water does evaporate more slowly than fresh water has been proved by the observations of Mazelle at Triest and of Okado in Azino (Japan). Their experiments show that in similar conditions the evaporation of sea-water amounts to from 70 to 91% of the evaporation of fresh water, a fact of some importance in geophysics on account of the vast expanses of ocean the evaporation from which determines the rainfall and to a large extent the heat-transference in the atmosphere.

The optical properties of sea-water are of immediate importance in biology, as they affect the penetration of sunlight into the depths. The refraction of light passing through sea-water is dependent on the salinity to the extent that the index of refraction is greater as the salinity increases. From isolated observations of J. Soret and E. Sarasin and longer series of experiments by Tornèö and Krümmel this relation is shown to be so close that the salinity of a sample can be ascertained by determining the index of refraction. According to Krümmel the following relations hold good at 18° C. for the monochromatic light of the D line of the sodium spectrum in units of the fifth decimal place.

Relation of Refractive Index and Salinity.

<table>
<thead>
<tr>
<th>For water of salinity (per mille)</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>35</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refractive index 1.33000+</td>
<td>308</td>
<td>502</td>
<td>694</td>
<td>885</td>
<td>981</td>
<td>1077</td>
</tr>
</tbody>
</table>

The refractometer constructed by C. Pflüffer (of the firm of Zeiss, in Jena) has been successfully used by G. Schott and E. von Drygalski for the measurement of salinity at sea, and was found to have the same degree of accuracy as an areometer with the great advantage of being quite unaffected by the motion of the ship in a sea-way.

The transparency of sea-water has frequently been measured at sea by the simple expedient of sinking white-painted disks and noting the depth at which they become invisible as the measure of the transparency of the water. For the north European seas disks of about 18 or 20 in. in diameter are sufficient for this purpose, but in the tropics, where the transparency is much greater, disks 5 ft. in diameter at least must be used or the angle of vision for the reflected light is too small. In shallow seas the transparency is always reduced in rough weather. In the North Sea north of the Dogger Bank, for instance, the disk is visible in calm weather to a depth of from 16 to 19 fathoms, but in rough weather only to 61 fathoms. Knipovich occasionally observed great transparency in the cold waters of the Murman Sea, where he could see the disk in as much as 25 fathoms, and a similar phenomenon has often been reported from Icelandic waters. The greatest transparency hitherto reported is in the eastern basin of the Mediterranean, where J. Lüksch found the disk visible at 32 ft. as far as 70 fathoms and off the Syrian coast even to 33 fathoms. In the open Atlantic there are great differences in transparency; Krümmel observed a 6 ft. disk to depths of 31 and 36 fathoms in the Sargasso Sea, but in the cold currents of the north and also in the equatorial current the depth of visibility was only from 11 to 163 fathoms. In the tropical parts of the Indian and the Pacific Oceans the depth of visibility increases again to from 20 to 27 fathoms. Some allowance should be made for the elevation of the sun at the time of observation. Mill has shown that in the North Sea off the Firth of Firth the average depth of visibility for a disk in the winter half-year was at fathoms and in the summer half-year 61 fathoms, and, although the greater frequency of rough weather in winter might tend to obscure the effect, individual observations made it plain that the angle of the sun was the main factor in increasing the depth to which the disk remained visible.

There are some observations on the transparency of sea-water of an entirely different character. Such, for instance, were those of Spindler and Wrangel in the Black Sea by sinking an electric lamp, the invention of Paul Reppard by means of the change of electric resistance in a selenium cell or the chemical action of the light on a mixture of chlorine and hydrogen, by which he found a very rapid diminution in the intensity of light even in the surface layers of water. Many experiments have also been made by the use of photographic plates in order to find the greatest depth to which light penetrates. Foli and Sarasin detected the last traces of sunlight in the western Mediterranean at a depth of 244 to 260 fathoms, and Lüksch in the eastern Mediterranean at 328 fathoms and in the Red Sea at 273 fathoms. The chief cause of the different depths to which light penetrates in sea-water is the varying turbidity due to the presence of mineral particles in suspension or to plankton. Schott gives the following as the result of measurements of transparency by means of a white disk at 23 stations in the open ocean, where quantitative observations of the plankton under 1 square metre of surface were made at the same time.

<table>
<thead>
<tr>
<th>Volume of Plankton</th>
<th>Depth of Visibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean of 11 stations poor in plankton</td>
<td>85 cc.</td>
</tr>
<tr>
<td>Mean of 12 stations rich in plankton</td>
<td>530 cc.</td>
</tr>
</tbody>
</table>

Any influence on transparency which may be exercised by the temperature or salinity of the water is quite insignificant.

The colour of ocean water far from land is an almost pure
blue, and all the variations of tint towards green are the result of local disturbances, the usual cause being turbidity of some kind, and this in the high seas is almost always due to swarms of plankton. The colour of sea-water as it is seen on board ship is most readily determined by comparison with the tints of Forel's xanthometer or colour scale, which consists of a series of glass tubes fitted with the rungs of a ladder in a frame and filled with a mixture of blue and yellow liquids in varying proportions. For this purpose the zero or pure blue is represented by a solution of 1 part of copper sulphate and 9 parts of ammonia in 190 parts of water. The yellow solution is made up of 1 part of neutral potassium chromate in 190 parts of water, and to give the various degrees of the scale, 1, 2, 3, 4, &c., % of the yellow solution is mixed with 99, 98, 97, 96, &c., % of the blue in successive tubes. Observations with the xanthometer have not hitherto been numerous, but it appears that the purest blue (0-1 on Forel's scale) is found in the Sargasso Sea, in the North Atlantic and in similarly situated tropical and tropical regions in the Indo-Pacific, and that the waters of northern seas have an increasing tendency towards green, the Irminger Sea showing 5-9 Forel, while in the North Sea the water is usually a pure green (10-14 Forel), the western Mediterranean shows 5-9 Forel, but the eastern is as blue as the open ocean (0-2 Forel). A pure blue colour has been observed in the cold southern region, where the "Valdivia" found 0-2 Forel in 52° S. between 16° and 31° E., and even the water of the North Sea has been observed at times to be intensely blue. The blue of the sea-water as observed by the Forel scale has of course nothing to do with the turbidities of the sea, but is due to the extension of the water surface due to the reflection of a cloudless sky. Over shallows even the water of the tropical oceans is always green. There is a distinct relationship between colour and transparency in the ocean; the most transparent water which is the most free from plankton is always the purest blue, while an increasing turbidity is usually associated with an increasing tint of green. The natural colour of pure sea-water is blue, and this is emphasized in deep and very clear water, which appears almost black to the eye. When a quantity of fine white powder is thrown in, the light reflected by the white particles as they sink assumes an intense green, and thus observations of J. Aitken with clear sea-water in long tubes leave no doubt on the subject.

Discoloration of the water is often observed at sea, but that is always due to foreign substances. Brown or even blood-red stripes have been observed in the North Atlantic when swarms of the copepod Calanus finmarchicus were present; the brown alga Trichodesmium erythraeum, as its name suggests, can change the blue of the tropical seas to red; swarms of diatoms may produce olive-green patches in the ocean, while some other forms of life have at times been observed to give the colour of milk to large stretches of the ocean surface.

On account of its salinity, sea-water has a smaller capacity for heat than pure water. According to Thoulet and Chevalier the specific heat diminishes as salinity increases, so that for 10 per mille salinity it is 0.968, for 35 per mille it is only 0.932, that of pure water being taken as unity. The thermal conductivity also diminishes as salinity increases, the conductivity for heat of sea-water of 35 per mille salinity being 4.2/7% less than that of pure water. This means that sea-water heats and cools somewhat more readily than pure water. The surface tension, on the other hand, is greater than that of pure water and increases with the salinity, according to Krümmel, in the manner shown by the equation: $a = 0.005 + 0.0221 S$ at 0° C., where $a$ is the coefficient of surface tension and $S$ the salinity in parts per thousand. The internal friction or viscosity of sea-water has also been shown by E. Ruppin to increase with the salinity. Thus at 0° C. the viscosity of sea-water of 35 per mille salinity is 5.2/7% greater and at 25° C. 4.4/7% greater than that of pure water at the same temperatures; in absolute units the viscosity of sea-water at 25° C. is only half as great as it is at 0° C.

The compressibility of sea-water is not yet fully investigated. It varies not only to a marked degree with temperature, but also with the degree of pressure. Thus J. Y. Buchanan found a mean of 20 experiments made by piezometers sunk in great depths on board the "Challenger" give a coefficient of compressibility $k = 490 \times 10^{-5}$; but six of these experiments made at depths of from 2740 to 3125 fathoms gave $k = 580 \times 10^{-5}$. The value usually adopted is $k = 450 \times 10^{-5}$. The compressibility is itself very small, but so great in its effect on the density of deep water in situ that the specific gravity $(\sigma_{25}^{25})$ at 2000 fathoms increases by 0.017 and at 3000 fathoms by 0.026. In other words, water which has a specific gravity of 1.0280 at the surface would at the same temperature have a specific gravity of 1.0450 at 2000 and 1.0540 at 3000 fathoms. If the whole mass of water in the ocean were relieved from pressure its volume would expand from 319 million cub. m. to 321.7 million cub. m., which for a surface of 139.5 million sq. m. means an increased depth of 100 ft. The rate of propagation of sound depends on the compressibility, and in ocean water at the tropical regions is normally somewhat less, but so great in its effect on the density of deep water in situ that the specific gravity $(\sigma_{25}^{25})$ at 2000 fathoms increases by 0.017 and at 3000 fathoms by 0.026. For the great range of submarine sound signals, which can thus be very serviceable to navigation in foggy weather.

The electrical conductivity of sea-water increases with the salinity; at 59° F. it is given according to E. Ruppin's formula $L = c = 0.01455 S = 0.0000978 S^4 + 0.00000076 S^3$ in reciprocal ohms.

The radio-activity of sea-water is extraordinarily small; indeed in samples taken from 50 fathoms in the Bay of Danzig it was imperceptible, and R. T. Strutt found that salt from evaporated sea-water did not contain one-third of the quantity of radium present in the water of the town supply in Cambridge.

Dissolved Gases of Sea-water.—The water of the ocean, like any other liquid, absorbs a certain amount of the gases with which it is in contact, and thus sea-water contains dissolved oxygen, nitrogen and carbonic acid absorbed from the atmosphere. As Gay-Lussac and Humboldt showed in 1805, gases are absorbed in less amount by a saline solution than by pure water. The first useful determinations of the dissolved gases of sea-water were made by Oskar Jacobsen in 1872. Since that time much work has been done, and the methods have been greatly improved. In the method now most generally practised, which was put forward by O. Pettersson in 1894, two portions of sea-water are collected in glass tubes which have been exhausted of air, coated internally with mercuric chloride to prevent the putrefaction of any organisms, and sealed up beforehand. The exhausted tube, when inserted in the water sample and the tip broken off, immediately fills, and is then sealed up so that the contents cannot change after collection. One portion is used for determining the oxygen and nitrogen, the other for the carbonic acid. The former determination is made by driving out the dissolved gases from solution and collecting them in a Torricellian vacuum, where the volume is measured after the carbonic acid has been removed. The oxygen is then absorbed by some appropriate means, and the volume of the nitrogen measured directly, that of the oxygen being given by difference.

In the second portion the carbonic acid is driven out by means of a current of hydrogen, collected over mercury and absorbed by caustic potash.

C. T. Fox, of the Central Laboratory of the International Council at Christiania, has investigated the relation of the atmospheric gases to sea-water by very exact experimental methods and arrived at the following expressions for the absorption of oxygen and nitrogen by sea-water of different degrees of concentration. The formulae show the number of cubic centimetres of gas absorbed by 1 litre of sea-water; $t$ indicates the temperature in degrees centigrade and $C$ the salinity as shown by the amount of chloride in pereille:

$$ O_2 = 10.391 - 0.2809 t + 0.00609 S - 0.000632 S^2 + 0.000034 S^3 $$(1)
$$ N_2 = 18.561 - 0.482 S + 0.007152 S^2 - 0.0000594 S^3 $$(2)
$$ Cl^- = 21.490 - 0.00117 S^2 + 0.0000931 S^3 $$
In the case of ocean water with a salinity of 35 per mille, this gives for saturation with atmospheric gases in cc. per litre:

\[
\begin{align*}
\text{Oxygen} & : 8.93 \quad 5.84 \quad 4.93 \\
\text{Nitrogen} & : 14.40 \quad 11.12 \quad 9.78
\end{align*}
\]

at 0°C. 15°C. 25°C.

The reduction of the absorption of gas by rise of temperature is thus seen to be considerable. As a rule the amount of both gases dissolved in sea-water is found to be that which is indicated by the temperature of the water in situ. Jacobsen on some occasions found water in the surface layers of the Baltic super-saturated with oxygen, which is ascribed to the action of the chlorophyll in vegetable plankton; in other cases when examining the nearly stagnant water from deep basins he found a deficiency of oxygen due no doubt to the withdrawal of oxygen from solution, by the respiration of the animals and the oxidation of the deposits on the bottom. When these processes continue for a long time in deep water shut off from free circulation so that it does not become aerated by contact with the atmosphere the water becomes unfit to support the life of fishes, and when the accumulation of putrefying organic matter gives rise to sulphuretted hydroxide as in the Black Sea below 150 fathoms, life, other than bacterial, is impossible. The water from the greatest depths of the Black Sea, 1160 fathoms, contains 6 cc. of sulphuretted hydrogen per litre.

The distribution of dissolved oxygen in the depths of the open ocean is still very imperfectly known. Dittmar’s analysis of the “Challenger” samples indicated an excess of oxygen in the surface water of high southern latitudes and a deficiency at depths below 50 fathoms.

The facts regarding carbonic acid in sea-water are even less understood, for here we have to do not only with the solution of the gas in the water, which is chemical, but also with respiration of plankton, and it is very difficult to know when all the gas is driven out of a sample of sea-water, and a much larger proportion is present than the partial pressure of the gas in the atmosphere and its coefficient of absorption would indicate. These constants would lead one to expect to find 0.5 cc. per litre at 0°C. while as a matter of fact the amount absorbed approaches 50 cc. The form of combination is unstable and apparently variable, so that the quantities of free carbonic acid, bicarbonates and normal carbonate are liable to alter. Since 1851 it has been known that all sea-water has an alkaline reaction, and Turner defined the alkalinity of sea-water as the amount of acid necessary to convert the excess of bases into normal carbonate. The alkalinity of North Atlantic water of 35 per mille salinity is 26.86 cc. per litre, corresponding to a total amount of carbonic acid of 49.07 cc. According to the researches of August Krogh, the alkalinity is greatly increased by the admixture of land water. This is proved by E. Ruppini’s analysis of Baltic water, which has an alkalinity of 16 to 18 instead of the 5 or 6 which would be the amount proportional to the salinity, while the water of the Vistula and the Elbe with a salinity of 1 per mille has an alkalinity of 8 or 9. Thus the alkalinity serves as an index of the admixture of river water with sea-water. Carbonic acid passes from the atmosphere into the ocean as soon as its tension in the latter is the smaller; hence in this respect the ocean acts as a regulator. The amount of carbonic acid in solution may also be increased by submarine exhalations in regions of volcanic disturbance, but it must be remembered that the critical pressure for this gas is 73 atmospheres, which is reached at a depth of 400 fathoms, so that carbonic acid produced at the bottom of the ocean must be in liquid form. The respiration of marine animals in the depths of deep basins in which there is no circulation adds to the carbonic acid at the expense of the dissolved oxygen. This is frequently the case in fjord basins; for instance, in the Gullmar Fjord at a depth of 50 fathoms with water of 34.14 per mille salinity and

\[1\text{ Meddeleler om Grønland} (Copenhagen, 1904), p. 331.\]
H. R. Mill in 1885 devised a self-locking arrangement by which the bottle once closed was automatically locked and rendered watertight; H. L. Ekman made further improvements; and, finally, O. Pettersson and F. Nansen perfected the instrument, adapting it not only for enclosing a portion of water at any desired depth, but by a series of concentric divisions insulating in the central compartment water at the temperature it had at the moment of collection. By means of a weight dropped along the line the water-bottle can be shut and a sample enclosed at any desired depth. The use of a sliding weight is not recommended in depths much exceeding 200 fathoms on account of the time required and the risk of the line sagging, but at a low angle and slow speeds the deep penetration of the closing mechanism is usually actuated by a screw propeller which begins to work when the line is being hauled in and can be set so as to close the water-bottle in a very few fathoms. A small but heavy water-bottle has been devised by Martin Knudsen, provided with a pressure gauge or bathometer, by which samples may be collected from any moderate depth down to about 100 fathoms, on board a vessel going at full speed. This has made it possible to obtain many samples from moderate depths along a long line in a very short space of time. Sisquée's small water-bottle on the deck of a steamer, as used by a propeller requires extremely skilful handling to enable it to give good results.

As yet it is only possible to speak with confidence of the vertical distribution of salinity in the seas surrounding Europe, where there is a general increase of salinity with depth. For the open ocean the only quite trustworthy results are those obtained by the prince of Monaco in the North Atlantic, and by the recent Antarctic expeditions in the South Atlantic and South Indian Oceans. The observations made on the "Challenger" and "Gazelle," though enabling some perfectly sound general conclusions to be drawn, require to be supplemented. It appears, as J. Y. Buchanan pointed out in 1876, that the great contrasts in surface salinity between the tropical maxima and the equatorial minima give place at the moderate depth of 200 fathoms to a practically uniform salinity in all parts of the ocean.

In the North Atlantic a strong submarine current flowing outward from the Mediterranean leaves the Strait of Gibraltar with a salinity of 36 per mille, and can be traced as far as Madeira and the Bay of Biscay in depths of from 600 to 2000 fathoms, still with a salinity of 36 per mille, whereas in the tropical equal depths the salinity is from 0·5 to 0·7 per mille less. In the tropical and sub-tropical belts of the Atlantic and Indian Oceans south of the equator the salinity diminishes rapidly from the surface downwards, and at 500 fathoms reaches a minimum of 34·3 or 34·4 per mille; after that it increases again to 800 fathoms, where it is almost 34·7 or 34·8, and this salinity holds good to the bottom, even to the greatest depths, as was first shown by the "Gauss" and afterwards by the "Planet" between Durban and Ceylon.

Our knowledge of the Pacific in this respect is still very imperfect, but it appears to be less salt than the other oceans at depths below 800 fathoms, as on the surface, the salinity at considerable depths being 34·6 to 34·7 in the western part of the ocean, and about 34·4 to 34·5 in the eastern, so that, although the data are by no means satisfactory, it is impossible to assign a mass-salinity of more than 34·7 per mille for the whole body of Pacific water.

The causes of difference of salinity are mainly meteorological. The belt of equatorial minimum salinity corresponds with the easterly currents of calms and of the equatorial counter-current, the salinity diminishing towards the east. The tropical maxima of salinity on the poleward side of the trade-winds coincide with the regions of minimum rainfall, high temperature, strong winds and consequently of maximum evaporation. Evaporation is naturally greatest in the enclosed seas of the nearly rainless subtropical zone such as the Mediterranean and Red Sea. Where the evaporation is at a minimum, the inflow of rivers from a large continental area and the precipitation from the atmosphere at a maximum, there is necessarily the greatest dilution of the sea-water, the Baltic and the Arctic Sea being conspicuous examples.

Temperature of the Oceans.—There is no difficulty in observing the temperature of the surface of the sea on board ship, the only precautions required being to draw the water in a bucket which has not been heated in the sun in summer or exposed to frost in winter, to draw it well forward of any discharge pipes of the steamer, to place it in the shade on deck, insert the thermometer immediately and make the reading without delay. The measurement of temperature in the depths, unless a high-speed water-bottle be used, involves stopping the ship and employing thermometers of the bathometer type. Many forms have been tried, but only three types are in general use. The first was the Phipps thermometer which was originally used with good effect by de Saussure in the Mediterranean in 1780. He covered the bulb of the thermometer with layers of non-conducting material and left it immersed at the desired depth for a very long time to enable it to take the temperature of its surroundings. When brought up again the thermometer retained its temperature so long that there was ample time to take a correct reading. Since 1870 thermometers on this principle have been in use for regular observations at German coast and light-ship stations. Following Saussure's example of Cavendish, Irving made observations of deep temperature on Phipps's Spitsbergen voyage of 1773 with a valveless water-bottle, insulated by non-conducting material. A similar instrument gave excellent results in the hands of E. von Lenz on Kotzebue's second voyage of circumnavigation in 1823-1826. The last elaboration of the insulated slip water-bottle by Ekman, Nansen and Pettersson has produced an instrument of great perfection, in which the insulation is effected by layers of water between a series of concentric ebonite cylinders, all of which are closed both above and below when the apparatus encloses a sample, and each of which in turn must be warmed considerably before there is any rise of temperature in the chamber within. This can be used with certainty to °0·5 C. for water down to 250 fathoms, after taking account of the slight disturbance produced by the expansion of the greatly compressed deep water.

The second form of deep-sea thermometer is the self-registering maximum and minimum on James Sis's principle. These instruments must be constructed with the greatest care, but when well-made in accordance with J. Y. Buchanan's large model they can be trusted to give a good record of the vertical distribution of temperature, provided the water grows cooler as the depth increases. They would act equally well if the water grew continually warmer as the depth increases, but they cannot give an exact account of a temperature inversion such as is produced when layers of warmer and colder water alternate.

The third form is the outflow or reversing thermometer, first introduced by Aimé, who used a very inconvenient form in the Mediterranean in 1841-1845, but greatly improved and simplified by Negretti and Zambra in 1875. The principle is to have a constriction in the tube above the bulb so proportioned that when the instrument is upright it acts in every way as an ordinary mercurial thermometer, but when it is inverted the thread of mercury breaks at the constriction, and the portion above the point runs down the now reversed tube and remains there as a measure of the temperature at the moment of turning over. For convenience in reading, the tube is graduated inverted, and when it is restored to its original position the mercury thread joins again and it acts as before. Various modifications of this form of thermometer have been made by Chabaud and others. It has the advantage over the thermometer on Sis's principle that, being filled with mercury, it does not require such long immersion to take the temperature of the water. A correction has, of course, to be made for the expansion or contraction of the mercury thread if the temperature of reading differs much from that of reversing. Magnagni introduced a convenient method of inverting the thermometer by means of a propeller actuated on beginning to heave in the line, and this form is used for all work at great depths. For shallow water greater precision and certainty are obtained by using a lever
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actuated by a weight slipped down the line to cause the reversal, as in the patterns of Rung, Mill and others. All thermometers sunk into deep water must be protected against the enormous pressure to which they are exposed. This may be done by the method suggested by Arago in 1828, introduced by Aimé in 1841 and again suggested by Glaisher in 1858, of sealing up the whole instrument in a glass tube exhausted of air or, less effectively, by surrounding the bulb alone with a strong outer sheath of glass. In both forms it is usual to have the space between the bulb and the protecting sheath partly filled with mercury or alcohol to act as a conductor and reduce the time necessary for the thermometer to acquire the temperature of its surroundings.

The warming of the ocean is due practically to solar radiation alone; such heat as may be received from the interior of the earth can only produce a small effect and is fairly uniformly distributed. On account of the high specific heat of sea-water the diurnal range of temperature at the surface is very small. According to A. Buchan’s discussion of the two-hourly observations on the “Challenger” the total range between the daily maximum and minimum in the warmer seas is between 0.7° and 0.8° F., and for the colder seas still less (0.2° F.), compared with 3.2° F. in the overlying air. The maximum usually occurs between 1 and 2.30 P.M., the minimum shortly before sunrise. The temperature of the surface water is generally a little higher than that of the overlying air, the daily average difference being about 0.6° F., varying from 0.9° lower at 1 P.M. to 1.6° higher at 1 A.M. There are few observations available for ascertaining the depth to which this warming penetrates in the ocean. The investigations of Aimé in 1845 and Hensen in 1859 indicate that the amount of cloud has a great effect. Aimé showed that on a calm bright day in the Mediterranean the temperature rose 0.1° C. between the early morning and noon at a depth of about 12 fathoms. Luksh obtained a much greater penetration of solar warmth from the comparison of observations at different hours at neighbouring stations in the eastern Mediterranean, but his methods were not exact enough to give confidence in the result. The penetration of warmth from the surface is effected by direct radiation, and by convection, which acts partially rendered dense by evaporation increasing salinity. Conduction has practically no effect, for the efficiency of thermal conductivity in sea-water is so small that if a mass of sea-water cooled to 0° C. and the surface kept at a temperature of 30° C., 6 months would elapse before a temperature of 15° C. was reached at the depth of 1.3 metres, 1 year at 1.83 metres, and 10 years at 5.8 metres. Great irregular variations in radiation and convection sometimes produce a remarkably abrupt change of temperature at a certain depth in calm water; the layer in which this sudden change takes place has been closely measured by Schott. How closely two bodies of water at different temperatures may come together is shown by the fact that in the Baltic in August between 10 and 11 fathoms there is sometimes a fall of temperature from 57° to 46° F. Such a condition of things is only possible in very calm weather, the action of waves having the effect of mixing the water to a considerable depth. After a storm the whole of the water in the North Sea assumes a homothetic condition, i.e., the temperature is the same from surface to bottom, and this occurs not only south of the Dogger Bank, where the condition is normal, but also, though less frequently, in the deeper water farther north. Similar effects are produced in narrow waters by the action of tidal currents, and the influence of a steady wind blowing on- or off-shore has a powerful effect in mixing the water.

The warmest parts of the Indian Ocean and Western Pacific have a mean annual temperature of 82° to 84° F., but such high temperatures are not found in the tropical Atlantic. In the Indian Ocean between 15° N. and 3° S. the surface temperature in May averages 84° to 86° F., and in the Bay of Bengal the temperature is 86°, and on part of the Atlantic basin is so high a month's mean temperature at any season. G. Schott’s investigations show that the annual range of surface temperature in the open ocean is greatest in 40° N., with 18.4° F., and in 30° S., with 9.2° F.; on the contrary, near the equator it is less, only 4° F. in 10° N., and in high latitudes it is also small, 5.2° F. in 50° S. The figures quoted above are differences between the average surface temperatures of the warmest and of the coldest month. As to the absolute extremes of surface temperature, Sir John Murray points out that 90° F. frequently occurs in the western part of the tropical Pacific, while among seas the Persian Gulf reaches 96° F., only 2° under blood-heat, and the Red Sea follows closely with a maximum of 94°. The greatest change of temperature at any place has been recorded to the east of Nova Scotia, a minimum of 28° F. and a maximum of 86°, and to the north-east of Japan with a minimum of 27° F. and a maximum of 85°. In those localities, however, it is not the same water which varies in temperature with the season, but the water of different warm and cold currents which periodically occupy the same locality as they advance and retreat. The zones of surface temperature are arranged roughly parallel to the equator, especially in the southern hemisphere. Between 46° N. and 46° S. the currents produce a considerable rearrangement of this simple order, the belts of warm water being wider on the western sides of the oceans and narrower on the eastern. The arrangement of the isotherms thus affords a basis for valuable deductions as to the direction of ocean currents. The surface temperature of the Atlantic is relatively lower than that of the other oceans when the whole area is considered. According to Krümmel’s calculation the proportional areas at a high temperature are as follows:

<table>
<thead>
<tr>
<th>Temperature Range</th>
<th>Atlantic</th>
<th>Indian</th>
<th>Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td>27° F. (25° C.)</td>
<td>22-4</td>
<td>38-0</td>
<td>40-1</td>
</tr>
<tr>
<td>68° F. (20° C.)</td>
<td>50-1</td>
<td>51-7</td>
<td>58-4</td>
</tr>
</tbody>
</table>

This disparity results in some degree at least from the comparative narrowness of the inter-tropical Atlantic, and the absence of a cool northern area in the Indian Ocean. Krümmel calculates that the mean temperature of the whole ocean surface is 63.3° F., while the mean sea-level temperature of the whole layer of air at the surface of the earth is given by Hann as 57.8° F.

We are still ignorant of the depth to which the annual temperature wave penetrates in the open ocean, but observations in the Mediterranean enable us to form some opinion on the matter. The observations of Aimé in 1845 and of Semmla in the Gulf of Naples in 1881 show that the temperature of the sea-water increases until the whole mass of water from the surface to the bottom, in 1600 fathoms or more, assumes the same temperature. Towards the end of summer the upper layers have been warmed to a depth which indicates how far the influence of solar radiation and convection have reached. Aimé calculated this depth at 150-200 fathoms, while the observations of the Austrian expedition in the eastern Mediterranean found it to be from 200 to nearly 400 fathoms. In the Red Sea, where a similar seasonal change occurs, the depth to which the surface layer warms up is about 275 fathoms. The great difference in salinity between the surface and the deep water excludes the possibility of effective convection in the seas of northern Europe, and in the open ocean the currents which are felt everywhere, and especially those with a vertical component, must exercise a very disturbing influence on convection.

The vertical distribution of surface temperature in the open ocean is much better known than that of salinity. The regional differences of temperature at like depths become less as the depth increases. Thus at 300 fathoms greater differences than 9° F. hardly ever occur between 30° N. and 30° S., in 800 fathoms the differences are less than 5° F. and in 1500 fathoms less than 2°. Even in the tropics the high temperature of the surface is confined to a very shallow layer; thus in the Central Pacific where the surface temperature is 82° F., the temperature at 100
fathoms is only 52° F. The whole ocean must thus form but a cold dwelling-place for the organisms of the deep sea. Sir John Murray calculates that at least 80% of the water in the ocean has a temperature always less than 40° F., and a recent calculation by Krümmel gave in fact a mean temperature of 36° F. for the whole ocean.

The normal vertical distribution of temperature is illustrated in curve A of fig. 1, which represents a sounding in the South Atlantic; and this arrangement of a rapid fall of temperature giving place gradually to an extremely slow but steady diminution as depth increases is termed anathermic (άνά, back, and θέρμη, warm). Curve B shows the typical distribution of temperature in an enclosed sea, in this case the Sulu Basin of the Malay Sea, where from the level of the barrier to the bottom the temperature remains uniform or homothermic. Curve C shows a typical summer condition in the polar seas, where layers of sea-water at different temperatures are superimposed, the arrangement from the surface to 200 fathoms is termed in 45° S., and 33°-8° to 34°-5° in 35° S., while north of the Walisich Ridge and east of the South Atlantic Rise bottom temperatures of 36° to 36°-7° F. prevail right northwards across the equator into the Bay of Biscay, although the depth of bottom temperature as successive submarine elevations restrict communication with the Antarctic. On the other hand, in the more open Argentine Basin, which carries deep water far to the south, the bottom temperature in 40° S. is only from 32°-2 to 32°-7° F., and the same low temperature continues throughout the Brazil Basin to the equator; but in the North American Basin from the West Indies to the Telegraph Plateau no satisfactory bottom temperature lower than 35°-6 F. has been reported. On the floor of the Indian Ocean temperatures of 33°-3° to 33°-6° occur south of 35° S. in depths of 2500 fathoms or more, but north of 35° S. the prevailing bottom temperatures are from 34°-9° to 34°-3°. In similar depths in the Pacific south of the equator temperatures of 33°-8° to 34°-5° are found, and north of the equator bottom temperatures at the same depth increase to 35°-4° in the neighbourhood of the Aleutian Islands, again completely justifying the conclusion as to the Antarctic control of deep water temperature throughout the ocean.

The marginal rises and continental shelves prevent this cold bottom water from penetrating into the depths of the enclosed and fringing seas. Thus in the Central American Sea below 90 fathoms, the depth on the outside of the barrier, no water of bottom temperature lower than that prevailing in the open ocean at that depth, viz. 35°-6° F., not even at the bottom of the great Bartlett Deep in 3450 fathoms. Such homothermic masses of water are characteristic of all deep enclosed seas. Thus in the Malay Sea the various minor seas or basins are homothermic below the depth of the rim, at the temperature prevailing at that depth in the open ocean: in the China Sea below 875 fathoms with 36°-5° F.; in the Sulu Sea (depth 2550 fathoms) below 400 fathoms with 35°-5° F.; in the Celebes Sea below 850 fathoms with 38°-6° F.; in the Banda Sea below 902 fathoms with 34°-5°. In 3500 fathoms enclosed seas which are shut off from the ocean by a very shallow sill the rule holds good that the homothermic water below the level of the sill is at the lowest temperature reached by the surface water in the coldest season of the year, provided always that the stratification of salinity is such as to permit of convection being set up. To this group belongs the Arctic Sea; the Norwegian Sea is homothermic below 550 fathoms at 29°-8° F., but this cold water does not penetrate into the Arctic Basin on account of the ridge between Spitsbergen and Greenland, and there the water below 400 fathoms at 30°-6° to 30°-9° F. because the surface layers of water are too light, on account of the low salinity due to ice-melting, to enable even the cold of a polar winter to set up a downward convection current. The Mediterranean Sea also belongs to this group; its various deep basins are homothermic (at the winter surface temperature) below the level of their respective sills—the Balcariac Basin below 190 fathoms at 55° F.; the Eastern Basin below 270 fathoms at 55°-9° F.; the Ionian Sea at 50°-3° F.; and at 56°-7° south of Cyprus. Similarly in the Red Sea the water below 380 fathoms is homothermic at 70°-9° F.

An under-current flows out from the Red Sea through the Strait of Bab-el-Mandeb, and from the Mediterranean through the Strait of Gibraltar, raising the salinity as well as the temperature of the part of the ocean outside the gates of the respective seas. The action of the Red Sea water affects the whole of the Gulf of Aden and Arabian Sea, raising the temperature at the depth of 550 fathoms to 52° or 53° F. or 9° Fahrenheit degrees higher than the water of the Bay of Bengal at the same depth. The effect of the Mediterranean water in the North Atlantic does not require such large figures to express it, but is none the less far-reaching, as first indicated by the work of the "Challenger" and subsequently defined by H. N. Dickson's discussion of the observations of Wolfenden in the little sailing yacht "Silver Belle." The temperature at 550 fathoms is raised to 49° or 50° F. between Madeira and the Biscay Shelf, i.e. 5°-4° F. above the temperature at the same depth off the Azores.

In shallow seas such as the North Sea and the British fringing
seas, where tidal currents run strong, there is a general mixing together of the surface and deeper water, thus making the arrangement of vertical temperature anathemetic in summer and katathermic in winter, while at the transitional periods in spring and autumn it is practically homothermic. Thus at Station E4 of the international series at the mouth of the English Channel in 49° 27' N., 4° 42' W., the following distribution of temperature $F.$ has been observed by Matthews:

<table>
<thead>
<tr>
<th>Month</th>
<th>Temperature ($F.$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 1904</td>
<td>55°F</td>
</tr>
<tr>
<td>November 1904</td>
<td>55°F</td>
</tr>
<tr>
<td>February 1905</td>
<td>50°F</td>
</tr>
<tr>
<td>May 1905</td>
<td>55°F</td>
</tr>
</tbody>
</table>

It is noticeable that there is a marked vertical temperature gradient only at the end of summer when a warm surface layer is formed, though in August 1904 that was only 8 fathoms thick. In small nearly land-locked basins shut off from one another by bars rising to within a short distance of the surface and affected both by strong tidal currents and by a considerable and close shore of land-water, the contrasts of vertical distribution of temperature with the seasons are strongly marked, and there are also great unperiodic changes effected mainly by wind, as shown by the investigations of H. R. Mill in the Clyde Sea Area, and of O. Pettersson, J. Hjort and Helland-Hansen in the Scandinavian fjords.

**Sea Ice.**—The freezing-point of sea-water is lower as the salinity increases and normal sea-water of 35 per mille salinity freezes at 28.6°F. Experience shows that sea-water can be cooled considerably below the freezing-point without freezing if there is no ice or snow in contact with it. Freezing takes place by the formation of pure ice in flat crystalline plates of the hexagonal system, which form in perpendicular planes and unite in bundles to form grains so that a thick covering of ice exhibits a fibrous structure. It is only the water that freezes; the dissolved salts are excluded in the process in a regular order according to temperature. At temperatures about 17°F. sodium sulphate is the first ingredient of the salts to separate out, potassium chloride follows at 12°F., sodium chloride at -7.4°F., magnesium chloride at -28.5°F. and, as O. Pettersson was the first to point out, calcium chloride not until -$6.0°F. During the rapid formation of ice the stiff unbroken ice is often imprisoned between the little plates of frozen water; hence without some special treatment sea-ice is not suitable as a source of drinking water. A long continued frost the last of the included brine may be frozen and the salts driven out in crystals on the surface; these crystals are known to polar explorers by the Siberian name of *rassol.* Ice is a very poor conductor of heat and accordingly protects the surface of the water beneath from rapid cooling; hence newly-formed pancake ice does not increase excessively in thickness in one winter, and even in the centre of the Arctic Basin, the ice-covering only amounts to 6 or at most 9 ft. in the course of a year, while in the Antarctic regions the season's growth is only half as great; in the latter also the accumulated snow is an important factor in the thickness of the ice, and snow is an even worse conductor of heat. The influence of wind and tide breaks up the frozen surface of the sea, and sheets yielding to the pressures slide over or under one another and are worked together into a hummocky ice-pack, the irregularities on the surface of which, caused by repeated fractures and collisions, may be from 10 to 20 ft high. Such formations, termed *torriss* by the Russians, may extend under water, according to Makaroff's investigations, to at least an equal depth. Such old sea-ice when prevented from escaping forms the palaeocryostic sea of Nares; but, as a rule, it is carried southward in the East Greenland and Labrador currents, and melted in the warmer seas of lower latitudes. In the southern hemisphere the ice-pack forms a nearly continuous fence around the Antarctic continent. Pack-ice forms regularly in the inner part of the Baltic every winter, but not in the Norwegian fjords. Even in the Mediterranean sea-ice is formed annually in the northern part of the Black Sea, and more rarely in the Gulf of Salonica and at the head of the Adriatic off Triest. Hudson Bay is blocked by ice for a great part of the year, and the Gulf of St Lawrence is blocked every winter. Ice also clothes the continental shores of the northern fringing seas of eastern Asia. In addition to sea-ice, icebergs which are of land origin occur at sea. In the north, icebergs break off, as a rule, from the ends of the great glaciers of Greenland, and in the far south from the edge of the great Antarctic ice-barrier. The latter often gives birth to prodigious icebergs and ice islands, which are carried northward by ocean currents, nearly as far as the tropical zone before they melt. Thus in December 1906, an iceberg was seen off the mouth of the La Plata in 38° S., and in 1840 one was seen near Cape Aguñas in 35° S. The Antarctic icebergs are of tabular form and much larger than those of Greenland, but in either case an iceberg rising to 200 ft. above sea-level is uncommon, and one exceeding 300 ft. is very rare. The Greenland icebergs are carried by the Labrador current across the great banks of Newfoundland, where they are often very numerous in the and rolling of the vessel produce disturbances that greatly affect the result. Such current-meters as those used by J. C. in 1841 and by Irminger since 1858 only gave the direction of the deeper current by comparison with the surface current at the time of observation. Later apparatus, such as Pettersson's bifilar current-meter or his more recent electric-photographic apparatus, and Nansen and Ekman's propeller current-meter, measure both the direction and the velocity at any moderate depth from an anchored vessel. One of the indirect methods of investigating currents is by taking account of the initial temperature of the current and following it by the thermometer throughout its course. Hence the familiar contrast between warm and cold currents, of which the Gulf Stream and the Labrador current are types. Benjamin Franklin in 1775 and Charles Blagden in 1781, by means of numerous observations of temperature made on board the packets plying on the Atlantic passage, determined the boundaries of these two currents and their seasonal variations with considerable precision. The differences of salinity support this method, and, especially in the northern European seas, often prove a sharper criterion of the boundaries than temperature itself; this is especially the case at the entrance to the Baltic. Evidence drawn from drift-wood, wrecks or special drift bottles is less distinctly but still interesting and often useful; this method of investigation includes the use of icebergs as indicators of the trend of currents and also of plankton, the minute swimming or drifting organisms so abundant at the surface of the sea.

The general lines of the currents of the oceans are fairly well understood, and along the most frequented ocean routes the larger seasonal variations have also been ascertained. The general scheme of ocean currents depends on the prevailing
winds taken in conjunction with the configuration of the coast and its submarine approaches. The trade-wind regions correspond pretty closely with westward-flowing currents, while in the equatorial calm belts there are eastward-running counter-currents, these lying north of the equator in the Atlantic and Pacific, but south of the equator in the Indian Ocean. In the region of the westerly winds on the poleward side of 40° N. and S. the currents again flow generally eastward. A cyclonic circulation of the atmosphere is associated with a cyclonic circulation of the water of the ocean, as is well shown in the Norwegian Sea and North Atlantic. The westerly winds pump the water northwards in the Atlantic and southwards in the Pacific. When the westerlies become southward, they heave up the surface water against the east coast of the continents the currents turn poleward. The north equatorial current divides into the current entering the Caribbean Sea and issuing thence by the Strait of Florida as the Gulf Stream, and the Antilles current passing to the north of the Antilles. Both currents unite off the coast of the United States and run northward, turning towards the east when they come within the influence of the prevailing westerly winds. In a similar manner the Brazil current, the Agulhas current and the East Australian current originate from the drift of the drift drift-drift, and in the North Pacific the Japan current arises from the north-east trade drift. The west-wind drifts on the poleward side carry back part of the water southward to re-unite with the equatorial current, and thus there is set up an anticyclonic circulation of water between 10° and 40° in each hemisphere, the movement of the water corresponding very closely with that of the wind. The coincidence of wind and current direction is most marked in the region of alternating monsoons in the north of the Indian Ocean and in the Malay Sea.

The accordance of wind and currents is so obvious that it was fully recognized by early mariners in the time of the first circumnavigators. Modern investigations have shown, however, that the relationship is by no means so simple as appears at first. We must remember that the ocean is a continuous sheet of water of a certain depth, and the conditions of continuity which hold good for all fluids require that there should be no vacant space within it; hence if a single water particle is set in motion, the whole ocean must respond, as Varennius pointed out in 1650. Thus all the water carried forward by any current must have the place it left immediately occupied by water from another place, so that only one fluid is involved, and the drift-drift-drift-drift-drift-drift, and in the ocean. Further, all water particles when moving undergo a deviation from a straight path due to the forces set up by the rotation of the earth deflecting them towards the right as they move in the northern hemisphere and towards the left in the southern. This deflecting force is directly proportional to the velocity and the mass of the particle and also to the sine of the latitude; hence it is zero at the equator and comes to a maximum at the poles. When the wind acts on the surface of the sea it drives before it the particles of the surface layer of water, and, as these cannot be parted from those immediately beneath, the friction of the fluid causes the propelling impulse to act through a considerable depth, and if the wind continued long enough it would ultimately set the whole mass of the ocean in motion right down to the bottom. The current set up by the grip of the wind sweeping over the surface is deflected by the earth's rotation about 45° to the right of the direction of the wind in the northern hemisphere and to the left in the southern. The deeper layers lag behind the upper in deflection and the velocity of the current rapidly diminishes in consequence. The older theory of the origin of drift currents enunciated by Züppritz in 1878 was modified as indicated above by Nansen in 1901, and Walfrid Ekman subsequently went further. He showed that at a certain depth the direction of the current becomes exactly the opposite of that which has been imposed by deflection on the surface current, and the strength is reduced thereby to one-twentieth of that at the surface. He called the depth at which the opposed direction is attained the drift-current depth, and he found it to be dependent on the velocity of the surface current and on the latitude. According to Ekman's calculation with a trade-wind blowing at 16 m per hour, the drift-current depth in latitude 5° would be approximately 104 fathoms, in latitude 15°, 55 fathoms, and in latitude 45° only from 33 to 38 fathoms. A strong wind of 38 m an hour would produce a drift-current depth of 82 fathoms in latitude 45°, and a light breeze of 3 m an hour only 22 fathoms. It follows that a pure trade-wind drift cannot reach to any great depth, and this seems to be confirmed by observation, as when tow-nets are sunk to depths of 50 fathoms and more in the region of the equatorial current they always show a strong drift away from the side of the ship, the ship itself following the surface current. The direction of the drift-drift-drift-drift-drift-drift, is always a direction of the whole mass of the current is perpendicular to the direction of the wind which sets it in motion. This produces a heaping-up of warm water towards the middle of the anti-cyclonic current circulation between 10° and 40°, and on the other hand an updraft of deep water along the outer side of the cyclonic currents. The latter phenomenon is most clearly shown by the stripes of cold water along the west coasts of Africa and America, the current running along the coast tending to draw its water away seawards on the surface and the principle of continuity requiring the updraft of the cool deep layers to take its place. For this reason the up-welling coastal water is coldest close to the shore, and hence it only appears on the Somali coast during the south-west monsoon. On the flat coasts of Europe the influence of on-shore wind in driving in warm water, and of off-shore wind in producing an updraft of cold water, has long been familiar to bathers. In a similar way updrafts of cold water to the surface occur in the neighbourhood of the equator, especially in the Central Atlantic and Pacific. When a drift-current impinges directly upon a coast there is a heaping up of surface water, giving rise to a counter-current in the deep-drift-drift-drift, which maintains the level, and this counter-current, although subject to deflection on account of the rotation of the earth, is deflected much less than a pure drift-current would be. Such currents, due to the banking up of water, have a large share in setting the depths of the sea in motion, and so securing the vertical circulation and ventilation of the ocean.

The difference in density which occurs between one part of the ocean and another, shares with the wind in the production of currents. Vertical movements are also produced by difference of temperature in the water, but these can only be feeble, as below 1000 fathoms the temperature differences between tropical and polar waters are very small. If we assign to a column of water at the equator the density of 3 fathoms at 1000 fathoms, or an average of 1000, and to a column of water at the polar circle a mean density of 1000, there would result a difference of level equal to (1000-1000) X 1000 = 3 fathoms in a distance from the equator to the polar circle of some 4000 m. A gradient like this, only in 1,330,000, could rise only to an extremely feeble surface current polewards and an extremely feeble deep current towards the equator. If there were strong currents at the bottom of the ocean the uniform accumulation of the deposit of minute shells of globigerina and radiolarian ooze would be impossible, the rises and ridges would necessarily be swept clear of them, and the fact that this is not the case shows that from whatever cause the waters of the depths are set in motion, that motion must be of the most deliberate and gentlest kind. In exceptional cases, when a strong deep current does flow over a rise, as in the case of the Wyville Thomson Ridge, the bottom is swept clear of fine sediment. Strongly marked differences in density are produced by the melting of sea-ice, and this is of particular importance in the case of the great ice barrier round the Antarctic continent. O. Petersson has made a careful study of ice melting as a motive power in oceanic circulation, and points out that it acts in two ways: on the surface it produces dilution of the water, forming a fresh layer and causing an outflow seaward of surface water with very low salinity; towards the deep water it produces a strong cooling effect, leading to increase of density and sinking of the chilled layers. Both actions result in the drawing in of
an intermediate layer of water from a distance which takes part in the double system of vertical circulation as is indicated in fig. 2. The actual direction of this circulation is strongly modified by the influence of the earth's rotation. The existence of a layer of water of low salinity at a depth of 50 fathoms in the tropical oceans of the southern hemisphere is to be referred to this action of the melting ice of the Antarctic regions. Petterson's view that ice-melting dominates the whole circulation of the oceans and regulates in particular the currents of the seas round northern Europe must, however, be looked on as carrying the explanation too far.

Differences of density between the waters of enclosed seas and of the ocean are brought about in some instances by concentration of the water of the sea on account of active evaporation, and in other instances by dilution on account of the great influx of land water. A very powerful vertical circulation is thus set up between enclosed seas and the outer ocean. The very dense water of the Red Sea and the Mediterranean makes the column of water saltier and heavier and the level lower than in the ocean beyond the straits. Hence a strong surface current sets inwards through the Straits of Bab-el-Mandeb and Gibraltar, while an undercurrent flows outwards, raising the temperature and salinity of the ocean for a long distance beyond the straits.

Through the Bosphorus and Dardanelles at the entrance of the Black Sea, and through the sound and belts at the entrance of the Baltic, streams of fresh surface-water flow outwards to the salter Mediterranean and North Sea, while salter water enters in each case as an undercurrent. Wind and tide greatly alter the strength of these currents due to difference of density, and the surface outflow may either be stopped or, in the case of the belts, actually reversed by a strong and steady wind. Both outflowing and inflowing currents are subject to the deflection towards the right imposed by the earth's rotation.

Modern oceanography has found means to calculate quantitatively the circulatory movements produced by wind and the distribution of temperature and salinity not only at the surface but in deep water. The methods first suggested by H. Mohr and subsequently elaborated by V. Bjerknes have been usefully applied in many cases, but they cannot take the place of direct observations of currents and of the fundamental processes and conditions underlying them. The determination of the exact relationship of cause and effect in the origin of ocean currents is a matter of great practical importance. The researches of Pettersson, Meinardus, H. N. Dickson and others leave no doubt, for example, that the variations in the intensity of the Gulf Stream, whether these be measured by the change in the strength of the current or in the heat stored in the water, produce great variations in the character of the weather of northern Europe. The connexion between variations of current strength and the conditions of existence and distribution of plankton are no less important, especially as they act directly or indirectly on the life-conditions of fish species.


Important current and temperature charts of the ocean and occasional memoirs are published by the Admiralty by the Meteorological Office in London, by the U.S. Hydrographic Office in Washington, the Deutsche Seewarte in Hamburg, and also at intervals by the French, Russian, Dutch and Scandinavian admiralties. *Pilot Chart of the North Atlantic* and *Charts of selected soundings of the South Atlantic* are issued monthly by the U.S. Hydrographic Office, and of the North Atlantic and of the Indian Ocean and Red Sea by the British Meteorological Office, giving a compass of the normal conditions of weather and sea.


Reports of many minor expeditions and researches have appeared in the *Reports of the Fishery Board for Scotland*; the Marine Biological Association at Plymouth; the Kiel Commission for the Investigation of the Baltic; the Berlin Institut für Meereskunde; the U.S. Office of the Hydrographic Department; the various official reports to the British, German, Russian, Finnish, Norwegian, Swedish, Danish, Belgian and Dutch governments on the respective work of the commission. In addition there are publications by the Commission operating in the North Sea the *Bulletin du maitre océanographique de Monaco* (1903 seq.); the *Scottish Geographical Magazine*; the *Geographical Journal*; Petermanns Mitteilungen; Wagner's *Geo-
graphische Jahrbuch*; the *Proceedings and Transactions* of various Societies of London and Edinburgh; the *Annalen der Hydrographie*; and the publications of the Swedish Academy of Sciences. (O. K.; H. R. M.)

OCEAN CITY, a city and seaside resort of Cape May county, New Jersey, U.S.A., in the S.E. part of the state, about 10 m. S.W. of Atlantic City. *Pop.* (1890), 452; (1900), 1307; (1905), 1635; (1910), 1950. It is served by the Atlantic City and the West Jersey & Seashore railways. The city is laid out to face both the ocean and Great Egg Harbor Bay, and is a popular resort during the summer months. Ocean City was incorporated as a borough in 1884, and was chartered as a city in 1897.
OCEAN GROVE, a summer resort of Monmouth county, New Jersey, U.S.A., in the eastern part of the state, on the Atlantic coast, and 55 m. by rail S. of New York City. Pop. (1909), about 2,500. It is served by the Pennsylvania and the Central of New Jersey railways. It is noted as a religious and musical seaside resort, and in July and August, and especially in the last ten days of August, during its annual camp-meeting, is visited by thousands of people. Ocean Grove was founded in 1862 by the Ocean Grove Camp-Meeting Association of the Methodist Episcopal Church, as a place for religious worship, rest and recreation, free from all forms of questionable amusement, and is governed under a corporation charter, the corporation having power to place restrictions in all leases.

OCEANIA, or OCEANICA, a name used to cover all the islands of the Pacific Ocean (q.v.) which are included in the divisions of Polynesia, Micronesia, Melanesia, Australasia, &c.

OCEANUS (Gr. Ὢκεανός), in Greek mythology, the greatest of rivers and at the same time a divine personification. Never mingling with the sea which it encloses, according to Homer it has neither source nor mouth. On its surface east to west, dwell the "blameless Aethiopians" in perfect happiness, and beyond it on the west, in the realms of eternal night, the "Cimmerians," wrapped in fogs and darkness. Here are the grove of Persephone and the entrance of the underworld. Personified, Oceanus is in Hesiod (Theog. 133, 337-370) the son of Uranus and Gaea, the husband of Tethys, father of 3000 streams and 4000 ocean nymphs. In Homer he is the origin of all things, even the father of the gods, and the equal in rank of all of them save Zeus. This conception recurs in the theory of Thales, who made water the first principle of all things. The idea of Oceanus as a river flowing unceasingly round the earth, which was regarded as a flat circle, was of long continuance. Euripides was the first among the tragic poets to speak of it as a sea, but Herodotus before him ridiculed the notion of Oceanus as a river as an invention of the poets and described it as the great world sea. As the geographical knowledge of the Greeks extended, the name was applied to the outer sea (especially the Atlantic).

In art, Oceanus was represented as an old man of noble presence and benevolent expression, with the horns of an ox and sometimes cobra's claws on his head. His attributes are a pitcher, cornucopia ("horn of plenty"), rushes, marine animals and a sceptre. On the altar of Pergamum he is depicted taking part in the battle of the giants.

Homer, Ἰλιάδ, i. 423, xiv. 201, 245, xxi. 196; Odyssey, x. 508, xi. 13; Herodotus ii. 23, iv. 8; Euripides, Orestes, 1376; Caesar, Bell. Gall. iii. 7, iv. 10.

OCELLUS LUCANUS, a Pythagorean philosopher, born in Laodicea in the 5th century B.C., perhaps a pupil of Pythagoras himself. Stobaeus (Ed. Phys. i. 13) has preserved a fragment of his Ποίησις (if he was really the author) in the Doric dialect, but the only one of his alleged works which is extant is a short treatise in four chapters in the Ionic dialect generally known as On the Nature of the Universe. Excerpts from this are given in Stobaeus (i. 20), but in Doric. It is certainly not authentic, and cannot be dated earlier than the 1st century B.C. It maintains the doctrine that the universe is uncreated and eternal; that its three great divisions correspond the three kinds of beings — gods, men and demons; and, finally, that the human race with all its institutions (the family, marriage and the like) must be eternal. It advocates an ascetic mode of life, with a view to the perfect reproduction of the race and its training in all that is noble and beautiful.

Editions of the Ποίησις: Τοῦ Πυθαγόρας ἀδελφοῦ, by A. F. Rudolph (1801, with commentary), and by F. W. Mullich in Fragmenta philol. Graecorum, i. (1866); see also E. Zeller, History of Greek Philosophy, i. (Eng. trans.), and J. de Heyden-Zielewitz in Breitwarth philologische Abhandlungen, viii. 3 (1901). There is an English translation (1837) by Thomas Taylor, the Platonist.

OCELOT (Mexican Felis catus, literally field-jaguar, from Flacce, field, and ocellar, tiger, jaguar), an American member (Felis pardalis) of the family Felidae, ranging from Arkansas in the north to Paraguay. The species is subject to great racial variation. The fur has, however, a tawny yellow or reddish-grey ground colour, marked with black spots, aggregated in streaks and blotches, or in elongated rings enclosing areas rather darker than the general ground-colour. In the typical form the total length may reach 4 ft.; the average measurement of the head and body lies between 26 in. and 33 in., and of the tail between 11 in. and 15 in. The ocelot is essentially a forest cat, and a ready climber; its disposition is said to be fierce and bloodthirsty but in confinement it becomes tame and playful. In Asia the group is represented by the Tibetan Felis tigris.

OCHAKOV, a fortified town and port of Russia, in the government of Kherson, 42 m. E. of Odessa, on a cape of the Black Sea, at the entrance to the estuary of the Dnieper, and opposite to Kinburn. Pop. (1897), 10,784. Strong fortifications have been built at Ochakov and on the Kinburn promontory, to protect the entrance to the Dnieper. Ochakov stands close to the site of the old Miletan (Greek) colony of Olbia and the Greek colony of Alekterror. The fortress of Kara-kerman or Ozu-kaleh was built on this spot by the khan of the Crimea, Mengi Girai, in 1429. At a later date it became the centre of a Turkish province which included Khaji-derush (Ovidiopol), Khaji-bey (Odessa), and Dubossary, as well as some 150 villages.

Russia, regarding it as the main obstacle to the possession of the Black Sea littoral, besieged it in 1737, when it was captured by Marshal Municch, but in the following year it was abandoned, and in 1739 restored to Turkey. The second siege by Russia was begun in 1788, and lasted six months, until the fortress was stormed and taken, after a terrible loss of life. By the peace of 1792 it became Russian. In 1855 it was bombarded by the Anglo-French fleet, and after that the Russians demolished the fortifications.

OCHILTREE, a barony in the county of Ayr, Scotland, from which a title in the Scottish peerage was held in the 16th and 17th centuries by a branch of the house of Stewart. Sir Andrew Stewart (d. 1488), chancellor of Scotland, a great-grandson of the regent Albany (d. 1420), was created Baron Avendale or Avendale about 1457. This peerage became extinct at his death, but was revived about 1490 in favour of his nephew and heir Andrew Stewart, who, being killed at the battle of Flodden in 1513, was succeeded by his son Andrew, 2nd Baron Avendale of this creation; and the latter obtained an act of parliament in 1543 empowering him to exchange the title of Lord Avendale for that of Lord Ochiltree, or Lord Stewart of Ochiltree. His son, Andrew, 2nd Lord Ochiltree (d. c. 1600), was a zealous supporter of the lords of the congregation, and especially of John Knox, in the struggle against Mary queen of Scots, and was wounded at the battle of Langside while fighting against the queen. Of his five sons, William was slain by the earl of
Bothwell in 1585, and James, created earl of Arran in 1587, was the father of Sir James Stewart of Killeith who became 4th Lord Ochiltrie in 1615; his daughter Margaret was the second wife of John Knox. His brother Henry Stewart married Margaret Tudor, widow of James IV. of Scotland, and was created Baron Methven by James V. in 1528; and another brother, Sir James Stewart of Beath, was ancestor of the Stewart earls of Moray. His other son through his son James, who was created Lord Doune in 1581.

The second Lord Ochiltrie was succeeded in the peerage by his grandson Andrew, who resigned the title in 1615, and having been summoned by writ to the Irish House of Lords was created Baron Castle Stewart in the Irish peerage in 1610. The barony of Ochiltrie which he thus resigned was conferred in 1615 on his cousin Sir James Stewart of Killeith (see above), son of the earl of Arran; and on the death without issue of his son William, 5th Lord Ochiltrie, in 1675, the title became extinct. In 1774 Andrew Thomas Stewart successfully claimed the barony of Castle Stewart in the peerage of Ireland as heir male under the creation of 1610; but although he was permitted in 1790 to vote as Lord Ochiltrie in an election of Scottish representative peers, his claim to this barony as collateral heir of the grantee of 1615 was disallowed by the House of Lords in 1793.

OCHINO—OCHRIDA

OCHINO, BERNARDINO (1487–1562), Italian Reformer, was born at Siena in 1487. At an early age he entered the order of Observantine Friars, the strictest sect of the Franciscans, and rose to be its general, but, craving a yet stricter rule, transferred himself in 1533 to the newly founded order of Capuchins, of which in 1538 he was elected vicar-general. In 1539, urged by Bembo, he visited Venice and delivered a remarkable course of sermons, showing a decided tendency to the doctrine of justification by faith, which appears still more evidently in his Dialogi VII. published soon after. He was suspected and denounced, but nothing ensued until, at the instigation of the austere zealot Caraffa, the Inquisition was established at Rome, June 1542. Ochino was at once cited, but was deterred from presenting himself at Rome by the warnings of Peter Martyr and of Cardinal Caraffa, whom he found at Bologna, dying of poison administered by the reactionary party. After some hesitation he escaped across the Alps to Geneva. He was cordially received by Calvin, and within two years published six volumes of Prediche, tracts rather than sermons, explaining and vindicating his change of religion. Twenty-five of these were published in English at Ipswich in 1548. In 1545 he became minister of the Italian Protestant congregation at Augsburg, which he was compelled to forsake when, in January 1547, the city was occupied by the imperial forces in the Schmalkaldic War. Escaping by way of Strassburg he found an asylum in England, where he came across Dr. John Field who was on his way to the newly created order of Capuchins. Ochino received a pension from Edward VI.'s privy purse, and composed his chief work, A Trajedy or Dialogue of the unjust usurped Primacy of the Bishop of Rome (1549). This remarkable performance, originally written in Latin, is extant only in the translation of John Ponet, bishop of Winchester, a splendid specimen of nervous English. The conception is highly dramatic; the form is that of a series of dialogues. Lucifer, enraged at the spread of Christ's kingdom, conquers the fiends in council, and resolves to set up the pope as Antichrist. The stage is set, and the drama proceeds. With the concurrence of the pope's assumption of spiritual authority; the other churches are intimidated into acquiescence; Lucifer's projects seem fully accomplished, when Heaven raises up Henry VIII. and his son for their overthrow. The conception bears a remarkable resemblance to that of Paradise Lost; and it is almost certain that Milton, whose sympathies with the Italian Reformation were so strong, must have been acquainted with it, and with some of his later works. In the Labryinth (dedicated to Queen Elizabeth of England), a discussion of the freedom of will, the covertly assailed the Calvinistic doctrine of predestination, and showed that his views were tinged with Socinianism.

The accession of Mary in 1553 drove him from England, and he became pastor of the Italian congregation at Zürich. In 1563 the long-gathering storm of obloquy burst upon the occasion of the publication of his Thirty Dialogues, in one of which his adversaries maintained that he had justified polygamy under colour of a pretended refutation. His dialogues on divorce and the Trinity were also obnoxious. Ochino was banished from Zürich, and, after being refused a shelter by other Protestant cities, directed his steps towards Poland, at that time the most tolerant state in Europe. He had not resided there long when the edict of the 6th of August 1564 banished all foreign dissenters. Flying from the country, he encountered the plague at Pinscof; three of his four children were carried off; and he himself, worn out by age and misfortune, died in solitude and obscurity at Schlakau in Moravia, about the end of 1564. His reputation among Protestants was at the time so bad that he was charged with the authorship of the treatise De tribus impostoribus, as well as with having carried his alleged approval of polygamy into practice. It was reserved for Dr Benrath to justify him, and to represent him as a fervent evangelist and at the same time as a speculative thinker with a passion for free inquiry. The general tendency of his mind ran counter to tradition, and he is remarkable as resuming in his individual history all the phases of Protestant theology from Luther to Socinus.

See Life by B. O. Benrath (2nd ed., Brunswick, 1802), translated into English by Helen Zimmern (London, 1876). In addition to the books already named, he wrote Italian translations of Romans (Geneva, 1545) and Galatians (Augsburg, 1546).

OCHRES, a class of pigments varying in colour from yellow to red, and consisting mainly of hydrated iron oxide. The Yellow Ochres are native earths coloured with hydrated ferric oxide, the brownish yellow substance that colours, and is deposited from, highly ferruginous water. These ochres are of two kinds—one having an argillaceous basis, while the other is a calcareous earth, the argillaceous variety being in general the richer and more pure in colour of the two. Both kinds are widely distributed, fine qualities being found in Oxfordshire, the Isle of Wight, near Jersey and Nuremberg in Germany, and in France in the departments of Yonne, Cher and Nièvre. The original colour of these ochres can be modified and varied into browns and reds of more or less intensity by calcination. The nature of the associated earth also influences the colour assumed by an ochre under calcination, aluminous ochres developing red and violet tints, while the calcareous varieties take brownish-red and dark-brown hues. The well-known ochre Terra di Siena which in its raw state is a dull-coloured ochre, becomes when burnt a fine warm mahogany brown hue highly valued for artistic purposes. Yellow ochres are also artificially prepared—Mars Yellow being made from the hydrated ferric oxide of an indigenous earth, mixed with a substance with an argillaceous or calcareous earth, and such compounds by careful calcination can be transformed into Mars Orange, Violet or Red, all highly important, stable and reliable pigments.

OCHRIDA (also written OCHIRDA and ACHRIDA; Turkish, Ochri), a city of Albania, European Turkey, in the vilayet of Monastir; on the north-eastern shore of Lake Ochrida, and at the eastern end of the Roman Via Egnatia. Pop. (1905) about 11,000, including Albanians, Turks, Greeks and Slavs. Ochrida occupies the site of the ancient Lychnidos, which was added to the Macedonian empire by Philip II. (382–336 B.C.), and destroyed by the Bulgarians in A.D. 561. It is the seat of Bulgarian and Greek bishops. From the creation of the Bulgarian patriarchate of Ochrida in 893 to its abolition in 1767 the city was the ecclesiastical headquarters of the Bulgarians in the west of the Balkan Peninsula. Lake Ochrida is 2560 ft. above sea-level, in a mountainous limestone region of Karst formation. It measures 107 sq. m., and has a maximum depth of 35 ft. Its waters are supplied by subterranean streams. Its chief outlet is the river Black Drin, on the north.
OCHSENFURT, a town of Germany, in the kingdom of Bavaria, situated on the left bank of the Main, here crossed by a stone bridge, 13 m. S. from Würzburg by the railway to Munich, and at the junction of a line to Röttingen. Pop. (1905) 3333.

It contains an Evangelical and five Roman Catholic churches, among them that on the site of the ancient sacred grove. There is a considerable trade in wine and agricultural produce, other industries being brewing and malting.

OCHELTROY, SIR DAVID, Bart. (1758-1825), British general, was born at Boston, Mass., U.S.A., on the 12th of February 1758, and went to India as a cadet in 1777. He served under Lord Lake in the battles of Koli, Aligarh and Delhi, and was appointed resident at Delhi in 1803. In 1804, having been promoted to the rank of major-general, he defended the city with a very inadequate force against an attack by Holkar of the Ghat Pass. He then took the command of one of four converging columns, and his services were rewarded with a baronetcy in 1815. Subsequently he was promoted to the command of the main force in its advance on Kanmanadu, and was detached to the Gurkhas by a flank march at the Ghat Pass, bringing the war to a successful conclusion and obtaining the signature of the treaty of Seguah (1810), which dictated the subsequent relations of the British with Nepal. For this success Ochterlony was created G.C.B., the first time that honour had been conferred on an officer of the Indian army. The family removed to London, and in 1818 he was created a baronetcy, and took the surname of Ochterlony. In 1819 he was appointed resident in Rajputana in 1818, with which the residency in Delhi was subsequently combined. When Durjan Sal revolted in 1825 against Balwant Singh, the infant Raja of Bharatpur, Ochterlony acting on his own responsibility supported the raja by proclamation and ordered out a force to support him. Lord Amherst, however, repudiated these proceedings. Ochterlony, who was bitterly chagrined at this refusal, resigned his office, and retired to Delhi. The feeling that the confidence which his length of service merited had not been given him by the government is said to have accelerated his death, which occurred at Meerut on the 15th of July 1825. The Ochterlony column at Calcutta commemorates his name.


OCHTMAN, LEONARD (1854—__), American painter, was born in Zonnermaine, Zeeland, Holland, on the 31st of October 1854. In 1879 he moved to New York, which he visited in 1882. In 1882 he began to exhibit landscapes at the National Academy, and he became a National Academician in 1904. His most characteristic pictures, which recall the work of Inness, are scenes on Long Island Sound and on the Minus river.

OCKLEY, SIMON (1678-1720), English orientalist, was born at Exeter in 1678. He was educated at Queen's College, Cambridge, became fellow of Jesus College and vicar of Swavesey, and in 1711 was made professor of Arabic at Cambridge. He had a large share in the publication of the Index Librorum Prohibitorum. In 1712 he was naturalized, and in 1713 was returned to Parliament for the constituency of the University of Cambridge. In 1720 he was re-elected, but did not attend. He was appointed to be custodian of the college, and in 1721 he was created a fellow of the college.

Ockley maintained that a knowledge of Oriental literature was essential to the proper study of theology, and in the preface to his first book, the Introductio ad linguas orientales (1706), he urges the importance of the study. In 1707 he published a translation of Leon Modena's History of the Present Jews throughout the World; and in 1708 The Improvement of the Hebrew Reader, a work which made an impression on Zend, who translated it into Persian. His chief work is The History of the Saracens (1708-1718), of which a third volume was published posthumously in 1757. Unfortunately Ockley took as his main authority a MS. in the Bodleian of the pseudo-Wakid's Fatsh Al-Sham, which is rather historical romance than history. He also translated from the Arabic the Second Book of Esdras and the Sentences of Ali. Ockley died at Swavesey on the 9th of August 1720.

O'CLERY, MICHAEL (1755-1843), Irish chronicler, grandson of a chief of the sept of O'Clery in Donegal, was born at Kilbarrow on Donegal Bay, and was baptised Tadhg (or "poet"), but took the name of Michael. He became a Franciscan friar. He was a cousin of Loughaidh O'Clery (fl. 1501-1630), who, with his son Caoghrigh O'Clery (d. 1664)—one of Michael's co-workers—is also famous as an Irish historian. He had already gained a reputation as an antiquary and student of Irish history and literature, when he entered the Irish College at St Anthony at Louvain. In 1620, through the initiative of Hugh Boy Macanward (1586-1633), warden of the college, and himself a famous Irish historian and poet, and one of an old family of hereditary bards In Tyrconnell, he began to collect and transcribe, a strong dislike of everything he could and historical importance; he was assisted by other Irish scholars, and the result were the Reim Riosghroidhe (Royal List) in 1630, Leobhar Gabhala (Book of Invasions) in 1631, and his most famous work, called by John Colgan (d. 1659), the Irish biographer, the "Annals of the Four Masters" (1636). Subsequently he made his Martyrologium of Irish saints, based on various ancient manuscripts, an Irish glossary and other works. He lived in poverty, and died at Louvain.

O'CONNEL, DANIEL (1775-1847), Irish statesman, known as the "Liberator," was born on the 6th of August 1775 near Cahirciveen, a small town in Kerry. He was one of a race the heads of which had been Celtic chiefs, had lost their lands in the wars of Ireland, and had felt the full weight of the harsh penal code which long held the Catholic Irish down. His ancestors in the 18th century had sent recruits to the famous brigade of Irish exiles in the service of France, and those who remained at home either lived as tenants on the possessions of which they had once been lords, or gradually made money by smuggling, a very general calling in that wild region. Thus he inherited from his earliest years, with certain traditions of birth and the high station, a British arple in Ireland and of the dominant owners of the soil, a firm attachment to his proscribed faith, and habitual skill in evading the law; and these influences may be traced in his subsequent career. While a boy he was adopted by his uncle, Maurice O'Connell of Derrynane, and sent to a school at Queenstown, one of the first which the state in those days allowed to be opened for Catholic teaching; and a few years afterwards he became a student, as was customary with Irish youths of his class, in the English colleges of St Omer and Douai in France. These years in France had a decided effect on the character of Michael, and to the very highest eminence among contemporary lawyers and advocates. This position was in the main due to a dexterity in conducting causes, and especially in examining witnesses, in which he had no rival at the Irish bar. He was, however, a thorough lawyer besides, inferior in scientific learning to two or three of his most conspicuous rivals, but well read in every department of law, and especially a master in all that relates to criminal and constitutional jurisprudence. As an advocate, too, he stood in the very highest rank; in mere oratory he was surpassed by Plunket, and in rhetorical gifts by Burke, the only 1See the account of O'Connell's uncle, Count Daniel O'Connell (1745-1833), to whose property he fell heir, in Mrs O'Connell's Life of the Irish Orator (1825), and of O'Callaghan's Irish Brigade in the Service of France (1820).
speakers to be named with him in his best days at the Irish bar; but his style, if not of the most perfect kind, and often disfigured by decided faults, was marked by a peculiar subtilty and manly power, and produced great and striking effects. On the whole, in the art of winning over juries he had scarcely an equal in the law courts.

To understand, however, O'Connell's greatness we must look to the field of Irish politics. From early manhood he had turned his mind to the condition of Ireland and the mass of her people. The worst severities of the penal code had been, in a certain measure, relaxed, but the Catholics were still in a state of vassalage, and they were still pariahs compared with the Protestants. The rebellion of 1798 and the union had dashed the hopes of the Catholic leaders, and their prospects of success seemed very remote when, in the first years of the 19th century, the still unknown lawyer took up their cause. Up to this juncture the question had been in the hands of Grattan and other Protestants, and of a small knot of Catholic nobles and prelates; but their efforts had not accomplished much, and they aimed only at a kind of compromise, which, while conceding their principal claims, would have placed their church in subjection to the state. O'Connell inaugurated a different policy, and had soon (though without the Catholic movement an energy it had not before possessed. Himself a Roman Catholic of birth and genius, unfairly kept back in the race of life, he devoted his heart and soul to the cause, and his character and antecedents made him the champion who ultimately assured its triumph. He formed the bold design of combining the Irish Catholics millions, under the leadership of the Protestant Irish, by a government avowedly hostile to the last, and of wresting the concession of the Catholic claims from every opposing party in the state by an agitation, continually kept up, and embracing almost the whole of the people, but maintained within constitutional limits, though menacing and shaking the frame of society. He gradually succeeded in carrying out his purpose: the Catholic Association, at first small, but slowly assuming larger proportions, was formed; attempts of the government and of the local authorities to put its branches down were skilfully baffled by legal devices of many kinds; and at last, after a conflict of years, all Catholic Ireland was arrayed to a man in an organization of enormous power, that demanded its rights with no uncertain voice. O'Connell, having long before attained an undisputed and easy ascendancy, stood at the head of this great national movement; but it will be observed that, having been controlled from first to last by himself and the priesthood, it had little in common with the mob rule and violence which he had never ceased to regard with aversion. His election for Clare in 1828 proved the forerunner of the inevitable change, and the Catholic claims were granted the next year, to the intense regret of the Protestant Irish, by a government avowedly hostile to the last, but unable to withstand the overwhelming pressure of a people united to insist on justice. The result, unquestionably, was almost wholly due to the energy and genius of a single man, though the Catholic question would have been settled, in all probability, in the course of time; and it must be added that O'Connell's triumph, which showed what agitation could effect in Ireland, was far from doing his country unmixed good.

O'Connell joined the Whigs on entering parliament, and gave effective aid to the cause of reform. The agitation, however, on the Catholic question had quickened the sense of the wrongs of Ireland, and the Irish Catholics were engaged ere long in a crusade against tithes and the established church, the most offensive symbols of their inferiority in the state. It may be questioned whether O'Connell was not rather led than a leader in this; the movement, at least, passed beyond his control, and the country for many months was terrorized by scenes of appalling crime and bloodshed. Lord Grey, very properly, proposed measures of repression to put this anarchy down, and O'Connell opposed them with extreme vehemence, a seeming departure from his avowed principles but natural in the case of a popular tribune. This caused a breach between him and the Whigs; but he gradually returned to his allegiance to them when they practically abolished Irish tithes, cut down the revenues of the established church and endeavoured to secularize the surplus. By this time O'Connell had attained a position of great eminence in the House of Commons: as a debater he stood in the very first rank, though he had entered St Stephen's after fifty; and his oratory, massive and strong in argument, although too often scurrilous and coarse, and marred by a strong undercurrent of vindictiveness, was strangely blended, made a powerful impression, if not a pleasing, impression. O'Connell steadily supported Lord Melbourne's government, gave it valuable aid in its general measures, and repeatedly expressed his cordial approval of its policy in advancing Irish Catholics to places of trust and power in the state, though personally he refused a high judicial office. Though a strict adherent of the creed of Rome, he was a Liberal, nay a Radical, as regards measures for the vindication of human liberty, and he sincerely advocated the rights of conscience, the emancipation of the slave and freedom of trade. But his rooted aversion to the democratic theories imported from France, which were gradually winning their way into England, only grew stronger with advancing age. His conservatism was most apparent in his antipathy to socialist doctrines and his tenacious regard for the claims of property. He actually opposed the Irish Poor Law, as encouraging a communistic spirit; he declared a movement against rent a crime; and, though he had a strong sympathy with the Irish peasant, and advocated a reform of his precarious tenure, it is difficult to imagine that he could have approved the cardinal principle of the Irish Land Act of 1881, the judicial adjudication of rents. But he succeeded O'Connell in his country was incompatible with good government, and he began an agitation for the repeal of the union. One of his motives in taking this course was a strong personal dislike of Peel, with whom he had often been in collision, and who had singled him out in 1829 for what must be called a marked affront. O'Connell, nevertheless, was sincere and even consistent in his conduct; he had denounced the union in early manhood as an obstacle to the Catholic cause; he had spoken against the measure in parliament; he believed that the claims of Ireland were set aside or slighted in what he deemed an alien assembly; and, though he had ceased for some years to demand repeal, and regarded it as rather a means than an end, he was throughout life an avowed repealer. It should be observed, however, that in his judgment the repeal of the union would not weaken the real bond between Great Britain and Ireland; and he had nothing in common with the revolutionists who, at a later period, openly declared for the separation of the two countries by physical force. The organization meetings were held for the next ten years, in 1829-1839, were recreated for the new project. Enormous meetings, convened by the priesthood, and directed or controlled by O'Connell, assembled in 1842-1843, and probably nine-tenths of the Irish Catholics were unanimous in the cry for repeal. O'Connell seems to have thought success certain; but he had not perceived the essential difference between his earlier agitation and this. The enlightened opinion of the three kingdoms for the most part approved the Catholic claims, and as certainly condemned repeal. After some hesitation Peel resolved to put down the repeal movement. A vast intended meeting was proclaimed for September; and in October 1843 O'Connell was arrested and held to bail, with ten or twelve of his principal followers. He was convicted (February 1844) after the trials that followed, but they were not good specimens of equal justice, and the sentence of imprisonment for a year and a fine of £2000 was reversed on a writ of error by the House of Lords (September 1844), and he and his colleagues were again free. The spell, however, of O'Connell's power had vanished; his health had suffered much from a short confinement; he was verging upon his seventieth year; and he was alarmed and pained by the growth of a party in the repeal ranks who scoffed at his views, and advocated the revolutionary doctrines which he had always feared and abhorred. Before long famine had fallen on the
land, and under this visitation the repeal movement, already paralysed, wholly collapsed. O'Connell died on the 25th of May 1847, at Genoa, whilst on his way to Rome. His body was brought back to Dublin and buried in Glasnevin cemetery.

O'Connell was a remarkable man in every sense of the word, of splendid physique, and with all the attractions of a popular leader. Catholic Ireland calls him her "Liberator" still; and history will say of him that, with some failings, he had many and great gifts, that he was an orator of a high order, and that, agitator as he was, he possessed the wisdom, the caution and the tact of a real statesman. Nevertheless he not only failed to accomplish the chief aim of his life, but Lecky trenchantly observes that "by a singular fatality the great advocate of repeal did more than any one else to make the Union a necessity. . . . He destroyed the sympathy between the people and their natural leaders; and he threw the former into the hands of men who have subordinated all national to ecclesiastical considerations, or into the hands of reckless, ignorant, and dishonest advertisers." O'Connell married in 1802 his cousin Mary O'Connell, by whom he had three daughters and four sons, Maurice, Morgan, John (1820–1858), known as the "Young Liberator," and Daniel, who all sat in parliament.


O'CONNOR, FEARGUS EDWARD (1794–1855), Chartist leader, was a son of the Irish National patriot, Denis O'Connell (1762–1854), and nephew of Arthur O'Connell (1763–1852), who was the agent in France for Emmet's rebellion; both belonged to the "United Irishmen." He entered parliament as member for the county of Cork in 1832. Though a zealous supporter of repeal, he endeavoured to supplant O'Connell as the leader of the party, an attempt which aroused against him the popular antipathy of the Irish. In 1835 he was unseated on petition, and after standing unsuccessfully for Oldham he took to stumping England in favour of the new Radical doctrines of the day, and the use of physical force for their adoption. In 1837 he established the Northern Star newspaper at Leeds, and became a vehement advocate of the Chartist movement. He was imprisoned for seditious libel in 1840, and after his release became prominent for his attack on John Bright, and the anti-corn-law league. In 1847 he was returned for Nottingham, and in 1848 he presided at a Chartist demonstration on Kennington Common, which caused great alarm (see CHARTISM). But the projected march on Westminster fizzled out when the preparations made to receive it became known. The eccentricity which had characterized his opinions from the beginning of his career gradually became more marked until they developed into insanity. He began to conduct himself in a disorderly manner in the House of Commons, and in 1852 he was found to be of unsound mind by a commission of lunacy. He died at London on the 30th of August 1855, and was buried in Kensal Green cemetery.

OCONOMOWOC, a city of Waukesha county, Wisconsin, U.S.A., about 33 m. W. of Milwaukee. Pop. (1850) 2729; (1900) 2880; (1905) 3013; (1910) 3064. It is served by the Chicago, Milwaukee & St Paul railway and by an electric railway connecting with Milwaukee. O'Connell, who in 1802 emigrated from Roscommon county, Ireland, to New York, where he devoted himself chiefly to journalism. The son studied law, was admitted to the bar in 1824, and soon won high reputation in his profession. He was United States district attorney for New York in 1853–1854. In politics an extreme States'-Rights Democrat, he opposed the coercion of the South, and after the Civil War became senior counsel for Jefferson Davis on his indictment for treason, and was one of his bondsmen; these facts and O'Conor's connexion with the Roman Catholic Church affected unfavourably his political fortunes. In 1872 he was nominated for the presidency by the "Bourbon" Democrats, who refused to support Horace Greeley, and by the "Labour Reformers"; he declined the nomination but received 21,550 votes. He took a prominent part in the prosecution of William M. Tweed and members of the "Tweed Ring," and published Peculation Triumphant, Being the Record of a Five Years' Campaign against Official Malversation, A.D. 1871–1875 (1875). He removed to Nantucket, Massachusetts, in 1881, and died there on the 17th of May 1884.

OCTAVE, a city and the county seat of Oconto county, Wisconsin, U.S.A., about 130 m. N. of Milwaukee, on the W. shore of Green Bay, at the mouth of the Oconto river. Pop. (1890) 5219; (1900) 5646, of whom 1544 were foreign-born; (1905) 5722; (1910) 6029. It is served by the Chicago & North-Western and the Chicago, Milwaukee & St Paul railways. The city lies in a good farming country, and has a considerable commerce in lumber and fish. The first settlement was made here in 1846, and Oconto was chartered as a city in 1882.

OCTAVE, Raymundus, (from Lat. octas, eighth, octo, eight), a period or series of eight members. In ecclesiastical usage the octave is the eighth day after a particular church festival, the feast day itself and the "octave" being counted. The octave thus always falls on the same day of the week as the festival, and any event occurring during the period is said to be in the "octave." In music, an octave is the eighth full tone above or below any given note. It is produced by double or half the number of vibrations corresponding to the given note. In the interval between a note and its octave is contained the full scale, the octave of a note forming the starting-point of another scale of similar intervals to the first. The interval between a note and its octave is also called an octave. The name is also applied to an open metal stop in an organ, and to a flute (more usually known as the piccolo) one octave higher in pitch than the regular flute. It is also a term for a "parade" in fencing. The "law of octaves" was a term applied in 1865 to a relationship among the chemical elements enunciated by J. A. R. Newlands.

In literature an octave is a form of verse consisting of eight iambic lines, and complete in itself. From its use by the poets of Sicily, the recognized type of this form is usually called the Sicilian Octave. It is distinguished from a single stanza of oitana rima, in which the rhyme-arrangement is abababec, by having only two rhymes, arranged abababab. In German Hertz-tachische the October had been used not infrequently since 1525, when Ruckert published "Sichcityen," as they are called in German, for the first time. The word octave is also often used to describe
OCTAVIA, the name of two princesses of the Augustan house.

(1) Octavia, daughter of Gaius Octavius and sister of the emperor Augustus, was the wife of Gaius Marcellus, one of the bitterest enemies of Julius Caesar. In 41 B.C. her husband died, and she was married to Marcus Antonius, with the idea of bringing about a reconciliation between him and her brother. Her efforts were at first successful, but in 36 Antony left for the Parthian War and renewed his intrigue with Cleopatra. Though Octavia took out troops and money to him (35), he refused to see her and finally divorced her (32), but in so doing he butted his children, even those by Fulvia and Cleopatra. Her beauty and virtues are praised by all ancient authorities. By her first husband she was the mother of Marcus Marcellus (q.v.), who died in 23 B.C.

(2) OCTAVIA, daughter of the emperor Claudius, was the wife of Nero, by whom she was put to death. A Latin tragedy on her fate is attributed, though wrongly, to Seneca.

OCTAVO, a shortened form of Lat. in octavo, “in an eighth, i.e. of a sheet of paper, a term applied to a size of paper and to a size of a printed volume. Paper is in octavo when a whole single sheet is folded three times to form eight leaves; a book is technically said to be of such a size when made up of sheets folded three times (see Bibliography and Paper).

OCTOBER, the eighth month of the old Roman year, which began in March. In the Julian calendar, while retaining its old name, it became the tenth month, and had thirty-one days assigned to it. The mediterranea, when a libation of new wine was made in honour of Meditirna, were celebrated on the 11th, the faunalia on the 15th, and the equina, when the equus October was sacrificed to Mars in the Campus Martius, on the 15th. Several attempts were made to rename the month in honour of October, and in the reign of Domitian it was referred to as Germanicus, Antonius, Tacitus and Hercules, the latter a surname of Commodus. The Senate's attempt to christen it Faustinus in honour of Faustina, wife of Antoninus, was equally unsuccessful. The principal ecclesiastical feasts in October are those of St Luke on the 18th and of St Simon and St Jude on the 28th. By the Slavs it is called "yellow month," from the fading of the leaf; to the Anglo-Saxons it was known as Winter-fylicth, because at this full moon (fylicth) winter was supposed to begin.

OCTODON, the generic name for a small South American rodent or marsupial mammal (Octodon degus) locally known as the degu. It is the type of the family Octodontidae, the members of which—collectively termed oedodonts—are exclusively Central and South American. Several of them, such as Echimynys and Loncheres, are rat-like creatures with spiny or bristly fur (see Rodentia).

OCTOPUS (Gr. οκτώ, eight and πός, foot), the name, in scientific zoology belonging to a single genus of eight armed Cephalopoda (q.v.), one of whose distinguishing characters is that it has two rows of suckers on each arm. This true octopus occurs occasionally in the Baltic, but in the southern coast, but it is usually rare. It is more common on the southern coasts of Europe, including those of the Mediterranean. The usual species of Octopoda on the British south coast is Eledone cirrosa, which has only one row of suckers on each arm, and is a smaller animal. The celebrated account of the octopus given by Victor Hugo in his Travailleurs de la mer is not so fictitious as some critics with a knowledge of natural history have maintained. It is true that the great French author has made the mistake of using the name Cephaloptra, which belongs to a large tropical fish similar to a skate, instead of Cephalopoda, and that he applies the term devil-fish, which belongs to Cephaloptra, to the octopus. His description is exaggerated, imaginative and sensational; but it is correct in its most important particulars, and bears evidence that the author was to some extent personally acquainted with the animal and its habits, although he was not a scientific observer. The octopus feeds on crabs, and crabs feed on Carrion, and, therefore, there is nothing impossible in Hugo's account of the skeleton of a drowned man surrounded by the shells of numbers of crabs which the octopus had devoured. Whether an octopus would attack and kill a man is another question, but it certainly might seize him with its arms and suckers while holding to the rocks by other arms, and a man seized in this way when in the water might be in danger of being drowned.

The octopus and many of the Octopoda move about by means of their arms on the sea bottom, and are not free-swimming, though like other Cephalopods they can propel themselves on occasion backwards through the water by means of the funnel. Other Octopoda, however, are pelagic and free-swimming, and their habits are not confined to those forms which are provided with lateral fins. The Argonaut (see NAUTILUS) is one of the Octopoda. The separation of one of the arms of the male for purposes of reproduction is one of the most remarkable peculiarities of the Octopoda. It does not occur, however, in octopus nor in many other members of the group. One arm is always considerably modified in structure and employed in copulation, but it is only in three genera, one of which is Argonauta, that the arm spontaneously separates. The detached arm is found still alive and moving in the mantle cavity of the female, and when first discovered in these circumstances was naturally regarded as being the natural termination of the arm, but as the time was slowly revealed, it became evident that the numerous suckers of the detached arm, gave it the name Hectocotylus (hundred suckers). When the arm is not detached but only altered in structure it is said to be hectocotylized. In Octopus and Eledone it is the third right arm which is hectocotylized. The extremity of this arm is expanded and assumes the shape of a spoon. Whether detached or not the modified arm possesses a cavity into which the spermatophores are passed and the arm serves to convey them to the mantle cavity of the female.

It has been mentioned above that the true octopus (Octopus vulgaris) is usually rare on the English coast. In 1899 and 1900, however, they became so abundant on the south coast as to attract general notice, and to constitute a veritable plague which threatened complete ruin to the shell-fish fisheries. This visitation and its effects were described by W. Garstang in the Journal of the Marine Biological Association. The abnormal abundance occurred all along the west coast of France, whence it extended to the Channel, and was probably due to a succession of unusually warm summers and mild winters, beginning with the warm spring and hot summer of 1893. In the following 1894 and 1895 years the South Foreland entered the lobster pots of the fishermen and devoured or killed the crabs and lobsters captured. The pots when hauled contained usually only living octopuses and the mutilated remains of their victims. One fisherman took in a single week 64 specimens of octopus and only 15 living uninjured lobsters. The octopus also almost exterminated the swimming crabs (Portunus) in Plymouth Sound, and in the tanks of the Plymouth aquarium attacked and devoured all the specimens of its smaller relative Eledone cirrosa.

With regard to the size which the octopus may attain, the dimensions of the body are not usually given in records, but it is stated that the arms in the largest specimens measured 3 ½ ft., and in numerous cases were 3 ft. in length. This would enable the eight arms to extend over a circle 6 ft. in diameter, but the globular body is not more than about a third of the length of an arm in diameter. When not in pursuit of prey the octopus hides itself in a hole between rocks and covers itself with stones and shells. Like its victims it seems to be active chiefly at night and to remain in its nest during the day.


(Octopus vulgaris), (Octopus vulgaris), or Ocloron (from Lat. ocloro, eight, formed on the example of quadron), the offspring of a quadron and a white; a person having one-eighth negro blood. In rare instances such persons are called tercereons, as being third in descent from a negro ancestor. Occasionally persons are called octoceans.
OCTOSTYLE

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Gr. ὀκτώς, eight, and σῖκλος, a column), in architecture, a portico of eight columns in front (see Temple).

OCTROI (O. Fr. octroir, to grant, authorize; Lat. auctor,)
a local tax collected on various articles brought into a district for consumption. Octroi taxes have a respectable antiquity, being known in Roman times as vectigalia. These vectigalia were either the portorium, a tax on the entry from or departure to the provinces (those cities which were allowed to levy the portorium shared the profits with the public treasurer); the artorium, a local tax levied at the entrance to towns; or the edulis, sale imports levied in markets. Vectigalia were levied on wine and certain articles of food, but it was seldom that the cities were allowed to use the whole of the profits of the taxes. Vectigalia were introduced into Gaul by the Romans, and remained after the invasion by the Franks, under the name of tonnicus and coutumes. They were usually levied by the owners of seigniories. But during the 12th and 13th centuries, when the towns succeeded in asserting their independence, they at the same time obtained the recognition of the royal authority; and these local taxes were allowed to have control of it. The royal power, however, gradually asserted itself, and it became the rule that permission to levy local taxes should be obtained from the king. From the 14th century onwards, we find numerous charters granting (octroir) to French towns the right to tax themselves. The taxes did not remain strictly municipal, for an ordinance of Cardinal Mazarin (in 1647) ordered the proceeds of the octrois to be paid into the public treasury, and at other times the government claimed a certain percentage of the product, but this practice was finally abandoned in 1852. From an early time the octroi was farmed out to associations or private individuals, and so great were the abuses which arose from the system that the octroi was abolished during the Revolution. But such a drastic measure meant the stoppage of all municipal activities, and in 1798 Paris was allowed to re-establish its octroi. Other cities were allowed gradually to follow suit, and in 1809 a law was passed laying down the basis on which octrois might be established. Other laws have been passed from time to time in France dealing with the octroi, especially those of 1816, 1824, 1867, 1871, 1884 and 1897. By the law of 1897 octroi duties are allowed to be levied on: (1) estables; (2) fuel; (4) forage; (5) building materials. A scale of rates was fixed, graduated according to the population, and farming out was strictly regulated. A law of 1816 enacted that an octroi could only be established at the wish of a municipal council, and that only articles destined for local consumption could be taxed. The law of 1852 abolished the 10% of the gross receipts paid to the treasury. Certain indispensable commodities are allowed to enter free, such as grain, flour, fruit, vegetables and fish.

French octroi duties are collected either by the (1) régie simple, i.e. by special officers under the direction of the mayor; (2) by the bail à forme, i.e. farming, the contractor paying yearly a certain agreed upon sum calculated on the estimated amount; (3) the régie intéressé, a variation of the preceding method, the contractor sharing the profits with the municipality when they reach a given sum; and (4) the abonnement avec la régie des contributions indirectes, under which a department of the treasury undertakes to collect the duties. More than half the octrois are collected under (1), and the numbers tend to increase; (2) is steadily decreasing, on (3) has been practically abandoned; (4) tends to increasing. The net receipts in 1897 amounted to £11,132,870. A law of 1897 created new sources of taxation, giving the power of the (1) new duties on alcohol; (2) a municipal licence duty on retailers of beverages; (3) a special tax on wine in bottle; (4) direct taxes on horses and carriages, clubs, billiard tables and dogs; (5) additional centimes to direct taxes.

From time to time there has been agitation in France for the abolition of octrois duties, but it has never been pushed very earnestly. In 1869 a commission was appointed to consider the matter, and reported in favour of their retention. In Belgium, on the other hand, they were abolished in 1870, being replaced by an increase in customs and excise duties; and in 1903 those in Egypt were also abolished. Octroi duties exist in Italy, Spain, Portugal and in some of the towns of Austria.

AUTHORITIES.—A. Guignard, De la suppression des octrois (Paris); Saint Julien and Bienaimé, Histoire des droits d'octroi à Paris; M. Tardif and A. Ripert, Traité des octrois municipaux (Paris); L. Hourcade, Manuel encyclopédique des contributions indirectes et des octrois (Paris, 1905); much useful material from some of the foregoing will be found in Report on the French Octroi System, by Consul-general Hearne (British Diplomatic and Consular Reports, 1906); the abolition of the Belgian octrois produced a voluminous official report: Abolition des octrois communaux en Belgique: discussion et discours prononcés. (T. A. L.)

O'CURY, EUGENE (1815–1864), Irish scholar, was born at Dunvana, county Clare, in 1796, the son of a farmer who was man of unusual intelligence. After being employed for some time in the topographical and historical section of the Irish ordinance survey, O'Curry earned his living by translating and copying Irish manuscripts. The catalogue of Irish manuscripts in the British Museum was compiled by him. On the founding of the Roman Catholic University of Ireland (1854) he was appointed professor of Irish history and archaeology. His lectures were published by the university in 1860, and give a better knowledge of Irish medieval literature than can be obtained from any other one. It may be noted here that these other materials have developed posthumously, under the title On the Manners and Customs of the Ancient Irish (1873). His voluminous transcripts, notably eight huge volumes of ancient Irish law, testify to his unremitting industry. The Celtic Society, of the council of which he was a member, published two of his translations of medieval tales. He died in Dublin in 1862.

OCYDROME, a word formed from Ocydromus, meaning "swift-runner," and suggested by J. Wagler in 1830 as a generic term for the New Zealand bird called in the then unpublished work of J. R. Forster, "the Wood-hen," and designated in 1878 by S. G. Gmelin, who knew of it through J. Latham's English description. Wagler's suggestion has since been generally adopted, and the genus Ocydromus is accepted by most ornithologists as a valid group of Ratilidae; but the number of species it contains is admittedly doubtful, owing to the variability in size and plumage which they exhibit, and their correct nomenclature must for the present be considered uncertain. Sir W. Buller in his Birds of New Zealand identifies the "Wood-hen," observed in great abundance on the shores of Dusky Bay in 1773 by Cook and his companions on his second voyage, with the Ocydromus described and figured by Dunstan and accordingly calls it O. fuscus; but it cannot be questioned that the species from this locality—which appears to have a somewhat limited range in the Middle Island, and never to have met with fresh from the sea-coast, where it lives wholly on crustedans and other marine animals—is identical with that of the older authors just mentioned. In 1786 Sparrman, who had also been of Cook's company, figured and described as Ratilus australis a bird which, though said by him to be that of the southern coast of New Zealand, differs so much from the R. fuscus as to cast doubt on the validity of the name. Indeed his species has generally been identified with the common "Weka" of the Maories of the Middle Island, which can scarcely be the case if his statement is absolutely true, since the latter does not appear to reach so far to the southward, or to affect the seashore. It may therefore be fairly inferred that his subject was obtained from some other locality. The North Island of New Zealand has what is allowed to be a third species, to which the name of Ocydromus carrii is attached, and this was formerly very plentiful; but its numbers have rapidly decreased, and there is every chance of its soon being as extinct as is the species which tenanted Norfolk Island on its discovery by Cook in 1774.

1 It also occurs in Stewart Island, and singularly enough on the more distant group known as the Snares. The Gallirallus brevipes of Lafresnaye, of which the typical (and unique) species from an unknown locality is in the Caen Museum, has also been referred to this species, but the propriety of the act may be doubted.
and which was doubtless distinct from all the rest, though no specimen of it is known to exist in any museum. 1 Another species, O. sylvistris, smaller and lighter in colour than any of the rest, was found in 1869 to linger yet in Lord Howe's Island (Proc. Zool. Society, 1869, p. 473, pl. xxxiv.). Somewhat differing from Ocydromus, but apparently very nearly allied to it, is a little bird peculiar, it is believed, to the Chatham Islands (Ibis, 1872, p. 247), and regarded by Captain Hutton as the type of a new Cuban species, name of C. modestus, while other naturalists consider it to be the young of the rare Rallus diefenbachii. So far the distribution of the Ocydromine form is wholly in accordance with that of most others characteristic of the New Zealand sub-region; but a curious exception is asserted to have been found in the Gallirallus lafresnayi of New Caledonia, which, though presenting some structural differences, has been referred to the genus Ocydromus.

The chief interest attaching to the Ocydromes is their inability to fly in flight the wings with which they are furnished, and hence the extreme improbability of the formation of "wholly extinct in a short time. Of this inability there are other instances among the Rallidae (see Moor-Hen); but here we have coupled with it the curious fact that in the skeleton the angle which the scapula makes with the coracoid is greater than a right angle, a peculiarity shared only, so far as is known, among the Carinatae by the dodo. The Ocydromes are birds of dull plumage, and mostly of retiring habits, though the common species is said to show great boldness towards man, and, from the accounts of Cook and the younger Forster, the birds seen by them displayed little fear. They are extremely destructive to eggs and to any other birds they can master.

ODAENATHUS, or Odenatus (Gr. ὁ ὀδανᾶτος, Palm, τὸν = “little ear”), the Latinized form of Odaenathus, the name of a famous prince of Palmyra, in the second half of the 3rd century A.D., who succeeded in recovering the Roman East from the Persians and restoring it to the Empire. He belonged to the leading family of Palmyra, which bore, in token of Roman citizenship, the gentilicium of Septimius; hence his full name was Septimius Odaenathus (Vogüé, Syrie centrale, Nos. 23, 28 = Cooke, North-Semitic Insers. Nos. 126, 130). It is practically certain that he was the son of Septimius Haron, the “senator” and chief of Tadmor, 2 the son of Septimius Odaenath “the senator” (N.S.I. p. 285). The year when he became chief of Palmyra is not known, but already in an inscription dated A.D. 258 he is styled “the illustrious consul our lord” (N.S.I. No. 126). He possessed the characteristic vigour and astuteness of the old Arab stock from which he sprang; and in his wife, the renowned Zenobia (q.v.), he found an able supporter of his policy. The defeat and captivity of the emperor Valerian (A.D. 260) left the eastern provinces largely at the mercy of the Persians; the prospect of Persian supremacy was not one which Palmyra or its prince had any reason to desire. At first, it seems, Odaenath attempted to propitiate the Parthian monarch Shāpūr (Sapor) I.; but when his gifts were contemptuously rejected (Petr. Patricius, § 10) he decided to throw in his lot with the cause of Rome. The neutrality which had made Palmyra’s fortune was abandoned for an active military policy which, while it added to Odaenath’s fame, in a short time brought his native city to its ruin. He fell upon the victorious Persians returning home after the sack of Antioch, and before they could cross the Euphrates inflicted upon them a considerable defeat. Then, while two pinnacled emperors were pitted in the East (A.D. 261), Odaenath took the side of Gallienus the son and successor of Valerian, attacked and put to death the usurper Quietus at Eumes (Homs), and was rewarded for his loyalty by the grant of an exceptional position (A.D. 262). He may have assumed the title of king before; but he now became “tutus Orientis imperator,” not indeed joint-ruler, nor Augustus, but “independent lieutenant of the emperor for the East” (Mommsen, Provinces, ii. p. 103). 3 In a series of rapid and successful campaigns, during which he left Palmyra under the charge of Septimius Worod his deputy (N.S.I. Nos. 127-129), he crossed the Euphrates and relieved Edessa, recovered Nisibis and Carrhae, and even took the offensive against the power of Persia, and twice invested Ctesiphon itself, the capital; probably also he brought back Armenia into the Empire. These brilliant successes restored the Roman rule in the East; and Gallienus did not disdain to hold a triumph with the captives and trophies which Odaenath had won (A.D. 264). While observing all due formalities towards his sovereign, there can be little doubt that Odaenath aimed at independent empire; but during his lifetime no breach with Rome occurred. He was about to start for Cappadocia against the Goths when he was assassinated, together with Herodes his eldest son, by his nephew Magonius; there is no reason to suppose that this deed of violence was instigated from Rome. After his death (A.D. 266-267) Zenobia succeeded to his position, and practically governed Palmyra on behalf of her young son Wahab-allath or Athenodorus (see Palmyra).

ODALISQUE, a slave-woman who is a member of an oriental harem, especially one in the harem or seraglio of the sultan of Turkey. The word is the French adaptation of the Turkish odalîye, formed from odâh, chamber or room in a harem.

ODD (in middle English odd, from old Norwegian oddi, an angle of a triangle; the old Norwegian oddamann is used of the third man who gives a casting vote in a dispute), that which remains over after an equal division, the unit in excess of an even number; thus in numeration the word is used of a number either above or below a round number, an indefinite cardinal number, as “eighty and odd,” or “eighty odd.” As applied to individuals, the sense of “one left after a division” leads to that of “solitary,” and thus of “uncommon” or “strange.” In the plural, “odds” was originally used to denote inequalities especially in the phrase “to make odds even.” The sense of a difference in benefit leads to such colloquialisms as “makes no odds,” while that of variance or change is expressed “to be at odds.” In betting “the odds” is the advantage given by one person to another in proportion to the supposed chances of success.

ODDE, or Odda, a village of Norway, in South Bergenshus amt (county), on the Sør Fjord, a head-branch of the great Hardanger Fjord. It is 48 m. directly S.E. of Bergen, but 123 by water (to Elde), road (to Vossevangen), and rail thenceforward, or about the same distance by water alone. It is one of the principal tourist-centres in southern Norway, being at the end of the road from Fredfon (27 m.) near which the routes join from Tønsberg and Sand, Lake Suldal, and the Brattlanddal, and from the south-eastern coast towns by the Telemark. This road, descending from the Horrebraekke, passes through the gorge of Selbstadjuvet, passes the Espelandspols and Loteafls, and skirts the Sandven lake. Odda is also a centre for several favourite excursions, as to the Uiarane, one of the glaciers descending from the great Folgefond snowfield, situated in a precipitous valley (Jordal) to the west of Sandven lake; to the Skjærgedalsfoss, a magnificent fall (525 ft.); or across the Folgefond to Suldal, a station on the Mauranger branch of the Norwegian fird. Touring steamers and frequent local steamers from Bergen call at Odda, and there are several large hotels.

1 The younger Forster remarked that the birds of Norfolk Island, though believed by the other naturalists of Cook’s ship to be generally the same as those of New Zealand, were distinguished by their broader coats; (see also Nisbet). There can be no doubt that all the land-birds were specifically distinct. It is possible that Sparrman’s R. australis, which cannot very confidently be referred to any known species of Ocydromus, may have been from Norfolk Island.

2 The later Roman chronicler Trebellius Pollio goes further and asserts: Odenatus rex Palmyrenorum optimum totius Orientis imperium. Gallienus Odenatum participato imperio Augustow vocavit,” Hist. Aug. xxiii. 10 and 12. This is not borne out by the evidence. The highest rank claimed for him by his own people is mentioned in an inscription dated 271 (N.S.I. No. 130) set up by the two generals of the Palmyrene army; Odaenath is styled “king of kings and restorer of the whole city”; but this does not mean that he ever held the title of Augustus, and the inscription was set up after his death and during the revolt of Palmyra.
ODDFELLOWS, ORDER OF, a secret benevolent and social society, having mystic signs of recognition, initiatory rites and ceremonics, and various grades of dignity and honour. Great antiquity has been claimed for the order of Oddfellows—the most popular tradition ascribing it to the Jewish legion under Titus, who, it is asserted, received from the emperor its first charter written on a golden tablet. Oddfellows themselves, however, now generally admit that the institution cannot be traced back beyond the first half of the 18th century, and explain the name as adopted at a time when the severance into sects and classes was so wide that persons aiming at social union and mutual help were a marked exception to the general rule. Mention is made by Defoe of the society of Oddfellows, but the oldest lodge of which the name has been handed down is the Loyal Aristarces, No. 9, which met in 1743 “at the Oakley Arms, Borough of Southwark; Globe Tavern, Hatton Garden; or the Boar’s Head in Smithfield, as the noble master may direct.” The earliest lodges were supported by each member and visitor paying a penny to the secretary on entering the lodge, and special sums were voted to any brother in need. If out of work he was supplied with a card and funds to reach the next lodge, and he went from lodge to lodge until he found employment. The lodges gradually adopted a definite common ritual and became confederated under the name of the Patriotic Order. Towards the end of the century many of the lodges were broken up by State prosecutions on the suspicion that their purposes were “seditious,” but the society continued to exist as the Union Order of Oddfellows until 1809. In 1813, at a convention in Manchester, was formed the Independent Order of Oddfellows, Manchester Unity, which now overshadows all the minor societies in England. Oddfellowship was introduced into the United States from the Manchester Unity in 1819, and the grand lodge of Maryland and the United States was constituted on the 22nd of February 1827. It now rivals in membership and influence the Manchester Unity, from which it severed its connexion in 1842. In 1843 it issued a dispensation for opening the Prince of Wales Lodge No. 1 at Montreal, Canada. The American society, including Canada and the United States, has its headquarters at Baltimore. Organizations, connected either with the United States or England, have been founded in France, Germany, Switzerland, Gibraltar and Malta, Australia, New Zealand, the Fiji Islands, the Hawaiian Islands, South Africa, South America, the West Indies and Barbados, and elsewhere.

The rules of the different societies, various song-books, and a number of minor books on Oddfellowship have been published, but the most complete and trustworthy account of the institution is that in The Complete Manual of Oddfellowship, its History, Principles, Ceremonies and Symbolism, privately printed (1879). See also Friendly Societies.

END OF NINETEENTH VOLUME

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