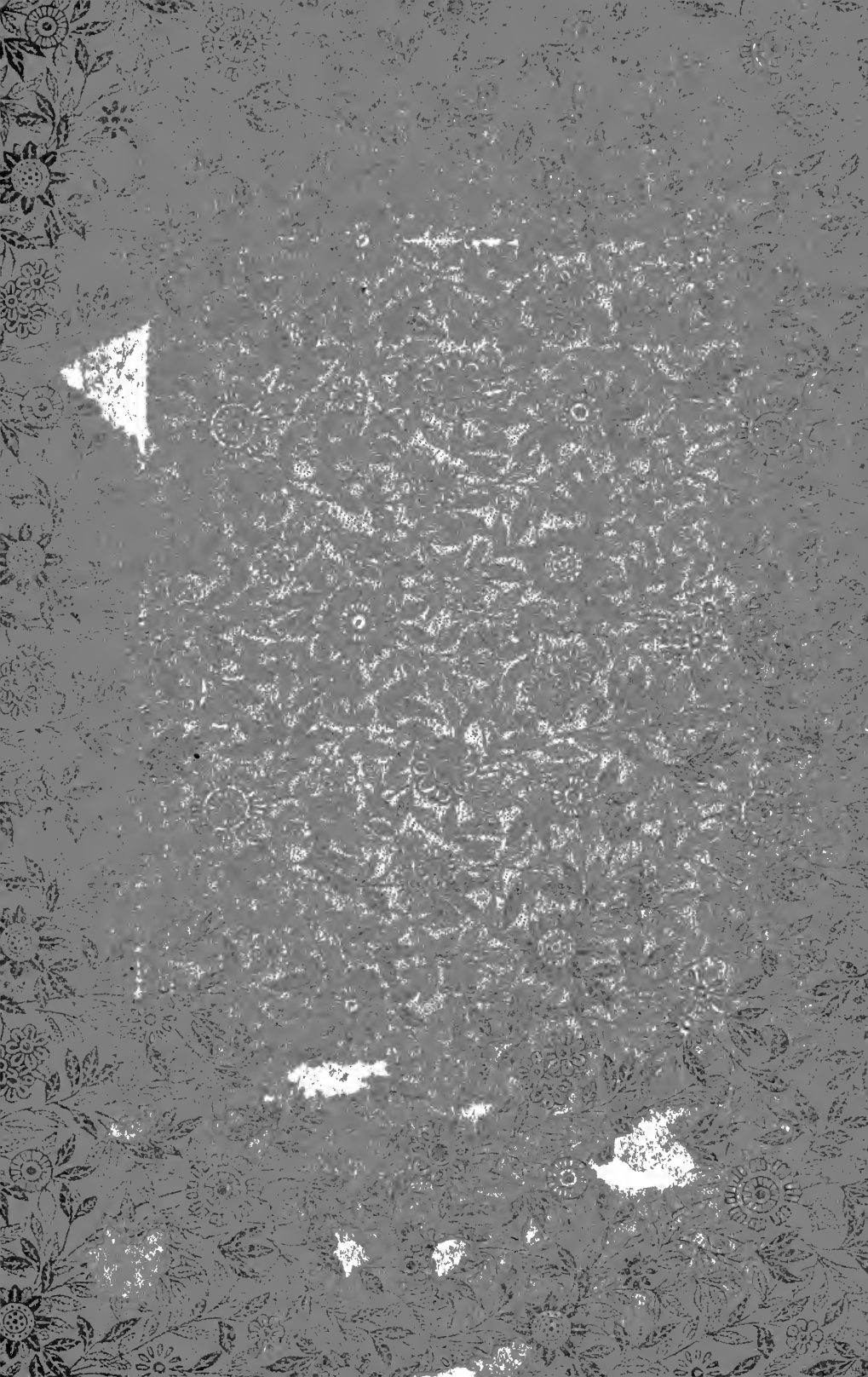
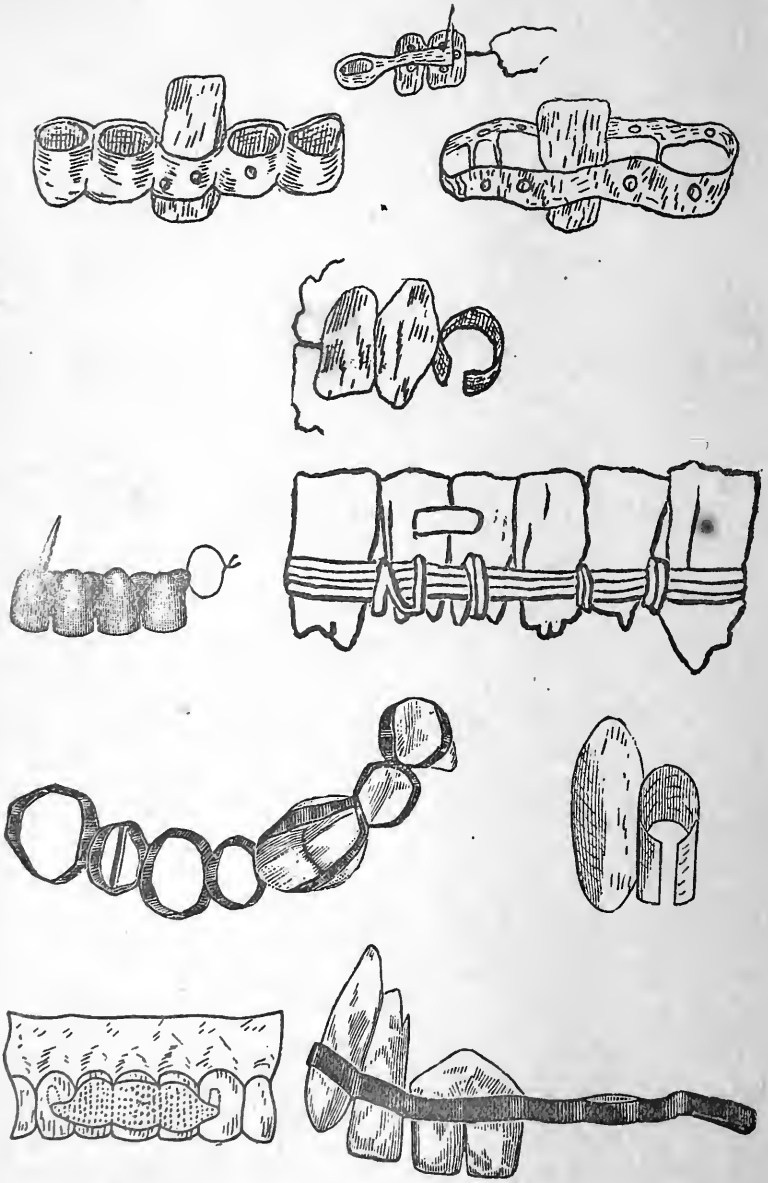


PLATE I.



Specimens of Ancient Dental Art.

THE

RISE, FALL AND REVIVAL

—OF—

DENTAL PROSTHESIS

INTRODUCTORY LECTURE

—BY—

B. J. CIGRAND, B. S., D. D. S.,

PROFESSOR OF DENTAL PROSTHESIS IN THE AMERICAN COLLEGE OF DENTAL SURGERY.

PUBLISHED BY REQUEST OF CLASS

1892

CHICAGO, ILLINOIS.

SEVERINGHAUS & BEILFUSS, PRINTERS, 448 MILWAUKEE AVENUE.

Proem to Students.

The title of this Lecture is so fully indicative of its character that scarcely a word of "Foretalk", as the Saxon express it, seems necessary. As this is my inititatory talk to you, my lecture will be of a prefactory character, in inaugurating the course in Dental Prosthesis. All that is requisite by way of preface here, is to give brief account of the within contained remarks. This proem may at the same time serve as an apology for some of the defects of which the author is fully conscious.

Believing it necessary that the dental student in beginning the study of his chosen profession, should know something of its antique birth, growth and development, I felt it a duty incumbant on myself to open our acquaintance by cordially introducing to you the history of this branch of dental science.

Knowing full well that many of you, before coming here, had little knowledge relative to this interesting theme, on account of non-access to journals, I am confident we can profitably spend our first hours.

In many of our dental schools, during the entire

three or more years that the student serves within its walls, not one sentance does he hear concerning the struggles and advancements of his prehistoric professional forefathers; and sorry to say, the worthy college from which I hail was addicted to this apparent neglect.

Many months have been spent in gleaning the contents of this lecture, which is the result rather, of occasional moments of leisure from the duties of an active professional life, than of a special devotion to the cultivation of any suberb thesis on the subject.

Such sources of information were consulted as were deemed advantageous, towards compiling and completing the lecture. Among these "helpmates" I gladly mention, Cosmos, Review, Item of Interest, and many voluminous references in the various Libraries.

In conclusion, will add, should this published research merit a dedicatoral note, I am certain none more worthily deserve the inscription than my many kind and thorough instructors, and more especially Drs. Haskell and Sherwood, whose untiring devotion has placed them in my memory's safe keeping.

Very Sincerely,
B. J. Grigrand.

Encouraging Words.

God bless those Surgeons and Dentists!
May their good deeds be returned upon
them a thousand fold. May they
have the felicity in the next
world to have successfull
operations performed
upon them at all
eternity.

WASHINGTON IRVING.

TABULAR EMBRACE

— OF —

LECTURE.

I. PROEM TO STUDENTS.

II. ENCOURAGING WORDS.

III. DENTAL PROSTHESIS—DEFINITION.

IV. EGYPTIAN DENTAL ART.

V. HEBREW DENTAL ART.

VI. CHINESE DENTAL ART.

VII. GREEK DENTAL ART.

VIII. ROMAN DENTAL ART.

IX. ETRURIAN DENTAL ART.

X. EUROPEAN DENTAL ART.

XI. AMERICAN DENTAL ART

XII. CONCLUSION.

Introductory Lecture.

AN HISTORICAL REVIEW OF DENTAL PROSTHESIS.

To the faithful dental student, who is ever yearning for fresh draughts of information, every subject that pertains to the history and progress of dental science, is fraught with the deepest interest; and probably no features in the annals of dentistry solicit his attention sooner, and merit such sincere consideration as does the story of the rise, fall and revival of dental art. The dental student who is ignorant of the beginning of the trials and tribulations of the ancient surgeon dentist is not unlike the patriot who glories in the triumphs and achievments of his native land, but knows not of the making of the established institution he so fervently loves, such patriotism is but local and superficial as that.

There is an old Arabian maxim which says: "If you are about to acquaint yourself with a man, first learn where he was born, and next how he was raised."

And the good advice in sentiment might well be given to those who are about to acquire knowledge of the mysteries of the arts or sciences, namely — first learn of the origin of the sciences, and next determine its progress.

Hence in this mornings talk to you I can in no safer manner inaugurate the course than by gathering the fragmentary parts of dental history, and present them to you in one solid unbroken chain.

That we may clearly understand the subject let us see if all agree as to the meaning of *Dental Prosthesis*. No doubt we are harmonious when we analyze the first word DENTAL, and say it is of Latin origin, and as applied here is the simple adjective form of the Latin noun "*dens*" a tooth. But we are apt to differ materially as to the rendering of PROSTHESIS; present time dictionaries tell us that this word is of Greek derivation and signifies *Add to, Replace or Restore*.

Thus the term Dental Prosthesis is a combination of two words, the one of Latin, the other of Greek origin, and when connected in their literal sense designates Tooth addition, Tooth replacement or Tooth restoration. Dental Prosthesis would seem to imply nearly all dental operations, since litttle else is the dentist called upon to do other than *replace*,

add to and *restore* dental organs. This would mean, that all specialities of dentistry are branches of Dental Prosthesis, which in fact is the case though not generally so accepted. Hence if the dentist fills a crown cavity with foil or plastics he simply *restores* the dental organ by *replacement*; if he crowns a root with porcelain or gold shell-crown, he again resorts to prosthetic art, and restores by *addition*; if he replant or transplant a tooth or teeth he further follows prosthesis and restores by *replacement*; if he attach to the natural teeth several artifical ones by means of a system of bridge-work he but restores the denture by *addition*; if he treat with the aid of medicinal agencies a sore tooth he similiarly labors in a prosthetic sense, since he *restores* the tooth to its natural health; if he is sought to relock a jaw or aid in healing a fractured maxilla he *replaces* and *restores*, thus again adopting prosthetic principals. There are but two operations, of which I now think that a dentists services is sought, which are not thoroughly prosthetic, and these are the devitalization of a nerve and the extraction of a tooth. Latest authorities pronounce the custom of saying Prosthetic Dentistry as incorrect, and should be designated Dental Prosthesis, Tooth Replacement, not Replacement Tooth as in the former remark.

Dental Prosthesis is that branch of dental science which teaches the art of replacing lost organs of the mouth or any part thereof; it includes the laws and principles which determine and regulate the various processes employed in the construction of all forms of dental mechanism.

The word may be spelled P-r-o-s-t-h-e-s-i-s or P-r-o-t-h-e-s-i-s; when written with letter "s" in first syllable the word is divided into three syllables Pros-the-sis, with primary accent on first, and secondary accent on second syllable, and all vowel sounds short, except "e".

When spelled without the "s" in first syllable the syllabrication is markedly different although containing also three syllables thus: Proth-e-sis, with primary accent on first and second accent on last syllable, and all vowel sounds short, but "e".

The profession of dentistry is generally considered a modern science, but on careful investigation we find on the contrary that it is ancient and there is abundant evidence to show that the art is of great antiquity. Although it is less than a century that it has taken the rank of a distinct profession, attention was directed from the earliest period to the means of preserving and improving the beauty of

natural teeth. In order that all possible doubt be eliminated as to its antiquity we will give it careful retrospect and in no small measure profit from the research.

Of the origin of the art of dentistry no one can speak with certainty, as its early history is shrowed in the mists of oblivion, but dental operations are recorded in very remote times.

Egyptian Dental Art.

Away back in the dim centuries when mythology had its happy reign, and historians began to chronicle in their order transpiring events, we find dentistry was studied and practiced with great success. There can be little doubt that sunny Egypt was the birth place of ancient dentistry, at any rate the Greek historian Herodotus recites that the Egyptians practiced dental art. In his second book narrating his travels through Egypt he states that the art and practice of medicine was divided among the Egyptian priesthood, each physician or surgeon applying himself to one class of disease

only; some to the head, others to the eye and others to the teeth. And although little is known of the attainments of these ancient practioners of dentistry judging by the work deposited in some of the tombs of Egypt one would willingly conclude that the practioners of that time were comparatively learned and highly proficent in the science of Dental Prosthesis.

In recent dental journals we are informed that in one of the royal mummies taken from the catacombs of Egypt a set of artificial teeth was discovered in which the plate was of wood carved to fit the roof of the mouth, while the teeth which were of brass were ingeniously attached.

The great Egyptologist Ebers has proven that in the Egyptian Medical schools they had special teachers of dentistry upward of three thousand years ago.

Had Egyptian universities their chairs of dental surgery? If so, an added laurel may deck the fame of the "land of science and sacred recollections."

Exhumed, from the time worn Egyptian tombs antedating the records of Herodotus, mouldering skeletons present arrays of gold filled teeth; I vouch not for the authority but it is well stated that the art of clasp work was understood to some exactness.

One of the mummified bodies of an Egyptian Pharoah demonstrates most conclusively that natural teeth were not only well cared for in the way of gold and lead fillings, but that the fair Pharaoh had perhaps by accident lost one of his incisors, and the court dentist did the best he could and carved an ivory tooth of similar shape to the lost organ and by means of silk ligatures fastened it to the adjoining sound ones.

Hebrew Dental Art.

The Ancient Hebrews too well knew the worth of teeth, and the great king Solomon wisely nicknamed the teeth the "Millstones", and were by his people recognized as the motive power of life. Moses legislated his famous law known as "tooth for tooth", an edict which was altered and explained in the Talmud to mean a fine or penalty. The man who broke the tooth of his fellow man had to pay the unfortunate a sufficient amount of money for damage done, or have the substitute placed at the cost of the aggressor.

So highly did the Hebrews value a natural tooth that if a master broke the tooth of a slave the latter was set at liberty on account of his great misfortune. Mosaic law in this respect was in force long after the Christian era, as the following from Talmud says: "Rabon Gamliel who was the teacher of the Apostle Paul, had a slave Tabi by name, and as he was anxious to set him at liberty for ever, he broke his slaves tooth that the latter should be free, and the Rabbi was so happy the day of his slaves liberation, that he gave a banquet to his friends, besides sending his slave off with a present."

The Talmudical Folk lore says: "If a man dreams that his false teeth have fallen out, it is a bad omen that his children will soon die." Indeed the dental profession was in the utmost cultivation under the care of the learned sages, of the Talmud and modern dentists would be astonished to learn that the art of replacing false teeth for natural ones was practiced among the Hebrews more than two thousand years ago.

Samuel the dentist who lived after the destruction was the house physician and dentist of the famous Rabbi Jehuda the Saint. The latter was often afflicted with toothache but was cured by Samuel. What drug this Rabbical dentist used is

unknown, but according to the Talmudical narration it must have been chloroform or something with similar qualities. Since the Rabbi's suffering was stopped by the use of inhalation of anaesthetic fumes.

Among the Hebrews it was strictly forbidden by law to carry jewelery or precious metals or stones on the Sabbath, but the Talmud wisely allowed the Jewish women "to go out on the Sabbath with her false golden or silver teeth." Some Rabbis allowed their people to wear the silver false teeth since these appeared natural, but the use of golden false teeth on Sabbath were prohibited.

Chinese Dental Art.

Following up closely the history of Dental Art we next visit the land of tea. The Chinese it must be remembered were in ancient days a persevering people and made wonderful advancement in the arts and especially in the sciences. In medicine and surgery they were considered preeminent. One of the ancient kings of China instituted a free medical

school for those citizens who were inclined to study medicine or its many branches." Although it is very difficult to obtain facts and figures of ancient China it notwithstanding fortunately happens that a Chinese MSS. is deposited in the French academy of science, which gives much information as to Chinese methods of dental practice. In this paper we are told that the court dentists ever preserved for the royality the entire natural denture and kept the same "clean and sweet.". Tradition has it, the paper says, that the native China dentist possessed a wonderful powder for painless extractions, the same is rubbed on the gums over an effected tooth and after an interval of a few moments the patient was requested to sneeze, where upon the tooth would drop from the jaw. The paper further states that the dentist used a peculiar pitch of a white appearance, and this was used to restore decayed teeth.

Artificial teeth among the Chinese of medevial times were seldomly worn, since the dental surgeon not only seemed skilled enough to preserve them, but the Chinese were known to be the possessors of sound teeth. We now leave the superstitious Chinaman and wander to the land of *fair maids*.

Arabian Dental Art.

Although the Arab thought more of his steed than of his wife, yet he did not fail to appreciate self and give time and attention to the "pillars of the mouth", as he called the teeth. Among the archives of tradition, in Arabia, we are informed, that the augur and physician Navius Actius, as early as 300 A. D. discovered the foramina in the roots through which the nerves and vessels enter the pulp chamber; and for years subsequent to this discovery the christian world was ignorant of this and other of his important finds.

Another Arabian surgeon, Albacasis by name, was recognized to be a great and preeminent "carver of human teeth". This famous doctor lived about 1100 A. D., and he suggested means for replacing lost dental organs by substituting extracted natural ones; he also produced many dentures of bone and ivory.

The Arabs generally were very proud of their teeth and among them the tooth-pick was a pocket friend. The tooth-picks were made of mastic-wood and they used them in preference to quills; hence

Rabelais says that "prince Gargantua, like the Arabians picks his teeth with mastic-wood tooth-pickers".

The Arabs not only appreciated their teeth, but in ancient days worshiped the cuspid tooth of a monkey. Tradition has it that they once offered 700,000 ducats, or about 725,000 dollars in our money, for the redemption of a monkey's tooth.

In a recent number of the Harper's we read that a traveller who had visited and acquainted himself with the fleet Arabians, says: "If you are ever intending to visit the land of the "ship of the sand" do not fail to comment the Arabian on his grand steed and pearly teeth, these are the two things that are cherished in his heart."

But notwithstanding that the Arab never neglected his teeth or steed, we find that some of his good people wore artificial dentures; at any rate an Arabian general under Mohammed of Ghor, and conqueror of India, was slain and his body could only be identified by means of the false teeth he wore, and held in place by gold wedges and wire.

Greek Dental Art.

"The Greeks", it is said, "learned what the Egyptians knew", and no doubt the science of dental surgery emigrated from Egypt to Greece as did nearly all knowledge. The Greeks who were at one time a very dexterous and progressive race were skilled in all arts and science and to their ancient historians and bards belongs much credit for having noted the then present state of dental prosthesis not only in the land of the Greeks but the land of man.

Homer the great Greek sage and historian tells us that Esculapius, a surgeon who lived about 1250 B. C., used a narcotic to produce insensibility when performing minor operations such as tooth drawing. He too we are informed was the first to teach the art of tooth purging and filling. Esculapius performed many wonderful operations and his skill enabled him to cure the most desperate diseases. He was thought of so highly by the Greeks that a statue of him was made in gold and after his death was called the god of medicine.

The Greek writer Cicero gives credit to the third son of Esculapius for the invention of an instrument for the extraction of deceased teeth. It is further claimed that these ancients were acquainted

with the art of healing dental caries by plugging the cavity with Gold foil, and that the British Museum contains skulls taken from Greek tombs, and the teeth in these dead remains are unmistakably filled with gold foil.

Aristotle the Greek philosopher who lived about 350 B. C., gives considerable consideration to the teeth in his book of problems and treatise on physiognomy as well as in his other works. The Temple of Delphi well illustrates the antiquity of Grecian dental art. This old structure contains within its walls a pair of leaden forceps which date back 2000 B. C., and Aristotle informs us that the dentist who deposited it there was known as Erasistratus.

Greecian lore abundantly testifies that Dental Prosthesis was practiced and to no small extent. The tenth of the celebrated Greek Laws of the Twelve Tables allowed that any gold used to fasten the teeth might be burned or burried with the body.

In the works of the renowned archaeologist Belozoni we read that "the Greeks wore false teeth of sycamore wood which had been fastened to the adjoining natural ones by ligatures of gold or silver; and that many of the decayed natural ones were filled with a clay-like substance which became remarkably hard and durable."

Roman Dental Art.

We will now bid the scholarly Greecians good-bye and travel to the land of war — Italy — there to greet the model Roman. Although the Roman was constantly engaged in battle, yet much attention was paid to the fine arts. "The greatest Roman Surgeon that ever lived", says Herodotus, "was Hippocrates, who lived about 450 B. C. This genius was a distant relative of Esculapius, and like the great surgeon was divinely skilled in the practice of medicine and surgery".

At the time of the birth of Hippocrates medicine and surgery was entirely in the hands of the heathen priesthood, who knew little of medicine as a science, and so thoroughly clothed the subject with superstition and mysteries that future generations still suffer the effect. Every minute operation which these priests performed was accompanied by some special religious ceremonies. Temples were erected, and within their walls mythological figures stationed; each and every god or goddess being recognized as the divine guard against some disease, accident, pain or ailment. The priests who had these several temples in charge reaped at these doors unknown

harvest of riches; since if some poor unfortunate plebian suffered from toothache or other malady he would by payment of toll or tarrif be permitted to enter the temple and there at the feet of the specially created god or goddess patiently pray until the pain subsided; if it happened to continue for more than a day the wretched sufferers would return to the temple the next day with less money, less hope and more pain.

In later times to endow a monastery, found one, or to have performed a miracle was the safest passport to canonization. The following taken from an ancient work on mythological beliefs gives a complete list of such saints and gods, as the plebians would be obliged to give devotion in case of ordinary dental troubles: Saint Apollonia guarded against toothache, Saint Lucy guarded against sore tooth, Saint Anthony guarded against inflammation, Saint Germanus guarded against diseased erruption, Saint Marcus guarded against neuralgia, Saint Herbert guarded against poisened teeth.

The Roman priests also erected temples in memory of the great Greecian physician Esculapius, and worshipped him as a god of medicine. The cock was commonly sacrificed to his memory, but a peculiar bread of serpents was the favorite type

The monks shrewdly worked upon the confidence of the laity, as regards the miraculous cures wrought by praying to Esculapius; and the priests of the temples at once founded the society known as Esculapae or children of Esculapius, and the members of this association were the only regular physicians and surgeons of antiquity. "The sale of Esculapian snakes, or holy snakes" as they were called, was a source of revenue to the priests and physicians who lived about the temples. Thus religion, medicine and surgery were practiced together; and through the instrumentality of priest-physicians, sacrifices and votive offerings of value served to enrich the medical temples, and oppose the anger of the immortal Gods and saints at the same time. Charms, talismans and amulets were resorted to for individual ailments and to ward of disease.

The priests in simple had what we would nowadays term a "corner on medical science", and they jealously guarded the votaries and fought every advance made by the plebians towards medical discoveries.

But alas these shrewd monks soon lost the substantial portion of their income when the young Hippocrates grew up "learned in all the wisdom of medical science and surgical art." Although him-

self the son of a priest-physician and inheriting all the superstition and educated in the traditions of the priestly rites he broke loose from former teachings and proclaimed to all the civilized world that medicine was based on inductive philosophy, and disclosed at the risk of his life that the priestly system was a fraud and an imposition. He it was who first undertook to collect the fragmentary knowledge of medicine and restore it to something of an order. He classified and described diseases and with him medicine and surgery began their careers as sciences. All that is known concerning early history of medicine, and surgery is derived from the works of Hippocrates, his family or his pupils. When we consider the age in which he lived—400 B. C., and the difficulties under which he studied medicine, we can not fail to admire the great advance he made. His system is conspicuous in rejecting the superstitions of his time by teaching his many disciples to impute a proper agency to physical cause. It was to the interest of those connected with the temples to refer all diseases to supernatural agencies, and any contradiction of such doctrine by Hippocrates must have met with great reprehension. Yet the opposition seemed to weigh but little with this great and talented physician. He pursued his practice without giving

himself the least concern in that respect, and in doing so, set an example to all who should succeed him in his noble profession, and most forcibly taught his pupils not to hesitate in encountering the prejudices and superstitions of the present, for the sake of truth in the future.

We as dentists should reverence the memory of Hippocrates for the complete manner in which he accomplished his object. While Hippocrates investigated all branches of medicine, the diseases of the mouth and teeth did not escape his notice. He observed the teeth in their healthy and diseased condition from the time of their appearance until lost in old age. Some of his quotations are as follows: Teeth in similar conditions will erupt with less difficulty in winter than at any other period; that children who sleep well have little difficulty in erupting their teeth; that teething children with open bowels are less subject to convulsions than those suffering from constipation. He directed the attention to the influences that diseased teeth have in diseases of the breast, throat and ears, which diseases he claimed could only be cured by removing the troubling teeth. He further remarked: Cold drinks effect and injure the teeth; different seasons of the year have their various influences on the dental organs; ulceration and sup-

ration of the gums can be prevented if proper care be given the teeth; loose teeth he advises to be tied to their neighbors by means of gold or silk thread; cleansing the teeth is a precautionary measure against decay; avoid eating hard substances thus not break or crack the teeth; substances that set the teeth on edge are injurious. In one of his note books couchres this observation: "In consequence of a diseased tooth the maxallary bone of the son of Metrodorons become disorganized the gums grew exuberantly but the supperation was moderate. He lost the molars and the maxillary bone".

After the death of Hippocrates the science of medicine and surgery took a retrograde step and again fell to the hands of the pagan priests who made use of the discoveries of Hippocrates to further the confidence that divine power was invested in the priesthood.

Phiney says: Thus the priests became the recognized surgeons and they taught the science with many acult and mysterious ceremonies well calculated to impress the vulgar and to excite belief in their miraculous power." So we find that the great science of medicine and surgery was confined to the ancient priestcraft and they took good care to keep it well saturated with mysteries; but they themselves

were well posted and studied laboriously to gain knowledge in the promising new field. The priests discovered numerous medicinal agencies but the outside world was kept ignorant of these priestly accomplishments. While the science was being cradled by these inquisitors, the common surgeon was prohibited from practicing under penalty of imprisonment or death.

Sumner has wisely said that "vice and barbarism are inseperable companions of ignorance and superstition, and without knowledge there can be no sure progress." Hence we comprehend why there was a pause in the research and advancement in surgical science; the priests having full sway and unlimited power, kept all information from the laity, and only a select few who had the necessary influence and pecuniary circumstances could learn of the new and wonderful discoveries in the prosthetic art.

But pupils of this class through an agency entirely unknown to antiquity knowledge of every kind has become general and permanent; it can no longer be confined to select circle or crushed by tyranny nor be lost by neglect. The press ever watchful with its 100 eyes of Argus and strong with more than a 100 arms of Briarious, not only guards all conquests of civilization but leads the way to further triumphs

Among the voluminous writings of the Latin poets frequent reference is made to artificial teeth. The famous Martial who lived in the first century B. C., says that a Roman Dentist "Calcellius is in the habit of fastening as well as extracting the teeth". To Lelius the same author says: You are not ashamed to purchase teeth and hair; and adds that the toothless mouth of Egle was repaired with bone and ivory; also that "Galla more refined removed her artificial teeth during the night.". The immortal Horace of the same century cites the case of the sorceresses Canida and Lagana running through the city and loosing the one her false hair, the other her false teeth. If we may place reliance upon written history then we are obliged to believe that a certain Cornelius Celsus, a noted Roman dentist of the time of Tiberius (A. D. 14—37) wrote upon the diseases of the teeth and their treatment, and is also credited with inviting or introducing the art of plugging teeth with gold foil.

The Roman practice of cremating all but the most noted of their dead has consequently destroyed most of the desired evidence in this direction. Ovid and Virgil make similar remarks which prove beyond the shadow of doubt that Dental Prosthesis was a known art to Ancient Romans.

As to the condition of the teeth in prehistoric and medevial or modern times I can quote no better authority than Dr. Talbot, who has devoted years, energy and finance to learn of the true condition of the dental organs or their substitutes of our historic ancestors. In an address by the doctor last year he says; relative to the ancient dental practitioner: "The instruments for dental as well surgical purposes, which are to be seen in the museums of Europe, together with the beautiful specimens of Etrurian and Phoenician dentistry—now in the possession of Drs. Van Marter of Rome, Barrett of Buffalo and Taft of Cincinnati—are striking illustrations of the superior ability wich men of early times acquired."

These specimens of which Dr. Talbot speaks are rare, not owing to the supposed cause of dentures, not being common in ancient days, but on account of the peculiar customs of their early folks in disposing their dead, the few and treasured relics which we as a profession possess, has come down to us simply because time, weather and circumstaces did not destroy them.

In 1889 Dr. Barrett while exhibiting some of the *treasure trove* remarked: "These specimens date from about the founding of Rome. They are of more than unusual interest, as they bear unimpeach-

able testimony on some interesting points connected with the teeth of man. Dentists of today unusually entertain the idea that the prevalence of diseases of the teeth is to be attributed to the altered methods of living, to the modes of cooking food to change in the manner of life, etc. Some years since I had examined about two thousand (2000) ancient skulls, more especially with reference to evidences of dental disease. The examination at once demonstrated conclusively that all the diseases of modern life, except syphilis, were as rife in ancient times as to-day. Two of the teeth I have shown you prove the existence of Pyorrhea alveolaris in teeth seven hundred and fifty years before the Christian era."

Now, if this as Dr. Barrett cites, is correct, which no doubt it is, there is abundant proof that in those days, like in our own times, there were as Shakespeare says:

"Sans teeth, sans eyes,
Sans taste, sans everything".

And since Dr. Talbot comes to us with conscientious assurance that the ancient practioners were highly skilled in the preserving and as well reconstructing dental organs we must feel convinced that the old dentist practiced upon the *sans teeth*, of which Dr. Barrett lends undoubted authority.

The reason why I dwell upon this subject of ancient dental substitutes is that we have modern scientists among our ranks who are attempting to popularize the idea, that there are not in existance any authentic proofs of there having ever been in ancient times dental practioners, nor that the mouldering dead demonstrate the science of crown bridgework or artifical teeth. Some years since one of our American dentists wrote an article for one of our dental journals, in which the author states that "no well authenticated case of gold filling has been found in the teeth of the ancient Romans, Etrurians or Egyptians and that the superior cement reported to exist in the teeth of these dead has proved to be simply tartar." The same author adds that the so-called "bridgework" reported to have been found are crude attachments of artificial teeth by gold-wire, and from large use in the mouth are thickly coated with calcareous deposit; their mechanical contrivances are in no wise comparable with the artificial productions of today."

It gratifies me to tell you as a class that I have assurance from doctors who are in the possession of genuine cases of filled teeth, crown work and bridges which were exhumed in various parts of Italy, Greece and Egypt, that they will be on exhibition in the

coming Columbian World's Fair; and I hope the writer of the about spoken disclaimer can have the pleasure of acknowledging his mistake.

In a recent copy of a scientific weekly paper I noticed the following seemingly wonderful disclosure: "It is claimed by the modern dental surgeon that ancient people had their teeth filled with gold, obviously to prevent further decay of the teeth. This on recent and close investigation proves to be, as the Americans term it, a *fake*, and it is easily proven to be such. What the anxious dentists of today thought to be gold plugs now clearifies to be nothing more or less than mere gilding of the teeth. The belles of old were accustomed to lend aesthetic marks to their delicate features by gilding their front teeth."

This writer too, no doubt, believes that he has solved an intricate problem, but in this case his little knowledge has proven to be a dangerous thing, since he does discredit to the ancients and attempts to deride medical science of its laurels and simultaneously rob history of facts. Had the writer drank but deeper of the *Pierian Spring* he would have sipped up a drought of information, such as would have not only cautioned him from writing as he did, but on the contrary stimulated him to regard records of the

past as worthy of deep and continued study. It is true that in many of the tombs of ancient Italy and Greece, the mummified corpse presents golden teeth, or more clearly speaking gilded teeth, and it will be of interest to us, to learn why such was the case.

We learn in the Grecian and as well Roman mythology that in the event of the death of an eminent personage, and more especially the kings, emperors and public benefactors, the burial ceremony included the gilding of the teeth of the dead. And why this you ask? For the simple and particular reason that their mythological belief proclaimed that the teeth be gilded, in order that the departed might greet the immortal gods of judgment in all possible glory. The river Styx was by them supposed to be the boundary line between life and death, and in consequence the departed in order to enter the kingdom of the immortal god—heaven—was obliged to cross this fearful river Styx. But to facilitate the passage the dead must be in the good graces of the god Charon, the watchman of this stream and the ferryman of the shades of death, and in no way could the love of this god be secured other than by gilded teeth and copper coin. The fee exacted by him for this service from each spirit ferried over the

Styx was never less than one obulus — one penny — nor more than three; and to provide for this fee small coins were placed in the mouth of the dead. The spirits of those bodies which had not gilded teeth and sufficient copper coin to pass, were supposed to wander on the shore of the Styx for one century, after which period the god Charon would permit the unfortunate to enter the boat and cross the stream and be escorted to the seat of judgment. Now then, kind listeners, we comprehend, why some of the dead and mummified bodies of the ancients have gilded teeth.

I would caution any dental student against believing too readily anything pertaining to the accomplishments of the ancient dentist; yet I also would advise him not to be too reluctant about yielding, especially when the facts and figures thoroughly demonstrate him as being opposite to truth and justice.

Etrurian Dental Art.

The Etrurians who inhabited the northern part of Italy were well skilled in mechanical sciences, and Etruria flourished as the Italian seat of learning. Etrurian was the home of ancient, Italian talent,

wealth and power. These ancient Etrurians were a very remarkable people. Among them the fine arts were highly cultivated and dexterity so well developed as at the present time to excite admiration. They were exceedingly luxurious in both dress and appetite, and extremely fond of personal ornaments, even going so far as to have their sound natural teeth gilded, a custom of which our modern belles can not boast.

In those days the barber did not claim dentistry as a foster child, as the following depiction of a tonsorial shop, by Plutarch, about 73 A. D., will clearly show. "The barber shop with its talkative inmates was not only frequented by those requiring the service of the barber in cutting hair, shaving, cutting the nails and corns and tearing out small hairs, but was also a symposium house where politics and local news were discussed". Had the barber in this ancient day practiced the science or art of dentistry this writer who was very minute and exacting in his composition, would have made proper reference in the description.

Among the Etrurians, dental science was studied and practiced as a specialty of medicine. "However in this department of learning", says Professor G. A. F. Van Rhyn, the eminent archaeologist, "the Etrur-

ians were imitative rather than creative, and the art bore at every period the marks of foreign influence, especially Egyptian, Babylonian and Grecian."

Nothwithstanding that the Etrurian dentists paterned much after the oriental artists yet much credit is due them for having perfected many dental operations of a more difficult character. We shall in the near future know more about the accomplishments of the Etrurians, since many archeologists are hard at work solving the language of these grand people. They left us no key to their strange language, and no history except that which is written in the tombs; hence all we know of them is from adjacent and contemporary nations of people; numerous are the theories advanced as regards derivation or origin of the Etrurian race. Simultaneous with the discovery of the key to the language shall come a long, interesting and profitable lesson relative to their attainments as dental practioners.

The Etrurians like the Greeks and Romans held great faith in the mythological gods, and much like the oriental people sought the good will of the angry immortals, by prayers, votive offering and sacrifices.

Their priests, whom they called *lucumos*, were the guards and guides of the various religious and medical temples; but the medical profession with its

numerous branches was practiced with great success as we learn from the object lessons left us.

Modern dentists feel somewhat flattered by their late success in crown and bridge work, but our prehistoric professional forefathers we find did the same ingenious work centuries ago.

In the museums at Cornets, Italy, can be found carefully guarded with lock and key two specimens of ancient Etrurian bridgework. Their authenticity is undoubted since Van Marter, at present a Roman dentist, procured from the Sig. Dasti, the royal inspector of excavations and exhumations at Cornets, Etruria, a certificate duly signed and sealed, testifying that said specimens of gold bridgework were discovered in the mouth of a corpse which had been entombed upwards of 2400 years ago.

The cases were well made, the artifical teeth were evidently carved from the teeth of some large animal and were well executed. The artificial substitutes were the two superior central incisors and the first bicuspid of the left side. The artificial centerals and the natural lateral and cuspid of the right side were in a fair state of perservation, and the entirety was retained in position by gold bands; while the natural lateral, cuspid and second bicuspid and artificial first bicuspid of the left side were lost. The

three substitutes were also encircled by gold bands secured by rivets passed through each tooth. Three cases more of a similar construction were unearthed in the crumbling Etrurian tombs.

These are the earliest known essays of dental bridgework. What conclusions are we to draw from this evidence of wonderful surgical instruments and appliances found in the ruins of Pompeii, instruments that have been re-invented in recent years to meet the demands of modern surgery? One is almost inclined to call a halt before expressing any opinion and wait a little longer for excavators to dig up Etrurian or Urbain telephones and a long catalogue of similar-supposed modern inventions.

In 1884 the great English surgeon, Sir Spencer Wells, made investigations relative to Etrurian medical and dental science and expressed great interest in the matter; he related to Dr. Van Marter, D.D.S., of Rome, that he learned that these ancient folks had their teeth filled with a kind of fusible metal. The noted English archeologist and writer Mr. Forbes, while in Etruria and Rome, discovered that many of the mummified dead, had teeth filled with gold and a peculiar amalgam.

Hence we would conclude that few Etrurians suffered or died from toothache. On the contrary

we are inclined to think they had better teeth than we of now-days have, and that in many respects these people were wiser than we are.

As a rule they cremated their dead and this custom of theirs renders our task of procuring evidence a very difficult one. From what I can learn, only great warriors and civilians of distinction were embalmed and laid at rest in the family tomb. Two or three thousand years of time has accomplished the same end, for nearly all those who were embalmed and laid to rest in state as did the common burial—"ashes to ashes, dust to dust". This narrows our limits of research to a small territory and makes it rather surprising that any symbol of dental work should come down to us from those remote times.

But in the days of flourishing Etruria only the noble were fortunate enough to receive the benefits of dental operations, while the low and lowly were forced to suffer the tortures which disease of the teeth and oral cavity entailed.

The tombs in which the elite of those days were enshrined were most beautifully finished and their walls were ornamented with frescoes typical of the life of that period. Time has naturally covered these sacred vaults, and the ground above them has been

cultivated for ages, while below are human ashes telling unknown legends of the lost art—DENTISTRY.

The science of dentistry from the 5th to the 18th century was entirely neglected and to the suffering masses lost in oblivion during the long and blank period of human record; the mere operation of extracting useless and painful teeth was the extent of dental science, thus the dark ages not only retarded advancement in our science but it produced retrogation; with only an occasional ray of light penetrating its misty veil, only to be immediately swallowed in the dense surrounding gloom of superstition and religious intolerance.

During these dark days, known as the dark ages, all sciences and arts were completely neglected and the born artists, scientists and even the philosophers were, by cruel fate, turned into soldiers, knights and marshalls. This gloomy period covered a duration of time estimated by historians to be about one thousand years. All professions suffered in this reign of terror and the various callings of scientific men fell to the hands of mere artisans and laborers. Dentistry, once in the hands of competent and deserving men, now took a retrogade step and became a branch of the blacksmith's, barber's and jeweller's trade. The Oral surgery or more properly speaking

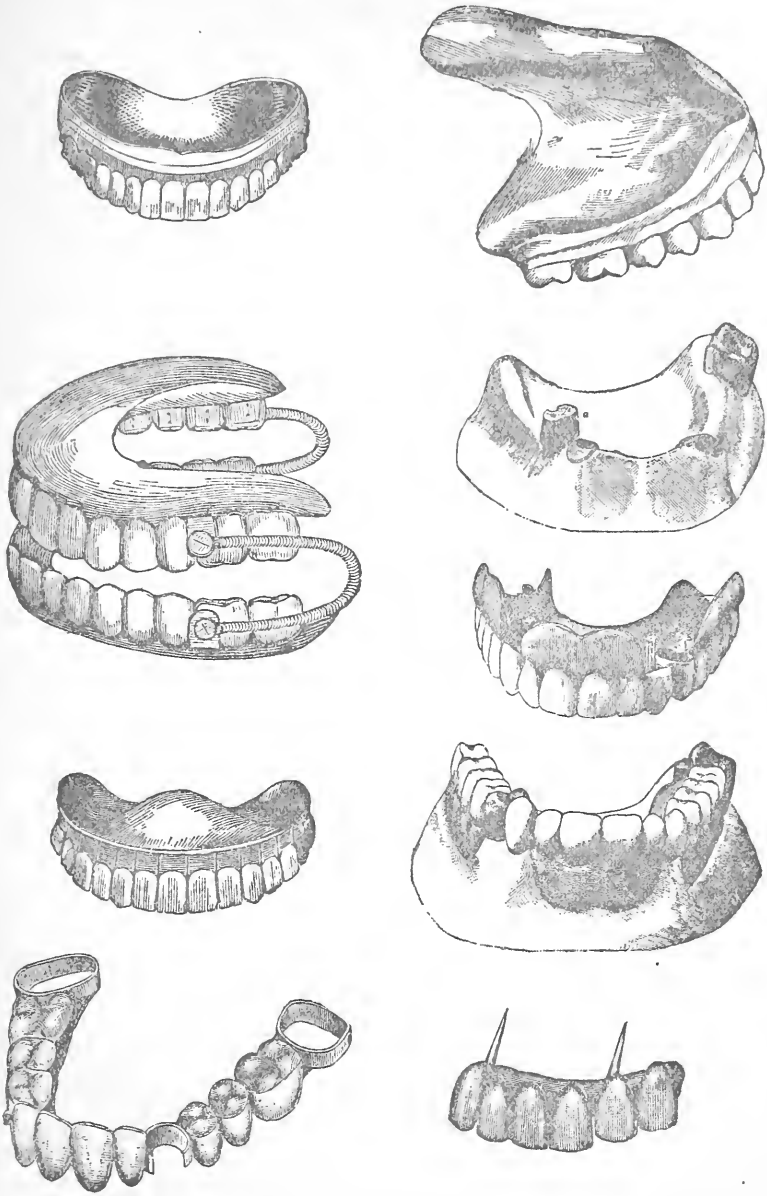
dental surgery was then practiced by the barbers and blacksmiths exclusively. The following from George Elliot's Romula (1492) well illustrates the tonsorial claim on the dental school: "Nay Bratti," said the barber in an undertone, "thy wisdom has much of the ass in it, as I told thee just now; especially about the ears. This stranger is a Greek, else I'm not the barber who has had the sole and exclusive shaving of the excellent Calcondila Demetrio, and drawn more than one sorry tooth from his learned jaw."

While the surgical portion of dental science was being looked after by the barber and blacksmith, the prosthetic branch was cared for by the skilled jewellers of those times. Jewellers in those early days were far ahead of the modern artist, since all the intricate gold and gem work, as also the engraving of same was all done unaided by the numerous machines and appliances at the command of the moderns. On this point Rev. Haines, who has investigated antiquy, says: "Etrurian and Roman jewellers were wonderfully skilled in the rolling, smelting and manipulating of gold and other precious metals, in all their varied forms. In fact, Etrurian jewellery has been famous for twenty-five hundred (2500) years. I have seen some specimens which were more than two thousand years old, that would be difficult

of reproduction to-day by any but the most skilled artificers." Hence dental prosthesis was in the safe keeping of men who would to-day do credit to their own as well as our profession.

But it was not until late in 1700 that the science of dental prosthesis was eliminated from the jewellery shop and put in the hands of men who not only understood the fundamental principle underlying the science, but also thoroughly studied the human mouth and its many adjacent connections The oral-surgery on the other hand had not be completly restored to specialists or even medically skilled representatives; in every civilized country of the earth the barber had been known to be definitely connected with rude surgery, such as blood-letting, dressing of wounds, and extraction of teeth or the lancing of gums. In consequence of their slight acquaintance with the rudiments of surgery the name barber-surgeon was usually applied to those of the barber trade, who demonstrated some surgical skill. In mediaeval Etruria the barbars were usually men of liberal education, and hence their intimate association with noted personages gave rise to the Latin remark: "*As inseparable as Musicus, Tuturos et Barba.*" As inseparable as the musician, teacher and barber. Thus for generations after prosthetic dentistry ceased

PLATE II.



Specimens of Medieval Dental Art.

(*Copyrighted.*)

to be practiced by jewellers and watchmakers, oral surgery was firm in the grasp of the aspiring barber.

Years rolled upon years and generations after generations passed beneath the sod, ere again the dental specialist arose from among the down-trodden trades to rise to his former dignity.

In the beginning of the seventeenth century dental science in Europe was revived, but to no marked degree; artificial dentures were beginning to receive attention and filling teeth with lead and putty led the way to future conquests.

European Dental Art.

Among the European scientists, who did much toward dental science we find Fallopius, Eustachius and Pare. During the seventeenth century the attention of many medical men in France, Germany and England was directed to the subject, and a few works were published, devoted exclusively to the art and science of dentistry. These, and prominent among them the treatise of John Hunter (1771—8) laid the foundation of the English system of dental practice. Hunter however treated the subject, anatomically and philosophically, rather than practically; and the same may be said of the writings of the eminent French surgeon of that period, Dr. Bichat. Neither Hunter nor Bichat was a practical dentist and thus their theories bore with them no great confidence. Subsequent to these writings Dr. Blake in 1798 and Dr. Fox in 1803, as others of later date served, rather to elucidate the physiology of the teeth, and the diseases to which they are subject, than the method of treating or restoring them.

From advertisements appearing in French and English newspapers of 1700 — 1800 the practice of making teeth and cleaning them appears to have been in the hands of silversmiths and jewellers.

The earliest reference in modern times to the practioner of dental surgery, as a DENTIST occurs in the Manchester (England) Times, in the latter part of sixteen hundred. The following is the complete item in which the word dentist appears: "We are told that a clergyman who had taken temporary duty for a friend among us, and who had the ill luck to injure his false teeth during the week, the plate was sent to the *dentist* for repairs, a faithful assurance being given that it should be duly returned by Sunday's Post; but the *dentist* or the post proved faithless. With the assistance of the clerk the clergyman managed to stumble through the prayers but felt it would be useless to attempt to preach. He therefore instructed the clerk to 'make some excuse for him and dismiss the congregation.' But the feelings of the Reverend may be better imagined than described when, in seclusion of the vestry, he overheard the clerk in impressive tones, thus deliver the 'excuse': Parson's very sorry, but it is his misfortune to be obliged to wear a set of artifical teeth. They busted last Wednesday, and he aint' got them back from London to-day as he was promised. I've helped him all I could through the service, but I can't do no more for him. It is n't any use him coming out of there (pointing to vestry) and going

into the pulpit, for you would'nt understand a word he said, so he thinks you may as well go home."

We moderns can form some idea how awkward and unbecoming the dentures of these days were when we read in Sheridan's *The Duenna,* Act. II, Sec. 3, these lines: "For her *teeth,* where there is one of ivory, its neighbor is pure ebony, black and white alternately, just like the keys of a harpsichord.'

About this same time there was a latent strife, which eventually burst forth in an open contest between the dentist and the barber. We read that the barber surgeons were separated from the mere perruquiers, and that the former were incorporated as a distinct body in the early part of the reign of Louis XIV. This success of the tonsorial trade gave them eminence in their own eyes, and being ambitious to continue to rise in public favor made a desperate attempt to capture the dental art and called themselves barber-chirurgeons; but alas! the few dentists, who at this period practiced the various departments of dentistry, saw danger in the barber's new venture and so thoroughly protested the claim of the tonsors, on the ground "that the barbers practiced the science of dentistry and were not regularly educated", that Louis XIV, in 1741 separated the barbers and dentists and made two distinct voca-

tions. The same grand change took place in England in 1785, under George II.

The barbers on the one hand reluctantly yielded to the kingly proclamations, and have retained up to date a desire of performing the minor operations. Dr. Hunter says on this interesting struggle: "The memorial between the dental profession and the tonsorial art is still seen in the striped pole and basin sometimes seen projecting as a symbol in front of the barber shops".

The same was true with reference to the jewellers, but to a less earnest degree.

This separation between the humbler calling and the more dignified profession immediately gained for the science of dentistry a high social position, and has made the most marvelous progress known to any science in the annals of man.

The French school of dental science made more rapid progress than the English or German, and after the year 1800 the latter countries copied exclusively from the French artists.

The French people thought much of their natural teeth, and we find in that wonderful fancy of the brain, Cervante's Don Quixote, which was written in 1584, many lines to corroborate this statement; the following from this book: "Unfortunate that I am!

I had rather they had torn off an arm; provided it were not my sword arm; for thou must know, Sancho, that a mouth without teeth is like a mill without a stone: and that a diamond is not as precious as a tooth," There are many people of this nineteenth century who think less of their teeth than did this chivalrous knight.

It is claimed by modern dentists that Dr. Fuchard of France in 1785, was the first doctor to refer to gold-leaf as a filling material; and Dr. Harris of America is responsible for the statement that gold-leaf was first used for filling purposes in the early part of the eighteenth century. This on close investigation proves to be a mistake, since to a German dentist, Dr. Mesue by name, we should be grateful for re-inventing the process of filling teeth with gold-leaf. In a German volume published in Frankfort in 1541, entitled: "*Medicine for the teeth, etc.,*" conclusively demonstrates the point as follows:

"Corrosio is a disease of the teeth when they get holes and hollows, happening mostly to the molar teeth, especially if they do not get cleaned after eating; for the victuals adhere, decay, produce bad, acrid fluids, that eat and itch into the teeth, and keep on doing so, until the teeth are entirely de-

stroyed, and one piece after another must, not without pain, drop of."

This condition,according to Mesue, is stopped and cured in three different ways: First, by purging. Secondly, by destroying the matter that hollows them out and eats them away; this is done by boiling cockle, that grows in rye and wheat, with vinegar, and holding it in the mouth, or with vinegar in which capers-root with ginger is boiled. Thirdly, by getting rid of the hollow, which may be done in two ways. The first is to scratch and clean with a fine chisel, knife, file, or with any other instrument fit for it, the hollow and the parts attacked, and fill with *gold-leaves*, for the preservation of the remaining part of the tooth. The second is to use medicine, which is done by filling the teeth, after cleaning, with gall-nut and wild gallows-wood. Or, take henbane-seed mixed with gum storax, and make with it a smoke through a funnel into the hollow tooth. Or galbanum laid on hollow teeth mitigates the pains. The pains are also quieted if the hollow teeth are filled with oppoponacum."

In 1728 Dr. Fuchard, proposed as substitute for natural teeth, such as could be made of porcelain; this however was simply a key for some future in-

ventor, as the proposed porcelain teeth were not yet in existence.

A curious old book has come to light, pertaining to primitive French dental art; that the book in question was popular in its time is demonstrated clearly as, 1816 it had reached its fifth edition. It was entitled: "A Dissertation on Artificial Teeth" by M. De Chemant. The chief point of interest in the book centres in a sheet of engravings illustrating the various types of dentures which M. De Chemant, was prepared to supply to his patients. He here clearly portrays a porcelain bridge of ten teeth supported by four pivots, by which it is fastened to the remaining roots of the jaw. A simple tooth from this ingenious bridge, would be a true representation, of what we Americans call a Logan Crown. M. De Chemant speaks of these teeth as his invention and records the circumstance; and to satisfy the curiosity of students of primitive dental-prosthesis will give his own words on the subject:

"In 1788, when I exercised the profession of a surgeon, I was consulted by a lady, who had fallen into such a state of weakness, as produced considerable fears of her life. On approaching her, I perceived a tainted odor, which I thought proceeded from her lungs; or her teeth, which were black. I examined

her mouth, and was struck with the bad state of *a set of human teeth implanted on the base of a* TOOTH *of the hippopotamus*. This set of teeth removed, I perceived her mouth to be almost entirely covered with small ulcers, and I had no doubt that her disease was the effect of the putrid exhalations which proceeded from the set of teeth, and which corrupted the air she breathed; what confirmed his conjecture was, that after having laid these teeth aside, her health improved in a few days. Perceiving that this lady would not do without artificial teeth, I advised her to have several sets of teeth at the same time, so that she might change them often, after having washed and let them dry. She did so, and her health became re-established in the course of some months. But as the teeth of this kind required to be renewed frequently they occassioned a great expense, and notwithstanding their frequent renewal they always produced a bad smell. I was induced from that time to reflect on the possibility and means of making teeth and sets of teeth of durable and incorruptible materials. I examined almost all the substances of the mineral kingdom, and at length composed a paste which, when it was baked (Porcelain) had every desirable advantage.'

Now as a matter of fact, porcelain teeth were

invented by an apothecary of St.-Germain, Duchateau by name. He himself wore artifical dentures of ivory and natural teeth, but found they rapidly became tainted by the various disagreeable odors emanating from his mouth, the porous animal substances becoming rapidly impregnated by the effuvia. This druggist called the attention of Mr. Guerard to the discovery of a paste which, when baked, became very hard. The latter gentleman undertook in 1776 to manufacture the substance and with the aid of a dentist produced a porcelain tooth.

But to Dr. Chemant is due the credit of perfecting the discovery or invention; he bought the right, from the former, and managed to attract the attention of the French Academy of Science, who at once appointed a sub-committee to examine the teeth and their merits, The committee reported favorable, at the same time informing M. De Chemant where improvements were needed, and with the aid of Dubois, dentist, the new substance (porcelain) was considerably improved,

In 1805 Professor Lafargue published a book on the practice and art of dentistry. Dr. Debarre is another early dental practitioner who deserves much praise, since he in the early century published a volume called "Prosthetic Dentistry", this is the firs

book devoted especially to this great branch of Dental Science. This rare work was considered superb and contained forty-two well executed plates. Subsequently to Dr. Debarre's volume, many publications appeared in the French book-market.

The other European nations modeled after the French and English dental art with the exception of Germany, which land of learned physicians and surgeons, made additional progress in dental science. Perhaps the only item pertaining to the German, art of dental prosthesis is the mysterious discovery near Bologna, Germany. Some years since while some workmen were at work digging a ditch through an old God's acre,were obliged to excavate many graves. The dead of course had differenciated to earth, but dozens of artifical dentures were still remaining and in good repair. The dentures were made of ivory and bone, while the plates were of solid gold. The superintendent of the excavations thinking little of the find, sold the old dentures to a goldsmith who in turn thought slightly of his purchase and remelted and refined the precious metal. Whether these gold dentures and the workmanship of ancient dentists, or the production of mediaeval jewellers, is beyond the power of this generation to prove.

American Dental Art.

Dentistry had as yet received no great impetus, nor had the science met the people that were to restore it to its ancient dignity and even cherish and foster its grand purpose. The latent beams of the art were destin ed however to appear and we can be proud to say that the initial steps towards progress and attainments were taken in our own dear native land. It was during the period covered by our war for independence something over one hundred years ago that dentistry was introduced into America, but it was yet in its crude state and absent of mature modern development. From the most reliable information obtainable we learn that a Mr. John Woofendate of England was the first dentist in the new world. He came to the colonies about the time when New York city was a village, and practiced dentistry in New York City and Philadelphia from 1766 to 1768, at which time he returned to England. His successor was Mr. Joseph Le Maire of France, who came to America with the French army during the period of the revolutionary struggle.

The patriotic Frenchman La Maire was an intimate associate of both Washington and Lafayette,

and while fighting with them for the independence of the colonies he often relieved the suffering soldiers of the pangs of odontalgia. Not only did he exercise his skill to secure for the revolutionary veterans freedom from physical suffering, but he too seized his sword and shouldered his gun and played an active part in that memorable strife for human liberty.

Shortly after the establishment of the United States as an independent nation, an Englishman, Dr. Whitlock by name, emigrated to our shore and practiced dentistry in the New England states, How long he continued is not known, but positive evidence can be obtained that he landed in 1784.

Two years later Dr. Isaac Greenwood emigrated from Great Britain, and located in Boston where he practiced until his death. Mr. Greenwood's son John who was born in America learned his fathers chosen profession and thus was the first native American dentist.

He established himself in the city of New York and during his professional career while there immortalized himself and profession as well by carving from the tusk of the Hippopotamus a full set of artifical teeth for the great American "who was first in war, first in peace, and first in the hearts of his countrymen". This set of teeth was secured by

spiral-springs and were intricate in their appearance as compared with our later dentures. The denture in fact carricatured the lower portion of his noble face, and they gave him much discomfort, and as Senator William Maclay of that time said "his voice is hollow and indistinct, owing, I believe, to artificial teeth".

The material used in them was Hippopotamus ivory. The lower plate was made of one solid piece, teeth and base being carved together; the upper denture required greater skill, and was made with the plate seperate, and the teeth riveted to it with fine gold rivets. The general had several sets of teeth, but the only one that gave him any comfort where those made by Greenwood. A Swiss artist of New York City also produced dental substitutes for Washington, and the following recently written regarding this mechanism obviously tells: "The plate or framework which held the teeth in his mouth was made of iron, and after Washington's death were sent to the New York Loan Exhibition in aid of Washington's Memorial Arch, but was deemed by the committee too horrible to display; so they locked it up in a safe. No one could have dreamed what it was unless it had been labled; most spectators believed it to be a colonial rat trap."

Probably had it not been for the ingenuity of the first American dentist, Dr. Greenwood, the basic structure of this glorious country would have lacked completeness, by having at an early date lost its most devoted father. A block of marble might with propriety have been cemented into the monument reared in memory of Washington, and in it carved in glittering letters the name of DR. JOHN GREENWOOD.

From the time of Dr. Greenwood's successful appliance for General Geo. Washington until 1820, successors from Europe, and adaption of the profession by native born Americans greatly increased the number of dentists. The darkness which shrouded scientific dentistry in 1700 was now being dispelled and in the beginning of the 19th century, with the development of a new political life in the American empire, saw dentistry given a professional and social standing worthy of all its importance in alleviating the woes of the human family.

A curious specimen of mediaeval American prosthetic art is in the custody of Dr. Brophy. The piece consists of ivory, carved to fit the upper and lower jaws. The block was carved so as to fit the alveolar-ridge or process, and on each side a bicuspid and two molars were carved in the same block. The anterior teeth consist of human teeth, fastened

with gold to the ivory. The carving was skillfully done, the sulci and cusps of the molar were artistically reproduced. The ivory however did not resist the actions of the fluids of the mouth, and thus the ivory was attacked by caries similar to the effect of that disease on the natural teeth. Another unique specimen of early American dental skill is in the possession of the H. D. Justi Dental Manf'g Co. and they have kindly allowed the cases to my table that I might describe the crude workmanship.

The first case, an upper partial gold plate supplying all the teeth except the two twelve-year molars, is a grand success and would do credit even today. The gold plate snuggly fitted the alveolar process and slightly covered the palatal portion of the mouth. The teeth which were carved from the tusks of the walrus were ingeniously shaped and the gold pins which penetrated the teeth from cutting edge through the main shaft and body, penetrated the gold plate, and were soldered to the latter on the palatal surface. The spacing between the teeth so closely approximates nature that the wearer of this denture could use the tooth-pick to good advantage. The plate instead of clumsily enveloping the two natural molars has skillfully fitted gold clasps which

materially aided in keeping the denture properly positioned.

The second case, a partial upper and lower connected by means of spiral-springs, is an intricate arrangement but demonstrated to a dot, that the primitive dental practioners of America were of an ingenious order. The upper partial denture supplied the upper labial teeth, while the two twelve-year natural molars were still in position. The artificial substitutes were of two kinds, the anterior six teeth were carved from bone and attached with gold, similar to modern methods; the bicuspids and molars instead of being carved individually were executed in one solid block, with cross groves on the cutting surface to represent the sulci of the natural teeth. The entire block being rivited to the gold plate which simply followed the alveolar ridge. Around the natural molars were clasped two gold bands. The lower denture was attached to the upper one with gold-spiral-springs. This denture like the upper, was partial, and intented to supply substitutes for the central incisors, one bicuspids on the right, and two molars on the left side of the jaw. The two central substitutes were human teeth imbedded in a socket of gold which received the respective roots of the two substitutes. From the

centrals there was a continued bar of platinum, ending in clasps to surround the lateral and bicuspid natural teeth. The artificial molars and bicuspids were made of one solid block of bone and lines of demarkation, representing the divisional space of the teeth. The natural molar on the right side was encircled by a platinum clasp.

No matter how unique or ungraceful their first attempts after their ideal, rising from step to step with progressive thought, ever keeping in view that philosophical principle, that he is the greatest philanthropist who helps the greatest number; being followed from time to time and succeeded by others, and from a congress of thought, each new idea was alike heralded to all, keeping no secrets but ever extending the olive branch of fraternal peace and kindly greeting. The public becoming aware by benefits received of its indispensibility, gave to them encouragement and increased patronage, and the practicability of a dental college was discussed.

Enough at least has been given which conclusively proves that dental science, though, perhaps, rude at first, is not of very recent origin.

No matter by whom, when, or by what means it first became a thought and opened up its petals to receive the warmth and genial sunshine of a credul-

ous people, it stands to-day one of the first and noblest of the sciences, extending and taking in its embrace almost every part of every continent and inhabited islands of the seas, and with it all pertaining to its first grand idea, that of doing good to humanity. But not until the eighteenth century did dentistry become the subject of much critical inquiry, and thorough investigation. Men of education and talents devoted themselves to it exclusively, and from that period it has progressed rapidly in importance; and within this brief period its progress has been so rapid that to understand and expound the whole extent of the subject is already far beyond the possible.

To the American dentists is due the glory of establishing nearly all the strides of dental advancement, and placing the profession in a commanding position. The mechanical devises, and various labor saving appliances, and materials contributed by them to the advancement of dentistry, are numerous and important, the mere specifying of which would consume hours of time.

Perhaps the most important American donation to dental art is the production of porcelain teeth. This industry was an outgrowth of prosthetic dent istry. Though of French origin, their perfection is

due entirely to the untiring efforts of the American manufacturer.

To Drs. A. A. Plantou and C. W. Peale of Philadelphia, must be awarded the credit of manufactoring in 1820 the first porcelain teeth in the country; but S. W. Stockton of Philadelphia, and James Alcock of New York, in 1835 began their production upon a more extended scale, and for the purpose of supplying the profession at large, and thus initiated an industry which has gained remarkable proportions. The present degree of perfection in moulding and enamelling the teeth was not attained until some years later, nor was the color so lifelike, or the shades so varied. For many years after the introduction of porcelain teeth, the best artisans were unable to make them sufficiently perfect in form, and in color, to give good appearance in the mouth. The porcelain teeth were indestructible by the oral secretions while the then popular carved blocks of ivory decayed, became offensive and were eventually destroyed. This latter difficulty with the ivory teeth rendered the porcelain teeth very desirable, and in conseqence improvement in their manufacture continued. Americans have been very successful in this form of advance, and mainly instrumental in bringing he manufacture to its present high state of perfect-

ion. So far indeed has this art of tooth production from Felspar, Silex and Kaolin been developed that any dental form, and coloring desirable can be rendered so as to deceive any but the trained eye of an expert. These improvements in the fabrication of porcelain teeth, which have so admirably displayed the possibilities of the manufactors in the transparency of the tooth, the granulated appearance and flesh-like tint of the gums, and the unlimited shades were due to the persistency of Dr. Elias Wildman of Philadelphia, who began his numerous experiments in 1837.

In 1844 Samuel S. White a nephew of Samuel W. Stockton began the production of these teeth in Philadelphia, and this was the initiatory step in an enterprise which has since grown to be the largest of its kind in the world.

Numerous improvements are accredited to Mr. S. S. White, but not all the comment does he reap, since shortly after his attempts and experiments H. D. Justi of Philidelphia, believing that he too, saw an opportunity for improving the asthetic effects of porcelain teeth laboriously toiled to reach the goal of perfection in the yet crude art.

Dentistry seemed destined to rise as a learned science and profession; and able artists in all parts

of our country lent a helping hand to establish the truths of Dental Science; and among the many depots, shops and factories which have aided in this good work we find those of Johnston, Lund & Co. More recently the Willmington Dental Menufacturing Co., and various others have loomed above the horizon, and these too, are companies whose artists are highly skilled in cermic work.

The various dental companies are now producing all the various appliances, instruments and material; it is estimated that not less than 100,000 teeth a month, or nearly 12,000,000 per *annum* are manufactured in America alone.

All this present perfection and completeness has not been brought to us in a single birth; but on the contrary required time, patience, talent and expense.

About the same time that the several dental companies were devoting their attention to the newly discovered art, the individual dentists too, were busy calculating on the self same subject. The result was that early in 1850 Dr. John Allen a distinguished dental practitioner devised a method embracing original and important modifications in the asthetic shapes, colors and arrangement of the dental substitutes. The exactness with which Dr. Allen represented the natural gum-tissue, gave to his process

and discovery, the name of Continuous Gum work. The intimate but later identification of Drs. Hunter and Haskell with Continuous Gum work have rendered their names familliar, as being skilled an devoted to this specialty of Prosthetic Dentistry ; and their respective contributions to the developement of a perfect process in the departure, has done much towards establishing for the dental profession a lasting glory.

The announcement in 1851 of Nelson Goodyear's process for making the hard-rubber compound, substantially termed "Vulcanite", turned the attention of those interested in the manufacture of various small articles for use and ornament, to the adoption of this material which was announced as a substitute for horn, bone and ivory, susceptible of being colored and possessing the plasticity of gutta percha, while it was exempt from the actions of heat, cold and acids.

In 1855 the first patent was obtained for making a dental plate in hard rubber. The introduction of vulcanite into the profession materially injured the general tone of dexterity, and science among the dentists; the ease with which vulcanite is worked invited many into the profession, who were utterly unfit and incapable of scientiffically replacing

the lost organs. Prior to the invention of Goodyear's the dentist was obliged to be more than a mere mechanic, since the various metals were then used as bases for the dentures.

Celluloid like vulcanized rubber, a cheap base for artificial dentures was first introduced in 1869, and during the existance of the "Rubber Patents", was much used by those who objected to become licencees of the Goodyear Rubber Company. The advantages claimed for celluloid were, its unlimited artistic possibilities, resemblance in color to the natural tissues, readily tolerated by mucous membrane elasticity under strain adaptability for partials or complete dentures and the readiness with which it could be applied to the correction or concealment of all oral deformities.

But celluloid like, we hope, rubber too, "has seen the days of triumph", and every dentist who has the welfare of this profession at heart, is pronounced in his desire to see all cheap and injurious plastic, base-dentures shelved, thus to make room for the furtherance of our acquaintance with metals and numerous other materials for dental plates.

An incidental but most important advantage to dentistry accompanying the revival of gold-crown and bridge-work, is the requirement of increased

manipulative and artistic skill on the part of the operator. The character of a large proportion of the vulcanite work of the last few years has a sulphurous oder about it suggestive of the adage, *facilis est descensus Averni*. To such a facile method of constructing artificial dentures is due the advent of a class of dentists who have "picked up the business" in a few months of untutored experiment. To clumsy, disfiguring dentures, so bulky as to impair speech, and so incompletely finished, as to occasion sore mouths, have been chargeable in great degree the discomforts and diseases attributed to the vulcanite base.

The increasing demand for dentures on gold bases must of necessity raise the standard of qualification for dental practice. For the promotion of this most desirable end the dental society clinics, increasing as they are alike in frequency and in interest, have become potent factors.

If you possess the requisite skill, and will do yourself the justice to use it, you can make even a rubber plate that will not disgrace you, and get paid for it too. While visiting different offices, I have often been amused at the assumed airs "Oh I never dirty my hands with that class of work, I leave that to the cheap Johns, or, as they say down South, 'I have a nigger to do my plate work' ". Occasionally

you find one old in the profession who *delegate* the "*mechanical* to the shops". Such almost invariably demonstrated the fact that they are not capable of constructing a *decent* artificial case. The renowned Josephs of San Francisco said: "After twenty years experience, the first thing I would impress upon a *tyro* is that fiddle-making is a trade but violin-making is an art." Tooth filling as well as plate-making is too often a mere trade, but properly restoring loss with artificial teeth, with all that is implied in the operation, is the acme of dental art, if there is any *art* in dentistry.

To-day the vast variety in shape, size, color, etc., of the porcelain teeth, gives opportunity for the selection of forms suitable to nearly every case which presents itself to the general practitioners. The assortment must of necessity be very large and varied to meet the wants of the prosthetic dentist.

Porcelain is a material in which the beauty of the result well repays the highest exercise of art. It has been for centuries the favorite material for expressing the poetry of Form. The famous Etrurian vases of antiquity, the exquisite gems of the Majolica of the sixteenth century may be named in proof of the fitness of porcelain to embody the conception of Genius.

Dental porcelain is worthy of such associations; not only like them does it delight the eye and give evidence of high aesthetic cultivation, but it adds to beauty the charm of usefulness.

It is customary to attribute the rapid growth of Dental Art since 1840, to dental associations, colleges, journals and its didactic literature—and worth much truth. But to porcelain it owes its very existence as an aesthetic art, and the largest extent and utility as a prosthetic science. It was altogether impossible for perishable human teeth, or their wretched imitations in ivory, to offer such tempting fac-similes of nature as we meet in porcelain productions.

The dental depots not only rendered service by superior excellence of surgical instruments, and prosthetic appliances and material, but they directly benefited the science and art of dentistry by releasing the practitioners from the manufacturing toil, and give them time for the acquirement of increased knowledge and skill in the various departments of Dental Science.

Few people can comprehend, and fewer still thoroughly appreciate the many noble favors the dental profession deals out to suffering humanity. Among the myriads of grand achievements wrought, very few

excell, the prosthetic accomplishments in the cure, and relief of deformed palatine organs, or what is known to surgeons by the name of cleft palate.

This is one of the most distressing deformities to which the human frame is liable. The unfortunate sufferer is compelled, in a great measure, to be an alien among his fellow creatures; an object of compassion to the considerate, he is often made painfully conscious of his deformity by heartless companions. And were he gifted with eloquence of Demosthenes or Webster he could make little more use of his endowments than a mute. Fortunately this painful defect, which may be either accidental or congenital, is no longer reckoned one of the uncurable, since dental prosthesis has risen to the present pinacle of perfection. The same is true with reference to irregular teeth and malformations of the jaw in general.

Probably no feature in the annals of dentistry is worthy of so much comment and merits such deep consideration, as the subject of crown and bridge-work. For the past few years it has been a subject of overwhelming magnitude, and to-day is the tidal wave in the Dental Prosthesis, stirring to eloquence its admirers, and agitating the dental fraternity in an effort to establish its worth or uselessness.

In searching for the history of crown-work, we are utterly dumfounded, and upon becoming cognizable with its antiquity, we are almost prompted to chronicle it as a lost art, recklessly omitted in the list of ancient advertisements. The operation of pivoting teeth, synonomous to our modern crowns, is one of the primitive methods of replacing lost natural ones, and it is indeed debatable, whether the plate preceeded the pivot, or "*vice versa*".

Historical thesis unfortunately left but few "foot-prints on the sands of time", and in consequence are much at loss as to the data of the subject. The artificial replacement of the loss of a portion of the teeth by crowns, was first written about by Robert Mofendale in 1783, when he wrote regarding the act of joining artificial crowns to the roots of natural teeth; he tells, that where the enamel had suffered severe destruction, it was advisable to cut off the injured remaining portion of same, and replace by means of an artificial one, and he dwelt elaborately on the wonderful stability of such a piece of work. It is extremely difficult,indeed,almost impossible to arrive at anything like certainty in determining priority of invention or introduction of any improvements earlier than 1839, at which date recorded history of dentistry was inaugurated by was a dental Journal.

Statements are made pro and con relative to crown-work and its early popularity. Scrap, dental literature bears witness, that in 1807 and 1804, current newspapers contained lengthy articles on the "art of restoring roots of teeth by means of wire-pivots, wooden-pivots, cotton-wrapped pivots, and screw-pivots".

I deem it unnecessary to enter into a detailed description of the numerous new and improved modern crowns, and it would be an extensive work that would treat of each and every method of construction. Suffice it to say, that Drs. Lawrence, Foster, Bean, Richardson, Buttner, Thomas, Leech, Webb, Williams, Hay, Boice, Weston, Carman, Hunter, Bonwell, Davis, How, Logan, Richmond, Land and Evans, have contributed a commendable amount towards bringing the artificial crown within the rays of perfection.

True, we have seen marked advancements in the construction and appliance of the various crown substitutes, and bow in all homage to pay tribute to those great minds who conceived the grand and satisfactory results. Shall we honor most the practitioners who first wrought the happy means, or those who later perfected it, is one of those questions which would be interesting grounds for debate.

As to the history of bridge-work, we are about as knowing, as can be expected on account of existing circumstances; in brief, the developments in this departure are not unlike those of crown-work and the same catalogue of dentists names adorn its tabular record, with the exception that the names of Drs. Bing, Case, Brown, Starr and Melott are directly connected with the numerous steps of improvement.

It was not until 1839 that any movement in the way of organization was made on the part of American Dentists to elevate their profession, to a strictly educational basis. In view of uniting the widely separated members of the profession, a medium was established in the form of the *American Journal and Library of Dental Science*. The journal was published in Baltimore and ably edited by Chapin A. Harris and Eleazer Parmly. In connection with this movement, it was the ambition of Dr. Harris to organize a dental school as adjunct to the medical department of the University of Maryland. The practice of dentistry at this time, however, being with few exceptions at a very low ebb, the faculty of the university, rejected the proposition of Dr. Harris, they giving as an excuse, that the subject of dentistry was of little consequence and thus justified their unfavorable action. The rejection seemed to give

Dr. Harris new energy and stimulated in him a new desire, and as a result the Baltimore College of Dental Surgery was established; and in due time labeled with dignity and honor a small class of "Doctors of Dental Surgery".

Thus a system of education was initiated, which immediately placed the practitioners of dentistry upon an equal footing with other liberal professions. All hail the banner of the old Baltimore College of Dental Surgery, the progenitor of much good and the Alma Mater of Alma Maters, claiming among her Collegiate Alumni, your adopted mother.

Thus with this college as the nucleus many prototypes have since been generated, and the good effect these various institutions have on the public, none can more sincerely testify than suffering humanity. The profession and as well its many faithful representatives, have steadily but surely risen, never again to fall.

In 1800 there were but one hundred dentists in the United States, ten years later there were three hundred representatives of the profession, while today we have a congress of twenty-thousand.

What is true of the increase in colleges and professional practitioners is of necessity true of the journals and literature pertaining to this great and

wonderful science. The initial dental periodical we find was the American Journal and Library of Dental Science, established in Baltimore in 1839. Following its publications, and up to the present time, there have been about forty-five (45) periodicals established ostensibly in the interest of dentistry. While many of these had an ephemeral existence, others have lived well and do worthy service in their strict devotion to the profession, and among these latter we proudly refer to the Cosmos, Review, International, Items of Interest, Ohio Journal, Register, Western, Southern, Odontographic, Missiouri, Practitioner, Advertiser, World and last but hopefully not least the Weekly Tribune. I here wish to call your attention that our transatlantic friends too, have been occupied in the cherished purpose of establishing for dentistry a glorious future, and have inaugurated many worthy principles through the medium of colleges and journals.

These various journals did eminent service, in my research, and the records of dentistry contained in these monthly educators are the safe archives of the profession, where we may trace the present dental progress back to those traditional ages, when too our favorite vocation prospered and attained that semi-state of perfection.

But we must not rob the modern dentists of all the laurels and glories, for he certainly has many of both. The days of unwieldy instruments and rude operators are now in oblivion, and in their stead we find instruments and appliances complete in every respect, and practitioners who are as mild a class of men as ever played the lute or sang the songs of love.

It was in the spirit of advancement and a love for the beautiful that the dental infant was taken from the barbershop, and raised to the high and ennobling position it now occupies. And who has wrought this most desirable change? None else than the ingenious and persevering modern dentist. The dental office is no longer a prison of torture; but on the other hand is a welcome resort for suffering humanity. To accomplish this good end, has cost the burning of much midnight oil; and many of the energetic minds who have labored vigorously in this most beneficient cause, are now timbering in the cities of the dead.

It is said, that "a poet is born, not made", and this old saw is in a certain sense applicable to the dentist. In order to advance and be successful in the dental profession, the practitioner must have certain definite qualifications and inclinations. And these essentials must be his or her natural bend of

character. Among the requests of a model dentist the most important are: That peculiar quality which makes the successful surgeon coupled with mechanical ingenuity, dexterity, studiousness, and last but far from least, the patience of Job. Perhaps the reason why there are so many lamentable failures among the practioners of dentistry at the present time is because so many enter the profession with the sole and whole purpose of gathering the supposed hoards of money which are believed to be accessible to its votaries. But how soon are the plans and anticipations of these empirics frustrated when they find they are not adapted to their chosen work; unfitted for the science, they drop by the way. They are allowed admission into the labyrinthal highway, but soon are lost and bewildered, among the "ologies" and "isms" of the professions. Dentistry is too high a science for the gross and unskilled to appreciate the aesthetic beauties of its art. The modern dentist must be in the full sense of the words a "facial sculptor", for to his tender care and consideration is left the moulding of many a scowl or smile. He must appreciate the lines of beauty in expression and discern at a glance the changes necessary in the different physiognomy to make them charming and inviting, rather than repellent and false.

In prosthetic dentistry and dental surgery the sculptoral genius is certainly afforded an opportunity to exercise his art, since it is in these departments of dentistry that the study of the face is most essential. The face is divine territory which solicits the prosthetic dentist's sincerest consideration. The face to him is the window to the brain, the avenue to mind and character. The face is the servant of the emotions; it mirrors the feelings, and gives expression to impulses. It is the visible record, the map of the heart proclaiming the character of the individual to all, who can read. The symbols of character which are unmistakably in the face, are not occult and secret, but are open and plain that even a child may read, and know distinctly the heart of its owner. Now since the distinctive feature of dental prosthesis is "Restoration", you can readily comprehend why the dentist is continually sought to restore faces, must of necessity be thoroughly prepared to restore the lost features, — and rebuild the symbols of individuality and character. He must have a clear conception of the outlines of that which is to be established, and constantly have the imaginary ideal vividly before him. In all grand works of man the ideal was ever the basis of the real. In our own modern city take for example the mag-

nificent Auditorium, with all its halls, porticoes, entrances, pillars, stairways, arches, balconies, and tower, was all designed by the architect in all its grand proportions, and arrangements before the foundation stone was laid. The sculptor who chiseled from the huge misshapen block the almost living and breathing figure of Abraham Lincoln in a park by his name saw in the rough stone the ideal statue.

Dr. Allport once said: He who has but moderate ideas of symetry, harmony of expression and color, is constantly pained by lack of that artistic selection and arrangement of artificial teeth which serve to restore to the face the shape and expression left upon it by the Creator, the absence of which in artificial dentures stamps him who should be an artist an *artisan—a mere mechanic—a libeller of the soul—a deformer of humane face divine.*" We can only know how thoroughly scientific, artistic and technical the restoration of the face is when we hearken to that great lecturer Fuseli who says: If the nose of Apollo be shortened but one-sixteenth of an inch the god of physical beauty would be destroyed." If this be true, which it certainly is, it should lead us to be very cautious as to the duty of our calling, and ever remember that the perfect restoration of the countenance, with the original

power of expression by art, as to defy detection, is one of the crowning glories of dental prosthesis.

This branch of dental science is as a general thing underestimated inasmuch that those who have made a speciality of it have failed to bring to light the many grand principles that underlie this most deserving speciality. I can do no fairer justice to the subject of prerequisite qualifications of the student of dental prosthesis than by quoting the able scholar Dr. W. W. Allport who says:

"It is in prosthetic dentistry the dentist has the greater field for the use of art. It is for him to so construct substitutes for the natural teeth that they will harmonize with the works of the Creator that surround them, and be so true to nature in size, shape, color and position that they will not produce discord in the facial expression. There is an individuality in everything that God has made. There are no two blades of grass, no two flowers, two faces, two eyes, nor are there any two sets of teeth, that are alike. They may be similar in type, but not in detail, and it is this detail that gives the specific individuality by which we are enabled to tell one from the other. Between these details there is a harmony that makes any one part a fit companion of its surroundings. Any important change in any of

these details would — to the extent of the change made — alter the individuality of the original. As there are no two things exactly alike in nature, there can be no exact rules by which anything in nature can be imitated. There are, however, rules which may be aids in producing general outlines, but it is the soul and feeling of the artist that works out the details which gives life to the substitute. A mechanic, pure and simple, may construct a set of teeth and make them serviceable to the wearer, inasmuch as they will fit and be strong and useful in mastication. But only he who has the artistic feeling and skill will be able to select his materials and so adapt them in the mouth that they will harmonize with the complexion and anatomy of the face and be true to nature. From infancy to old age there is harmony in contour, as well as in color, and there is change and adaption of one to the other at every stage of life. The hair that would be becoming to a girl of sixteen, would not be suited to the same person at sixty. Hence nature changes the color of the hair to be in keeping with the face as age advances. The same is true of the teeth; all change and grow old together, and there is beauty in age only as there is harmony. To attempt, therefore, to make the face look younger or more attractive by making any one

part of it appear younger than is natural, is a great mistake, for the other parts suffer by an inharmonious contrast which always unpleasantly attracts attention.

In applying this idea to the selection and adaptation of artificial teeth, it will at once be seen how very important it is that he who gives his attention to this branch of industry should not only be a good mechanic, but should possess that art feeling that will enable him to appreciate the importance of physical harmony. If he does not possess this quality, he will be a mechanical dentist only. His work may be useful for mastication, but the face will be apt to look "*toothy*". To produce this appearance the teeth need not of necessity be too large for the face. In fact, artificial teeth are usually smaller than were the natural, and yet they give the appearance of which I have spoken — as it is usually the inharmonious color, rather than the size of the teeth that is at fault. The first, as well as the most lasting, impression made on the beholder of the individual will be the teeth, whereas they should be so thoroughly in keeping with the rest of the face that they will attract no more attraction than any other feature.

One of the prerequisites to the study and prac-

tice of this specialty is a talent for and knowledge of art. The proportion of good artists who could have made good mechanics is very large, while the proportion of good mechanics who could have made good artists is very small. A person may have great mechanical ability, but little or no artistic sense. There are few dentists who have any idea of proportion or feeling for color. This is why we see so many mouths filled with abominably unnatural looking artificial teeth, and this condition of things will never be greatly improved till more attention is given to art in this department of practice. It would be useless to attempt to develop this talent in every dental student, for probably not more than one in twenty-five, or perhaps fifty, could respond to the demand, should they be encouraged to follow dental prosthesis as a calling.

Artistic ability, therefore, should be among the first requisites to the study and in the practice of prosthetic dentistry. It would be far better for those who engage in its practice to have acquired a theoretical, as well as a practical knowledge of the leading ideas of proper proportions, modeling, drawing and harmony of colors, rather than to have studied so much of medicine as is usually taught in dental colleges."

On this same subject Dr. Joseph Richardson, one of the beacon-lights of Dental Prosthesis, says:—

"Among the unnumbered millions of human beings who have peopled the earth since the dawn of time, it may be affirmed that no two have been created with faces exactly alike. There is the same aggregate of features, and a pervading general resemblance of one person to another, but there will be found as infinite a multiplication of distinct shades of facial expression as there are human faces, and each separate shade of expression characteristic of each one, and distinguishing him or her from all others, constitutes facial individuality. Each separate feature —as the eye, the nose, the mouth, the teeth, facial contour, complexion, temperament, etc.—contributes to this individuality, and no one special feature more, perhaps, than the teeth. There are few more repulsive deformities than those inflicted by the loss of these organs, and none more fatal to the habitual and characteristic expression of the individual. It is the special mission, as it is the first and highest duty, of the dentist to preserve this individuality intact, and an equally imperative duty to restore it as perfectly as possible when impaired. To fullfil in the most perfect manner possible this most difficult of all the requirements of prosthetic practice implies

an art culture that is competent to interpret the distinct play of features associated with individual physiognomies, to differentiate individual temperaments, and make available the sculptor's and painter's perceptions of the subtile harmonies of form and color. To the failure or inability to properly comprehend the practical import or significance of individual characteristics, so far as they fixed expression in the teeth, and the consequent failure to conform our methods of replacement to the imperative requirements of art, may be fairly ascribed the deserved reproach into which prosthetic practice has fallen, and not, as is generally charged, to the employment of any particular material or methods concerned in the mechanical execution of the work."

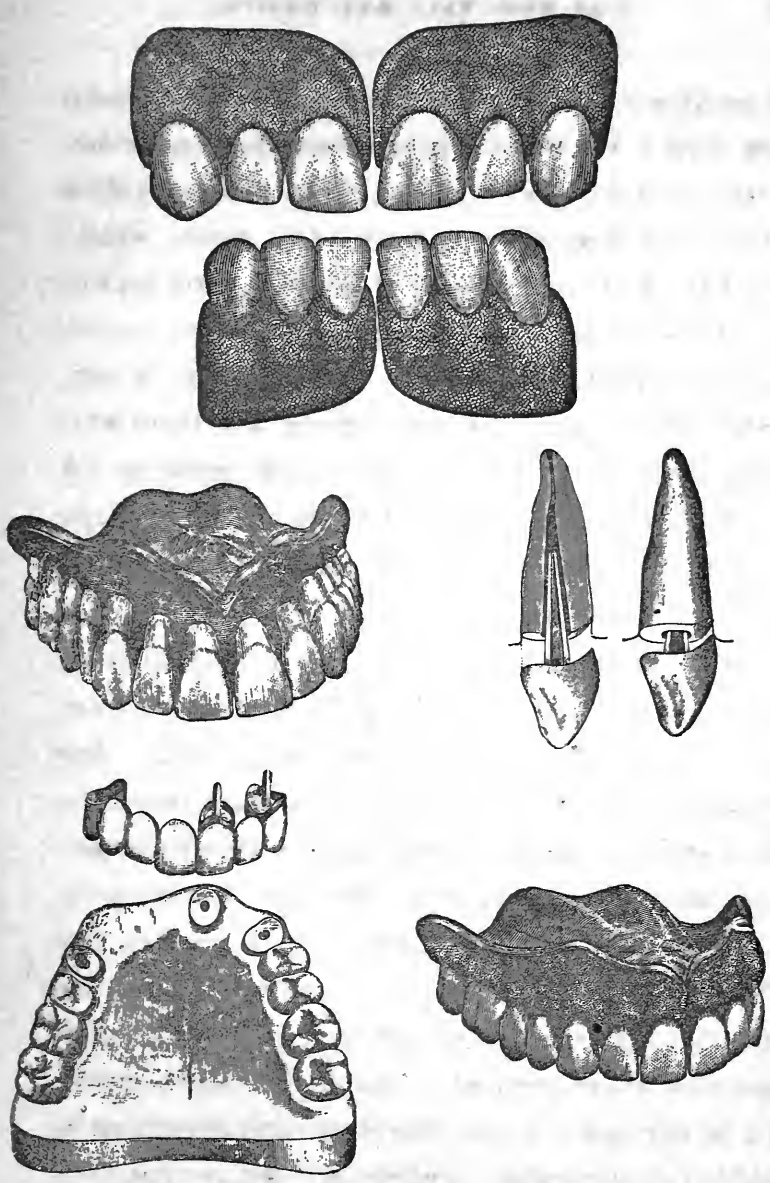
Thus, a good dentist should, indeed, be a man of great refinement of artistic conception with a true sense of the proportion of things, and of the harmony of colors. We have only to look at the teeth people often wear to notice that this is not very often the case. It must be remembered that in nature there is a great beauty in the irregularities, in what is often called the ugliness of shape and color. Because an even row of very white teeth is the ideal, it does not prove that such teeth suit everybody. What can be more ghastly than an old, decrepit personage, with a

bad complexion, who wears a double row of splendid white teeth? What is more ridiculous than one white, spotless artificial tooth standing in the midst of yellow and partially decayed real teeth? Or, again, what a lob-sided effect is produced if natural teeth on one side of the mouth grew irregularly, while, on the other side artificial teeth have been fixed up in regimental order. Yet how few people are there who, having artificial teeth, have the good sense to ask that these teeth should be just as imperfect in shape, position and color as the real teeth were, they are destined to replace?

If we have not ideal teeth, the probabilities are that there are many other things in feature and complexion which also are far from being ideal. And the introduction of one or more ideal teeth, where the surroundings are anything but ideal,is no improvement. It creates a discordant note, destroys the hormony which prevails even in ugliness, and renders that ugliness more evident and more unpleasant. But it requires a high conception of true art to thoroughly appreciate these principles and apply them successfully in practice. It is, therefore, not surprising to find that distinguished dentists are the constant and appreciated friends of men of art and letters.

Nothing but careful study and experience can

PLATE III.



Specimens of Modern Dental Art.

(Copyrighted.)

develop the artistic sense to a degree that will enable one to forecast the shades of expression that it may be desirable to give the patient by well-considered alteration in the length and edge-shape of an oral tooth or teeth.

In short, he must be as Dr. Marshall says: "Thoroughly conversant with physics, with mechanics and with metallurgy. He must acquire a delicacy of touch and a manipulative skill of the very highest order; his eye must be trained to a keen perception of form, color and harmony, and his hand to execute the thoughts of his brain: in other words, he must be an artisan, artist and physician all in one."

Conclusion.

In the last few years many women were initiated into the scientific mysteries of dentistry, and this profession is prominent among the many new occupations opened to women. In keeping with the enlightened spirit of the age, the question of sex in labor is being lost sight of, in the vast more important consideration of the quality of labor. It is the work *per se*, not the work *per sex* that is command-

ing the attention of an educated and discriminating public. The question naturally arises, is woman fitted for this new field? Is she endowed by nature with those qualifications necessary for the labor in the vocations, is she physically and intellectually adopted, and can she attain proficiency in mechanical skill and mathematical precision. These questions are open to debate yet, if we permit the general public to be the jury and allow the suffering masses, who have received professional care at the woman's hand, to plea, I am confident that the decision would be a general and grand triumph for the ladies of our profession.

The following sentiment on this interesting subject from the Dental Cosmos is fully corroborated by the liberal representations of our profession: "The time has long since passed", says the editor, Dr. Edward Kirk, "when the availability and fitness of woman for the practice of dentistry can be successfully questioned, and whatever may have been the difference of opinion as to her qualifications, both physical or mental, for this work when measured by the standard of male requirements, the fact remains that in dentistry, as in all branches of the great healing art, woman has found and successfully occupied a field of usefulness in which the sum

total of those distinctively feminine qualities, which go to make up an ideal womanhood, have been invaluable, and are, after all, the essential factors of her success in these departments. The question", continues the editor, "is not whether she is capable of doing her work from a man's standpoint and by masculine methods, but, is there a sphere of usefulness in our profession which she can pursue and properly fill by virtue of her womanhood, and achieve success as woman? The affirmation of this has been demonstrated by experience and we believe that the ennobling influence of her activities in dentistry will be increasingly felt in the course of time to the whole dental profession."

In this memorable American year 1892, the Women's Dental Association was organized in Philadelphia, and like the many similar organizations, its object is to promote the professional interests of its members, through the advantages which association confers.

In consequence of the liberal advantages offered in dentistry to artists, scientists and students, we today, as a profession, stand almost alone in the realization of our imaginings, the equal of any, the superior of almost any other specialty in point of success. But because of the fact we must not permit

the thought to become lethargic and assume an attitude indifferent to our surroundings. For, if we stop to sleep, others with that assiduity of purpose and labor will excell us in their persuits, while we then will assume a position of mediocrity. Man is too often deluded with false ideas of greatness: to cease to labor is a dead-lock to progress, and to stop thinking but another form or name for imbecility. During the last two decades, the improved methods, larger range, and more exact style of inquiry, and the assistance and hints which one branch of study has given to others has produced the most satisfactoy results. The inquiries are not yet complete, they seem on the contrary to have only commenced, and promise ultimately to satisfy all the useful purposes and legitimate curiosity of the many lookers on.

Kind advice can be found in Dr. John S. Marshall's address recently delivered before a class of dental students, he said: "Knowledge proved and classified becomes science. The sciences underlie the intelligent practice of all the professions; consequently, to be educated for a profession means, that you shall have knowledge of those sciences upon which it is based, and upon which it must depend for its intelligent practice. The dental student who commences his practice with the idea of obtaining

his degree with just as little expenditure of time and energy as is possible under the rules of the institution with which he is connected, will make a dismal failure of both student and professional life. Justice will repay him in the same coin to the very last decimal, and in the same spirit with which they were meeted out by him during his student days."

The doctor continued by saying: "To be successfull in any profession in these times, the individual must be well grounded in the fundamental sciences that underlie the superstructure of special professional knowledge: he must begin at the very foundation stones, and step by step go over every principle taught, until he arrives at a correct understanding of their application and their individual and mutual relationship and dependencies."

Thus, cherishing these well-worded sentiments, and knowing full well that you too, agree with these worthy remarks, I began the course in dental prosthesis, with the study of the subject, at the very foundation stone, and step by step have gone over every principle taught.

To perfect yourself in this branch should be an upper thought of mind, and in order to accomplish this, you will have no easy task, for, as Dr. Harris says: "*Prosthetic dentistry constitutes by far the*

largest and most difficult part of dentistry, and this makes it a distinct branch of the Art of Medicine, and gives to it the power to add, as it does to health, comfort and the enjoyment of life."

As regard the benefit derived from an historical review of dental prosthesis, such as I have earnestly endeavored to impart, I am of the same mind as Dr. Patrick, who once said: "I have been of the opinion, that there is a growing desire in our profession to be more conversant with the ancient as well as the modern history of dentistry in its several departments —that there is a conviction that the literature of dentistry has been neglected. It is to be hoped that the time is not far distant, when our profession everywhere, will be convinced that the importance of becoming more intimately acquainted with the researches and views entertained on the subject of dentistry by some of the most intellectual men the world has ever produced. It is to be hoped that the profession will see the advantages and necessity of a dental encyclopedia or summary of dental knowledge; not a system, but a work that would rescue valuable purposes relative to dentistry, that are now resting in comperative obscurity, in the archives of dental society, and that are now in a manner, lost to the profession. One great advantage the profession

would have in the possession of such a work, would be, that when a new theory is advanced, it could be tested by comparing it with doctrines of a similar nature advanced in former times. Certainly every age should profit by the experience of the preceeding one; but without a record or history, of what has been accomplished, each investigator commences a new series of trials, and wanders over the same ground in research of truths which have long ago been discovered; or adopts theories that have been long ago discovered. *The views of our predecessors may be justly regarded as beacon lights, set up to guide our footsteps from pitfalls of error.*"

One of the most gratifying evidences of the progress of modern dentistry is the ever increasing interest manifested in historical research and study of the various branches of the science. The profession is gradually comprehending that the proper way to learn lessons of wisdom for the uncertain future is, to give immediate attention to events of the past. All down the "long avenues of time" the voice of the departed are calling, giving us words of warning, to avoid the errors which wrecked their successes and attempts. But how can we prevent a similar sad fate for our cherished plans and sail free from threatening perils if we heed not the advices of our

forefathers, and remain ignorant of their accomplishments, and the general status of our profession.

I confidently hope that those of you who have earnestly followed my remarks, on the *Evolution* of *Dental* Science, will have enjoyed as much pleasure and reaped a similar volume of information, as I have in the compilation of these historic facts; and I trust that my words shall have awakened in you the latent admiration for the profession, that you will from now on earnestly and persistently labor to "establish for our chosen profession a land-mark" among all sciences and vocations, that future generations, instead of yielding but reluctant confidence, will then pour forth a full measure of respect and devotion.

Valedictory Remark.

'The dental profession has established and prolonged
the reign of beauty; it has added to the charms
of social intercourse, and lent perfection to
the accents of eloquence; it has taken
from old age its most unwelcome
feature, and lengthened enjoy-
able human life far beyond
the limit of the years
when the toothless
and purblind, pa-
triarch might
exclaim:—
I have no pleasure in them."

DR. OLIVER WENDELL HOLMES.

CONTENTS.

PLATES.—DENTAL SPECIMENS.

INDEX.

C

D

E

PORCELAIN TEETH.

The 1800 molds in constant use in our manufactory afford an extent and variety of forms of Porcelain Teeth unapproached elsewhere

Practically they reproduce infinite variations of nature's forms, meeting every requirement of the dentist, every need of the patient, whether from the stand-point of usefulness or of esthetics

Cases requiring the substitution of either a partial or an entire denture which cannot be supplied from our stock are so rare as to be unknown.

FACTS AND INFERENCE.

It is a fact that the instruments and appliances used in dentistry should be the best obtainable.

It is a fact that goods which bear S. S. W. surpass all others in quality.

It is a fact that no other house makes every appliance used in dental practice.

The inference is that dentists and dental students should select their outfits from our stock.

THE S. S. WHITE DENTAL MF'G CO.

Manufacturers, Importers and Dealers in

Dentist's Supplies,

PHILADELPHIA, NEW YORK, CHICAGO,
BOSTON, BROOKLYN,
ATLANTA.

"The hand that follows intellect can achieve."

The story of the Sculptor and the Marble

Is well known to all, but in illustration of our subject will bear repetition:

THERE was a poor Artist, gifted with the fire of genius and a great desire to become famous He gave to the study of sculpture his entire attention, working faithfully early and late in his little studio, training his eye and hand, perfecting himself in carving and reproducing objects in marble. At last he decided to carve a statue so beautiful and perfect that it should be his masterpiece. The model chosen was a beautiful woman He produced a block of pure white marble and bent all his mind and energy to express his lofty ideal, carefully chiseling out each curve of the body, each lineament of the face, until his work was completed, so perfect that it only needed the breath, the tints of flesh, to give it life. This made him famous; his work was finished so true to life, the world proclaimed him the greatest artist of he age. It was the result of genius and intellect combined.

In much the same way has Mr. Justi perfected the manufacture of Porcelain Teeth. He has studied the subject from an artist's stand point, beginning at foundation principles, imitating Nature in her various forms, following each little detail so accurately that to day Justi's Teeth stand pre-eminent as the must perfect artistic Artificial Teeth in the world.

H. D, JUSTI & SON,

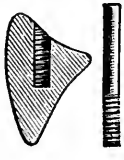
Philadelphia. ~ Chicago.

REMOVABLE PIN CROWN.

Patented, Feb. 25, 1890.

The REMOVABLE PIN CROWN possesses distinct features of great advantage over the Tooth crowns previously offered the profession.

The new characteristics and main advantages are obtained by the production of a Crown having a readily detachable pin, yet capable of easy and permanent fastening.



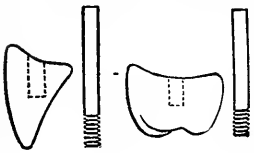
I A II

It consists as shown by cut A, of a porcelain Crown having a threaded socket, 1, to which is fitted a correspondingly threaded silver pin, II.

The advantages thus gained are obvious.

Perfect freedom in grinding and fitting the crown to root whilst pin is detached, as shown in cut B, without the difficulties heretofore experienced by interference with the stationary pin.

No liability whatever of breaking the Crown, in bending or fitting the pin, which is also free to manipulate as desired.



B

By the use of a SILVER PIN a gain of much importance is made in strength in the completed Crown, as any likelihood of its bending out of position after setting in the root is overcome.

The Removable Pin Crown is made of the same strength as the Johnson & Lund Artificial Teeth, and is beyond question the STRONGEST TOOTH CROWN OFFERED.

DIRECTIONS FOR USE.

Remove Pin from Crown by unscrewing, grind Crown to fit root and prepare pin.

When ready to insert for permanence, fill the threaded socket in the Crown with Onyx Cement mixed to the consistency of cream, screw the pin into it and remove the excess that exudes.

When set it will be perfectly firm and ready for adjustment in the usual way.

PRICE EACH, - - - - - THIRTY CENTS.

MANUFACTURED BY

JOHNSON & LUND,

BRANCH HOUSE:
514 WABASH AVENUE,
CHICAGO.

620 RACE STREET,
PHILADELPHIA.

For sale by our depots and agents generally. If they can not be obtained from the depot you are patronizing write to us, and we will supply or direct you where they can be purchased.

THE

AMERICAN COLLEGE OF DENTAL SURGERY

479 Wabash Ave., Chicago.

NEW MANAGEMENT! NEW FACULY! NEW LOCATION!

FACULTY:

JOHN S. MARSHALL, M. D., DEAN,
Professor Oral Surgery and Pathology.

L. C. INGERSOLL, A. M., D. D. S.,
Professor Dental Materia Medica.

R. F. LUDWIG, D. D. S.,
Profeesor Clinical Operative Dentistry.

E. L. CLIFFORD, D. D. S.,
Professor Gen'l Matria Medica and Therapeut

I. B. CRISSMAN, D. D. S.
Professor Operative Dentistry.

B. J. CIGRAND, B. S., D. D. S.,
Professor Prosthetic Dentistry.

Miss VIDA ANNETTE LATHAM, D. D.
Professor Histology and Bacteriology.

Dr. M. J. LOSSING,
Superintendent Infirmary.

H. B. HARRISON, A. B., M. D.,
Professor Chemistry.

WELLER VAN HOOK, M. D.,
Professor General Surgery.

GEO. LEININGER, M. D.,
Professor Anaesthesia.

T. B. WIGGIN, M. D.,
Professor Physiology.

W. M. TANQUARY, M. D.,
Professor Anatomy.

H. D. COGHLAN, B. A., L. L. D.,
Professor Medical Jurisprudence.

This school has a three-year graded course; large clinical faculties.

For further Information address

J. S. MARSHALL, Dean.
THEO. MENGES, Secy.

CHICAGO ILLINOIS,

STUDENTS SHOULD READ:

THE DENTAL COSMOS
Address: — Chestnut St., cor. Twelfth, Philadelphia.

THE DENTAL REVIEW
Address: — 66 Madison St., Chicago.

ITEMS OF INTEREST
Address: — 78 State St., Chicago.

INTERNATIONAL DENTAL JOURNAL
Address: — 3443 Chestnut St., Philadelphia.

DENTAL PRACTITIONER AND ADVERTISER
Address: — 587 Main St., Buffalo, N .

ODONTOGRAPHIC JOURNAL
Address: — Rochester, N. Y.

OHIO JOURNAL OF DENTAL SCIENCE
Address: — Toledo, Ohio.

DENTAL OFFICE AND LABORATORY
Address: — 620 Rice St., Philadelphia.

DENTAL REGISTER
Address: — 122 W. 7th St., Cincinnati, Ohio.

WESTERN DENTAL JOURNAL
Address: — 900 Brand Ave., Kansas City, Mo

THE DENTAL TRIBUNE (WEEKLY)
Address: — Masonic Temple, Chicago.

TEXAS DENTAL JOURNAL.
Address: — Dallas, Texas.

DOMINION DENTAL JOURNAL
Address: — 47 Miron Ave., Montreal, Can.

DENTAL AND SURGICAL MICROCOSM
Address: — 1208 Wabash Ave., Chicago.

The Haskell Post-Graduate School

— OF —

PROSTHETIC DENTISTRY,

211 WABASH AVENUE,

L. P. HASKELL, President.
A. M. MARKLE, Secretary.

CHICAGO.

This school, with a large and well equipped Laboratory, including Electric Motor for its Lathes, is open every month, EXCEPT SEPTEMBER, and Students may enter at any time.

Instruction given in all that pertains to Prosthetic Dentistry, including CROWN AND BRIDGE WORK, CONTINUOUS GUM WORK, AND PORCELAIN INLAYS.

One month of technical instruction under the personal supervision of PROF. HASKELL and assistants, has been found sufficient time for these specialties.

TUITION FIFTY DOLLARS.

The LABORATORY is prepared to construct Dentures of all kinds in the most finished manner for the Profession. Send for the Price List.

This is the first Post Graduate School in dentistry ever established; and that it has achiurd chieved a reputation is shown by these extracts:

"I want to express my appreciation of the work your school is doing for the profession and of Dr. Haskell's ability to impart instruc tion." E. B. S., TEXAS.

"I consider a course of instruction in your School essential to a dental education." T. B., INDIANA.

"I can freely recommend your School. Its methods and system of teaching are good." W. S. F., MICHIGAN.

IN PRESS.

The Story of the Great Seal

OF THE UNITED STATES OF AMERICA

—OR—

OUR NATION'S MARK.

Embracing its History and Heraldry, and its signification to the ' Great People" Sealed.

—BY—

B. J. CIGRAND, B. S., D. D. S.,

Author of "*The Rise, Fall and Revival of Dental Prosthesis.*"

The following testimonials from those who read but VI chapters, (the book will contain XXIII) of the rough manuscript: —

"You have succeeded in obtaining facts and information on a subject highly interesting: many historians have failed in this attempt, and among those are eminent writers."

Benson J. Lossing

"Send us a serial, on the same subject, I will promise it an early publication". *Educational Journal.*

(over

"We would like the matter as a serial; state your price and oblige. *Illustrated American.*

"It is replate with many facts now awaiting their first presentation to the public." *Gen. C. A. Totten, U. S.* Army.

"I look forward with much pleasure to reading your book: I admire the frank, independent and open tone of your composition". — *Theo. J. Pickett, Esq., Wash., D. C.*

"Patience, industry and studiousness, alone could not write the book and make it attractive and valuable: it being a patriotic subject it found nothing wanting in its author.
Martin J. Williston. A. M, D. D.

"This book will, and must find its way to every hearth in our land. It will be a right good companion to any American historical volume. *C. L. Edison, Chic. Pub., Lib.*

"When your book is issued, notify us at once."
Wisc. Hist. Society.

"We have examined the papers with great interest and would be pleased to arrange for publication' *The Century Mag.*

"I have looked over the greater portion of the M. S. S, and find the article highly interesting, your book will be a valuable addition to American History. I am ever prepared to encourage such carefully prepared patriotic works." *Bish Sam'l Fallows*

"All possible facilities, — at the hands of the State Department, — for research in the interesting field you have considered, have been afforded you." *Ex. Sec'y James G. Blaine.*

"This volume will be an historical treasure since little or nothing has ever been published on this thoroughly interesting subject." *The Student.*

"The new book soon to be published by Cigrand, promises to be highly interesting" *Chicago Herald.*

"The volume contains upwards of 600 pages and is graced with some 400 rare and original engravings.

(Kaplan)