Vol. CXX

July-December 1921

Special Index Issue

THE AMERICAN ARCHITECT and THE ARCHITECTURAL REVIEW

243 West 39th Street
NEW YORK

Published Fortnightly in New York

Six Dollars Yearly

TEXT ACCORDING TO SUBJECT

Light-faced figures refer to text pages; bold-faced to serial number

TEXT ACCORDING TO AUTHORS

Light-faced figures refer to text pages; bold-faced to serial number

TEXT ACCORDING TO AUTHORS

(Continued)

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frontispiece to No 2371

EARLY MEDIAEVAL CAMPANILE, RAVENNA, ITALY

THE AMERICAN ARCHITECT

VOL. CXX WEDNESDAY, JULY 6, 1921 NUMBER 2371

THE LIVING ROOM

THE HOUSE in WASHINGTON, D. C., of GEORGE OAKLEY TOTTEN, ARCHITECT

WHEN an architect designs for a client there is the natural impression that he has been more or less influenced by certain insistencies and that he has been compelled to introduce features which, if he followed his own judgment, he would not have considered. But, when he designs a house for himself, it may be taken for granted that it is the fulfilment of his own ideals, and as far as it is possible for him to accomplish it, he has created a result such as he thoroughly approves.

The house and garden of Mr. George Oakley Totten, of Washington, located in the very heart of what is known as the "Embassy District," are surrounded by the most aristocratic neighbors, but lose nothing in importance by such dignified surroundings.

Indulging in a hobby for collecting, such as is the custom with most architects, Mr. Totten, on his many trips abroad, brought back with him furniture and other accessories, all of which he has introduced into his well designed and equally well planned house.

The very simple character of this house is its greatest charm. It would not be possible to place an exact architectural style. The details are unusual, suggesting Spanish motives, and yet not the Spanish of Spain, but a dialect, so to speak—the Spanish Colonial of Mexico, perhaps. The ornament applied is unusually fine in detail. The general tone of color of the house is a light grey, and the stucco has a most interesting and admirably executed texture.

The brackets of the main cornice are hand-carved in polychrome, and like every detail of the house, declare the touch of the artist. In fact, these brackets were either painted by Mr. Totten himself or reproduced by the craftsman from Mr. Totten's original color scheme.

Free standing in its large garden, the house as

rich brown tone. The whole enclosure suggests a mediæval Italian room, and its restfulness has been assured by a careful and artistic selection and manipulation of the materials employed, and the various accessories to be found in the room.

A balcony from the second story hall and a small bay window from one of the second story rooms look down into the studio, while on the opposite side of the room are Gothic bookcases built into the wall. The principal feature is the great fireplace. The twelve large square Spanish tiles above the opening suggest the decorative scheme. These tiles were brought from Spain by Mr. Totten a long time ago, and about them, he states, he made the design. The

TWO VIEWS IN THE JAPANESE ROOM

to size is very deceptive in appearance, and it is only when one enters that it is found the house is of unusual dimensions.

The staircase in the central hallway is of walnut, with a well designed Gothic rail, while the floor is tiled with square black and white Italian marble tiles. On the right is an attractive studio or living room. This room is a two-story vaulted enclosure which gives an air of spaciousness and feeling of size that one does not realize when viewing the house from the outside. The proportions of this room have been admirably studied. It has a groined vault in smooth white plaster, with walls of a warm grey tone and a most artistic texture. The wood is old and carefully selected walnut, with hangings of the same

hangings and furniture are all evidences of Mr. Totten's artistic sense as to color, and were "picked up" by him on his various visits to Europe.

A marked contrast in size to the spacious living room is the small dining room just across the hall, but it is only small by contrast. Its ceiling and decorative treatment are in the Adams style, and every detail and bit of moulding to be found has been carefully selected or worked out by the architect. The ceiling in this room is unusually fine. It is of moulded white plaster, while the walls are paneled also in plaster, finished in a dull yellow tone. The floor, like that of the living room, is light oak parquetry. The over-mantel is gold, while the hangings are a rich dark blue, and the Adams furniture

HOUSE OF GEORGE OAKLEY TOTTEN, JR., ARCHITECT, WASHINGTON, D. C.

mahogany, carrying to completion, and without a single artistic discord, the decorative harmony of the room.

An interesting feature of this house is the added room, built to contain the famous "flower festival" Japanese room which was originally installed in the New York residence of Mr. Charles T. Yerkes. This fine specimen of Japanese architecture and decoration which has been acquired by Mr. Totten dark and do not afford sufficient light for laundry work. For this reason, the laundry was placed on the top floor. There are a dumbwaiter and a chute to the lower floors, so that the laundry may be quickly and efficiently handled without unnecessary labor.

While this house has been designed by Mr. Totten with all the affectionate care that a man would give to his own dwelling, and shows the combination of

THE DINING ROOM

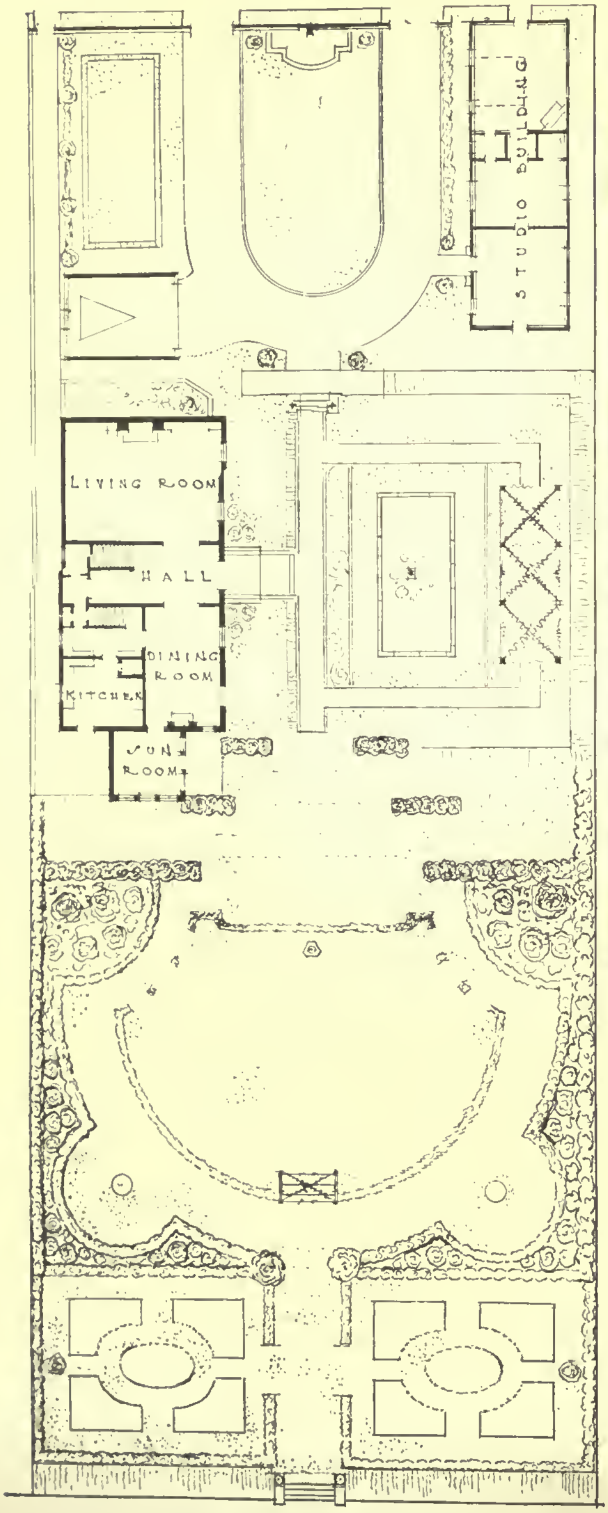
indicates the possibility that may be reached in the extension of this somewhat unusual house.

On the second floor there are the usual sleeping apartments, bath room, and a well placed sleeping porch, while on the third floor there are servants' rooms, store rooms, a cedar closet and a laundry. While it is customary to place laundries in the basement or cellar, it is not always desirable to do so, as in houses setting low to the ground cellars are every artistic impulse, the general conveniences that should be found in every modern dwelling have not been omitted, and the entire building is equipped with every modern housekeeping device.

The garden at present is a garden in the making. It covers over half an acre. As before stated, this house is centrally located in the "Embassy Section." Directly across the street is the Spanish Embassy; to one side is the home of the former Russian

MAIN ENTRANCE DETAIL
HOUSE OF GEORGE OAKLEY TOTTEN, JR., ARCHITECT, WASHINGTON, D. C.

Ambassador; to the other that of Mrs. Marshall Field, and next to that the French Embassy. All of these buildings were designed by Mr. Totten, and represent as many styles, each good in itself.



GARDEN THEATRE AND STUDIO
HOME OF GEORGE OAKLEY TOTTEN, JR., WASHINGTON, D. C.

The garden, as will be seen, is laid out on the French theatre plan type. It is already taking on some of the aspects that will make it a beauty spot in a section already famous for handsome buildings.

Neither this house nor its surrounding garden is finished, nor is it meant that they should be. It is a house and garden to which one may give care and

EXTERIOR DETAIL, SHOWING WINDOW TREATMENT

study year after year, watching its development and growth in the same way that the painter will labor over his picture, adding here and changing there, building up its "quality," adding to its beauty of color. It may never be finished in the sense that one regards completeness, but the very beauty of it is that it will serve for all times as a place where a man of correct artistic perceptions may devote his spare hours in the most beautiful and satisfactory elements of a true recreation, both mental and physical. Typically the house of an artist, its growth and development will be along artistic lines. No recreative elements that enter into the daily life of the artist architect can be greater than those attending the development of his own home. A thing of beauty, created as a result of his temperamental attitude toward his daily life, it will become a joy forever.

At Left:
Detail of living room in house of George Oakley Totten, architect, Washington, D. C.

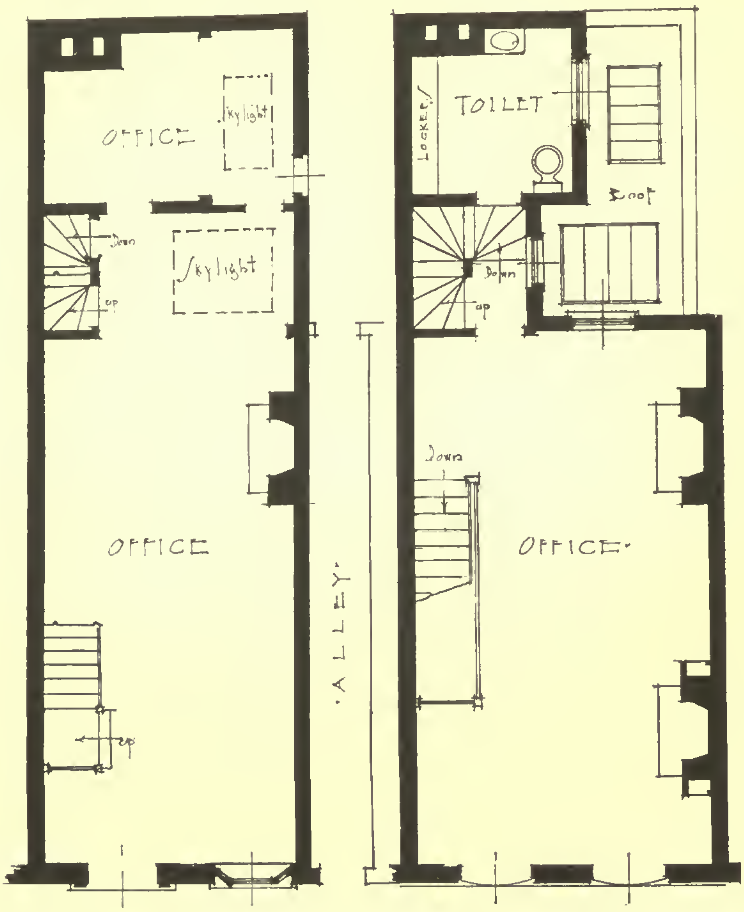
Below:
An apartment living room in building, 64 East 55th street, New York, comprising architects' offices, single and duplex apartments.

HARRY ALLAN JACOBS
ARCHITECT

ARCHITECT'S OFFICES SOLVING HIGH COST OF OFFICE RENT

By C. A. ZIEGLER

WHAT to do with the small dwelling houses that have become stranded in the business districts of our cities owing to the encroachment of commercial enterprises upon old residential sections, has always been a problem, but the profiteering landlord, paradoxical as that may seem, has really done a good work in forcing the office seeker to consider the advisability of remodeling these old dwelling houses for office purposes.



BUILDING, 208 SOUTH THIRD STREET, PHILADELPHIA

With office rents being raised 100 per cent. or more, and the cost of building increased to an even higher level, the erstwhile contented cliff dwellers who transacted their business in the high altitude afforded by the modern skyscraper have found that the long-neglected dwelling houses that were a drug on the market for years could be converted into office buildings at a cost that very often gave the investor his office rent free if he rented portions of the building to other tenants, and in any event gave him perfectly satisfactory quarters at a very low rental charge.

The exodus of the professional man from the larger office building was the natural result of the tremendous increase in rentals, as no class of men felt the hardships of war conditions more keenly than the professional class, and they simply could not meet the post-war demands for a higher rental.

Material men and manufacturers automatically received a higher price for their commodities during the war owing to the great demand for their goods. The memory of the profiteering by the laboring class during the war is still a blot on the escutcheon of the working man, but when the services of the professional man were required by the government, it was generally furnished at a rate lower than was customarily charged in private practice, and no provision was made to reimburse him for the time necessary to re-establish his private practice when the war was over, although manufacturers received very material aid in reorganizing their businesses.

To meet their necessity, many professional offices combined forces and bought or rented old buildings near active business centers in our larger cities and converted them into office buildings. So satisfactory have these quarters been found that reports show many plans are on the boards for similar projects.

As in most real estate ventures, the success of the project depends upon the ingenuity of the designer in planning the improvement. Nothing pays a larger return in real estate investing than a successful plan, and yet most alterations of this character are usually done carelessly and fail to make any impression upon the casual observer.

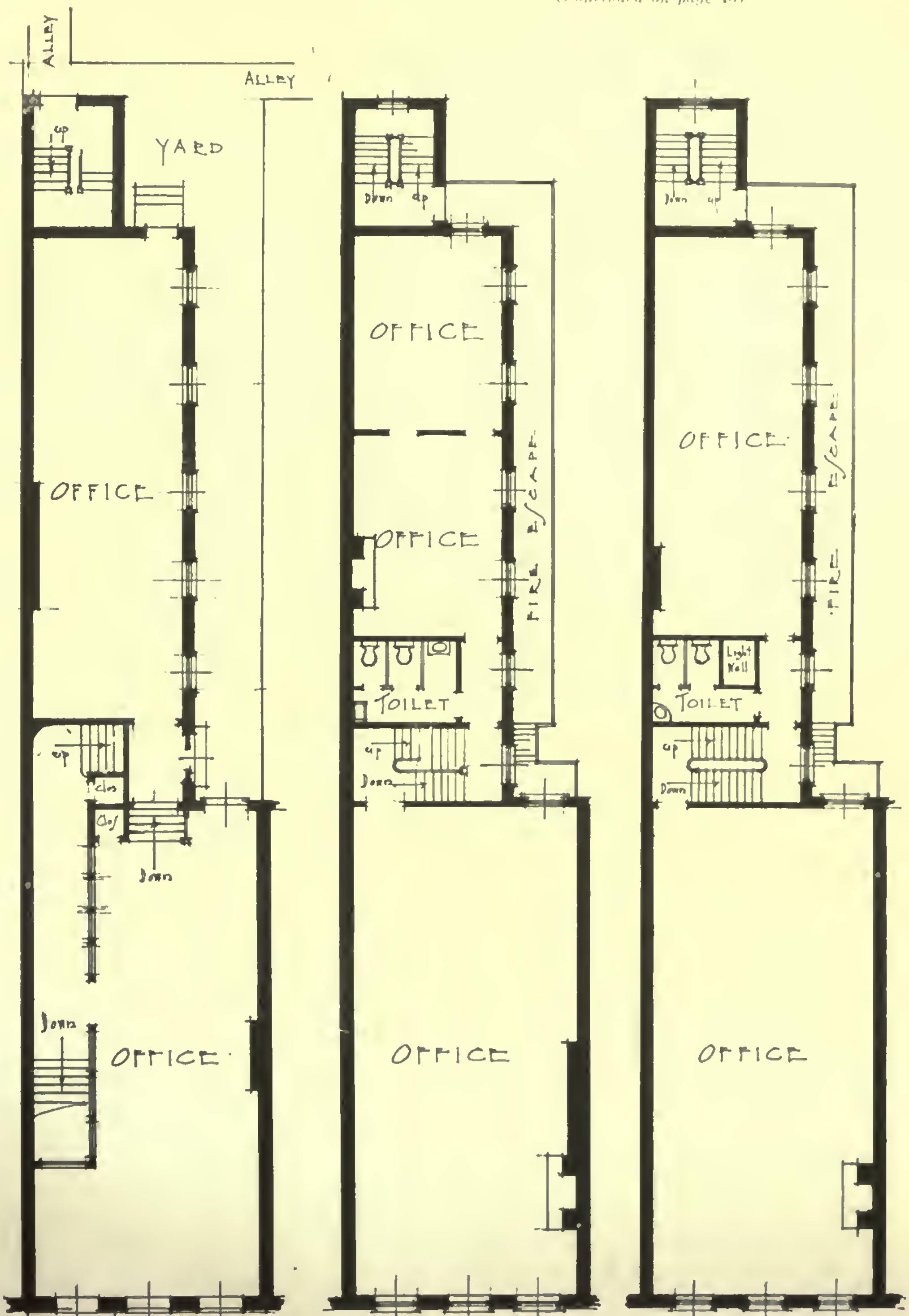
Those who successfully solve the problem obtain a greater individuality for their business than was possible in a larger office building and avoid the confusion and noise caused by the rush and bustle that seem unavoidable in the halls and elevators of the modern skyscraper, and as most old residences that were left stranded in the business centers of our large cities were once the homes of prosperous men of affairs, they usually contain old mantels and stairways which add an atmosphere of refinement to the professional office, seldom obtainable in the average commercial office building.

The accompanying photographs and plans show dwelling houses that were converted for office purposes, and in each case the owner secured much better accommodations than could have been obtained in a skyscraper for the amount represented by the interest on the investment.

The building at 208 South Third Street, Philadelphia, was originally very much like the adjoining buildings shown on the photographs. All the interior partitions were removed and a new front of Colonial design was added. This gave the tenant three stories of well-lighted and ventilated office space and an individuality that makes itself felt in the community.

At 132 South Fourth Street, Philadelphia, practically the same thing was done, and in addition a small warehouse was erected on the rear of the lot, with an entrance opening into same from the rear street. This arrangement gave the cotton brokers who occupy this building an unusually convenient arrangement at a very low rental cost.

(Concluded on page 16)



BUILDING, 1309 LOCUST STREET, PHILADELPHIA, PA.

BEFORE ALTERATION

THE BUILDING AFTER ALTERATION

THE building is situated one square from Broad street, which is the largest boulevard of the city and was until recently a very desirable residential district, but business interests have been slowly encroaching upon the territory, and in order to get a proper rental from the building, it was necessary to remodel it for office purposes. In order to accomplish this, the first floor of old dwelling houses was removed and the ground floor of the new building was laid out three steps below the street level, the new first floor being arranged a short flight above the pavement. In this manner an extra story was gained which brings in very desirable revenue.

ALTERATION TO BUILDING AT 1309 LOCUST STREET, PHILADELPHIA, PA.

C. A. ZIEGLER, *ARCHITECT*

BUILDING AT 208 SOUTH THIRD STREET, PHILADELPHIA, PA.
ALTERATIONS BY C. A. ZIEGLER, *ARCHITECT*

Washington Monument, Baltimore, Md.

(See reproduction of original drawing by O. R. Eggers on opposite page)

BALTIMORE'S title as "The Monumental City" is derived less from the number of its monuments than from the early date at which the Washington Monument in Mount Vernon Place, Baltimore, was erected.

This stately shaft rises 164 feet and is surmounted by a heroic figure of General Washington. The monument was built in 1815. Of the many monuments of Washington erected all over the United States none is more dignified or has a finer setting than this one.

The citizens of Baltimore, with a true sense of the artistic, have completed a scheme for the development of the Mount Vernon Place section, and in this scheme the Washington Monument will become the dominating feature. The plans for this dignified city development, as worked out by Thomas Hastings, architect, will be found in THE AMERICAN ARCHITECT, *issue of January* 16, 1918.

Facing p. 12

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THE WASHINGTON MONUMENT, BALTIMORE, MD.
E AMERICAN ARCHITECT Series of Early American Architecture

EDITORIAL

Architects' Registration Laws

IN this issue Mr. D. Everett Waid, long identified with the idea of proper registration laws for the architectural profession, presents in admirable form the whole case against joint registration boards of architects and engineers.

Reduced to the most simple terms the argument is that the scheme does not work. A convention of members of state registration boards representing twenty-six states declared by unanimous vote that joint registration boards are not desirable for the best interests of either profession. Six months later another convention of the same officials reaffirmed, also unanimously, the resolution adopted by the first convention. This should carry great weight, for the action was taken by the men best qualified to judge as a result of actual experience.

On first thought it seems a most desirable and practicable thing to regulate under one act the practice of architects and engineers who work together on one great structure whether it be the Woolworth Tower or Brooklyn Bridge.

It may be admitted that the architects should be stronger in construction and that engineers should learn more respect for aesthetic treatment of their work. At the same time each profession, while having much in common with the other, requires so much knowledge and training which are distinct and beyond the other profession that it is absolutely impossible for architects to pass upon engineers or engineers to pronounce judgment upon the qualifications of architects.

If architects and engineers are members of one board and both are required for a quorum, the situation is absurd and illegal, and a waste of time.

Boards of examiners for engineers have problems quite sufficient to tax the ability and time of the most competent. They must cover a wide field when preparing and conducting examinations for structural engineers, sanitary, electrical, mechanical, chemical, civil, and more besides. Architects have a wide field of their own to cover and it will certainly be difficult to induce practicing architects of standing to accept appointments and serve on Registration Boards if they must spend time outside of that required to pass upon their own profession.

By all means let us have co-operation between the professions and avoid for all time the trouble which occurred some years ago in one state. (Now Illinois has parallel laws for the two professions.)

But architects and engineers should combine to oppose joint boards which will result in throwing the membership of boards of examiners into the control of grafting politicians.

The Philadelphia-Camden Bridge

PHILADELPHIA, in order to meet its growing conditions and to provide more easy and modern methods of communication with adjacent sections lying on the banks of its rivers, proposes a bridge that will link together Philadelphia and Camden, New Jersey. There is unanimity as to the necessity for this bridge, but a very wide divergence of opinion as to just where it should be located.

The question of approaches looms largest. Both cities are so full of historic localities, and of these the citizens are so properly proud and watchful of their safety, that it is difficult to propose a site for an approach that will not at once call forth a flood of protesting letters to the daily press.

Protest is made of any location, particularly the proposed Washington Square site, that would mar the dignity of historically associated buildings. Philadelphia, like Boston or New York, is the custodian on behalf of all the people in this country, of their historic landmarks.

It is not pleasant to regard as possible agreement on a site that would make Washington Square the entrance point of the Philadelphia approach. On this square is Independence Hall, perhaps the most venerated shrine of American history. Desecration of this locality would be nothing but a crime. As it is today, Washington Square is a quiet, restful spot in a bustling city—a place where patriotic citizens may sit and ruminate upon the progress we have made as a nation since that memorable day when a group of earnest patriots signed the declaration of our national independence. Some day the city of Philadelphia, in co-operation with every state in the Union, will, if present plans mature, undertake to make this historic Square a purely national memorial. To locate a proposed bridge approach at that point would be to create a condition that would mar for all time the dignity of the neighborhood, and become a lasting reproach not alone to all Philadelphia, but to the nation as well.

REGISTRATION of ARCHITECTS and ENGINEERS

By D. EVERETT WAID

THE report of the Board of Directors of the American Institute of Architects contained a paragraph which was presented to and approved by the last convention as follows:

"The Institute has consistently stood for separate registration laws for Architects and Engineers and the Board still believes that wherever conditions make it possible separate laws are desirable. It recognizes, however, that in certain localities this may not be practicable and in view of such conditions, advises continuation of our co-operation with Engineering Council looking to the development of standard legislation with a view to the passage of laws that shall adequately recognize the independence of interest of the two professions and provide for that independent control of the practice of each profession by its own members that is essential to the satisfactory operation of such a law."

All architects and engineers who are promoting legislative registration should give the gist of this report careful study in order to avoid future difficulties for both professions. The point may be expressed as follows:

All joint registration laws should be opposed unless such joint bills are drawn upon a basis of providing common headquarters and clerical force but establishing separate boards or sub-boards of architects and engineers, each of which shall be independent of the other in administering its work of examination and registration.

That those architects and engineers who have in their charge prospective legislation cannot give too careful consideration to the details of this phase of co-operation between the two professions is emphasized by the action of the National Council of Architectural Registration Boards. At their convention in St. Louis, November, 1920, there were present thirty-eight delegates representing twenty-six states including members of different state boards of registration. They passed the resolution by unanimous vote: "That Joint Registration Boards are not desirable for the best interests of either profession."

THE convention of the same organization, held in Washington in May, 1921, reaffirmed the same attitude against registration.

Such a sentiment, coming as it did from men who have had to learn the difficulties and defects of existing laws from the close study necessitated by their experience in administering those laws, is significant. It means that they share in the general desire that the two professions shall strengthen each other by cordial co-operation and shall eliminate all reasons for a clash of interest,—false as those reasons are. It means at the same time that they regard registration laws as having for their chief purpose crystallizing and raising the standard of qualifications for practitioners.

It means also that they have found the actual work of administering registration laws so laborious and painstaking that each profession has its hands full solving its own problems, fixing its own peculiar standards, examining its own candidates. It means in short that one board of examination and registration is too busy with its own profession to undertake to do the work of two professions when their educational requirements differ so widely as must those of architects on one hand and those of chemical engineers, electrical engineers, and surveyors, on the other.

Altruistic co-operation is admirable if it is not undertaken in an impracticable way and so made ineffective. It is even conceivable that one composite board of engineers and architects made up of superior men full of cordial good intentions, may apparently succeed for a time. But that success is the more dangerous for the future inasmuch as it does not safeguard against certain possibilities of a change in personnel, of individual jealousies and of political influence.

The spirit of the report of the Directors and of many actions taken by the Institute and its officers during a series of years is that of cordial co-operation with the engineering profession. Architects and engineers should indeed co-operate most effectively when working together to secure the enactment of parallel registration laws.

The Board of Directors should also encourage Chapters (even those who have no legislation of their own in prospect) to aid engineers who may happen to be trying to secure registration laws for themselves.

THE wisdom of the Institute in declaring for co-operation and separate laws rather than joint laws, may be demonstrated when the real test comes. Already one particular difficulty inherent in the sort of joint laws so far enacted is revealed by a striking illustration. One architect member of a joint board has been present at meetings which have passed upon the qualifications of 900 engineers. He, the architect, had no voice in considering the engineers, but he was required to be present to make a quorum. It was an ordeal for a busy man to kill time at so

(Concluded on page 16)

THE building shortage in this country during the past two years produced some interesting problems and equally interesting solutions. In this issue Mr. Ziegler, of Philadelphia, has written of alterations of old city houses into office buildings. Mr. Totten, of Washington, has contributed interesting pictures of his house and gardens. Through the courtesy of Mr. Harry Allan Jacobs there is here shown a fine solution of the combination of an architect's offices, his city home and the utilization of additional floors as small apartments rented to a selected tenantry.

IN its exterior and interior Mr. Jacobs' house shows in every detail the artistic refinement of the well trained architectural mind. The house stands out among its neighbors as a picturesque detail. In its interior there are to be found splendidly worked out wall textures, skilfully handled woodwork. The decorative features, marked by a well considered restraint, are mainly contributed by paintings, rare old furniture, fine rugs and ornamental iron work. The drafting room is splendidly lighted and is a commodious, conveniently appointed working place.

BUILDING, 64 EAST FIFTY-FIFTH STREET, NEW YORK
COMPRISING ARCHITECTS' OFFICES, DUPLEX AND SINGLE APARTMENTS
DESIGNED AND ERECTED BY HARRY ALLAN JACOBS, *ARCHITECT*

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AN APARTMENT LIVING ROOM

AN APARTMENT LIVING ROOM

BUILDING, 64 EAST FIFTY-FIFTH STREET, NEW YORK
COMPRISING ARCHITECTS' OFFICES, DUPLEX AND SINGLE APARTMENTS
DESIGNED AND ERECTED BY HARRY ALLAN JACOBS, *ARCHITECT*

THE DRAFTING ROOM

MR. JACOBS' OFFICE

BUILDING
64 EAST FIFTY-FIFTH STREET
NEW YORK

COMPRISING ARCHITECTS' OFFICES, DUPLEX
AND SINGLE APARTMENTS

DESIGNED AND ERECTED BY
HARRY ALLAN JACOBS, *ARCHITECT*

A DUPLEX APARTMENT

AN APARTMENT LIVING ROOM

BUILDING, 64 EAST FIFTY-FIFTH STREET, NEW YORK, COMPRISING ARCHITECTS' OFFICES, DUPLEX AND SINGLE APARTMENTS

DESIGNED AND ERECTED BY HARRY ALLAN JACOBS, *ARCHITECT*

HOUSE OF S. H. P. PELL, ESQ., FORT TICONDEROGA, N. Y.
ALFRED C. BOSSOM, *ARCHITECT*

HOUSE AND GARDEN OF S. H. P. PELL, ESQ., FORT TICONDEROGA, N. Y.
ALFRED C. BOSSOM, *ARCHITECT*

TWO GATEWAYS IN GARDEN OF S. H. P. PELL, ESQ., FORT TICONDEROGA, N. Y.
ALFRED C. BOSSOM, *ARCHITECT*

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GARDEN OF S. H. P. PELL, ESQ., FORT TICONDEROGA, N. Y.
ALFRED C. BOSSOM, *ARCHITECT*

BUILDING FOR PEOPLES TRUST CO., TAMAQUA, PA.
TOOKER & MARSH, *ARCHITECTS*

EXTERIOR DETAIL
BUILDING FOR PEOPLES TRUST CO., TAMAQUA, PA.
TOOKER & MARSH, *ARCHITECTS*

INTERIOR DETAIL
BUILDING FOR PEOPLES TRUST CO., TAMAQUA, PA.
TOOKER & MARSH, *ARCHITECTS*

TREASURER'S OFFICE BUILDING, SUFFOLK COUNTY, NEW YORK
TOOKER & MARSH, *ARCHITECTS*

GRADE SCHOOL, BALDWIN, LONG ISLAND, N. Y.
TOOKER & MARSH, *ARCHITECTS*

DETAIL OF MAIN ENTRANCE
GRADE SCHOOL, BALDWIN, LONG ISLAND, N. Y.
TOOKER & MARSH, *ARCHITECTS*

DETAIL OF DOORWAY
HOUSE OF CHARLES OTTO, ESQ., HARTSDALE, N. Y.
TOOKER & MARSH, *ARCHITECTS*

ST. JUDE'S CHAPEL, 19 WEST NINETY-NINTH STREET, NEW YORK
LUDLOW & PEABODY, *ARCHITECTS*

14 16.

BUILDING AT 132 SOUTH FOURTH STREET, PHILADELPHIA, PA.
ALTERATIONS BY C. A. ZIEGLER, *ARCHITECT*

Registration of Architects and Engineers

(*Concluded from page* 14)

many meetings but dutifully he did it and was actually present to make the quorum while the records of 900 engineers were reviewed.

If a legal quorum is *three,* can two do work lawfully with a third present powerless to vote? If experienced board members think that five architects on one board are desirable, and at least three architects unanimous upon each judgment are essential,—is it sensible to allow two to make such decisions?

The practical difficulties and dangers confronting joint boards are bound to become more and more apparent with further experience.

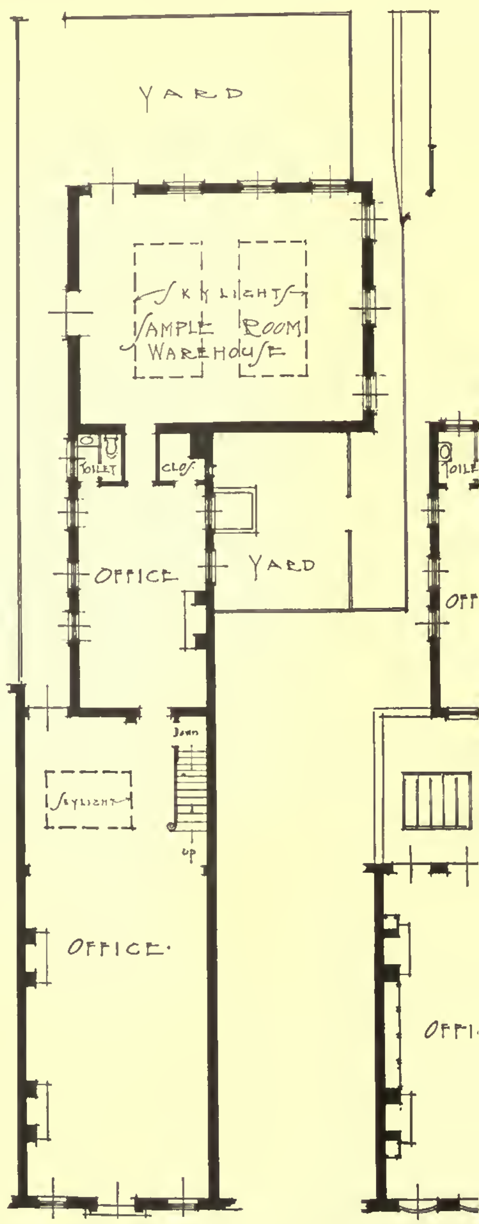
Architects' Offices Solving High Cost of Rent

(*Concluded from page* 9)

At 1309 Locust Street, Philadelphia, the problem was a larger one. The building is situated one square from Broad Street, which is the largest boulevard of the city and was until recently a very desirable residential district, but business interests have been slowly encroaching upon the territory, and in order to get a proper rental from the building, it was necessary to remodel it for office purposes. In order to accomplish this, the first floor of old dwelling hou es was removed and the ground floor of the new building was laid out three steps below the street level, the new first floor level being arranged a short flight above the pavement. In this manner an extra story was gained which brings in very considerable revenue. The owner secured by the alterations five floors of desirable office space, all well lighted and ventilated, which he was able to rent profitably at a much lower rate than is charged by the average office building, and in addition he is reaping a very considerable appreciation in the value of his property, which is in the heart of the Philadelphia business district and therefore certain to become of much greater value as the normal development of the city continues.

The alteration to this building represents the maximum that can be done in the conversion of a dwelling house, as every foot of floor space is utilized for office purposes with the exception of a small portion of the old cellar, which is retained for the heating system, and yet very little was done to alter the structure of the old building. The front was not torn out in this case, but new windows, larger than the old ones, were put in the old wall, and the entire surface was covered with "Color-tone Stucco," made by the Atlas Portland Cement Company, which gives a very agreeable texture to the front.

Many of the interior partitions were torn out and the stairway rearranged, but the general construction stayed as it was. A fire tower was added to the rear of the building to meet the require the building law and in all probability the will continue to be an asset to the owner absorbed into some larger building project, the usual future for a property of this kin



BUILDING AT 132 SOUTH FOURTH S
PHILADELPHIA

All of the buildings illustrated were fo bilities rather than assets, but immedia alterations no difficulty was found in sec ants; in fact, the owner of one of the pro posed of it in less than six months after tions were made, at a very considerable p

DEPARTMENT of SPECIFICATIONS

The Specification Writer

A STUDY and analysis of those qualities a specification writer should possess, his habits of thought and study and the course he should pursue constantly, in order that he may ever be "up to the minute" in all the details of his work, is quite essential to the correct understanding of specifications and their production. The specification writer must be known, in his office, as a compendium of information relating to all productive, executive, and constructive processes of the organization. He should keep in intimate contact with all its activities and be prepared to give advice that possesses the stamp of authority, gained through knowledge and good judgment. To do these things the specification writer must have a broad education and should be a student of current art and technical—more especially engineering—books and periodicals.

It is of great advantage to the specification writer to have a university education, this training consisting mainly of engineering subjects with a sufficient amount of study in design, proportion and related aesthetic subjects to give proper balance to the other studies. It is unfortunate that architectural universities devote so little attention to the earnest consideration of specifications as one of the essential fundamentals of correct construction. As it is, under present curricula, it is quite customary for the student to gain the impression that specifications are anathema, a necessary evil that is so difficult to understand that it does not admit of clear and concise instruction. It is to be hoped that the future will see a more thorough method of collegiate instruction in specification writing.

Some of the most important subjects that must be studied, whether in the university or later, are rhetoric, composition and what has been termed Engineering English. The specification writer cannot hope to produce a clear, concise and logical specification unless he understands the technic of writing, although it is by no means necessary that he be a purist. It will be found that the habit of thinking and expressing thoughts in a logical and understandable manner will result in a more careful handling of specification problems through the tendency to consider and analyze all details in a similar manner connected with the work.

IT is probably true that more disputes, unhappy situations (unhappy for the architect) and failures to achieve the success rightfully due the designer and constructor of the building are directly traceable to the neglect, on the part of the specification writer, to express his desires and instruction in a clearly understandable manner than to an other cause. Such an apparently innocent thing a the transposition or omission of a comma, or of word, may introduce ambiguity and place the architect in the position of requiring work or materia that he knows is incorrect or unsuitable for the purpose intended. Aside from the serious financia consequences of such an error the architect is mad to appear in a most ridiculous light and quite ofte he finds he is held in such contempt by those wh have suffered because of his error that it is quit difficult for him to handle subsequent operations o the work with the sure-footedness so essential t leadership.

After he has ceased his university studies th specification writer should pass through all the positions in an architect's drafting organization, devotin several years to general drafting work, design, engineering calculations and detailing in large scale This training is necessary so that the drawings ma be understood from the draftsman's point of vie and so that the specifications may be written to cooperate with them from the start to the finish of th work.

After several years spent in the drafting room th specification writer will find that supervision of construction work will open his eyes to many thing he did not understand clearly or was not familia with when working on drawings. This work wil acquaint him with the methods of fabrication o work in the field, its construction and installatio and will enable him to visualize, in true perspectiv the delineations of the drawings and the description he wishes to place in the specifications. In additio to these advantages this work will give the specification writer opportunity to study the habit of min of the contractors, foremen and workmen, will reveal to him the written and unwritten rules of th labor unions and building inspectors and will enabl him so to draw his specifications that friction wit the human element will be reduced to a minimum.

Field supervision will show how the drawings an specifications should be prepared so they may be coordinated in a manner logical to their use on construction work. The installation of work that ha been the subject of shop drawings, approved in th architect's office in the customary manner, will brin to the attention of the specification writer certai matters and things that must be considered whe preparing the general drawings and specifications and when approving the shop drawings of the contractor.

A GOOD training can be gained in two or three years of construction supervision, after which the specification writer should return to the office organization and enter the executive work of the office. He should become familiar with all details that must be given attention after the drawings and specifications have been completed, interesting himself in the securing of bids and their tabulation for presentation to the owner and be prepared to discuss them in an intelligent manner. He must make awards of contracts, prepare the necessary contract agreement papers and, in every way come to understand all steps in the progress of the work after bids are solicited. When construction work has started the attention of the specification writer must be directed to the full size details, making sure that the drafting room supplies these in regular sequence, so as not to delay the preparation of contractors' shop drawings and so that, wherever necessary, detail explanations of intricate or unusual features, merely indicated on the general scale drawings, are supplied. When the shop drawings begin to arrive in the architect's office they must be given proper attention, making sure that all requirements of the drawings and all provisions of the specifications have been adhered to or that good and sufficient reasons have been advanced for variations the shop drawings may show.

Perhaps simultaneously with the preparation of full size detail drawings, but most certainly shortly thereafter, the question of the selection of materials, in cases where the specifications have granted the architect a choice, and the approval of samples of materials the contractor is to furnish, must be given attention. Great care must be given this work, to make sure that superficial impressions of an article that has been submitted as an alternate to that which has been specified do not cause the approval of an article lacking merit. The general knowledge of the specification writer, gained in the university, office and field must be depended on to supply the grounds for the acceptance or rejection of submitted samples strictly on the basis of intrinsic value, adaptability to the use to which it will be put and permanency after installation. Adherence to the provisions of the contract documents must be the ruling factor, unless, as suggested above, there are very good reasons otherwise. It is presumed that the decisions of the specification writer or drafting room, as expressed in the specifications or on the drawings, have been the result of extremely careful consideration of the problems involved. Of course, at times specific decisions are reserved until after it is known the building is to be constructed as designed but generally the decisions, once having been made, should not be changed except where absolutely necessary.

AFTER construction work has progressed beyond the excavation stage attention should be given the reports of the field superintendents so that material that may hold up the rapid progress of the work may be followed up in the shop to insure its prompt delivery. Occasional visits to the operation will assist the specification writer in general supervision of the work so far as his specifications are concerned and refresh his mind with respect to the practical aspect of the work. Discrepancies and ambiguities that are not apparent when read in the office stand out as if printed in bold faced type when a keen-eyed contractor's superintendent calls attention to them. Such errors should be admitted unequivocally, so that the respect of the contractor may be maintained and to gain his co-operation, rather than opposition, in their correction. This spirit of fair dealing should obtain at all times, not only in the field but in the preparation of the drawings and specifications as it will lead to more complete unity of purpose between the architect, owner and contractor.

The description of the duties of the specification writer, as given herein, contemplates a broadly educated, broad-minded man who is thoroughly competent to supervise the activities of construction work because he knows from personal experience how each step is accomplished. It is not necessary that he personally attend to all details, but he must have supervising control, under direct authority of the architect, of all executive duties pertaining to the constructive processes.

The specification writer should have charge of the drafting room, with a chief draftsman who is directly responsible to him in the preparation of drawings. This supervision is urged as the logical source of authority on the assumption that the specification writer, because of his education in all branches of the office and field organizations and his familiarity with the many problems that must be successfully met is the more competent. If the chief draftsman has the training the specification writer should have it is very probable he will merge the duties of the specification writer with those of his own. This is the method of organization pursued in many offices and cannot be condemned except on one point. That point is, a chief draftsman should devote all his energies to detail supervision of the drafting room while the specification writer should devote his energies to specifications. These duties can not properly be assigned to one man except in those offices where the attention of each man must be given to his own special work half the time. Under such conditions this arrangement is effective and, perhaps, ideal. Nevertheless it leads to the conclusion that, after all, the specification writer should control the production of drawings and specifications and not the chief draftsman.

THROUGHOUT the years of preparation it is necessary to pass before assuming the duties of writing specifications, and what is of greater importance, after having assumed those duties, it is quite essential that current technical magazines and books be read conscientiously. The magazines frequently contain items of interest, such as reports of tests of materials, descriptions of processes found adaptable to certain difficult methods of construction and data with respect to the successful or unsuccessful use of comparatively new materials and methods.

The technical books are of great value because of the wealth of information they ordinarily possess. Immediate points of interest in magazines and books should be noted and recorded in a permanent file while the general items should be read with the expectations that they may be found readily when future necessity requires their re-study.

The specification writer will find that careful reading of well-written editorials, technical articles and books will quicken his thought and give him greater facility in the writing of specifications in an understandable manner. This phase of the daily work can very well be given the time necessary to survey the current articles, notes being made of the items requiring thorough study at a more convenient time. An orderly study of what is being accomplished by others is the one inexpensive and readily available means of keeping abreast of the times and this the specification writer must do if he expects to progress and retain mastery of himself and of his work.

One of the most important attributes the specification writer should cultivate is that of being capable of analyzing the drawing to determine the scope of the specifications and what they must include. If the preparation of drawings is under the control of the specification writer he will have the means at his disposal readily to have them prepared in the way he requires so that the drawings and specifications may be made completely co-operative. However, even though this ideal arrangement prevails the analytical mind remains as essential as under less ideal organization of the office.

The specification writer must be so equipped mentally that, when looking at the blue prints, he will be able to visualize the drawings in perspective or in other words to think in three dimensions while the drawings present their detail in two dimensions. The mind must carry itself beyond the drawings to the building, how the many parts are to be constructed and what relation one item bears to another. It is not enough to look at a sectional elevation and see only what appears on paper. All other drawings must be memorized so thoroughly that when looking at the sectional elevation those parts of the building that would appear are logically brought to mind.

IT must be borne in mind that drawings necessarily cannot show—and should not show—except perhaps by indications, many things that are essentially subject matter of the specifications. The specification writer must differentiate between those things that the drawings should show in detail, what the specifications must include in detail and what either the one or the other may include merely by indication for more explicit explanations in the other documents. A mind trained to analyze the work with this object in view is a valuable asset for the specification writer to have as it renders his work of greater ease in accomplishment, gives a certain orderliness of thought with respect to the preparation and assembling of the specifications and gives greater assurance of a successful building operation.

Specifications are most frequently written when the drawings are nearing completion and after the major details of the work have been determined. These specifications will be given greater scrutiny by those interested in the work than many believe to be customary. They are presumed to be the instructions of the architect, conveying to him in understandable language of what the operation consists and how it is to be accomplished. The specifications form an important part of the entire contract documents and if they are prepared by a specification writer possessing a modicum of the attainments mentioned herein, the architect, owner and contractor may well feel assured that a successful building construction operation will ensue.

DEPARTMENT OF ARCHITECTURAL ENGINEERING

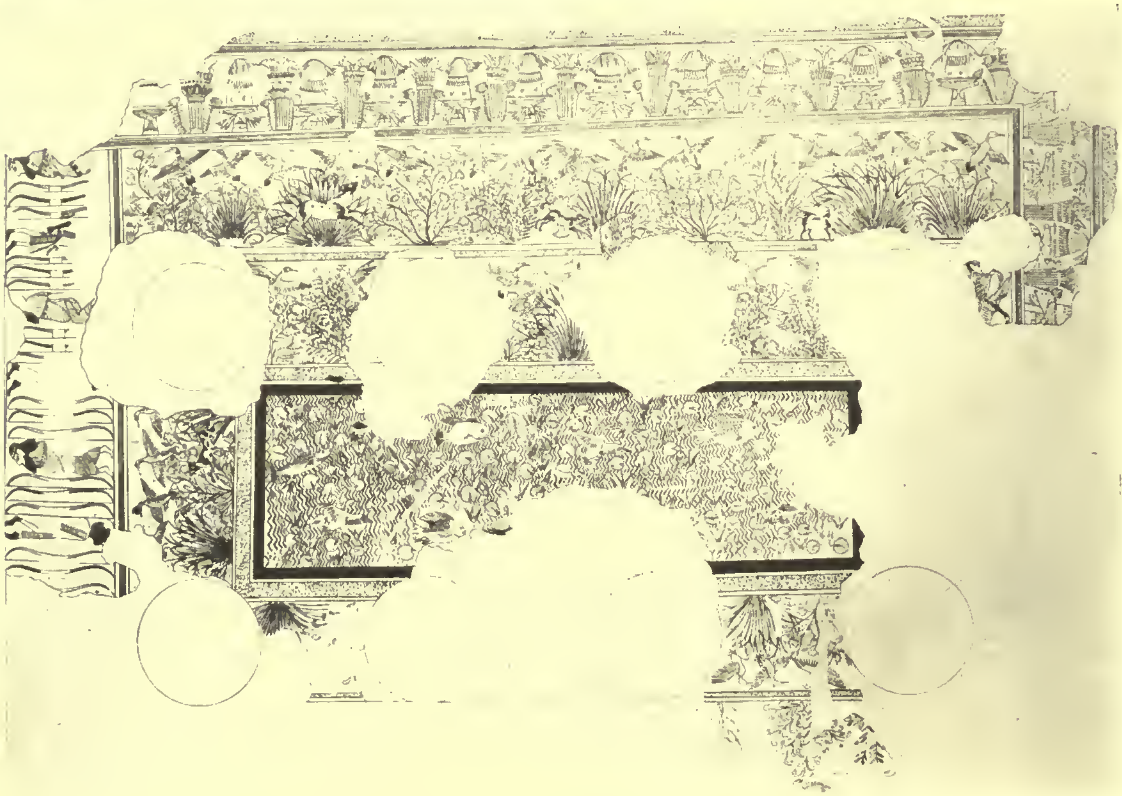


FIG. 1. WEST HALF OF PAINTED PAVEMENT, TELL-EL-AMARNA, EGYPT

THIRD ANNUAL CONVENTION of the NATIONAL LIME ASSOCIATION

THE National Lime Association held a convention in the Commodore Hotel, New York City, from June 14 to June 17, inclusive, the last three days being open sessions which the lime-using public was free to attend.

Some of the facts presented had a surprising interest for many of the visitors, who discovered, for example, that the amount of lime used in construction work is a rather small per cent. of all the lime used in the United States. Agriculture consumes a much greater per cent. and the general chemical uses of lime are on the increase. The report of Dr. Holmes, manager of the chemical section was most interesting. After listening to him the wonder is that the general public knows so little about this most important product. Has one ever stopped to think that when the oil wells of the world run dry and chemists begin to extract oil from the oil bearing shales that without lime, and lime in enormous quantities, it cannot be successfully done? Has one ever stopped to think of the importance of lime in the industries in which bleaching processes are followed?

Or of the medical uses of lime? The architect and engineer and contractor have often regarded the lime salesman with a pitying eye, wondering why the poor devil does not get into some other line because portland cement is so rapidly assuming vast importance in construction work. After attending a convention of the National Lime Association one has an itching to buy stock in a lime kiln. The great rival of lime in the construction field is forgotten, until a lime manufacturer gently remarks that portland cement is two-thirds lime. The tone of the convention was optimistic and one fell unconsciously into the way of thinking of the lime men, who see with prophetic eye every foot of arable land some day covered with their product, every building full of lime in one form or another, the people eating lime-impregnated foods, the doctors prescribing lime-filled capsules, the automobiles buzzing around with lime-extracted oils.

FIG. 2. ROMAN STUCCO-DURO, DETAIL OF PART OF A VAULT FROM A TOMB IN THE VIA LATINA, ROME

Lime Mortar

THE ordinary text books tell us that limestone is a carbonate, which, burned in kilns to expel carbon dioxide and moisture, again hardens into a stone by absorption of carbon dioxide from the atmosphere. Sand is added to give bulk and furnish voids through which the air can get to the lime and harden it, the sand combining with the lime forming a sandstone. The books tell us that the process of hardening of lime is "desiccation," or a drying out. When a thin layer of lime mortar is put between bricks or stones the carbon dioxide in the air first in contact with the lime turns it into a carbonate and little by little the hardening lime on the outside shuts off the air supply to the interior. Finally the mortar to a depth of half to three-quarters of an inch is hard, and the mortar on the interior, lacking the proper amount of air, cannot harden, the small amount of moisture trapped within finally causing it to become friable. Even with the greatest pains taken to insure a plentiful supply of dry air to the lime on the interior of a wall, the process of hardening is very slow, sometimes taking years.

Moisture being present everywhere in the air proper desiccation is impossible, so hydraulic limes and cements, notably portland cement, all of which harden by the process of "hydration," have been supplanting ordinary lime. The advantage to the builder of being able to count on a mortar setting within one day and obtaining its final strength within thirty days is real, so that in these days of rapid building the fact that "hardening by hydration" is preferred to "hardening by desiccation" is not to be wondered at. The moisture in the air is a help and not a hindrance with mortars containing hydraulic lime or cement.

As illustrative of the instinct of cupidity in mankind, the lime manufacturers, although the construction industry takes only a part of their product, do not want to lose anything to the newer chemical products. They have a large staff of chemical research workers studying the matter of regaining supremacy in the building field. The president, Mr. Charles Warner, had the following to say about this in his annual report:

Quick Hardening Lime Plaster and Mortar

TAKE, for instance, the problem of developing the best type of quick hardening lime plaster and mortar. This question is of great importance to the construction field. It has been attempted more or less superficially and spasmodically by many manufacturers as well as in some of the past efforts of your association staff.

To get at this problem there are four major lines

FIG. 3. FIFTEENTH-CENTURY WATTLE AND DAB, FROM QUEEN'S HEAD INN, DOWN, KENT

of study and research that have to be undertaken, and each of these four major divisions fans out into numerous sub-studies and minor researches to uncover any facts bearing on the main proposition.

The four major studies cover:—

First—The effect of burning, grinding and hydration in various combinations and in conjunction with other ingredients to locate any refinement in manufacturing progress that may stimulate hardening in the finished product.

Second—The study of any hardening materials which of and by themselves and upon addition to lime will harden the mixed product. This covers the field of Portland Cement, gypsum, Keene's Cement and numerous other quick hardening products as additions to lime. Possibilities in this direction are but very slightly known and careful research work through a long series of tests is essential.

Third—Since carbon dioxide is the ingredient first naturally employed in the normal hardening of plasters and mortars, but limited by the slow effect and small quantity of this gas found in normal atmosphere, it becomes necessary to determine all materials, such as charcoal, which might absorb carbonic gas in quantity yet hold it so loosely that upon admixture with lime and water a quick release of the carbonic gas would produce rapid carbonization and hardening through the mass. There are many materials which can hold carbonic gas in this fashion, but their various effects and manner of action in combination with lime products must be throughly investigated through laboratory studies and practical application.

Fourth—In chemistry we not infrequently find materials which in small quantities added to some other product will cause that other product to take on entirely new chemical and physical characteristics. It is within the bounds of possibility that we can locate among the numerous chemical compounds, such a material which upon addition in small quantities to lime will immediately establish in the lime an entirely new hardening characteristic and solve our problem in that fashion. This would make of lime a self hardener like cement and gypsum, which cementing materials do not need the use of any help from the atmosphere for hardening throughout the mass."

Lime and Cement

THE "desiccation" and "hydration" methods of hardening are used to make cement mortar more plastic by the addition to it of hydrated lime. The mason likes a lime he can "feel" and Mr. Hart, Manager of the Construction Department, waxes eloquent on this point. The addition of hydrated lime very slightly retards the setting of the cement but not enough to interfere with quick construction, the effect usually being noticed only by the mason who thereby has time to do what he likes to do, and believes should be done, to obtain a bed of uniform thickness between layers of brick, thereby securing uniform bearing which of course makes for uniformity of strength. The lime with its affinity for moisture holds it until the cement demands it, when it is given up gradually and prevents too rapid a hardening of the cement, the inert lime then becoming one of the aggregates in the compound, filling the pores and thus increasing the density of the cement mortar. Without the lime it is claimed the setting and hardening of the cement leaves the mortar porous after the contained water is absorbed.

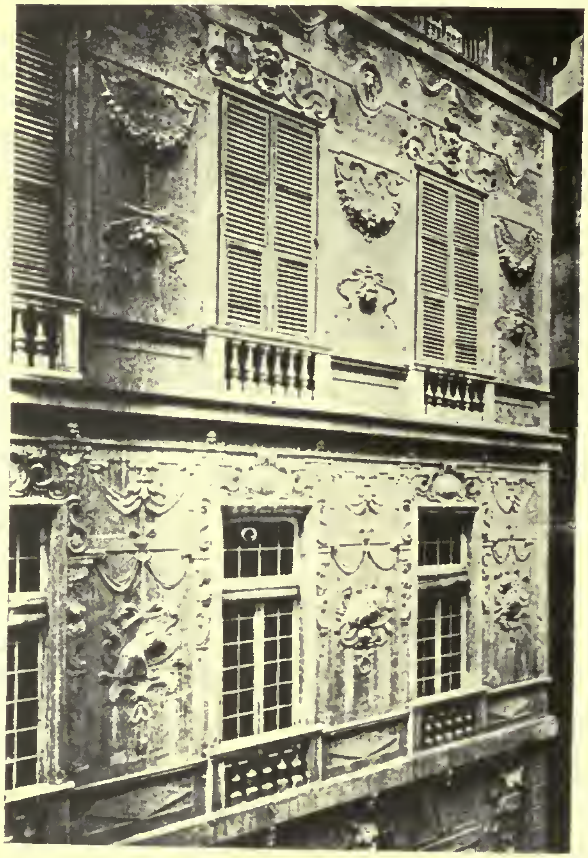


FIG. 4. EXTERNAL STUCCO-DURO FROM THE PALAZZO PODESTA, GENOA. ERECTED 1503

Mr. Hart in his paper, "Wetness versus Fatness" argues from the proven value of hydrated lime in cement mortar that it is of equal value in mass concrete. Mr. Hart says, "Workability is the best word yet devised for the desired property; for 'plasticity' and 'flowability' cover only part of the meaning, while 'consistency' refers only to apparent wetness; but 'workability' like 'strength' has a wide application. Strength covers compression, tension, shear, torsion and combinations of all these properties. In the same way workability includes easy dumping, proper flowing past and around obstructions into complicated forms, freedom from segregation and air pockets, easy tamping and easy finishing. Up to the present time no one word in English has described this quality, but, 'One must *feel* it with his tool,' as the masons say."

The Good Old Days

MR. HART mentioned a contractor in Georgia who made the remark that the old fashioned shell lime was far superior to modern sorry limes.

For the benefit of believers in the glorious days of old it is the mission of men in the Construction Bureau to tell users that lime has not lagged behind other building materials, but has been greatly improved within recent years. A generation ago many rocks were used in lime manufacture which are not touched today. There are great differences in limestones and the chemist today directs the lime burner.

The modern shaft kiln in which the fuel is burned separately from the rock, does away with the mixture of fuel and ashes with the lime; permits of proper temperature control with uniform temperature throughout the kiln; permits of inspection at every stage and keeps the boulders moving, thus making the product exceedingly uniform.

Manufacturers have cut down the time and cost for manufacture and introduced improved methods of handling. In the good old days only lump lime was produced, which had to be slaked and cured on the job. Today hydrated lime in the form of powder is in general use, greatly decreasing expense and making it as convenient as cement for all purposes. Modern contractors cannot afford the time necessary for slaking and aging lump lime and the scientifically slaked hydrated lime in the form of a fluffy powder caters to the speed spirit of today.

Machine Mixed Mortar

MR. W. C. HAY of Los Angeles gave an interesting description of the development of mortar mixing machines. He described the process of slaking, aeration and curing, telling about deliveries to buildings several miles from the plant. He quoted the following interesting retail prices at the mixing yard:

Brick laying mortar	\$4.25 per cu. yd.
Fibered lime plaster mortar	6.00 per cu. yd.
Keene's cement gauged lime plaster mortar	9.50 per cu. yd.
Lime putty	18.90 per cu. yd.

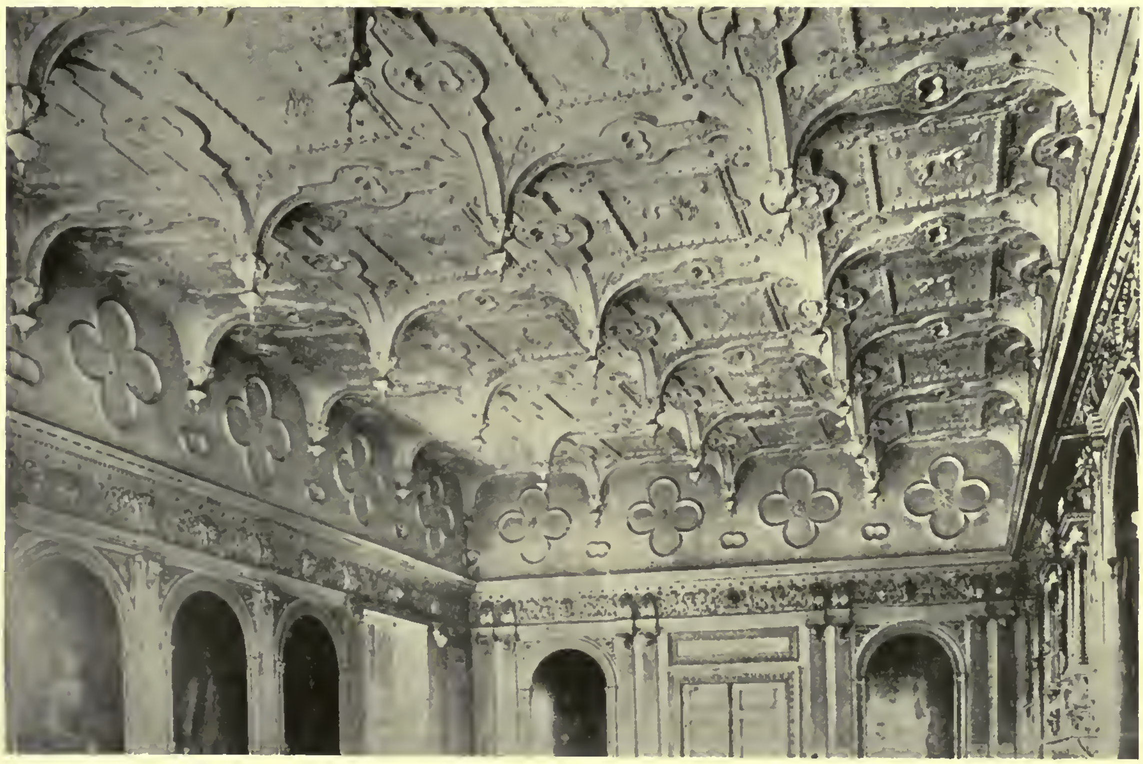


FIG. 5. THE "FISH ROOM" CEILING, AUDLEY END, ESSEX

The finest existing example of the pendentive type of plastered ceiling, executed during the period of the highest development of plaster work

Cartage costs \$1.00 per cu. yd. extra for any distance up to three miles, after which there is an additional charge of 15 cts. per cubic yard per mile or fraction of a mile.

By comparison he gave the cost of brick laying mortar mixed on the job as varying from \$6.00 to \$7.00 per cu. yd. and plaster mortar at about \$13.75 per cu. yd. The machine mixed mortars are considered by masons and plasterers to be far superior to the more expensive hand mixed mortars prepared on the job. The violent agitation of cured lime putty reduces it to a thick fluid with an increase of 25 per cent. in spreading capacity. This thorough aeration cannot be obtained by hand within a reasonable cost.

Mr. Shertzer, Construction Engineer for the Eastern Bureau stated that modern lime mortar mixing machines used the principle in use 1500 B. C. in Egypt. In those days, the best lime mortar was beaten with oak staves by slaves and cut with metal knives, these processes being alternated until the lime was of a creamy consistency and free from lumps. Mortar thus prepared was hard and durable.

Examples of Lime Plaster Work

MR. SHERTZER on the last day gave an illustrated talk on the durability of good lime plaster. Fig. 1 is from Dr. Wm. Flinders Petrie's work "Tell-el-Amarna" and shows the condition of a floor in a room 20 x 60 ft. in 1916. This floor was laid about 1500 B. C. and the colors were wonderfully bright when the excavators laid the floor bare. In a near-by storeroom some of the original pigments were found and the illustration in the book was colored with paints in which these pigments were used. The surface of the floor when found was as hard as when new, despite the passage of 3416 years and probable use for many years before the desert sands covered it from view.

This floor was probably laid in the manner described by Vitruvius who spoke about three thin layers of lime and sand mortar placed and beaten, followed by three thin coats of lime and marble dust mortar also beaten, in which durable pigments were frequently used. The hard surfaces were often colored with oil paints and he stated that the surface of well finished stucco reflected images.

Fig. 2 shows a detail of part of a vault from a tomb in the Via Latina, Rome. The lower portion, in relief, resembles fine carving. At the top is a painted panel. Vitruvius states that persons used to get slabs of plaster from ancient walls and used them for tables, the material being so beautiful in itself.

According to Banhart "The Art of the Plasterer" from which Fig. 2 to Fig. 5, inclusive, were taken, the best quality hard surface lime plaster was known as "Stucco Duro" and the common lime plaster was known as "Parget," or "Parge." Today the word "stucco" is practically confined to plaster on the outside of a building, exposed to the elements.

Common walls for homes of the poorer classes in England in the fifteenth century were of "Wattle and Dab," or "Daub" according to locality, as shown in Fig. 3. The frame and studding of hewed timbers show at "A" and "B." Small branches and withes of willow and other trees were woven between and around the studding like rough basket work as shown at "C." The spaces were filled with mud and a coating of mud placed on the walls as shown at "D" and "E." The final coat of parget is shown at "G." This picture of a building over three hundred years old not only shows the original materials but at "F" is seen the back of some modern plastering on laths done when restorations were recently made.

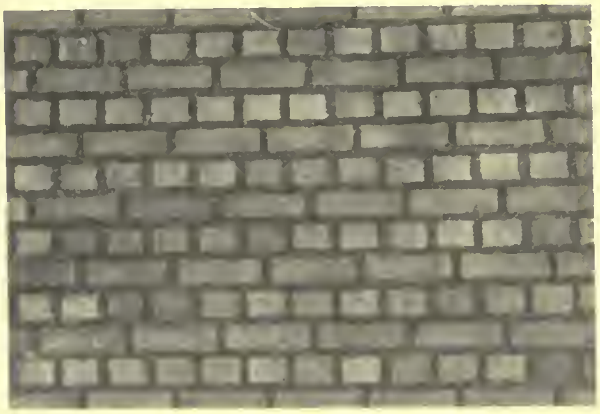
Fig. 4 illustrates exterior lime plaster work and Fig. 5 interior lime plaster work of stucco-duro. The showing made of properly executed lime plaster indicates that on the score of durability it has nothing to fear from newer materials. In the element of time required in which to harden it is suffering a present disadvantage, which, in view of the present scientific attitude of the lime manufacturers cannot long endure.

BRICKS of CONCRETE with TEXTURE of CLAY

AWAY back in ancient times before the dawn of recorded history men used small rectangular blocks of clay for building walls. At first dried in the sun and later burned in kilns, they have persisted through the centuries because nothing better has been produced for the purpose. The size is that most conveniently held in one hand and recent attempts to save cost of labor by making units equal in size to several brick have not met with unqualified success. It is not only a question of cost of placing, but it is a question also of appearance, for people have grown accustomed to seeing brick walls and like them. Large hollow units of clay simply serve as background for stucco exterior walls or plastered interior walls. Concrete blocks are not brick and cannot imitate brick, not always being a good imitation of stone unless one wishes to pay for hand cutting.

Because building brick have been made of clay since men began to use this convenient building unit, a feeling has grown up that brick made of other materials are imitations. Definitions should never be forgotten. A brick is a rectangular unit of material of convenient size to be held in one hand. We have bath brick for cleaning purposes, ice cream bricks, etc., and in prosperous times when money is easy the newspapers record sales of gold brick, all of which should be borne in mind when men talk about bricks.

Along with the genuine liking which exists for brick walls has grown up a liking for the texture peculiar to clay brick. It is because of this that men who use other materials must produce brick with a surface texture not distinguishable from clay. Recognizing this fact, the question naturally arises as to why men should endeavor under such handicaps to produce building brick of any material other than clay. The answer is that in some localities and under certain conditions these other materials are lower in first cost, this being notably the case in some parts of the United States today. For good face brick with smooth surface and for enamel faced brick no question of body material arises for only the face is seen.



A WALL OF CONCRETE BRICK WITH FLUSH JOINTS

Mr. Carrere once had to use a lot of white enamel faced brick and asked Mr. Crozier, who was making brick of concrete, to experiment for him. It was at that time not wholly a question of cost, speed in completion of his work and a shortage of good enamel face brick causing considerable embarrassment. A white brick was produced in which the aggregate was white marble and the matrix was white portland cement, the cement film on the face being washed off with acid. These brick were substituted for the white enamel faced brick originally specified, the texture of the acid-treated marble aggregate being highly satisfactory.

The experiments were continued with a view to lowering cost of manufacture and today the face brick consist of a body made of wet-process pressed concrete with a facing layer containing any desired aggregates. These brick compare favorably in appearance with clay brick similarly faced and compete successfully in price. The latest development has been the production of brick without a special

A WALL OF CONCRETE BRICK WITH RAKED JOINTS

facing which imitate in appearance ordinary clay building brick. They, of course, have a trade name, "Crozite," which applies to all brick made of wet concrete in the machine of Mr. Crozier. The wet-mixed concrete is placed in a high vertical tube and

REST BUILDING OF CONCRETE BRICK IN A MILWAUKEE PUBLIC PARK
ALFRED C. CLAS, *ARCHITECT*

pressed out at the bottom in a manner resembling the pressed-clay process. At the bottom the brick are cut off so that the surface texture cannot be distinguished from that of clay brick.

The brick are colored by the makers to match any given shade and are made in standard size. There was a brick shortage lately in the vicinity of New York and Mr. Crozier supplied his brick made of concrete to a number of builders, who worked them into clay brick walls and no one could see any difference in the texture of these walls. The price was somewhat lower per thousand than the then ruling price of clay brick. The Rest Building here illustrated was built several years ago in a public park in Milwaukee, Wis., of Crozite brick, ornaments in walls and columns being of terra cotta. The two smaller cuts are from photographs of recently built walls showing admirably that a brick after all is merely a wall unit of most convenient size and may be fabricated in any material possessing proper strength and durability, properties which no one denies are possessed by properly made concrete. Recent tests at Columbia University make a favorable showing for concrete brick.

IRON AND STEEL

A Discussion of Steel Making Processes As Applied to Iron Manufacture

IN building construction iron and steel are used for two general purposes. Steel is used for structural purposes because of its strength measured in terms of weight. The sections employed are heavy and substantial. Durability is secured by applied protection of various kinds. For uses other than structural, strength is not the greatest of the essential elements and the sections are usually thin and light in weight. Their exposure to the elements is generally severe in buildings and this requires care in the selection of protective coatings. Protective coatings at best have a limited capacity for service, measured in terms of time, and, therefore, the inherent durability of the material is an important factor. Being used in light sections, the effects of corrosion are more disastrous than in structural parts where there is usually a margin or factor of safety allowed for this and other causes.

The first step in the manufacture of iron and steel is the smelting of the ore in a blast furnace and the production of cast or pig iron from which is made iron foundry products, wrought iron and steel.

According to Sauveur, chemically pure iron is not a commercial product and can only be obtained in small quantities by carefully conducted laboratory manipulations. Therefore, it is reasonable to eliminate pure iron from commercial consideration for it would probably rust more quickly than the commercial products. It should be remembered that all metallic ferrous compounds are susceptible in some degree to corrosion. Commercial iron is always contaminated by the presence in greater or less degree of at least five elements,—manganese, silicon, phosphorus, sulphur and carbon.

Wrought iron is the commercial name for iron free enough from carbon and other impurities to be malleable. It is made by refining pig iron in a non-regenerative reverberatory furnace (the puddling furnace) where it is worked up into pasty balls by hand operated tools by a process known as puddling. This process consists of "removing from the pig iron nearly all of its carbon, silicon, manganese and most of its phosphorus and sulphur by agitation in the presence of suitable cinder and gases of the proper composition and temperature, and by crystallization, due to the greater infusibility of the iron as the metalloids are oxidized.

The puddle balls, in a pasty condition, are taken from the furnace and mechanically squeezed into elongated masses known as "blooms." The blooms are rolled into "muck bars" or "puddle bars." The squeezing of the puddle balls into "blooms" expels a large amount of the slag and firmly welds together the particles of iron. The retained slag naturally is worked into the direction of the squeezing and rolling and gives to the iron its fibrous character and appearance.

"Wrought iron consists essentially of a mass of ferrite containing many elongated particles of slag." In both the longitudinal and transverse sections the ferrite grains are equi-axed, that is, they show no signs of having been elongated in the direction of the rolling. Microscopic inspection shows that there is no difference in the ferrite which forms the bulk of wrought iron and low carbon steel, both being equally crystalline. Therefore, the "fibrous" structure and "crystalline" structure of wrought iron and steel are erroneus ideas. The slag consists of ferric and ferrous oxides of iron, oxide of manganese, silicon and phosphoric acid. Its functions are those of protecting the iron against oxidation during the balling and in its passage to the squeezer and to offer resistance to corrosion.

The refining of cast iron for the production of steel is done in a Bessemer converter or in a regenerative reverberatory open hearth furnace. In this process the impurities are eliminated as much as possible by oxidation, aided by the fusing and oxidation of the materials placed in the bed of the furnace. If on test, a larger content of carbon or other element is desired, it is added to the metal. The metal is reduced to a fluid state during the refining treatment and is cast into ingots which are later reheated in soaking pits and rolled into billets.

The reduction of the iron to a fluid state permits the separation of the slag due to the difference in the specific gravity of the slag and the iron. When the melted steel is cast into ingots, it is free from slag which is the only content distinguishing wrought iron from low carbon steel. Since wrought iron contains but a small amount of carbon, melting and casting it into ingots would convert it into low carbon steel. There are, therefore, three grades of low carbon iron known as "wrought iron," "ingot iron" and "steel."

Barring the presence of slag in wrought iron, both wrought and ingot iron may have identical chemical compositions. When iron is obtained in liquid form and contains little carbon, it is called low or very low carbon steel; mild, very mild or extra mild steel; or soft, very soft or dead soft steel.

If the presence of retained slag in wrought iron is conducive to resistance to corrosion, it would follow that this material is better adapted to resist corrosion than low carbon steel. Evidence is not produced which shows that this material possesses entire immunity from corrosion and consequently protective coatings secured by galvanizing, plating or painting must be applied. The tonnage of wrought iron produced in this country is but a small proportio of the total iron and steel production. Its production by hand labor materially increases its cost over the cost of steel.

As corrosion is the result of exposure, it necessitates the elapse of long periods of time to measure its action. Accelerated tests are not satisfactory because they are not natural tests. Time tests then are of real value.

(To be continued)

Column Tests to Be Conducted at Madison, Wis.

A SERIES of column tests which are of very broad, general interest will be made at the Forest Products Laboratory.

The work, which will cover a period of four years, is for the purpose of obtaining data on the effect of density and defects, such as knots, checks, cross grain, etc., on the strength of structural columns of both southern pine and Douglas fir. The data will be used as a basis for recommending safe working stresses for structural columns. It is estimated that 160 pieces of 12"x12"x24' timber will be used. In conducting the tests use will be made of the new 1,000,000-pound testing machine at Wisconsin University. If possible the work will be started this summer.

As a Matter of Fact

The Editors, THE AMERICAN ARCHITECT:

THE June 22nd issue of THE AMERICAN ARCHITECT has just come to my desk and upon a casual perusal of the leading article in reference to the new Straus Building, Fifth Avenue and 46th Street, I note that the statement is made that the exterior walls are brick, faced with Buff Bedford Limestone.

This is an error as the building in question is faced with Variegated Indiana Limestone. The designation "Bedford," while not constituing an error, is an obsolete method of designating the product of this Industry. The statement that Buff Stone was used is an error, however, and in view of the variegated effect, may lead people to believe that part of the stone has become changed in color or stained, whereas the variegated effect was exactly what was desired. Therefore, we think that this error should be corrected in your next issue of this publication.

INDIANA LIMESTONE QUARRYMEN'S ASSOCIATION.

An Improvement in Magnesite Plaster

MAGNESITE PLASTER has been in the class of so-called "Patent" plasters for many years. The preparation on the job has called for a rather high degree of skill and considerable labor. The announcement has been made quite recently that several years of chemical research have had the satisfactory result of producing a powder which does away with former disadvantages. It is stated that this dry powder coming on the job in sacks may be mixed and applied with as little trouble as cement or hydrated lime.

Magnesite in 1920

THE year 1920 was a history-making year in the magnesite industry in this country. The shortage of the important product in the war period stimulated home development, with the result that production increased 94 per cent. in 1920 over 1919. The entire output was made in two states, California and Washington. Most of the California products were used as a plastic material, only a small part of it being used for refractory purposes. Practically all the Washington product, however, was dead burned and used for the lining of furnaces and smelters.

Sand and Gravel Production

ACCORDING to a recent bulletin issued by the United States Geological Survey, the total quantity of sand and gravel produced in 1920 was nearly 78,000,000 tons, or about 7,000,000 tons in excess of the 1919 output, a total value increase from about $46,000,000 to more than $62,000,000. The production of building sand increased nearly 4,000,000 tons. The output of molding sand increased more than 1,000,000 tons.

The AMERICAN SPECIFICATION INSTITUTE

Bulletins

THE first bulletin has been issued to all members and a number of criticisms and suggestions have been received. The Board of Governors have determined that semi-monthly bulletins shall be issued on the first and fifteenth days of each month, the series at first to consist of outlines for the various branches of work covered in the general outline which formed Bulletin No. 1.

* * *

It is hoped that it will very shortly be possible to start issuing additional bulletins covering materials and methods of construction and installation, making available to the members, in convenient and readily accessible form, all the interesting matter that now is distributed throughout many books and periodicals.

* * *

Members are requested to advise the office of the Executive Secretary what subjects they wish treated in these special bulletins and whenever possible the selected subjects will be given early attention.

* * *

It must be borne in mind that the activities of The American Specification Institute can only reflect the knowledge and spirit of co-operation of each one of its members. It is therefore very gratifying to know that some of the members have felt free to offer suggestions on some subjects that have been sources of annoyance to them.

The Secretary's Office

A NUMBER of offers of co-operation have been received from national associations, such as the Portland Cement Association, these letters suggesting that they will be glad to be of service to our members in every possible way. Members who wish information that they have found it difficult or impossible to obtain are requested to report their desires to the Executive Secretary's office and if it is humanly possible the information will be procured.

* * *

It is interesting to report that a letter has been received from *The Times,* published in Bombay, India, enclosing a clipping from their Engineering Supplement, published May 20, 1921, in which the organization of THE AMERICAN SPECIFICATION INSTITUTE is reported.

* * *

In addition to this gratifying news from a distant country it should be noted that the Engineering Association of New South Wales, Sydney, Australia, has sent a letter expressing the hope that the Specification Institute will be successful and that its members may be enabled to receive some benefit from our activities.

THE AMERICAN SPECIFICATION INSTITUTE
Gardner C. Coughlen,
Acting Executive Secretary.

CURRENT NEWS

Happenings and Comments in the Field of Architecture and the Allied Arts

Course to Aid Housing

WITH a view to helping solve the housing problem, Columbia University, New York, will use this summer the equipment of the School of Architecture for special studies of dwelling house construction and design. The university's announcement of this plan says:

"Special courses of lectures and drafting, dealing with the problem of the small house, the medium size house, the two-family house, the apartment house and others will be opened to all those who are seeking accurate information about the design, construction and equipment of these buildings. In giving these courses the school feels that it is opening its equipment for a broader public service at a time when the need is at its peak.

"Other courses intimately connected with domestic architecture will be given, such as architectural drafting and architectural model making, in which the student will be trained to express himself with drawing and the making of three dimensional models."

Soviet Russia Plans to Sell Art Treasures for Food

SOVIET Russian officials are putting into effect a decree that Russian art treasures, seized from palaces and from private individuals, shall be placed on the market and sold abroad to buy food. The decree provides for the creation of a "state fund of valuables and art luxuries," to be controlled by a committee of educators.

Many of the most famous paintings, statues and objects of art in the world will thus be thrown on the market when the plan is in operation. For many months these treasures have been collected and stored in houses at Petrograd and Moscow, where they have been catalogued by experts.

Whitney Warren's Plans for Louvain Library Accepted

IT is announced that the plans for the reconstruction of the library at Louvain, France, prepared under the direction of Whitney Warren, have been accepted by a committee of which Cardinal Mercier is the head, and that work will probably begin in July. The cost of this reconstruction is estimated at $1,000,000, of which $300,000, it is learned, have already been subscribed. It is not proposed to erect the new building on the site of the former library, but on a location in the center of the city.

Frame House in Plymouth, Mass., Built in 1677 Yet Standing

ONE of the most interesting features of the Tercentenary Celebration of the landing of the Pilgrims, to be held at Plymouth, Mass., during the coming summer, will be the opening to the public of the William Harlow house, built in 1677. This is one of the few buildings now remaining which stood within the lifetime of any of those who came on the "Mayflower," and it has a particular interest, owing to the fact that it was framed with oak timbers from the old fort, which, as Winslow relates, "was built in 1622 on the top of the hill under which the town was located."

After King Philip's War, when danger from Indian depredation had passed, the fort was dismantled and the timbers sold to Sergeant William Harlow, a man of prominence in the colony, who used them in the construction of his house on the ancient highway where it still stands.

About forty years ago, in repairing the house, the oak posts and beams were uncovered and the ancient mortises, made in fitting the frame of the fort, were disclosed. An old hinge was also found, which is one of those on which the gate of the fort hung.

There is thus established in this house a connecting link between the founders of the first permanent settlement in America, three hundred years ago, and the present generation.

Origin of Macadam

DURING recent "genealogical" research work at the Congressional Library, the following was found among the files of the "Gentleman's Magazine" (The Book of Scotsmen) published in January, 1837:

"John Loudon Macadam, surveyor, was born in Ayrshire, Scotland, 1756. In 1815 he was made surveyor general of the Bristol (England) sections of highways, where he effected many improvements in road constructions.

"In 1822 he published his 'Observations on Roads,' which, though it is in various respects erroneous, affected a salutary revolution in the system of road-making, by establishing the supreme advantages of roads covered with a layer of stones broken into small pieces, without any admixture of sand, clay, or other material. Roads covered in this way are said to be 'Macadamized.'

"Macadam, in reward for his public services, received from the government, in two grants, the sum of £10,000."

Building a Five-Room Bungalow in Ten Hours

AN example of the rapidity with which the housing shortage may be overcome was given recently by the Lumbermen's Association of Chicago, when 30 workmen employed by the association erected a five-room bungalow in ten hours. The task included the installation of electrical and plumbing fixtures and decoration of the interior of the house.

Des Moines Only City in the World Having Municipal Observatory

DES MOINES' municipal observatory has recently been opened to the public, in accordance with the plans formulated by its sponsors, states *The Improvement Bulletin*.

Work on the observatory building, interrupted during the winter, was resumed April 1, and the dedication took place about the third week in June.

With the opening of this institution Des Moines will become the only city in the world to have a municipal observatory although there are several observatories which are open to the public at stated periods.

The city of Des Moines is furnishing the material and men for the erection of the building, which is located upon the highest point in Waveland park. A lecture hall and instrument room will be the main features.

Instruments will be furnished by Drake University and instructors from the university will demonstrate the use of the large telescope and other instruments and will give illustrated "talks" in order that the public may "see the universe." Lectures and instructions will be under direction of Dean D. W. Morehouse, of Drake University, who will personally deliver many of the "talks."

For Town Hall in Every City

THE Town Hall designed to be a civic center in New York City for public meetings of all kinds related to the general welfare illustrated in a recent issue of this journal, should serve as an example to every town and city, states the American Magazine of Art. This hall, admirably designed by the well-known architectural firm of McKim, Mead & White and appropriately decorated under the supervision of Mrs. John W. Alexander, promises to become not merely a civic center but a real force in civic education for the people of greater New York. In arranging programs for the opening week care was taken to give indication of the way in which this hall might serve as an instrument for a more enlightened citizenship. It was, therefore, of the utmost interest to find that one session was devoted to the popular appreciation of literature and art, thus indicating a conviction on the part of the founders that art is a factor in civic life as truly as the so-called practical and humanitarian subjects such as education, government, charities, etc.

Too much cannot be said in praise of the public-spirited, right-thinking movement which has found expression in the New York "Town Hall"—an institution peculiarly American and calculated to raise the whole standard of citizenship through normal methods on a sound basis. There is no reason why every city and town in the United States should not have a similar institution conducted on like methods.

Profiteers Forced to Build

SWITZERLAND has found a new use for war profits. The Swiss who reaped an excess profit during the war can get an abatement of taxes if he will invest his surplus in residential housing under official regulation. The regulation guards against unsightly and unsanitary building. It also restricts rentals to yield only a fair return on the investment. If the war profiteer does not care to put his easy money into this useful channel of public service at a fair return, the state takes a large part of it from him and itself subsidizes the building of homes.

Architectural and Building Exhibition in Liége

AN important exhibition is being organized at Liége, Belgium, by the Liége Association of Architects. The exhibition will be held at the Palais des Beaux Arts, Parc de la Boverie, overlooking the Meuse River, and will be open during the months of August and September next. Meetings of the National Congress of Belgian Architects will also take place during this period.

The exhibition will be divided into three sections, the first section being strictly architectural. Members of the Liége Association and their guests, the architects of allied countries, will exhibit works, both executed or in project.

The second part of the exhibition will be taken up by numerous examples of ancient and modern furniture, of all periods, executed by Liége cabinet-makers, carvers and joiners. The excellent work executed in the past by these artists is well known and it is pointed out that Liége craftsmen of the present day have lost nothing of the art of their ancestors.

The third section of the exhibition will deal with new methods of building construction.

Meetings of the Congress are being called by the Federation of Architectural Societies of Belgium, Monsieur A. Snyers, Architecte diplômé, Liége, being president of the Federation, and also president of the Liége Association.

Enquiries can be addressed to "Secretariat général," Exposition d'Architecture, 3, rue de la Boverie, Liége.

REVIEW of the CONSTRUCTION FIELD

With Reports of Special Correspondents in Regional Centers

The Business of Government and Business by the Government

PEOPLE who object that 68 per cent. of government expenses are incurred for national defense, regard themselves as discoverers of new facts. The truth is that government exists merely for the purpose of preserving a national entity. Properly organized, a government should see that natural economic laws are not set aside by powerful business combinations, to the end that free wholly legitimate competition may not be hampered. The natural law of supply and demand, or of production and consumption, will then operate and the greatest possible benefit will be secured by the individual whose taxes support the state. Ideally administered, nobody will object to paying 68 cents on every dollar of taxes collected in order to guard against loss of rights founded upon justice and morality. In the ideal government defense of the rights of the people should properly be the largest item of expense.

A false idea of "The State" as a personal Deity and an implicit faith in miracles continuously operating to set aside natural laws for the benefit of active minorities accounts for all the troubles into which the world has fallen. It is time a realizing sense of this truth were brought home to politicians. The real business of government is to keep the government out of business. The politicians alone seem not to realize this at the present moment, and by politicians is meant not only office holders, but the large number of people who approach the idol of brass and clay to right the wrongs of which it alone is the cause.

THE United States is contemplating a housing policy which will increase taxes in spite of the paralysis of business in England brought on by a similar policy there. We are in danger of becoming mendicants of government forgetting that we are the government. No matter how many new ways may be devised for buying things, no one has discovered a method for paying which supersedes the time-honored method of putting the hand into the pocket to find the coin. It may be true, as Sir Matthew Boyle said, "Posterity has done nothing for us," but that is not a good reason why we should so act that the belief of posterity in a simian ancestry may be strengthened.

The editor of *The Architect*, London, has the following to say about conditions in Great Britain on the interference by politicians with the orderly conduct of business according to economic laws:

> The present position of national chaos is clearly attributable to two causes, which are dealt with in a book written by Lord Rothermere, entitled "Solvency or Downfall," and forms a re-publication of a series of newspaper articles which might have been brought up to date by the inclusion of reference to the culminating misfortune of the present coal strike.
>
> With most of the conclusions of the writer we are in agreement, and some of them might be stated even more strongly. The two great mistakes which have led up to our misfortunes are, as Lord Rothermere states, the failure of those in authority to understand that the colossal expenditure of war time cannot be continued in times of peace, and the inability of Labour to recognize that only by increased effort and production can it hope to produce a betterment of conditions. The slackness, insincerity or stupidity of politicians has made our governmental policy socialistically anti-national, while it has consistently imposed heavy burdens on the taxpayer and spent the resources of the country on objects which evoke no enthusiasm among any section of the people.
>
> Formerly, if we spent money in the administration of a foreign country we at least obtained some advantage from it; now we are indirectly promoting trouble for ourselves in Egypt and India, while at the same time we make concession after concession to our avowed enemies. More than this, our Government has a perfect avidity for accepting "mandates" from the League of Nations for the philanthropic administration of countries like Palestine and Mesopotamia, which cost us heavy sums, without compensating advantages, at a time when everyone is burdened with excessive taxation. We, therefore, quite agree that the time has come to eliminate foreign adventures, but which the public conscience or public apathy determine shall not be of commercial advantage to us, and to cut down our armed forces to a minimum.
>
> We agree with Lord Rothermere that the new Education Act is, at any rate, a mistake in the present time, and that the absurd housing policy of the Government should be ended. We have not the means to subsidize colliers, railway men, or people who want cheap houses; and the greatest necessity of the time is the reduction of bureaucracy to its smallest limits. It will probably take years to do away with the pernicious belief that politicians have fostered in the minds of the people that by legislation we can interfere with advantage between employer and employed, for in the end such attempts come down to demands on the taxpayer for the benefit of small sections of the community who make claims for doles in continuous succession.

Why America Is Not Rebuilding France

AMERICANS do not seem to be playing a large part in rebuilding the housing facilities of France, and the editor of the *Engineering News Record*, who has been visiting in that country, gives some reasons for this in a letter to his publication.

In the first place, the French do not wish to admit that they need this sort of help. Aside from financing the new work and getting necessary raw material, they appear to be eager to do everything themselves. In addition to this, and perhaps of even stronger influence in shaping French opinion, it is clearly apparent that French traditions are incompatible with the mass-production proposed by some of the larger American contractors.

The French want to rebuild according to French ideas, having regards also for the traditions of ruined cities. Mass-production, with its inevitable sameness in thousands of structures, runs counter to these ideas and traditions. Furthermore, the French have pride in their ability to carry on construction in their own way, and construction cannot, in their judgment, be rushed. It can be taken in hand only as fast as the damages can be determined, and in the order of its economic importance. Building materials are scarce and must be distributed so that all districts and towns may make progress at about the same rate. They do not wish to hurry the permanent rebuilding of ruined cities.

Doubtless the strongest reason for all those mentioned is the desire to preserve French traditions and to carry out French ideas of architectural harmony. Even the country villages of France are picturesque and characteristic of the people who live in them. To one who knows the French character it is impossible to imagine in that country a mass of buildings substantially the same in appearance and actually the same in interior arrangement and equipment. We may not hope to introduce to the French the mass-construction in dwellings that some of our American contractors manage to impose on the people of our own land.

France may not rebuild as quickly as she would with the active aid of our rapid mass and factory-construction, but when she has the job finished to her liking the result will not be likely to violate French traditions and to be repugnant to French taste. It appears that our best way to help the French in their rebuilding is to do what we can in the way of financing and supply needed raw building materials and allow French taste and skill to do the actual building. We may make suggestions for what we would consider improvements and be ready to help where help of the sort we have to offer is needed, but wisdom counsels that we exercise much patience in the progress of having our suggestions accepted.

BUILDING CONDITIONS on the PACIFIC COAST

(Special Correspondence to THE AMERICAN ARCHITECT)

SEATTLE.—Uncertainties as to future prices of sheets, pipe and other building essentials of the steel family have served to soften a movement which had taken on fair proportions with jobbing houses of the Pacific Coast. Coast jobbers have been advised that Steel Corporation mills will meet competition in sheets and pipe down to sacrifices of $25 per ton, and this, added to the prospective reductions in rail freight rates from Pittsburg has scared buyers out. The feeling among them is that to buy now would give a competitor an advantage in both basic products cost that would be embarrassing later, and a general silence is felt from the trade and investors.

There has been a gratifying movement of galvanized pipe of halves and three-quarters such as is most generally used on the coast for apartment houses and dwellings. The home building, while not heavy from an individual unit base, has been great this summer in the total. Homes of $2,500 to $6,000 have been the most popular. Low lumber costs, with partial reductions in building labor, have helped materially in wooing investors from the discouraged frame of mind into which they had fallen. Building permits in Seattle in May totalled values of $1,566,-005, compared with $1,809,160 for May of last year. While there was a falling off in the total, there was a gain when comparisons are made between the buying power this season and last.

There have been many alterations and additions. Of the 1,044 permits issued in May, 486 were for alterations, seven for fireproof structures, four for slow-burning construction units, two for masonry buildings, and 521 for frame structures. The total estimated value of construction this year to date in Seattle is $6,585,225.

EASTERN rail lines after battling contrawise for several months, have consented to reductions in sheet rates from Pittsburg to Puget Sound, and it is now felt certain that these reductions will shortly be instituted. The old sheet rate is $1.66. The new will be $1.05.

The cement market is firm. Production on the Coast is at capacity and there is little reserve. The jobbing trade is selling only 30 per cent. of the cement moved last year, and it is inferred from this that the bulk of the products is going into road construction.

The fir lumber market is steady, with mills closing down for the July period all over the territory. Eastern rail enquiry is light owing to the prospective reductions in freight rates by rail and water. The railways will buy no maintenance lumber this summer, and this is weakening special cuttings, while holding the upward tendency in finishing lumber in check. Cedar logs are very scarce and prices of cedar siding are higher at $34 and $36 at the mill. Average sales of standard building sizes at the mill are $49 for No. 2 vertical grain flooring, $25 for No. 3, $19 to $21 for slash grain, $20 for ceiling, $20 for drop siding, $10.50 to $13 for boards and shiplap, and $13.50 for plank and small timbers.

[illegible]

MONUMENT OF GASTON DE FOIX, RAVENNA, ITALY

THE AMERICAN ARCHITECT

VOL. CXX WEDNESDAY, JULY 20, 1921 NUMBER 2372

ELEVATION OF STRAND FRONT, AS SCREENED BY CHURCH OF ST. MARY LE STRAND. SHOWING STUDIED RELATION OF STRAND TO CHURCH

The ARCHITECTURE of the BUSH BUILDINGS, LONDON

By HARVEY WILEY CORBETT, OF HELMLE & CORBETT, *Architects*

THE site of the Bush Buildings is in the geographical center of London. If you put your finger on what appears to be the center of a map of the City of London, you will touch this site. It is the last parcel to remain unbuilt of a section comprising many acres which were taken over some eighteen years ago by an act of Parliament. All the old shacks were destroyed, and cleared off, and new streets, Kingsway and Aldwych, running from High Holborn to the Strand, were built.

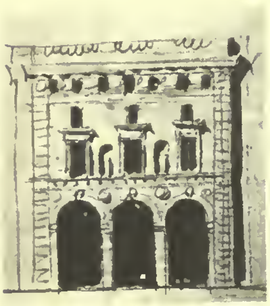
During the war the site was occupied by Y. M. C. A. huts known to every American soldier who passed through London by the name of "Eagle" huts. With the exception of the south side of the Strand and the little Church of St. Mary le Strand, which stands by itself in the middle of the street like a ship sailing up a river, all the architecture surrounding this building and on the whole length of Kingsway is modern, having been built within the past fifteen years.

The Strand front of the Bush Building has been particularly studied with an idea of serving as a frame to this little church, which is considered one of the architectural jewels of London.

The problem in the development of the site was to secure a location for the Bush International Sales Building and adjacent buildings to permit of the future development of the sales project. The new street of Kingsway, the finest business street in London, terminates at the center of this site, and therefore it was decided to place the International Sales Building as the terminus of this street, and have it stand free and unconnected, except by low arcades, with the adjacent Bush Buildings. This will make it the most striking feature of the whole of Kingsway, and the tower at its center will not only be viewed from the full length of Kingsway, but will occupy the unique position of being seen at least for half a mile to the east down Fleet street, and as far as Trafalgar Square along the Strand. There is probably not another site in the City of London where a point of architectural interest would form the vista of so many important streets.

ANOTHER interesting thing about the site is that during the eighteen years in which it has been vacant a great many projects have been started for it, but never completed. The most important among these was one to make it a center of all British Colonial possessions. Many sets of plans have been prepared for these different schemes, and several first deposits on the property have been made and sacrificed, so that London has had its attention drawn to this particular spot throughout all these years, and the curiosity of the people to learn of its final disposition is intense. In this respect the buildings of the Bush Terminal Company as proposed have aroused more interest than would be true of any to be built upon any other site in the city. The cost of the entire group of buildings when completed will probably reach, at the lowest estimate, the sum of ten million dollars.

SKETCH A



SKETCH B

SKETCH D

SKETCH C

SKETCH E

NIGHT VIEW, ALONG STRAND, AND SKETCH PROGRESS STUDIES OF STRAND END OF CENTRAL BUILDING

SKETCH F

The Building Act of London limits the height of all buildings to 80 feet to the cornice, and an additional two stories in a roof above this. Nothing is permitted to go beyond this height except it is in the nature of an architectural embellishment of which no use can be made. The tower feature of the Bush Buildings will be permitted under this later ruling. The buildings will all be finished, generally speaking, in the character of a first-class office building, such as we have constructed in New York, with all the modern facilities as to elevator service which has made New York the standard throughout the world.

The two side buildings are not equal in area, due to the fact that Kingsway does not strike the property quite at its center, but they will be treated to make as near an architectural balance as possible. The available area of the east building is about 200,000 square feet of floor space, the west building being about 230,000 square feet. The total

VIEW OF THE MODEL WITH CHURCH OF ST. MARY LE STRAND REMOVED AND A DIFFERENT STUDY OF TOWER IN PLACE

ground area of the site is approximately three acres.

There will be a passageway on both sides of the central Sales Building through gardens, with plantings and pools, stairways, and balustrades. There is a difference in level of one story between the entrance on the Strand side and that on Kingsway, all the land at this point of London sloping towards the Thames. The general character of the architecture may best be defined as a modernized Roman classic. The two lower stories of the adjacent buildings will be completed architecturally so as to permit their use for stores and banking purposes, being treated with a good deal of show window space. The central entrance which will form the vista of Kingsway will be a great recessed arch in which there will be two free-standing columns supporting a cornice and clock, silhouetted in the arch, forming the central feature. These columns will be 40 feet in height. The arch itself will be about 40 feet wide and 80 feet high. The tower column will be about 25 feet high, and the tower will be used as a point of observation from which the view of London will be the most interesting that can be secured from any point. Its height will be 300 feet.

AEROPLANE VIEW OF SITE, SHOWING THE ARMY Y. M. C. A. HUTS AS USED DURING THE WAR

This view is Northeast, overlooking Lincoln Inns Fields, Chancery Lane and the Law Courts

SAME AS VIEW AT LEFT, WITH PHOTO OF MODEL FITTED IN PLACE TO PROPER SCALE AND ANGLE

THE attitude toward this group of buildings from the point of view of the Londoner is one of intense curiosity because he has heard so much about it, and because he has watched this vacant property for so long a time. The London County Council, which has ab-

AEROPLANE VIEW WITH MODEL FITTED IN PLACE, LOOKING WEST ALONG STRAND TOWARD CHARING CROSS AND TRAFALGAR SQUARE

PRELIMINARY STUDY ALONG GOTHIC LINES OF VISTA DOWN KINGSWAY, RECALLING THE LINES OF THE BUSH BUILDING IN NEW YORK

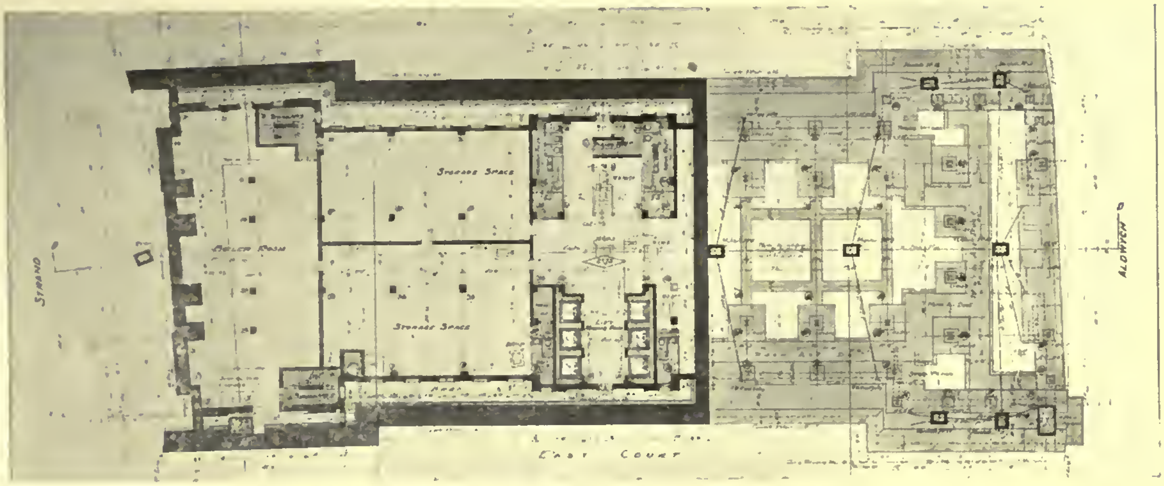
This was suggested as desirable for "trade" reasons, but was abandoned as being too much out of harmony with the existing environment

A FURTHER STUDY OF VISTA DOWN KINGSWAY, ALONG RENAISSANCE LINES

Abandoned as extreme tower height not permitted, another further reason that the structure itself lacked "emphasis" necessary to terminate so important a street

BUSH BUILDINGS, LONDON, ENGLAND

HELMLE & CORBETT, *ARCHITECTS*



CELLAR PLAN, CENTRAL BUILDING

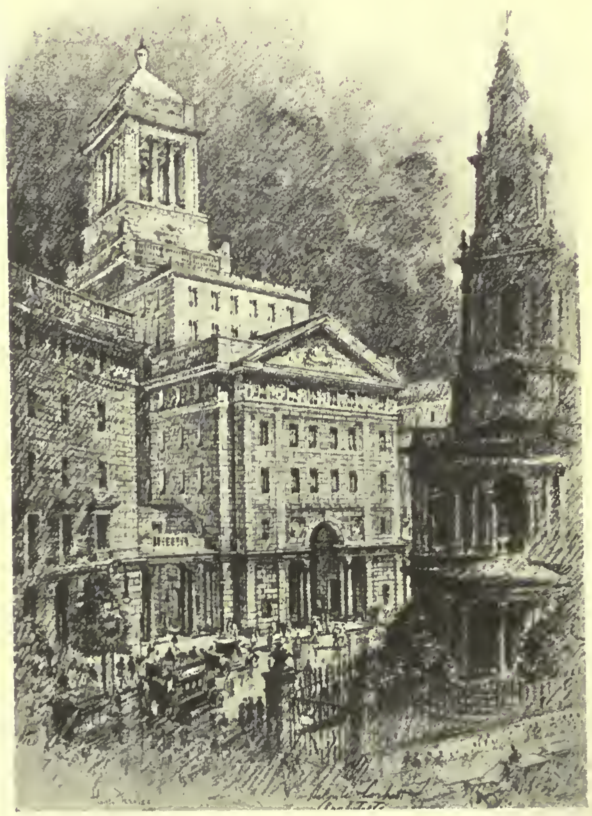
SIDE ELEVATION, CENTRAL BUILDING, COMPLETE WITH TOWER

SKETCH A

THE SCHEME AS FINALLY APPROVED

SKETCH D

SKETCH B



PERSPECTIVE VIEW OF BUILDING AND CHURCH OF ST. MARY LE STRAND, SHOWING "SQUARE" TOWER AND STREET FRONT OF BUILDING LIMITED TO THE LEGAL HEIGHT OF EIGHTY FEET TO CORNICE LINE

In margins, sketch progress studies for silhouettes of tower

SKETCH E

SKETCH C

SKETCH F

SKETCH A

SKETCH B

SKETCH C

Sketch studies for scheme of Aldwych end, Kingsway, where this building forms terminating vista.

solute control of every detail of construction, a control going far beyond the statute laws, showed itself more than ready to help us in every possible way. The London business man, to whom the co-operative idea of the buildings will naturally appeal, we found to be more than enthusiastic. London has for so many years been the greatest buying market in the world that an idea which would facilitate and increase this buying activity could not help but be received with enthusiasm.

There are many historical associations with the site on which the Bush Building is being erected. The house of the Earl of Craven, who championed the Queen of Bohemia in the seventeenth century, was here, and excavations by the builders have revealed a mass of garden mould and decayed roots of trees which, in all probability, formed a part of the garden of Craven House where these seventeenth century lovers concluded their romantic careers. Again, Nell Gwynne lived across the street in the hey-day of her glory, whilst another celebrity of the locality was Jack Sheppard, whose life was spent in the purlieus of Wych street and Magpole alley.

The Strand, too, is rich in historical interest, and with the construction of the great Bush Buildings the last glimpse of the Strand, perhaps for years to come—in the sense of the good mother earth on which the historic thoroughfare was laid so many centuries ago will be shut out with the covering of the "island" site. Many stirring scenes have been enacted here and thereabouts. Upon the Strand,—the name is held to be clearly of Saxon and not Norman origin — Earl Godwin and his son Harold, in 1052, drew their land forces in the insurrection

PERSPECTIVE WITH MODIFIED STUDY OF TOWER AND STREET FRONT OF BUILDING RAISED ONE STORY ABOVE LEGAL HEIGHT WHICH WAS PERMITTED BY SPECIAL ACT OF LONDON COUNTY COUNCIL BECAUSE OF THE "ARCHITECTURAL" NECESSITY OF A DOMINATING CENTRAL MOTIVE IN A FAÇADE SO LONG

SKETCH D

SKETCH E

which they headed against Edward the Confessor.

AT a later date several theatres sprang up, The Globe, The Opera Comique, and The Olympic, the last built over the site of Craven House. It was founded by Astley, the celebrated circus proprietor, and later contained the first revolving stage in London, evidences of which were found during excavations, in the shape of massive brick foundations at a very low depth, together with the girders and pivots on which his stage revolved. Astley called his theatre a "house of public exhibition of horsemanship and droll." In Wych street proper were some earlier buildings with over-hanging timbered fronts which probably had claims to picturesqueness, but the builders over the rest of the property appear to have rivalled in taste their descendants of the late Victorian era.

VIEW OF MODEL OF ENTIRE GROUP, WITH CHURCH OF ST. MARY LE STRAND
This was made at 1/32" scale, of cardboard, drawn and rendered
BUSH BUILDINGS, LONDON, ENGLAND
HELMLE & CORBETT, *ARCHITECTS*

BEAUX-ARTS INSTITUTE of DESIGN

DIRECTOR OF THE INSTITUTE, LLOYD WARREN

ARCHITECTURE, RAYMOND M. HOOD
INTERIOR DECORATION, ERNEST F. TYLER

SCULPTURE, JOHN GREGORY
MURAL PAINTING, ERNEST C. PEIXOTTO

PROGRAM

CLASS "A"—III PROJET

The Committee on Architecture proposes as subject of this Competition:

"A STORAGE WAREHOUSE"

The high value of real estate in New York City has recently forced the development of a type of warehouse devoted exclusively to the storage of old files and documents for banks, insurance companies and other business organizations which cannot afford to set aside the necessary space in their own building or quarters for this purpose. Thus all sorts of papers and files, for which there is no need of immediate or continuous reference, are sent to this storage building where space is rented. Such a building is naturally placed on a piece of property, not too far distant from the center of the business activities that it serves, but where land values are much lower.

The plot on which this building is to be built is in the form of a right-angled triangle, the hypothenuse and long side of which face two converging streets of equal importance, and the short side abuts adjoining property. The short side of the property measures 150 ft., the long side 200 ft., and the hypothenuse 250 ft.

The general requirements for the building are as follows:

There shall be one public entrance and one service or freight entrance at the street level, so disposed, that the main office of the building shall have full command of both entrances, as the control of the exits and the entrances is naturally of the first importance in a building of this character. The space occupied by the offices is relatively small, as it requires but few clerks and executives to handle the work of such an establishment.

Approximately 100,000 square feet of floor area is required. This area can be arranged in any way desired, bearing the following conditions in mind: (1) that the area requirements of the different tenants vary, so the form of the building and the units of space adopted should permit of great flexibility for sub-division; (2) all floors should be inter-connected by service stairs, and by freight and passenger elevators, preferably one each of the last two; (3) space near exterior light should be provided on each floor where occasional clerical work may be done in connection with the files; (4) exterior light for the storage spaces is optional, although for ventilation it is advisable to provide a few windows, which at the same time may serve as direct light for the clerical spaces mentioned above.

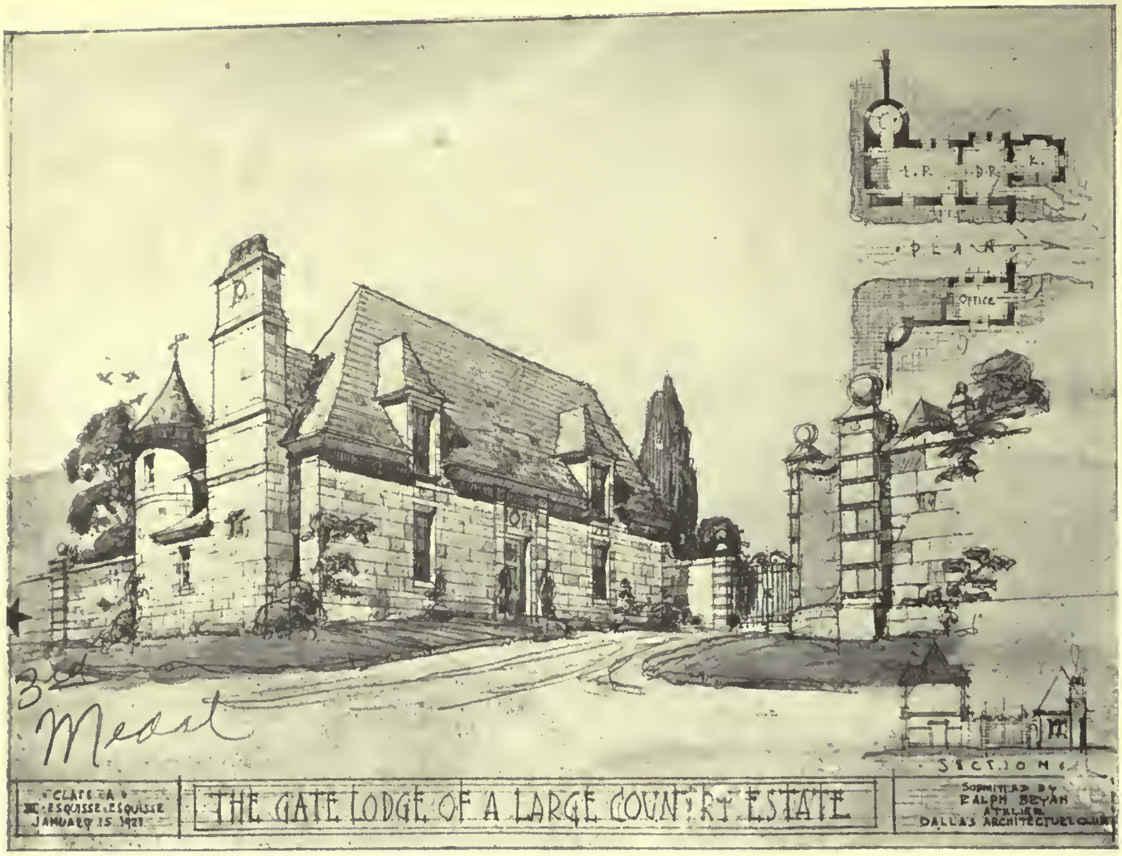
It will be seen that great freedom is allowed in handling the mass of the building, but the exterior should express the solidity and stability suitable to an establishment devoted to such purposes.

JURY OF AWARD:

B. W. Morris, C. H. Aldrich, H. Hornbostel, J. W.

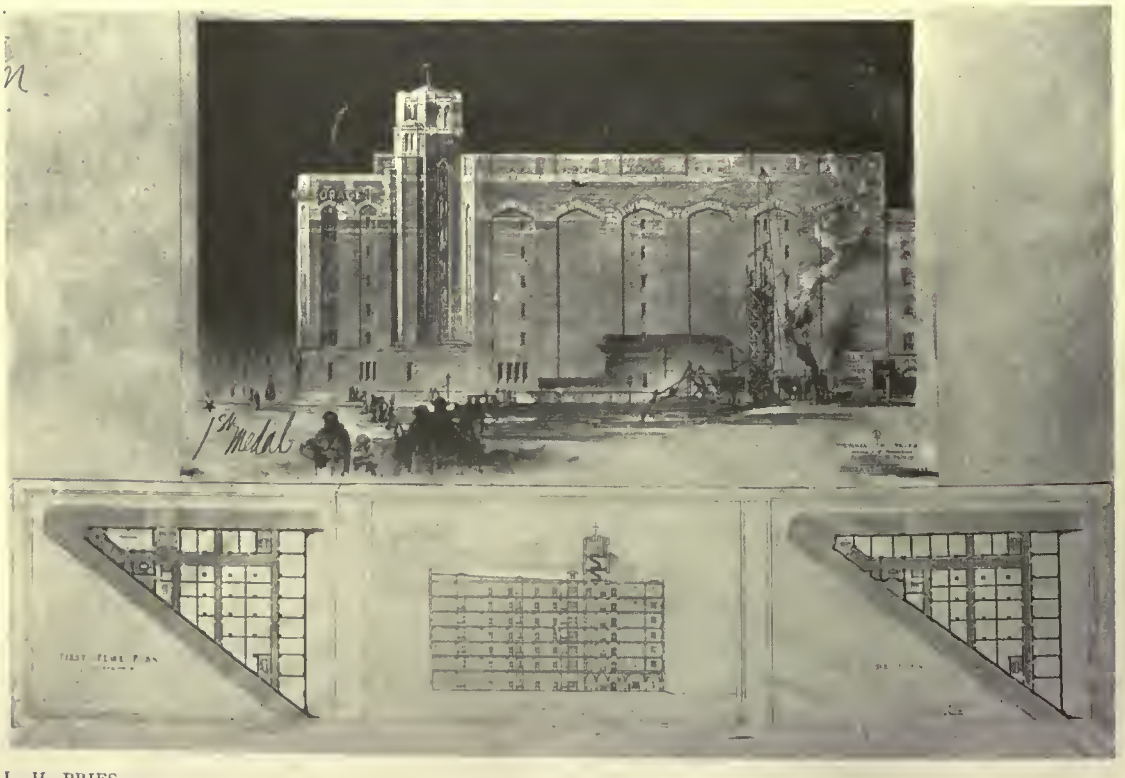
PLACED FIRST—NOT QUALIFIED FOR MONEY PRIZE
L. S. POTTER — UNIVERSITY OF PENNSYLVANIA
THE PUPIN PRIZE—A STREET CLOCK

PLACED SECOND—FIRST PRIZE
A. A. WEBER — CORNELL UNIVERSITY
THE PUPIN PRIZE—A STREET CLOCK



R. BRYAN THIRD MEDAL DALLAS ARCHITECTURAL CLUB

CLASS A—III. ESQUISSE-ESQUISSE



L. H. PRIES FIRST MEDAL UNIVERSITY OF PENNSYLVANIA

CLASS A—III. PROJET—A STORAGE WAREHOUSE

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN

O'Connor, O. Faelton, C. S. Peabody, E. V. Meeks, M. Prevot, J. Wynkoop and D. J. Baum.

NUMBER OF DRAWINGS SUBMITTED: 70.

AWARDS:

First Medal: W. L. Hindenach, "T" Square Club, Phila.; L. H. Pries, Univ. of Pennsylvania, Phila.; R. B. Thomas, Yale Univ., New Haven.

Second Medal: R. M. Crosby, B. H. Dierks and L. H. Lashmit, Carnegie Inst. of Tech., Pitts.; L. Hamilton, Yale Univ., New Haven.

Mention: H. A. Wieland, P. F. Simpson, H. T. Aspinwall, C. L. DePrefontaine, S. H. Jamison, N. D. Kutchukian.

PLACED THIRD—SECOND PRIZE
R. D. McPHERSON — CORNELL UNIVERSITY
THE PUPIN PRIZE—A STREET CLOCK

H. W. Pohlmeyer, A. P. Herrman, R. W. Schmertz, R. V. Murison, K. Snow, L. H. Rank and L. J. Rockwell, Carnegie Inst. of Tech., Pitts.; C. Contreras, D. R. Everson, L. Valker, E. W. Burkhardt, L. T. Obel, Y. P. Kasin, M. L. Colean, H. J. R. Barrett, M. L. Abbott and R. H. Bickel, Columbia Univ., N. Y. C.; M. F. Winiarski, W. C. Sponholz, A. J. Schoening, G. D. Conner, H. L. Fassett, T. M. Hofmeester, Jr., F. M. Baldwin, R. L. Minkus, S. C. Levi, N. J. Schlossman and I. J. Loebl, Chicago School of Architecture, Chicago; E. O. Lauffer and B. C. McGarry, Jr., Atelier MacDowell, Cleveland; E. Olsen, Atelier Hirons, N. Y. C.; E. L. Howard, Patron H. Van Buren Magonigle, N. Y. C.; W. B. Mylchreest, Syracuse Univ., Syracuse; E. C. K. Schmidt, A. Westover, Jr., L. Z. Slawter and H. R. Leicht, "T" Square Club, Phila.; R. Gleeson, D. R. Cochran and G. K. Geerlings, Univ. of Pennsylvania, Phila.; D. K. Frohwerk, Univ. of Kansas, Lawrence; T. F. Price, Atelier Wynkoop, N. Y. C.

H. C.: E. Coscia, Univ. of Pennsylvania, Phila.

PROGRAM

CLASS "A"—III ESQUISSE-ESQUISSE

The Committee on Architecture proposes as subject of this Competition:

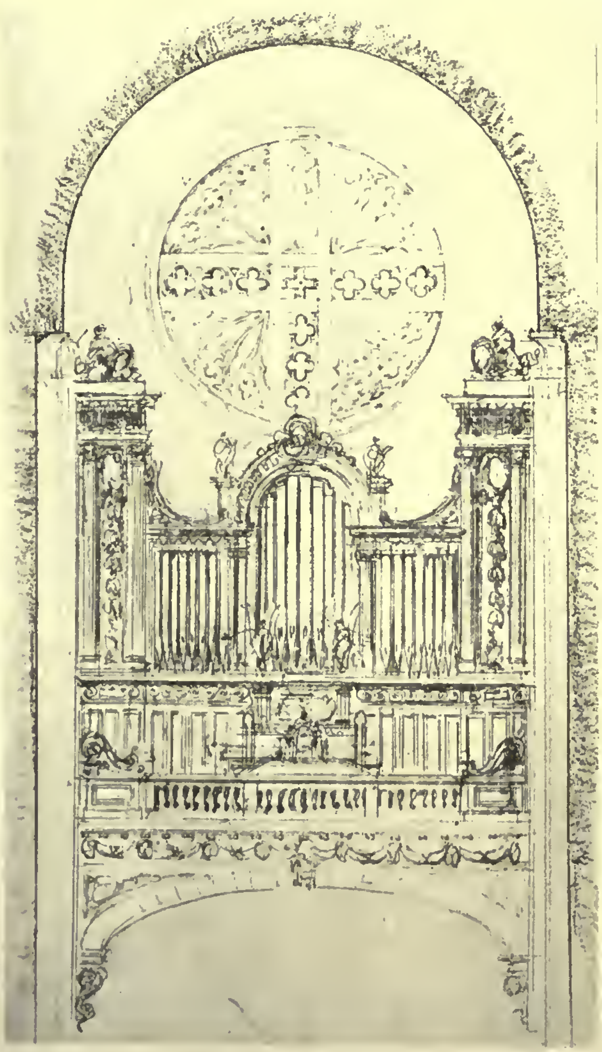
"THE GATE LODGE OF A LARGE COUNTRY ESTATE"

This building has a three-fold purpose; first, to provide an attractive and comfortable home for the head gardener and his family, second, to give adequate control of the entrance gate of the estate; third, and not least, to give the keynote in character, style and materials of the whole place, whether of formality, picturesqueness or whatever spirit is desired.

The entrance gateway is to be an integral part of the design of the lodge, either incorporated in an archway or immediately adjoining. The driveway entrance must have a clear width of 12 ft. and height of 10 ft. and is to be equipped with a pair of gates. A small auxiliary entrance for pedestrians is advisable, though not obligatory.

The head-gardener's quarters shall include a living-room, dining room, kitchen and two or three bed rooms arranged in two stories. Connected with, or forming a part of the lodge shall be his office, a single room, from which he directs the work on the grounds of the estate.

(Continued on page 46)



FIRST MENTION
DOROTHEA PORTER — COLUMBIA UNIVERSITY
CLASS B—III. ESQUISSE-ESQUISSE—A CHURCH ORGAN LOFT

Trinity "Old Swedes" Church, Wilmington, Del.

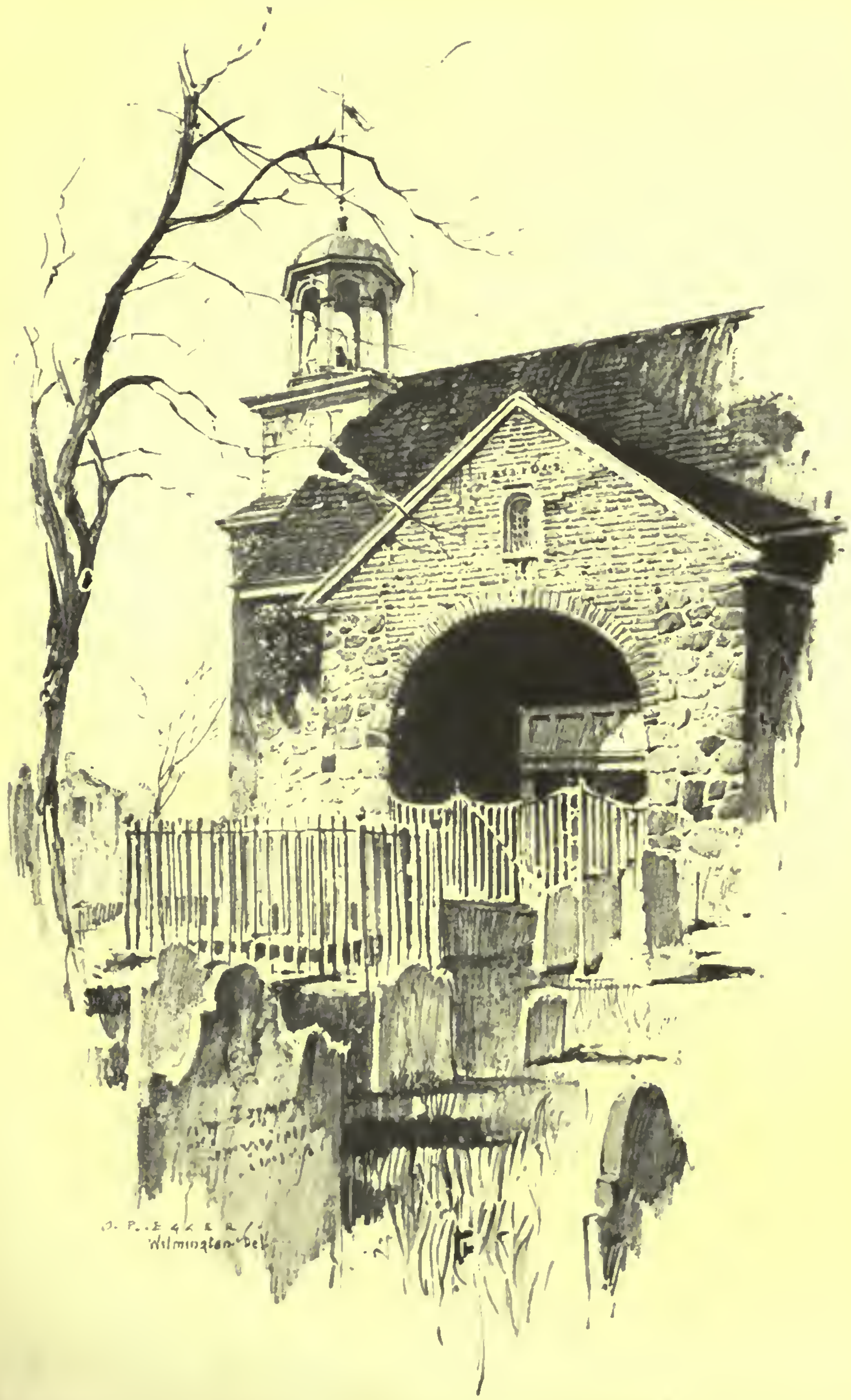
(See reproduction of original drawing by O. R. Eggers on opposite page)

TRINITY, the "Old Swedes" Church at Wilmington, Del., was built in 1698, *and is still in admirable repair and regular use. It is interesting not alone because it offers a picturesque effect, but also for the reason that the many restorations and additions have been so carefully and skilfully adjusted that it is only those familiar with this church who do not imagine that the entire structure did not originate at the same date.*

The tower was not added until 1802, *and it was only fifty years ago that the south porch with its big round arch, shown in Mr. Eggers' sketch, was built. This was not done through any motive to secure an architectural effect, but because it was found necessary to buttress the south wall. It is fortunate that someone with artistic knowledge accomplished this task in the present very satisfactory manner.*

The interior is less changed than the exterior, and is practically the same as it was in the eighteenth century.

44a



44a

OLD SWEDES CHURCH, WILMINGTON, DEL.

THE AMERICAN ARCHITECT Series of Early American Architecture

EDITORIAL

A Series of Measured Drawings

OUR readers will recall that during 1916 and 1917 there was reproduced in THE AMERICAN ARCHITECT a series of photographs and measured drawings of Northern Italian details secured by Mr. Walter G. Thomas and Mr. John T. Fallon, who visited Italy as representatives of THE AMERICAN ARCHITECT. The instant popularity of this series of details proved its great suggestive value. The outbreak of the war in Europe caused a suspension of the work of Messrs. Thomas and Fallon, and it is only recently that it has been found practicable to resume this important feature in THE AMERICAN ARCHITECT.

In this issue the first of a series of photographs and measured drawings of French and Italian details appears. It is proposed to include in following issues one example of foreign details, the material for which is now in hand, and which was secured by Mr. Robert M. Blackall, the thirty-fifth holder of the Rotch Traveling Scholarship.

A feature of these drawings that was not presented in the first series is the full sized sections of mouldings of the various subjects photographed and measured.

The American Academy in Rome

AN interesting announcement has been made that the American Academy in Rome will inaugurate a Department of Musical Composition providing for three fellowships. These new fellowships are to be awarded in a manner similar to the existing fellowships in architecture, painting, sculpture and landscape architecture, and there will be one prix de Rome winner in musical composition each year, the fellowship providing three years of residence and study in Rome, or two years in Rome and one year in Paris for each fellowship. The total funds necessary for permanently carrying on this important work, it is stated, will be forthcoming in ample time.

Reference has been made from time to time in these columns of the important work in architecture that has been accomplished by the American Academy in Rome, and it has been pointed out that generous donors in the United States might with consistency divert some of their large means to an institution so very worthy of support.

The inclusion of a scholarship in music rounds out the functioning of this organization in the beaux arts.

Every architect who has followed the work of the American Academy will, we are sure, feel a sense of pride that an institution so valuable and so constructive in all its efforts, is, if possible, to become even more valuable in the field of art.

What Retards Building Construction?

"THERE is one basis on which there is likely to be a general revival of building, and that is one of costs," editorially states the *Journal of Commerce* of New York. And it counsels legislatures, would-be reformers and the building material industries in general to learn this elementary truth. It is as significant in this instance as in almost every other, where the retardance of building is discussed, that in considering costs, that of the most essential item of all, money, is seldom, if ever, referred to.

It is the high cost of money more than anything else that is responsible for present conditions.

Let us take, for example, the present situation in Philadelphia, as ably summed up by the *North American* of that city.

Building projects in Philadelphia involving an expenditure of at least $100,000,000, are now held up, awaiting the adjustment of present building uncertainties. These uncertainties, state the *North American*, are not due so much to the high cost of labor and materials, as to the present excessively high cost of money.

With easier money conditions, these vast operations would be at once started on the way towards early completion, and the stagnation of building would be replaced by activities that would give employment to the thousands now out of work.

The general public have been fed to the point of repletion on various theories by self-constituted authorities as to the reason for building depression. Whether it is that they do not reason clearly, or because the herring has been so successfully drawn across the trail as to throw them off the scent, is debatable. But, with an easier, freer and cheaper loaning market, it is certain that the present loudly discussed factors of building depression would sink to insignificance.

Beaux-Arts Institute of Design

(*Continued from page 43*)

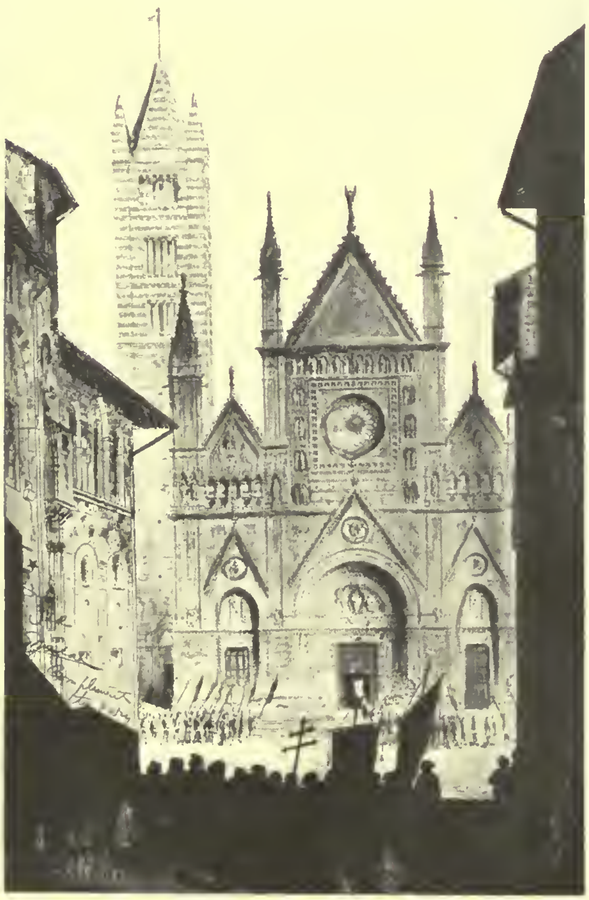
The ground area of the lodge proper including the office shall not exceed 1,300 sq. ft.

JURY OF AWARD:

R. M. Hood, L. Warren, J. M. Howells, F. G. Frost, H. W. Corbett, J. F. Harbeson and T. S. Holden.

Note: This Jury also served as Jury of Award for the Class "B"—III Esquisse-Esquisse, Class "A" and "B" Archaeology—III Projet and Class "A" and "B" Archaeology—III Measured Drawings.

NUMBER OF DRAWINGS SUBMITTED: 32.



THIRD MEDAL
R. F. LARSON UNIVERSITY OF PENNSYLVANIA
CLASS A and B ARCHAEOLOGY—III PROJET.
THE FAÇADE OF AN ITALIAN GOTHIC CHURCH

AWARDS:

Third Medal: G. W. Trofast-Gillette, Columbia Univ., N. Y. C.; R. Bryan, Dallas Archtl. Club, Dallas; R. K. Galbraith, Architectural League of Indianapolis, Indianapolis; R. F. Larson and K. A. McGrew, Univ. of Pennsylvania, Phila.

Mention: G. Fraser, Cornell University, Ithaca; C. Contreras, and Helen M. Gail, Columbia University, N. Y. C.; N. S. Schlossman, Chicago School of Architecture, Chicago; G. A. Hacker, Atelier Sibley, Palisade; R. L. White, Univ. of Texas, Austin; G. P. Turner and D. R. Cochran, Univ. of Pennsylvania, Phila.; R. B. Thomas and L. Hamilton, Yale Univ., New Haven.

PROGRAM
CLASS "B"—III ESQUISSE-ESQUISSE

The Committee on Architecture proposes as subject of this Competition:

"A CHURCH ORGAN LOFT"

The organ loft which forms the subject of the program is to be placed on the west entrance wall, of a church, and will comprise, beside the organ, a gallery or balcony for the accommodation of the organist. In the study of the organ the arrangement of and relation between the pipes may be freely interpreted, inasmuch as they are usually false pipes, the actual working pipes of the organ being concealed. The total height from the floor of the gallery to the top of the longest pipe must not exceed 35 ft. Access to the gallery is gained by means of a passage concealed in the adjacent walls. The width of the church nave is 35 ft.

NUMBER OF DRAWINGS SUBMITTED: 23.

AWARDS:

First Mention: F. L. Hutchins, Dorothea Porter and A. J. Bagley, Columbia University, N. Y. C.; H. F. Hunter, Los Angeles A. C., Los Angeles; A. L. Muller, Atelier Wynkoop, N. Y. C.

Mention: R. L. Linder, Atelier Denver, Denver; T. Ross, Jr., Atelier Parsons-Chicago A. C., Chicago; E. F. Penfield, Atelier Wynkoop, N. Y. C.

PROGRAM
CLASS "A" AND "B" ARCHAEOLOGY—III PROJET

The Committee on Architecture proposes as subject of this Competition:

"THE FACADE OF AN ITALIAN GOTHIC CHURCH"

Gothic architecture in Italy is, properly speaking, not "Gothic" architecture, inasmuch as it never followed the essential construction forms of the real Gothic, and it made use of Gothic motifs only superficially, permitting, even here, classic influence to modify the decoration.

Thus Gothic architecture in Italy was not a native expression, but rather a fashion imported from the north, and as such we see in it the modifications caused by Italian tradition, climatic conditions and the use of local building material. These influences growingly forced the use of classic forms in this style, until finally the rising tide of the Renaissance overcame the northern influence completely.

In the northern part of Italy examples of this architecture interpreted in brick, stone and terra cotta are found. Further south, where marble abounded, a different development occurred. The native love of color found expression in rich mosaics and polychrome marble incrustations. In all the examples the influence of classic detail is seen in the carving, which came finally to have the character of applied ornament. The hot climate made small windows necessary and thus limited the use of tracery decoration so familiar in the northern Gothic work.

Examples of Italian Gothic architecture may be found in the cathedrals of Florence, Lucca, Siena, Orvieto, Bologna and in the Ducal Palace at Venice and the Vecchio Palace at Florence.

The subject of this competition is the façade of a church with nave and two side aisles. The overall width of the façade shall not exceed 80 ft.

NUMBER OF DRAWINGS SUBMITTED: 16.

AWARDS:

Third Medal: L. G. Noyes, R. S. Twitchell, W. H. Kraemer and P. Simonsen, Columbia University, N. Y. C.; R. L. White, Univ. of Texas, Austin; R. F. Larson, Univ. of Pennsylvania, Phila.; F. A. Chapman, Atelier Wynkoop, N. Y. C.

Mention: E. J. Manning, Chicago Sch. of Architecture, Chicago; A. Gambell, Portland A. C., Portland, O.; Essie Lipscomb, Univ. of Texas, Austin.

CLASS "A" AND "B" ARCHAEOLOGY—III MEASURED DRAWINGS

NUMBER OF DRAWINGS SUBMITTED: 2.

Subject: Church, Mexico.

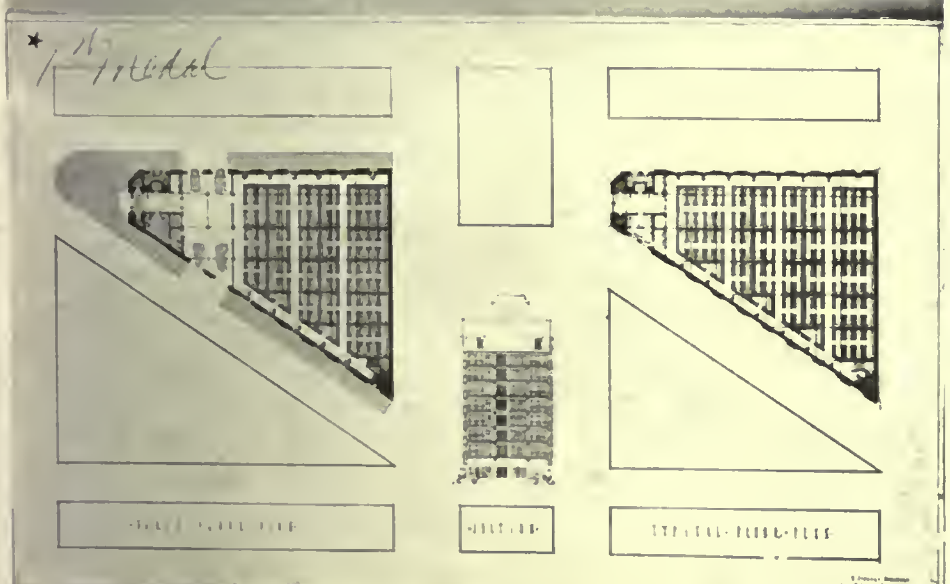
AWARD:

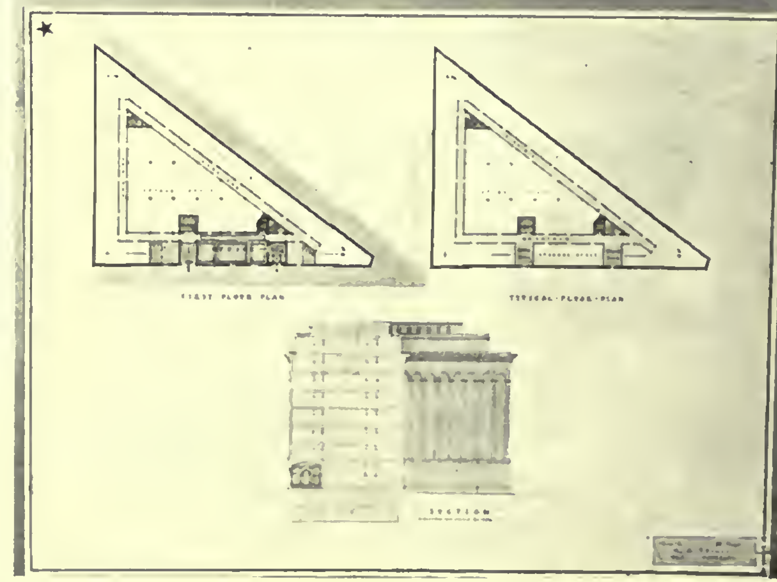
Third Medal: C. Contreras, Columbia Univ., N. Y. C.

Subject: Doorway on Beach Street, Syracuse, N. Y.

AWARD:

Third Medal: W. B. Mylchreest, Syracuse Univ., Syracuse.





W. L. HINDENBACH FIRST MEDAL T-SQUARE CLUB, PHILADELPHIA R. B. THOMAS FIRST MEDAL YALE UNIVERSITY

CLASS A—III. PROJET—A STORAGE WAREHOUSE
STUDENT WORK—BEAUX-ARTS INSTITUTE OF DESIGN

THE PUPIN PRIZE

The Gift of Prof. M. I. Pupin of Columbia University Offered for the ornamental treatment of some Scientific Appliance

FIRST PRIZE—$50.00 SECOND PRIZE—$25.00

(For conditions governing this Prize Competition, See Circular of Information, Article VIII—Sec. 2 and 3.)

PROGRAM

The Committee on Architecture proposes as subject of this Competition:

A STREET CLOCK

A clock, which has been given to a small town by one of its wealthy citizens, is to be placed in the middle of the square formed by the intersection of two important thoroughfares.

Entire freedom is left in the design of the clock as to the choice of materials used in its construction, its elaboration and form, and the method of telling time. The only restrictions are that the circular island of safety on which it is placed is only 10 ft. in diameter, and the total height of the clock is not to exceed 24 ft.

JURY OF AWARD:

R. M. Hood, H. O. Milliken, J. W. O'Connor, O. Faelton, F. G. Frost and C. S. Peabody.

NUMBER OF DRAWINGS SUBMITTED: 39.

AWARDS:

Placed First (Not qualified for money prize): R. S. Potter, Univ. of Pennsylvania, Phila.

Placed Second—First Prize ($50.00): A. A. Weber, Cornell Univ., Ithaca

Placed Third—Second Prize ($25.00): R. D. McPherson, Cornell Univ., Ithaca.

Placed Fourth: S. J. Laschenski, Univ. of Pennsylvania, Phila.

Placed Fifth: L. H. Pries, Univ. of Pennsylvania, Phila.

Building for Y. M. & Y. W. H. Association, Newark, N. J.

THE building is to be treated in Georgian style, an attempt being made to produce an effect not too institutional and not too residential. Along the property line is provided a light court, nine feet wide, which will afford protection from neighboring encroachment. The plans provide for another story to the main building should the structure ultimately become too small for the organizations.

The building will have a frontage of 96 feet on High Street and 176 feet on West Kinney Street, exclusive of an extension containing a swimming pool and shower rooms, 60 x 105 feet, on West Kinney Street. It is proposed to have the exterior finish of limestone or terra cotta and red Harvard brick.

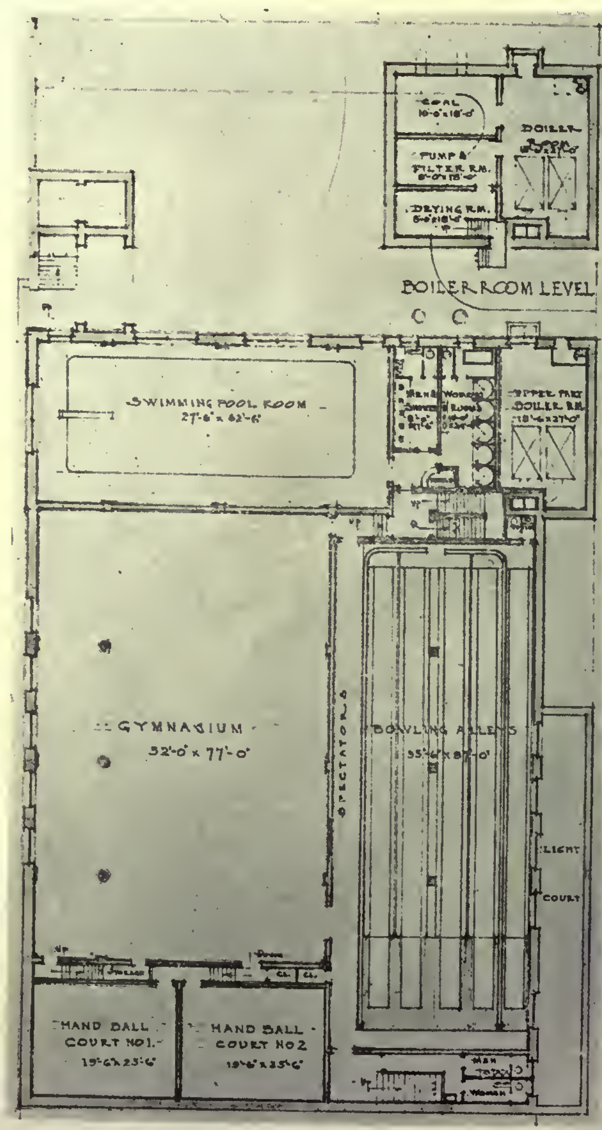
Placing the main floor a few feet above High Street makes the level of the swimming pool, gymnasium, locker rooms, and spectators' gallery easily accessible without going through the main building. A grade entrance on West Kinney Street is such as to accommodate those who wish to exercise without entering the main foyer, thereby preventing congestion at the entrances.

Entering the vestibule from High Street, one may look through large glass doors into an elliptical reception hall two stories high. The desk control is in this room and affords a view of the hall and main stairs. Off the room are the men's game room, women's social room, office, stairs which run from the gymnasium and bowling alley level to a roof garden, and the auditorium lobby, which may be shut off at this point if the auditorium is rented.

The terrace runs along West Kinney Street and around the rear, forming a wide passage to the street from the auditorium and also a lounging place.

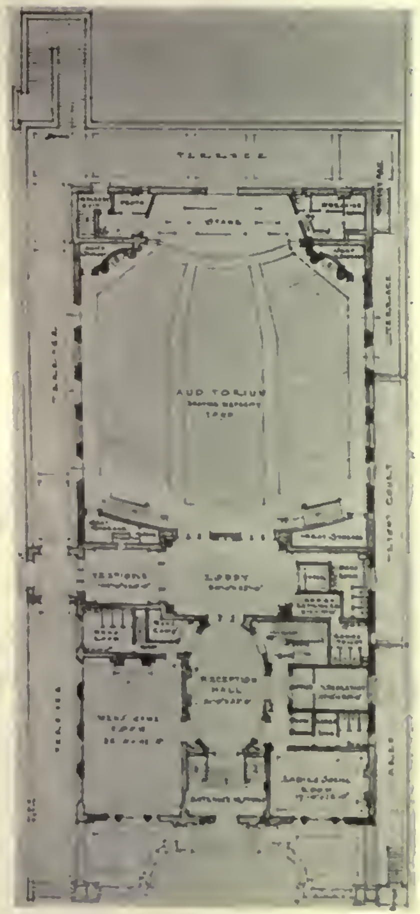
The Men's Department is placed at the corner in a single unit. On the main floor is their game room, opening direct to the terrace, with coat room and private stairs to the billiard room below.

The women are afforded a secluded social room on the main floor with the prescribed equipment and

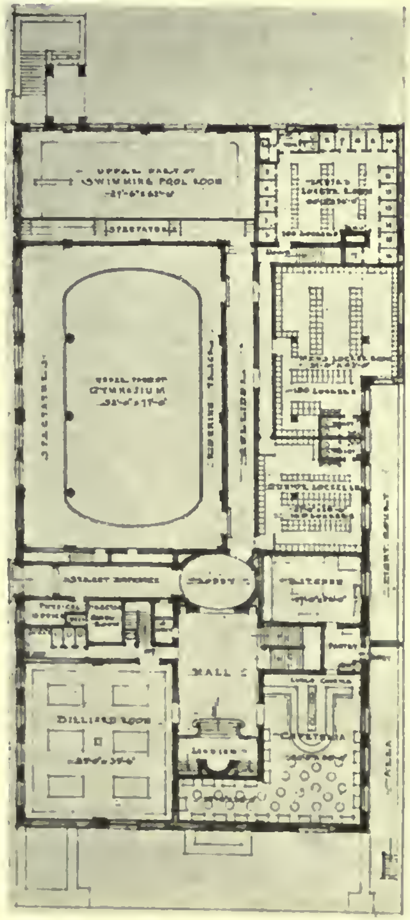


BASEMENT FLOOR

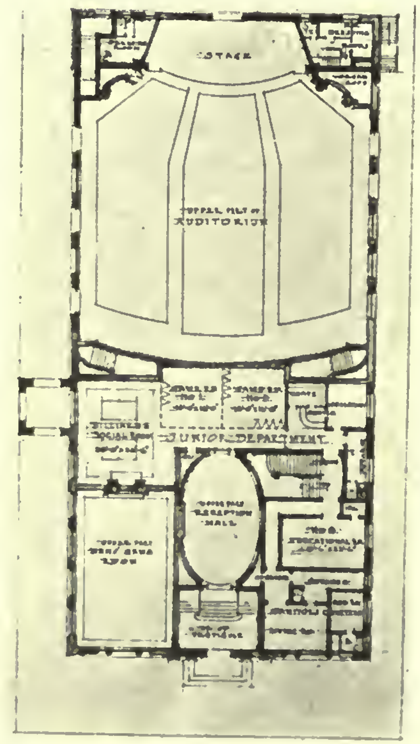
FIRST PRIZE DESIGN—FRANK GRAD, *ARCHITECT*



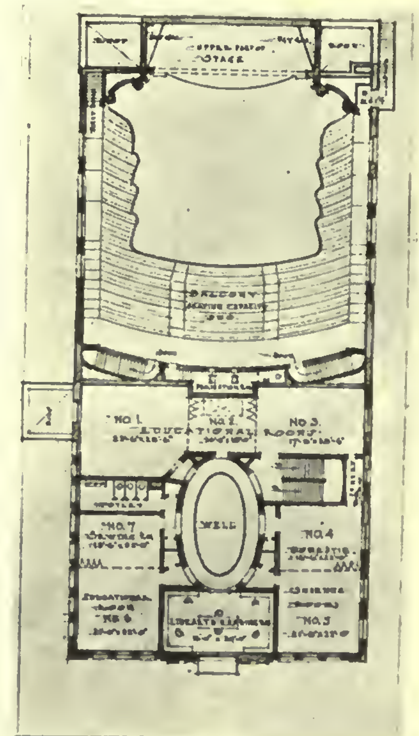
MAIN FLOOR



GROUND FLOOR

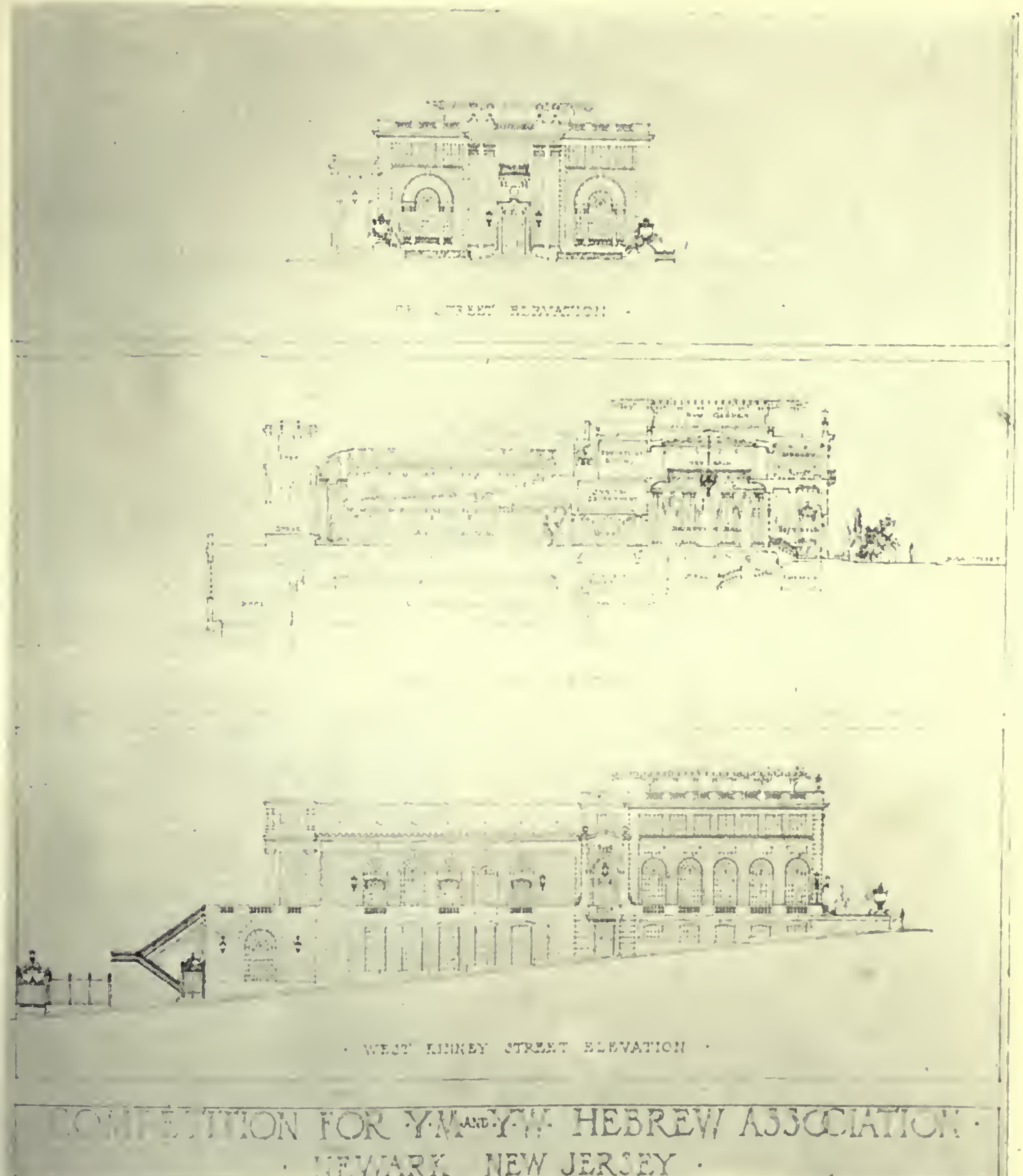


MEZZANINE FLOOR



SECOND FLOOR

COMPETITION FOR A Y. M. AND Y. W. HEBREW ASSOCIATION BUILDING, NEWARK, N. J.
FIRST PRIZE DESIGN—FRANK GRAD, *ARCHITECT*



FIRST PRIZE DESIGN—FRANK GRAD, *ARCHITECT*

ON the direct road from Florence, passing the Porta Romana, through the village of Galluzzo and but a short distance beyond, is the Certosa of the Val D'Emo. Its location is one of beautiful views. The convent crowns a cypress-covered hill, forming a picturesque sight as approached by the tourist.

The Certosa was founded in 1341 by Niccolo Acciajuolo, Grand Seneschal to Queen Joanna of Naples. In 1875 there were nineteen monks here and there are still residing in this old convent a number of members of the ecclesiastical order.

The principal church is excessively rich, decorated with frescoes, marbles and pietra-dura. The general character of the cloisters, here illustrated by photographs and measured drawings, is frankly early Florentine Renaissance, especially in the columns which appear to have been restored later.

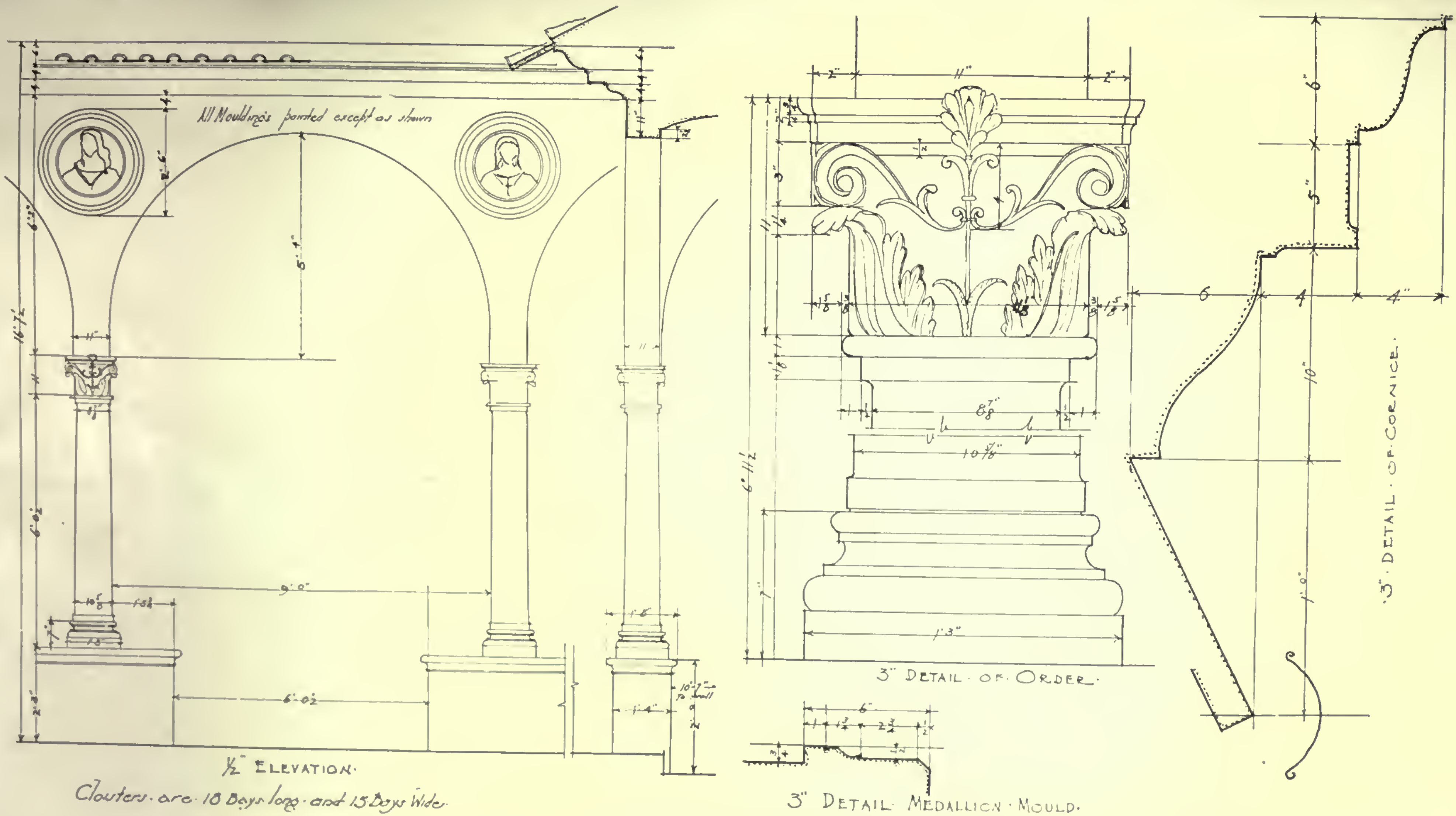
In the accompanying detail of the cloister bay there are terra cotta figures attributed to the school of Della Robbia. The detail shown in the photograph and not measured and drawn, is painted on the stucco.

THE AMERICAN ARCHITECT, SERIES II. FRENCH AND ITALIAN DETAILS

CLOISTERS OF THE CERTOSA DI VAL D'EMO, AT GALLUZZO, NEAR FLORENCE, ITALY

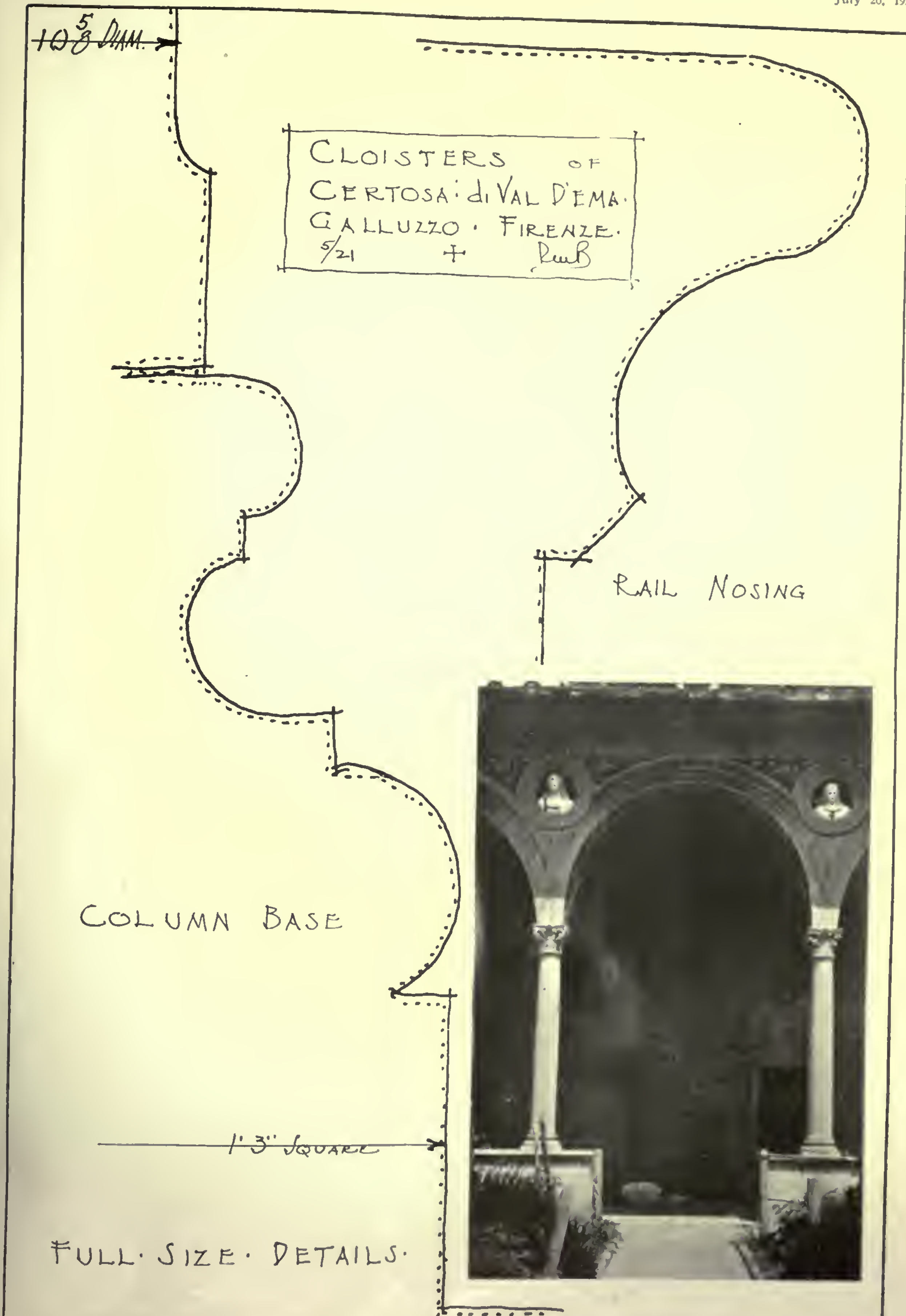
PHOTOGRAPHED, MEASURED AND DRAWN BY ROBERT M. BLACKALL, THIRTY-FIFTH HOLDER OF THE ROTCH TRAVELING SCHOLARSHIP, ASSISTED IN MEASUREMENTS BY LEON KEACH, HOLDER OF MASSACHUSETTS INSTITUTE OF TECHNOLOGY SCHOLARSHIP.

48



CLOISTERS OF CERTOSA DI VAL D'EMO, GALLUZZO, ITALY

MEASURED AND DRAWN BY ROBERT M. BLACKALL 35TH HOLDER OF THE ROTCH TRAVELING SCHOLARSHIP



MEASURED AND DRAWN BY ROBERT M. BLACKALL, 35TH HOLDER OF ROTCH TRAVELING SCHOLARSHIP

SURVEY MAP OF PORTION OF LONDON, SURROUNDING BUSH BUILDINGS, SHOWING THE NEW STREETS OF ALDWYCH AND KINGSWAY AND THE WIDENED STRAND

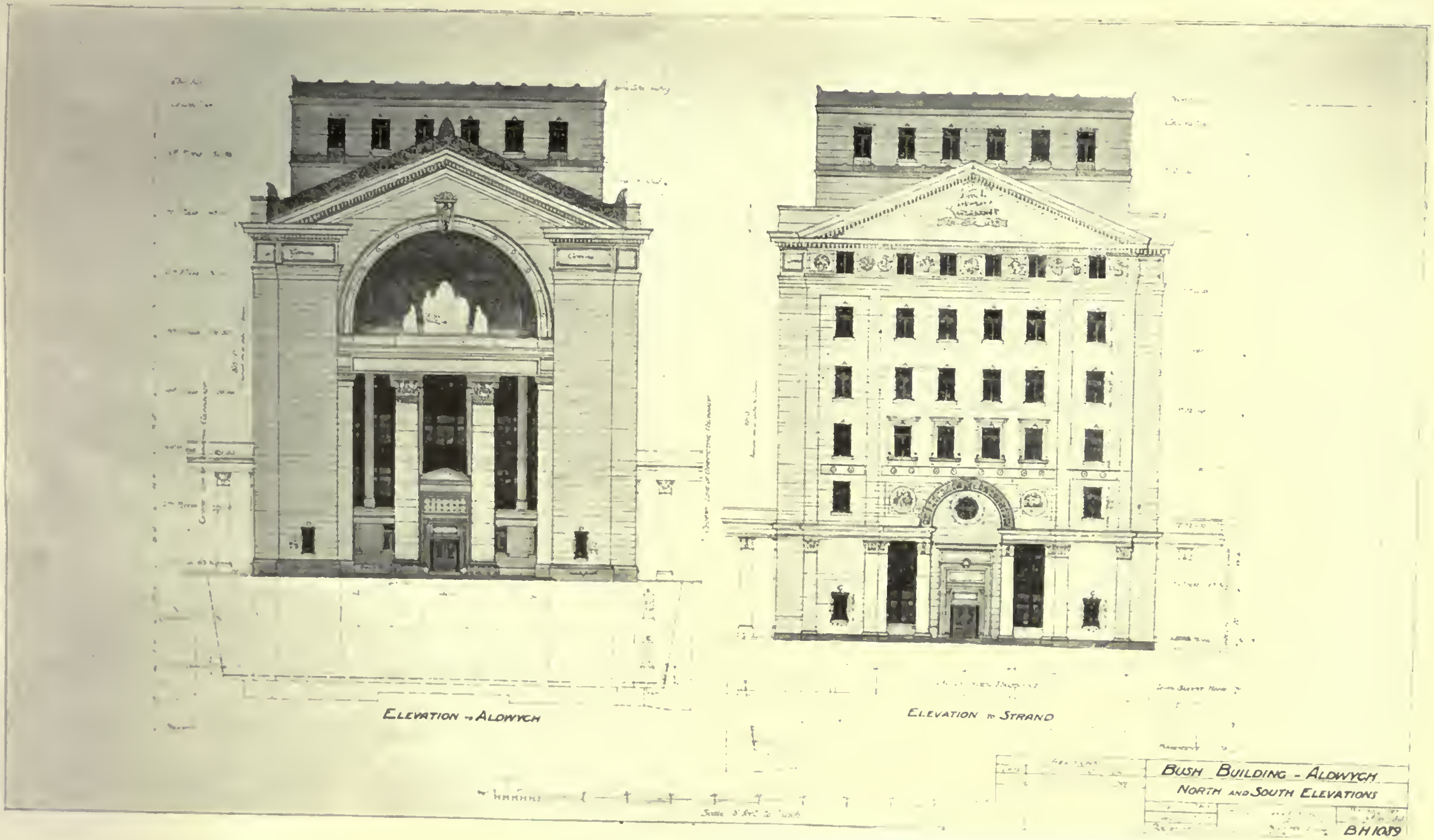
This map also shows the location of the tower as a focal point visible for considerable distance along the Strand to the West, Fleet Street to the East and the full length of Kingsway to the North

THE BUSH BUILDINGS, LONDON, ENGLAND

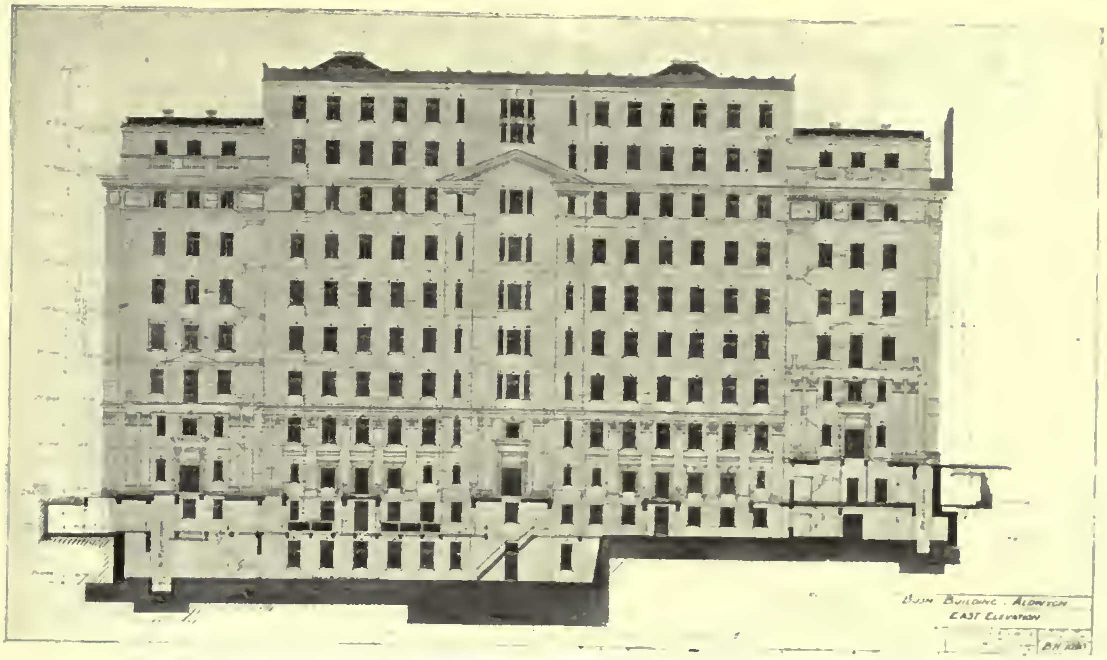
HELMLE & CORBETT, *ARCHITECTS*

COMPLETE STRAND ELEVATION
THE BUSH BUILDINGS, LONDON, ENGLAND
HELMLE & CORBETT, *ARCHITECTS*

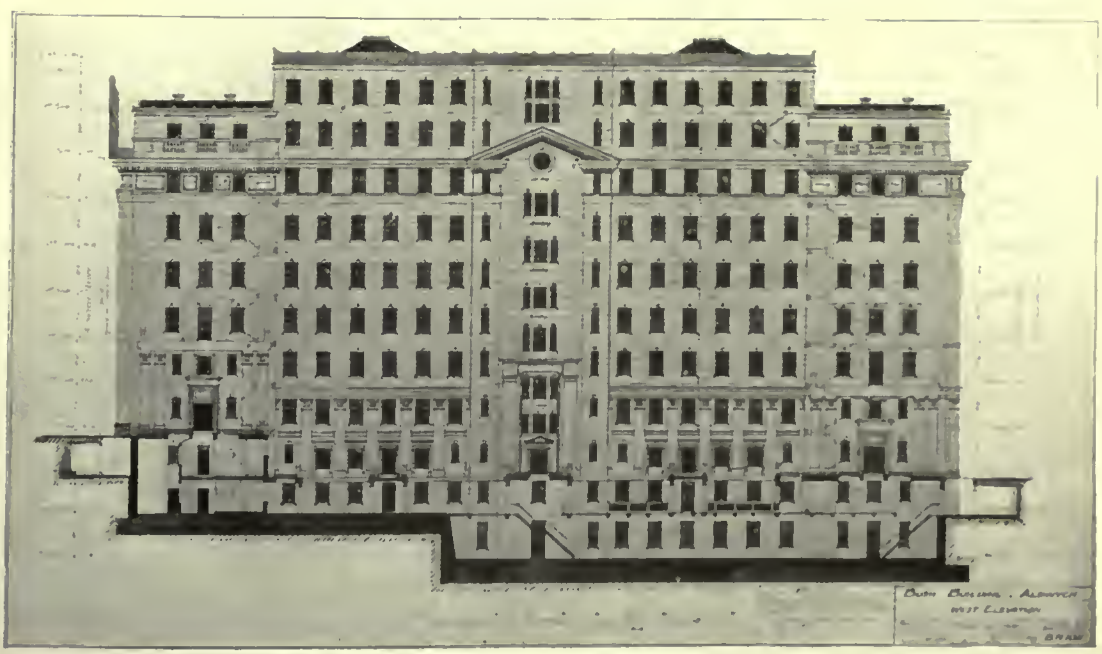
COMPLETE ALDWYCH ELEVATION
THE BUSH BUILDINGS, LONDON, ENGLAND
HELMLE & CORBETT, *ARCHITECTS*



ELEVATIONS ALDWYCH AND STRAND
THE BUSH BUILDINGS, LONDON, ENGLAND
HELMLE & CORBETT, *ARCHITECTS*



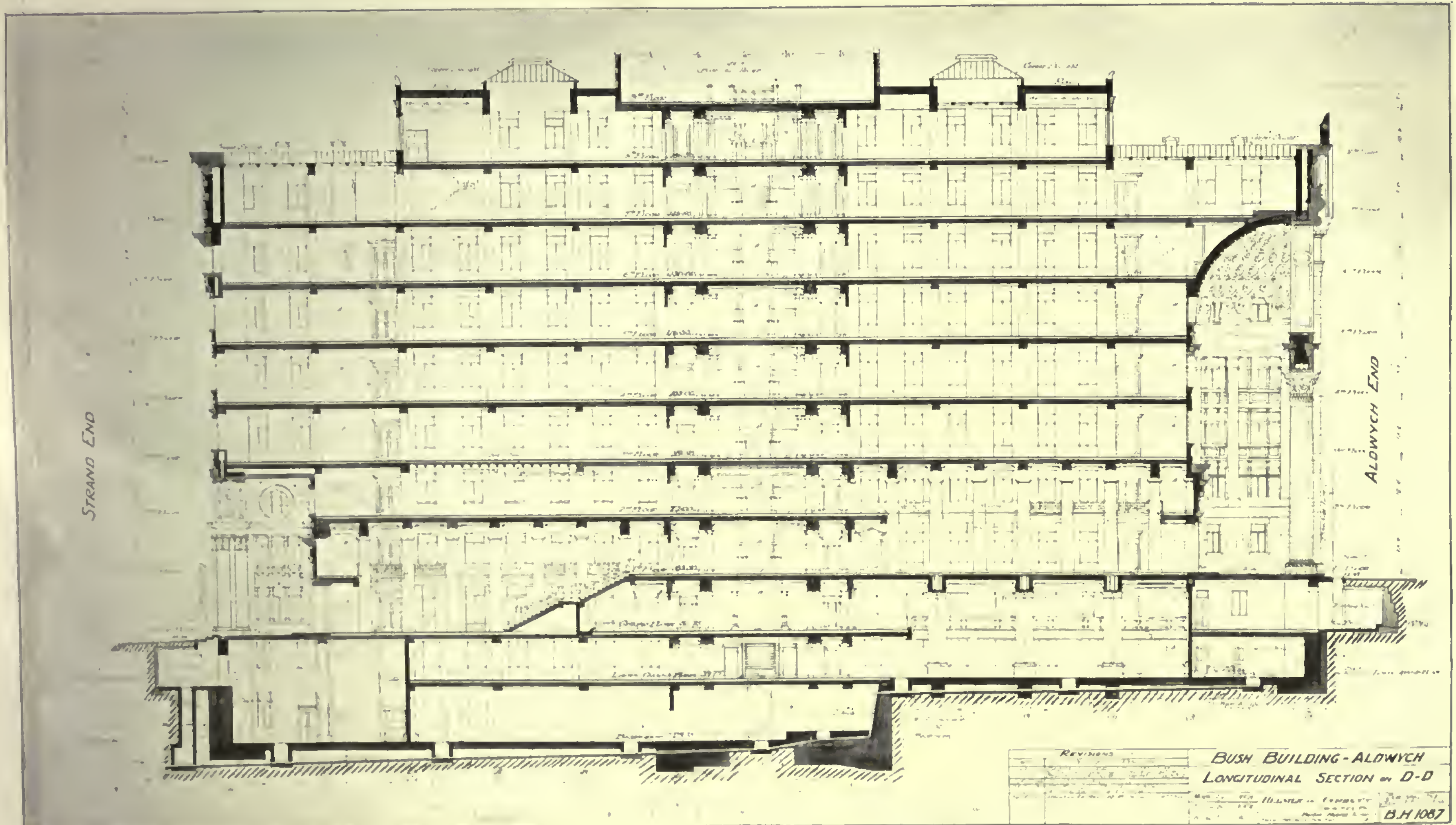
EAST ELEVATION



WEST ELEVATION OF CENTRAL BUILDING

THE BUSH BUILDINGS, LONDON, ENGLAND

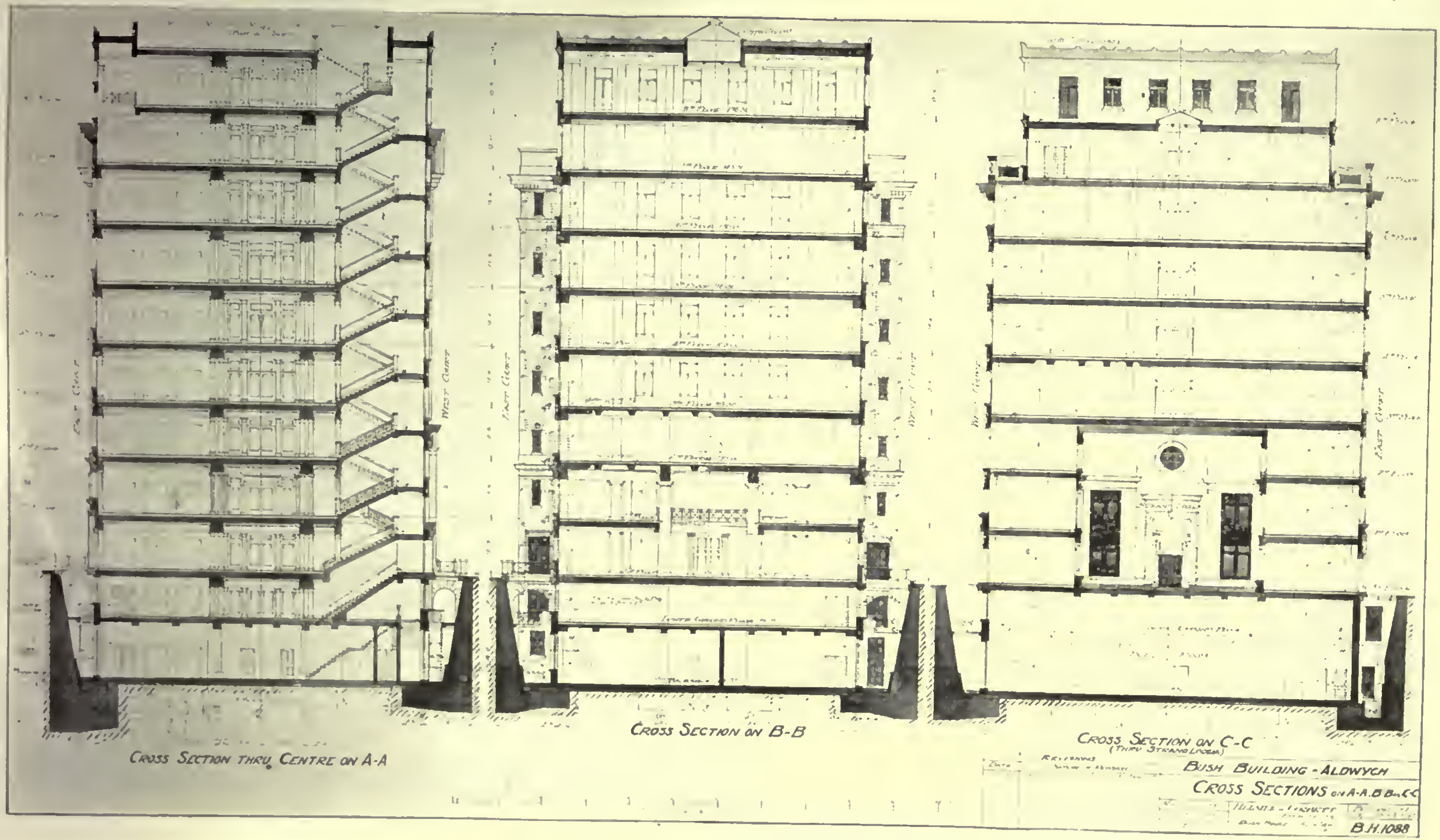
HELMLE & CORBETT, *ARCHITECTS*



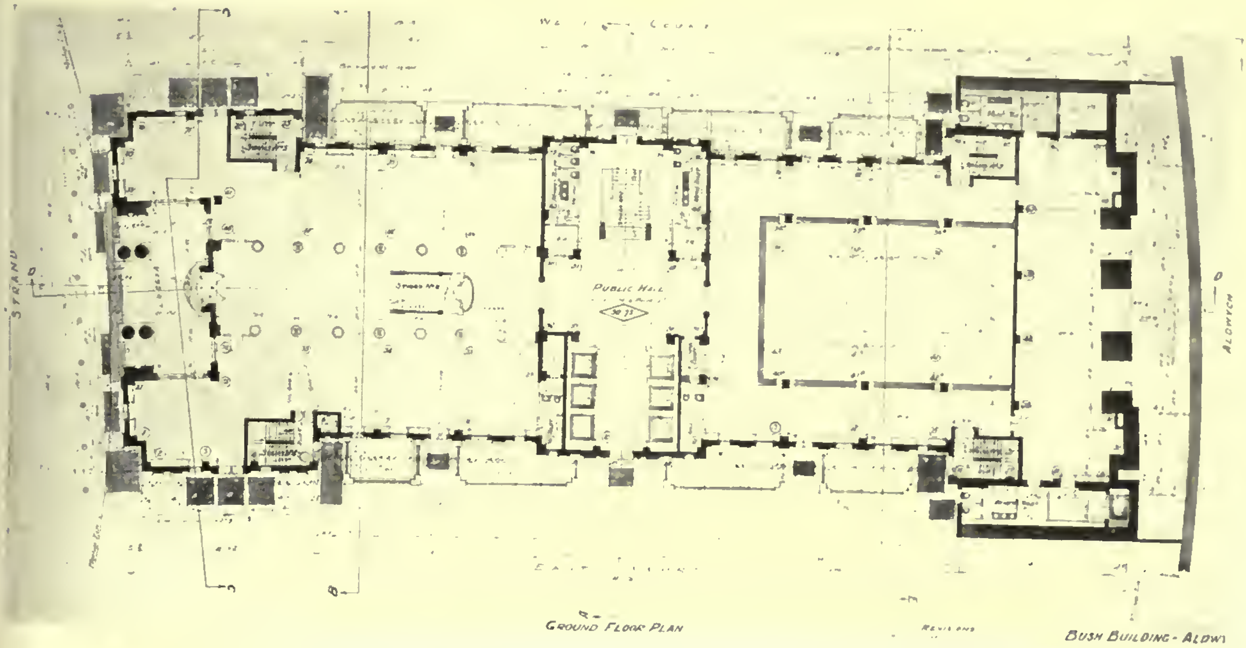
LONGITUDINAL SECTION, SHOWING DIFFERENCE IN LEVEL BETWEEN STRAND AND ALDWYCH END OF BUILDING, WITH TWO-STORY CONNECTING ARCADE AND SMALL AUDITORIUM UNDER ALDWYCH END.

THE BUSH BUILDINGS, LONDON, ENGLAND

HELMLE & CORBETT, *ARCHITECTS*



THE BUSH BUILDINGS, LONDON, ENGLAND
HELMLE & CORBETT, ARCHITECTS

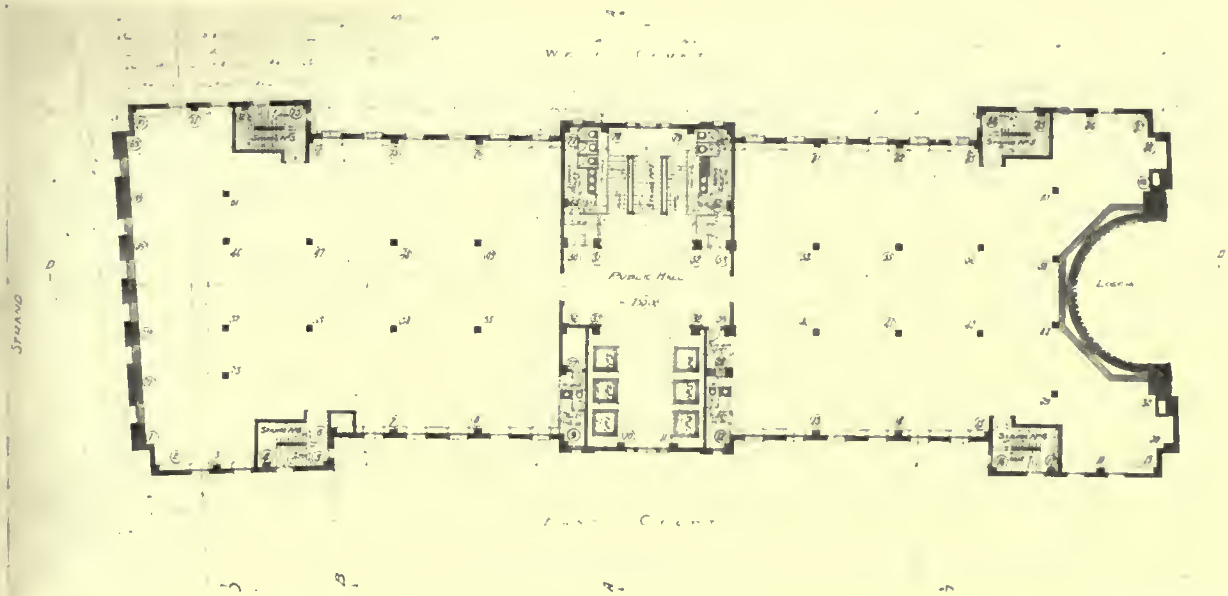


PLAN AT LEVEL OF STRAND, SHOWING STRAND ENTRANCE, LOGGIA AND BALCONY FLOOR OF SMALL AUDITORIUM AT NORTH END OF BUILDING.

PLAN AT LEVEL OF ALDWYCH, SHOWING THE LARGE LOGGIA WHICH FORMS THE VISTA FOR KINGSWAY

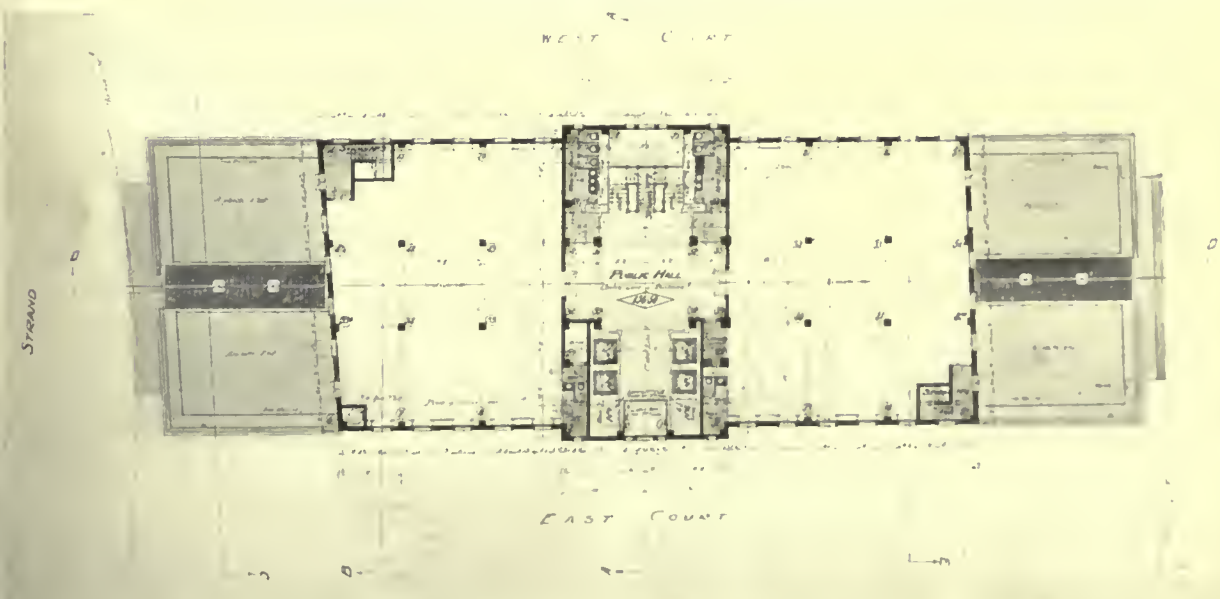
THE BUSH BUILDINGS, LONDON, ENGLAND

HELMLE & CORBETT, *ARCHITECTS*



Sixth Floor Plan

TYPICAL UPPER FLOOR PLAN



Eighth Floor Plan

ROOF STORY, SHOWING REQUIRED SETBACKS

THE BUSH BUILDINGS, LONDON, ENGLAND

HELMLE & CORBETT, ARCHITECTS

sewing room, domestic science department, etc., on the second floor.

An attempt has been made to seclude the Junior Department so that the youngsters may enter from West Kinney Street, passing the physical director's office and going up to their rooms without entering the main portion of the building. From a mezzanine level easy access is provided to the locker and educational rooms.

The gymnasium, swimming pool and lockers form a separate and easily controlled unit. Communication may be had from the lockers to the pool and gymnasium without entering the public hall. A running track is provided in the gymnasium and the showers are on the same level as the floors of the swimming pool and gymnasium. The pool is built on ground.

On the second floor will be eight educational rooms of various sizes and a reading room off the hall with plenty of outside light. A dumbwaiter from the kitchen will run to this floor, so that the rooms may be used for entertaining.

On the ground floor will be a cafeteria, easily accessible from the exterior and interior.

The Menace of Fire to Our Historical Structures

IT is gratifying to note that there is an awakening of public sentiment both in Philadelphia and Boston, as to the menace of destruction by fire of buildings of the most sacred of historical association.

Further, it is good to learn that the daily press of those cities is vigorously discussing these matters and by well-written editorials, seeking to arouse the people to the danger of a loss that would be irreparable and be felt by every man, woman and child in this country.

The Philadelphia *Inquirer* states in a recent issue:

Whatever needs to be done to protect Independence Hall and the connecting buildings from danger by fire should be done at once. Their present condition is attracting attention in other parts of the country. For this shrine of national patriotism is, normally speaking, the property of the whole nation. The loss of it would be irreparable. There would be swift and bitter condemnation of Philadelphia were such a calamity to happen. The duty of averting it, so far as that is humanly possible, should not longer be delayed. * * *

Valuable paintings, which are deteriorating rapidly and which will be completely ruined if the work of restoration is not undertaken, are stored there. The exterior has a battered look which shames the bronze tablet recording its honorable history, and crowding it at the rear is a comparatively modern building which does not belong to the group.

Had these dignified and beautiful specimens of Colonial architecture no sacred associations, it would be a duty to preserve them. In the circumstances neglect is a crime. Let it not be said that the city which holds the birthplace of American liberty is faithless to her trust.

Boston, whose proud boast it is that it is "the cradle of American liberty," is much worried, as it has right to be, over the safety of its historic State House. The *Transcript* urges the city to awaken to a realizing sense of the danger of fire to this fine old building. It states editorially:

The Brooklyn Eagle sees in the flames that swept through our Old State House a picture in which that ancient edifice appears as the storage place of priceless documents because Yankee thrift has not sanctioned the expenditure of money necessary to put them in fireproof vaults. "A fire in the Old State House in Boston, built in 1748," says the Brooklyn paper, "risked thousand of priceless documents. Massachusetts is rich enough to afford fireproof vaults. It's Yankee thrift that seeks to make a historic structure serve as a storehouse and thus kill two birds with one stone."

This is not a correct statement of the case. The rich collections of the Bostonian Society are not in the Old State House merely for storage. They have been placed there because it makes an appropriate setting for these reminders of the life of days long gone by, and because they, in their turn, by infusing the ancient structure with the atmosphere of Colonial times serve to enhance its interest for the home folk and for the thousands of visitors who come to it from all parts of the country as to a shrine.

That being the case, there remains the question of changes in the construction of the building to safeguard it, as far as may be possible, from the danger of fire. It might, of course, be made as fireproof as a modern office building. As the building has been restored, with its sweeping staircase of wood and its wood finish and paneling, it is in appearance the building known to the fathers. To fireproof it would necessarily rob it of its essential characteristics as a monument to the storied past.

But the Old State House may be guarded against fire to a very much greater degree than it has been in the past. It is a matter which demands earnest and expert attention.

The hundreds of millions of dollars that annually "go up in smoke" in this country are of sufficient reproach to us, but they represent a loss that money can repair.

To have even one of these fine old historical buildings lost through fire, the result of negligence or improper precaution, would be a national disgrace we might never live down.

DEPARTMENT of SPECIFICATIONS

Office Equipment

IN previous issues there has been a discussion of the general scope of the work of a specification writer and of the education, training, experience and mental attributes that are essential to a successful accomplishment of specification writing. Next in order in the general scheme of specifications comes the office equipment that forms a basis for the composition of the written document.

This equipment will consist of the files of catalogs and specification data, a well selected library of reference books, an outline and checking list, a master specification and a file of specifications that have been proven to be satisfactory or that have been corrected to remedy faults found during construction work. The complete set of drawings for which a specification is to be written must be considered a part of the equipment under discussion as it naturally forms one of the essential bases of specifications.

The files for catalogs and specification data should be of the vertical type, letter size, i. e., eight and one-half by eleven inches. This size will receive, without folding, the majority of catalogs, which fortunately are being prepared in accordance with the well-established recommendations of The American Institute of Architects.

The method of filing catalogs must be given consideration, the essential requirements being ease of filing and quickness in finding a certain catalog. The system to be used must permit of expansion without disorganizing the entire file and without introducing complications that will tend to discourage its intelligent use.

In general there are two systems of filing catalogs that seem to give general satisfaction. One is the classification recommended by The American Institute of Architects, while the other consists of an alphabetical arrangement, according to the name of the manufacturer. In either case it is necessary to make sure that catalogs containing several classes of items that are not related, so far as their use is concerned, are cross-indexed in some simple fashion. If the alphabetical system is used this cross-indexing becomes one of the steps necessary in maintaining control of the files and in indexing the matter to be filed the separation of products cataloged automatically will be cared for in the proper manner.

THE catalog file should be made and maintained as complete as possible, even though it seems unlikely that the practice of the office will require some of the information. This is especially necessary in those offices that enjoy a general practice, while even in those offices whose practice is somewhat specialized the remote possibility for use of a catalog may be a pressing necessity at a time when the desired catalog cannot be obtained without a wait of several days. The catalogs must be current issues and care must be given the weeding out of obsolete catalogs.

As the catalog file is, because of its purpose, restricted to certain classes of printed matter, it will be found that some data they contain should be filed elsewhere than with the catalogs. It then becomes necessary to plan a specification data file in which may be placed pages having to do with specifications of articles represented in catalogs, together with the numerous standard and recommended specifications and other matter of an informative nature that properly do not belong with catalogs.

The specification data file should be of the same size as the catalog file and should be arranged or classified according to the subject matter. In this file the alphabetical classification should govern as that is the most natural scheme of filing. It will be found that subject classification can be carried to extremes, making the number of file pockets or subdivisions entirely too great for a simplified arrangement. It is simple to arrange the classifications in master groups with whatever sub-master groups appear to make for flexibility and ease in finding the filed papers.

This data file should receive all specifications of manufacturers, historical data, standard specifications of recognized worth, recommended practices or rules of the various trade associations and labor unions and all other matter that will be of value as references when preparing the specifications.

THERE should be included in the specification data file, among other things, the following:

Standard specifications of The American Society for Testing Materials that have to do with building construction.

Standard specifications adopted by:

The American Society of Civil Engineers.

The American Society of Mechanical Engineers.

The American Institute of Electrical Engineers.

The American Society of Heating and Ventilating Engineers.

The American Concrete Institute, and such other professional organizations as have published standard or recommended specifications.

The Specification Manual published by THE AMERICAN ARCHITECT.

The Structural Service Book published by The American Institute of Architects.

Specifications, rules and regulations of the National Board of Fire Underwriters.

Specifications, rules and regulations of the Underwriters Laboratories.

Treatises, reports and other data published by the Bureau of Standards at Washington, D. C.

This list will give an indication of the contents of a specification data file and it will be found to be of invaluable assistance if it is kept up-to-date, as all-inclusive as possible and if the specification writer familiarizes himself with its contents.

It is, of course, quite essential that everything filed in both the catalog and specification data file be thoroughly familiar to the specification writer, otherwise he will find himself at times utterly at a loss for information urgently needed, but unavailable while within his reach. Thorough indexing and cross-indexing will be of assistance.

A well selected library of technical books and the larger catalogs will complete the general information equipment. Text books and handbooks covering all branches of engineering, building materials, equipment and their correlative subjects will be of assistance at times. A number of these books may contain matter that duplicates items in the specification data file, but those things filed will be more readily replaced by current reprints or new publications. This library should be studied by the specification writer and additions should be made as new books of merit are published. A recently published two-volume Handbook of Building Constructin by Hool and Johnson and a large number of collaborators is representative of the kind of books this library should contain.

AN outline and checking list, for the preparation of specifications and the coincident checking of drawings must be prepared carefully so that it may be of assistance and serve its purpose in a proper manner. An orderly preparation of specifications cannot be accomplished without the aid of an outline as it will be found to be an organizer of the skeleton work so necessary to have in mind while studying the drawings and planning mentally the matter that is to be included and that which is to be excluded from the specifications.

The outline should be made as comprehensive as possible, each step or operation in every branch or sub-division of the work being arranged in logical sequence so that the mind will function in orderly fashion when studying the problem. A hap-hazard scheme of specification writing usually is at fault when an outline has not been used and there is no more simple organizer of the function of composing specifications than a thoroughly well-prepared outline.

In checking over the drawings, either while they are still in process or after completion, it is necessary that an orderly method, represented by the checking list, be followed faithfully. The checking list should be prepared after the outline has been completed and will naturally have included many items not appearing in the specification outline, items that the drawings only can explain or indicate clearly.

The master specification consisting, as it will, of all standard paragraphs and of paragraphs of particular specifications covering, perhaps, some unusual phase or method of construction, will be as comprehensive as the practice of the office will permit. However, it is advisable to resort to research and investigation during odd moments to add to it paragraphs that will cover such ordinary and extraordinary phases of construction and equipment work as may reasonably be expected to be of use in the future work.

By using a loose-leaf book of standard letter size sheets on which the master specification paragraphs are to be pasted it will be found quite a simple means of permitting additions or re-arrangements without destroying the desired sequence. The paragraphs will, of course, be arranged in sequence and numbered in accordance with the specification outline. The numbering of the paragraphs will facilitate their location when they are referred to in the preparation of specifications or at any other time. When new paragraphs are inserted between consecutively numbered paragraphs the decimal system can be resorted to as this will permit of any number of additions without destroying the effectiveness of the numbering system adopted.

IN the preparation of the master specification extreme caution should be exercised in the text of the paragraphs, eliminating those words, phrases or clauses that refer to the particular work for which they were originally preferred. If the nature of these references is such that similar uses will be made of these portions of the text it will be a great convenience to leave sufficient blank space, with several question marks prominently displayed, to indicate that some words, phrases or clauses are to be added in order to complete the thought. It is to be understood that the flexibility and value of the master specification depends entirely on the thought and skill with which it is prepared. It is quite possible that the individual requirements of each specification writer will necessitate different methods in the arrangement of the standard paragraphs but the fundamentals of all master specifications, as given here, should remain the same.

The file of old specifications that have been used in construction work should be considered supplementary to the master specification. These specifications will have passed through the grief usually attendant on construction work and their value proved.

either to the credit or discredit of their author. While work is under construction this file, together with the master specification should be kept in mind and whenever ambiguities, errors, omissions or the countless other faults of a specification are developed proper notations should be made in the specification in this file and the master specification paragraph corrected or the error indicated in such a way that the future use of this section will not cause a duplication of the trouble. If this care is given the old specification file and the master specification the specification writer will soon realize their value because of the absence of disputes.

It is unfortunate that architects do not find it possible to exchange specifications of merit in the manner pursued by many attorneys who take pride in having extra copies of their briefs printed for distribution among their friends who may be interested in the arguments set forth. It is a pleasant custom, of great benefit to the legal profession and an earnest of friendly relations. It would be gratifying if architects would foster such a custom and it is to be hoped that The American Specification Institute will develop a means for the interchange of specifications that have been well written.

THE drawings may properly be considered last in a discussion of the "tools" that are of use in the preparation of specifications. The methods used in their preparation have a great deal to do with the scheme to be followed in the composition of the specifications. As a general rule there are two classes of drawings, the classification, of course, being based on the care with which they have been prepared. If the specification writer has charge of the preparation of drawings it will be possible for him to consider them in relation to the specifications and the responsibility for their correlation will be his. If, however, the drawings have been prepared without the jurisdiction of the specification writer, it becomes of increasing importance that there be a clear understanding of the two classifications of drawings.

Drawings may be prepared either as complete documents, thoroughly detailed and with all conditions that may arise having been given due consideration or they may be prepared in a somewhat hap-hazard and incomplete manner with the indicated understanding that large scale and full size details will be furnished later when time will permit. It is not to be understood that the second method should be condemned but it does bring up the question as to whether sufficient study has been given the various conditions the drawings present so as to enable the contractor who bids on the work to understand in full detail the expenses that his estimate must include. It is quite impossible, at times, to write the specifications so that the future desires of the one preparing the drawings can be anticipated with accuracy sufficient to provide an equitable basis for the contractor's estimate.

When either of these two methods of preparing drawings is used it will be essential to show, by a well-studied and thoroughly understood schedule of material indications, either cross-hatching or shading, of what the component structural and finishing parts consist. Since blueprints are in universal use now, great care should be given the study of these indications, particularly the usage local custom has given them, in order to avoid misunderstandings.

Notes that are to be placed on the drawings should not be located on the sheets indiscriminately or in a disconnected manner. It is customary to have blank spaces at the bottom or side of the sheets and the notes in most cases can be arranged in some logical method in these blank spaces. There are some notes that, by their nature, must be positioned close to certain parts of the drawings but, nevertheless, an attempt should be made to keep notes in a group by themselves as much as possible. As mentioned previously, the specification writer must adjust the conditions that surround his specification work to meet the requirements of the drawings and he is fortunate if he has sufficient control to have them so written and placed as to offer the best cooperation with the specifications. However, it is always necessary that the drawings be taken as prepared and submitted to him for his attention and it may be well that drawings not quite up to the usual standard of excellence sometimes be given him in order that his mental attitude be confronted with some conditions out of the ordinary.

It is rare that the drawings are completed to the last detail before the specifications are to be started and it is necessary that the specification writer watch the progress of the work from its inception, making notes from time to time as points requiring special care or investigation are brought to his attention. When the drawings are commenced it will be found to be quite a source of help later on if a schedule of materials, finishes, etc., is prepared in rough shape for the guidance of the drafting department. This schedule can be brought to a more complete state while the drawings are in progress, the man in charge of the work and the specification writer cooperating in order to effect a perfect understanding of all details. The attention thus given to the work while it is on the boards will tend to fix in the specification writer's mind the details of the work as he must know them, although this close contact will bring up one question of importance that must not be neglected.

This important phase of the work at this stage is that the specification writer must not become so saturated, as it were, with the details of the drawings that he cannot approach them in a certain unfamiliar manner when the specifications are to be started. In order that the drawings may be checked in a thorough manner it is quite necessary that they be approached from the standpoint of what might be

(Concluded on page 63)

DEPARTMENT OF ARCHITECTURAL ENGINEERING

CONSTRUCTION FEATURES IN THE BUSH BUILDINGS, LONDON

IN the construction of the Bush Buildings, London, 30,000 cubic yards of earth were excavated for foundations and basement. A clause in the specifications of more than passing interest to Americans, related to the ownership of objects of interest and value to antiquarians and archeologists, which might be found during the excavation. This, by the way, is a clause inserted generally in specifications for excavating work in European cities. In the Bush Buildings excavation, in which the bulk of the work was done by means of steam shovels, grab buckets and drag line scrapers, there existed little opportunity for scrutinizing the material. No finds of interest to souvenir hunters were recorded, although the site is a historic one.

The work below street level was all done in the famous blue clay of London, and it was necessary to build heavy retaining walls around the site. These walls do not serve as foundations, their sole purpose being to prevent the clay from flowing into the basement. A trench was dug around the site to a depth of 40 feet, at its deepest part, 640 feet long and 16 feet wide. London clay being exceedingly plastic, all excavation of the trench was performed by hand. The spades used are long and narrow, specially designed for this material, and are dipped in water after each cut. The trench is excavated to a depth of three or four feet and then lined on both sides with vertical "shuttering," held in place top and bottom by longitudinal "wallings," which in turn are kept the proper distance apart by screws and blocking. The excavation of trenches in London clay is a costly affair in which no detail can be neglected, for it possesses the flowing quality characteristic of bread dough.

REINFORCEMENT IN COLUMN FOOTINGS SHOWING HOOK ANCHORAGE—BUSH BUILDINGS, LONDON

Sidewalk Vaults

Reference to the accompanying figures shows the sidewalk vaults constructed by the municipality at the time the streets were improved. The floors of the vaults are at about one-half the total basement depth, it being necessary to put new foundation piers under the posts which support the inner edge of each walk. The old sidewalks were not destroyed during the progress of the work, the space between them and the building being specially treated after the framework reached sidewalk level.

Walls and Footings

The figures show plainly the wall sections, which are very heavy, an indication that they are of the gravity type without reinforcement. The footings were reinforced, serving to distribute the load of the walls with resultant pressure, as well as to carry the exterior building columns, or "stanchions" as they are called in Great Britain. Under some of the columns the footings were separate from the "L" shaped wall footings, as shown on the footing plan of the South Portion, and in the figure containing cross-sections. The construction of the wall is also shown clearly in the figures containing longi-

DETAIL VIEW OF EXCAVATION METHODS USED FOR END WALLS OF BASEMENT
BUSH BUILDINGS, LONDON. HELMLE & CORBETT, *ARCHITECTS*

GENERAL VIEW OF SITE LOOKING DOWN KINGSWAY
BUSH BUILDINGS, LONDON. HELMLE & CORBETT, *ARCHITECTS*

tudinal and cross sections of the building. The walls and footings are of machine mixed concrete.

The reinforcement of the footings consisted of plain round rods. The projecting wall footings carrying columns were reinforced as cantilevers under columns, the reinforcing being in the top, as shown in the first small figure. All rods were bent in round hook form for end anchorage, a method characteristice of European practice in reinforced concrete. The four figures showing reinforced concrete footings serve to give an idea of their size, as well as of arrangement of reinforcing.

THE "DUMPLING"

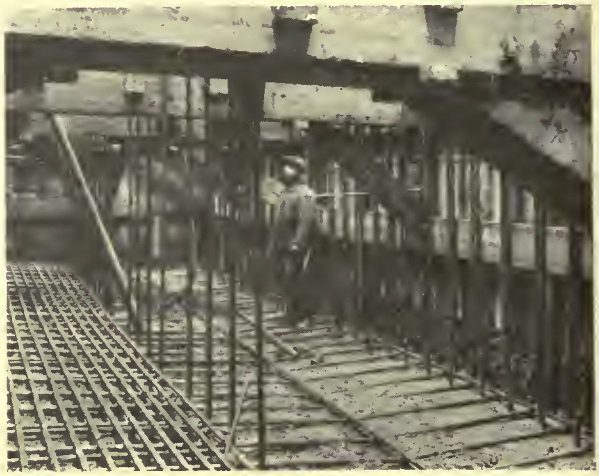
After the outer trenches were dug by hand in three

REINFORCEMENT IN COLUMN FOOTINGS
BUSH BUILDINGS, LONDON

or four foot stages, the footings were put in and the retaining walls poured in heights of three to four feet, trench braces and "shuttering" being removed ahead of each section. Finally the walls reached their full height and enclosed the "dumpling." The "dumpling" is everything within the surrounding walls and the American English language contains no word so good as this British English term for the material to be excavated on a building lot.

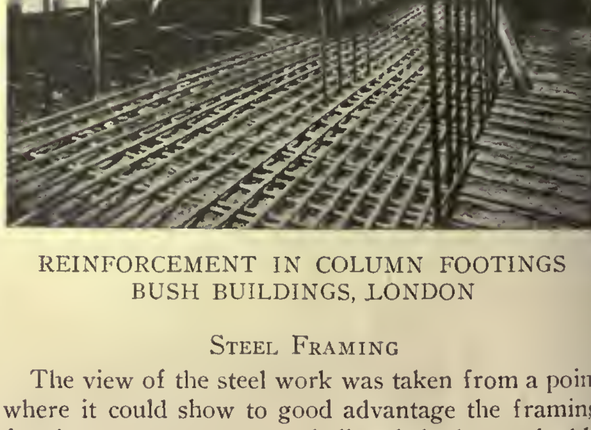
The yardage of hand excavated material was a large proportion of the whole, because of the "L" footings under the walls. The "dumpling" was excavated by steam shovels, grabs and scrapers. Before the war labor was paid small wages in England and contractors seldom found it profitable to use excavating machinery freely. Since the war there has been a distinct tendency towards the use of labor-saving machinery in contracting operations, not alone to keep down cost but to overcome a real shortage of untrained manual labor.

The "General View of Site Looking Down Kingsway" shows some of the walls completed and the ex-



REINFORCEMENT IN COLUMN FOOTINGS
BUSH BUILDINGS, LONDON

cavation of the dumpling well under way. A following view is from a photograph taken when the walls were completed and the excavation finished, with reinforcement placed for all column footings. Some of the structural steel is in position up to the level of the ground floor.

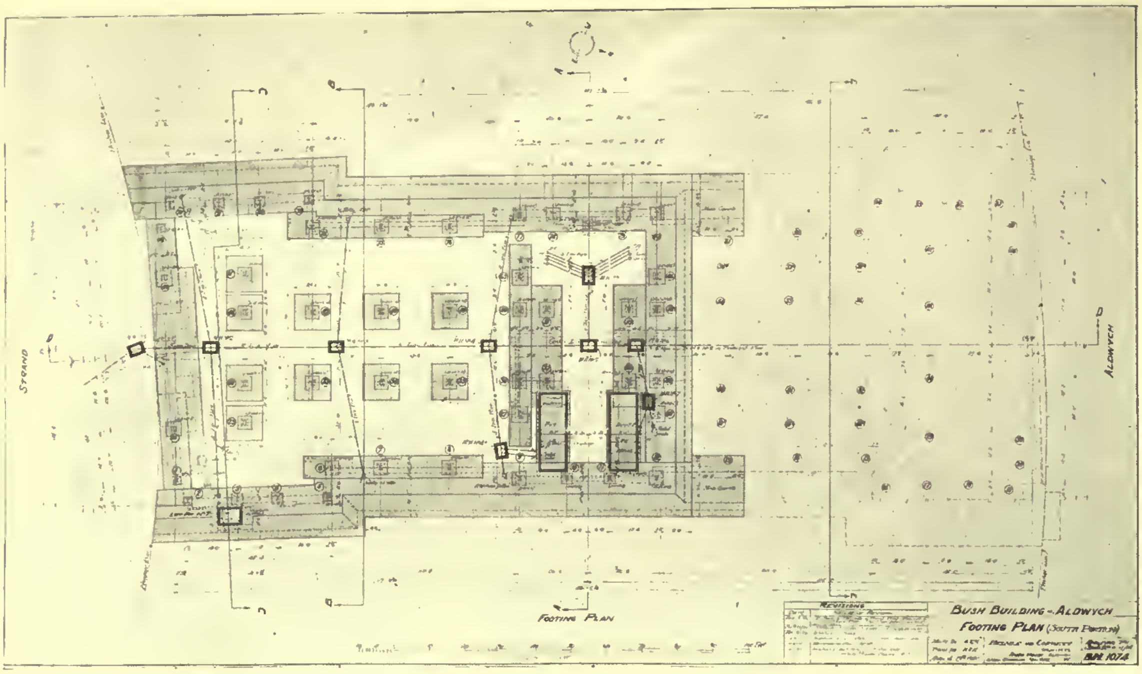


REINFORCEMENT IN COLUMN FOOTINGS
BUSH BUILDINGS, LONDON

STEEL FRAMING

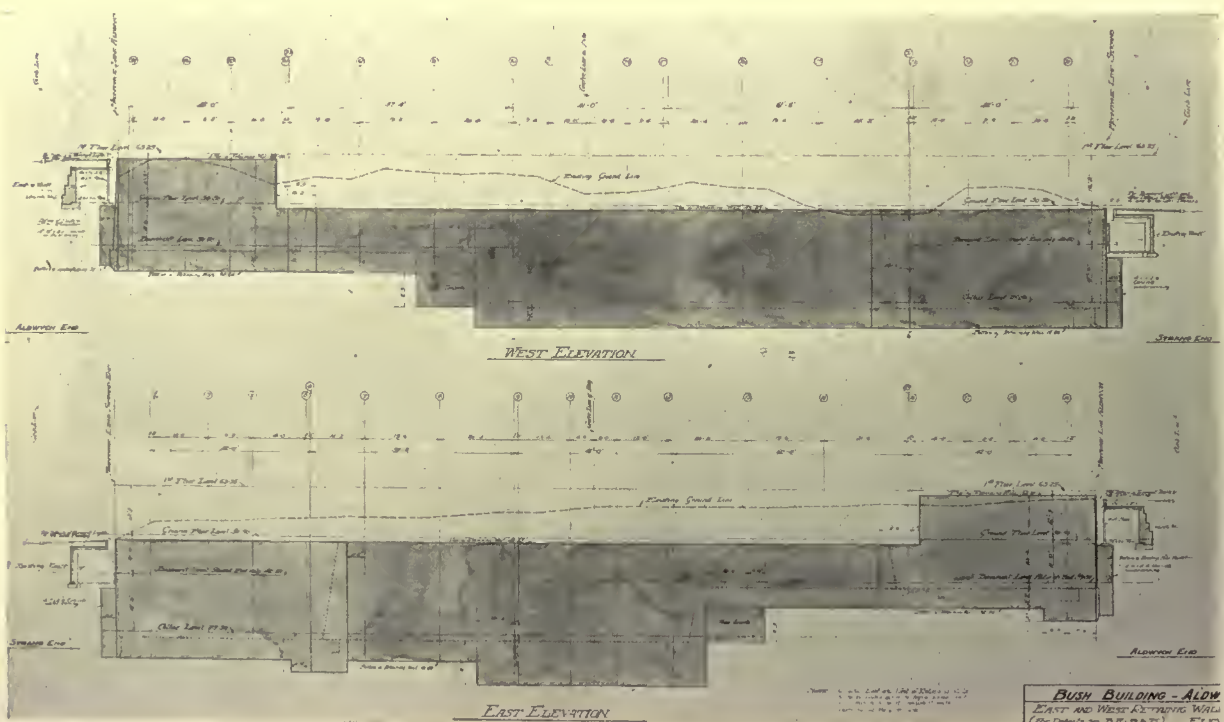
The view of the steel work was taken from a point where it could show to good advantage the framing for the two-story entrance hall and the heavy double girders over auditorium in the basement. There is

RETAINING WALLS COMPLETED AND COLUMN FOOTINGS UNDER WAY
BUSH BUILDINGS, LONDON
HELMLE & CORBETT, *ARCHITECTS*

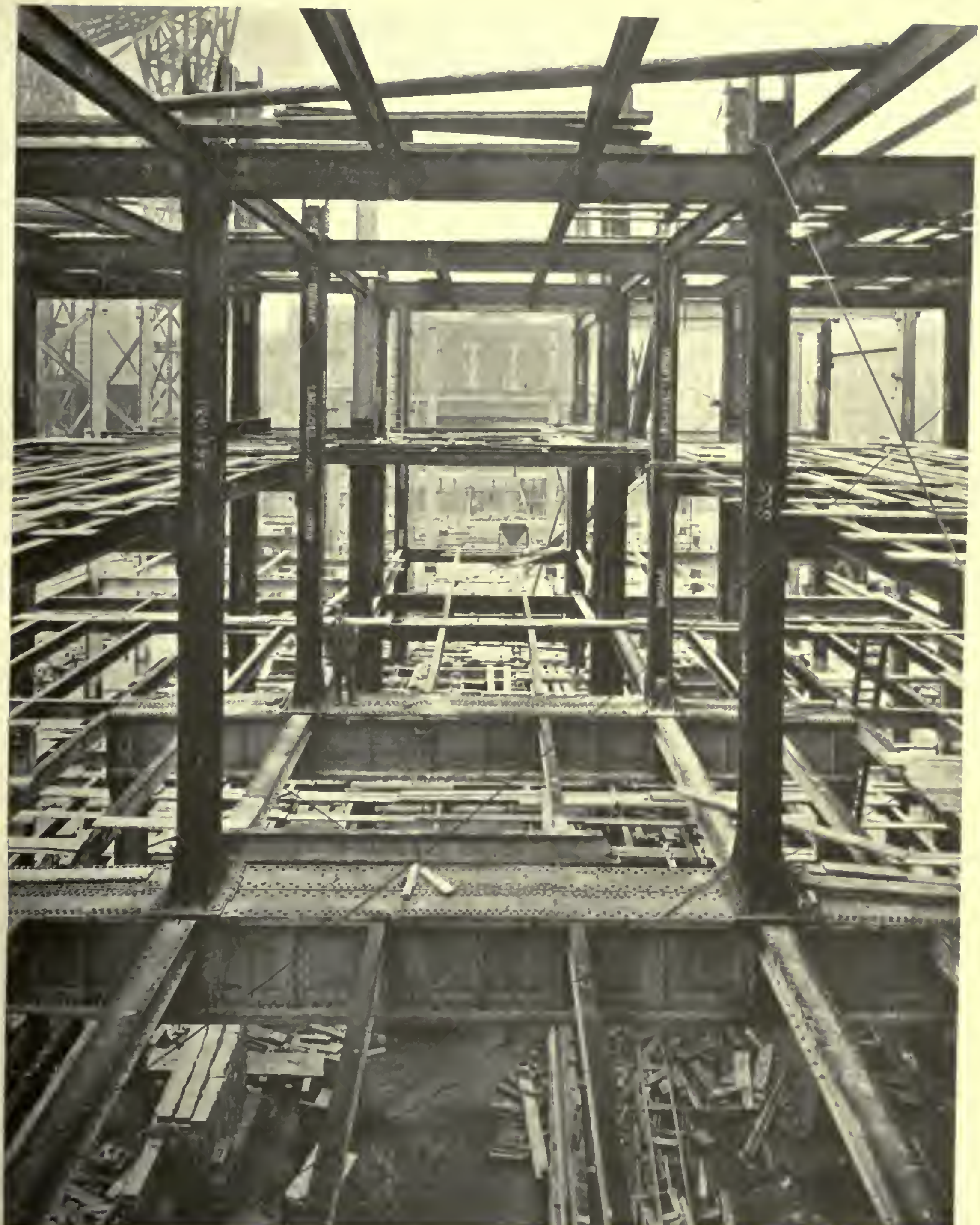


FOOTING PLAN OF SOUTH PORTION SHOWING DRAINAGE SYSTEM
BUSH BUILDINGS, LONDON

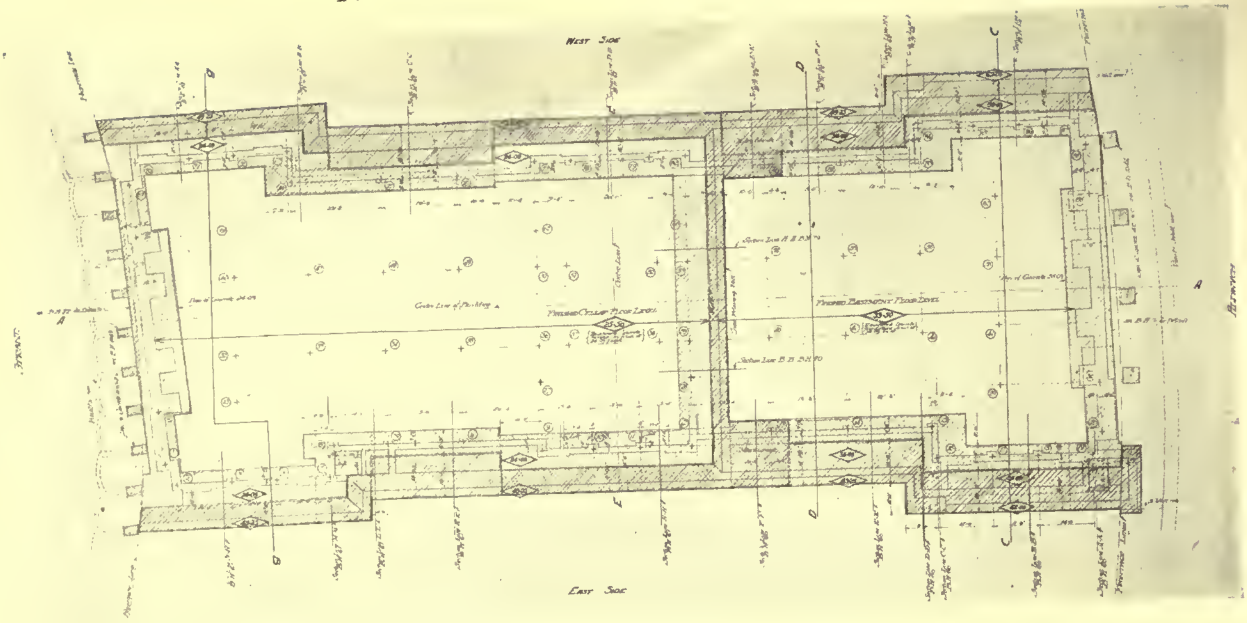
nothing out of the ordinary about the steel framing. The proportions of the structure are such that wind could be practically ignored, except as it may affect the tower. The girders over the auditorium in the basement carry four columns and their loads from the ground floor to the roof, and are the only things to relieve the plain every day character of the steel work. An idea of the loads on the girders may be



ELEVATIONS OF EAST AND WEST RETAINING WALLS
BUSH BUILDINGS, LONDON



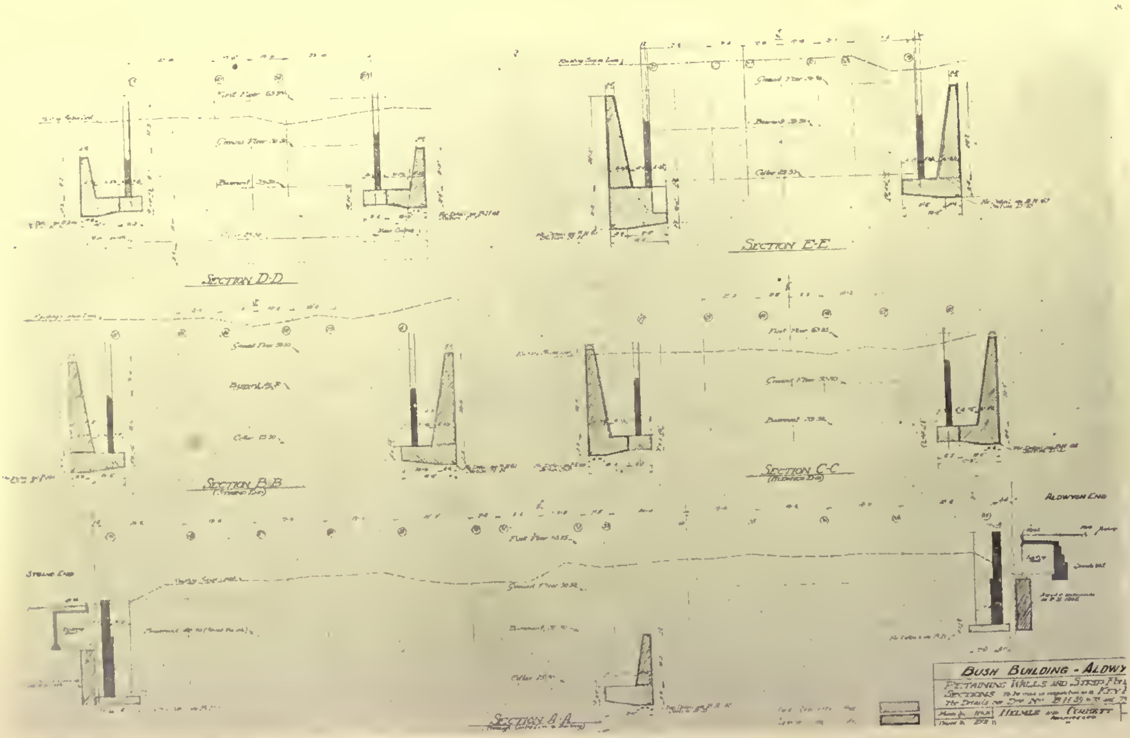
VIEW LOOKING SOUTH SHOWING FRAMING FOR TWO-STORY ENTRANCE HALL AND HEAVY GIRDERS OVER AUDITORIUM IN BASEMENT
BUSH BUILDINGS, LONDON. HELMLE & CORBETT, *ARCHITECTS*



PLAN OF RETAINING WALLS, BUSH BUILDINGS, LONDON

had by looking at the cover plates, which show plainly in the illustration. The main girders are each composed of two box girders somewhat shallow in proportion to the span, for it was necessary to obtain all the head room possible.

A number of studies were made for towers. The building was practically complete before the type of tower was decided upon, so the steel designer was forced to design for the tower which created the worst conditions under wind. This required close co-operation between the architect and engineer, for the action of wind on the tower is felt on the foundations and all intermediate framing. The design of the tower could not be changed materially after the steel was fabricated.



CROSS-SECTIONS OF RETAINING WALLS, BUSH BUILDINGS, LONDON

REVIEW of the CONSTRUCTION FIELD

With Reports of Special Correspondents in Regional Centers

The Opportunity for Home Builders

THE process of deflating credit and getting the United States back to a fairly normal condition financially is practically accomplished. Thanks to the Federal Reserve Bank System the matter has been arranged in an orderly manner with no more distress than was unavoidable. Now the breathing spell has come, common to all such periods of readjustment and the public is awaiting signs of when and in what direction revival will begin. Fortunately for general business the lull in the summer, a season when trading is dullest, but unfortunately for the building business which counts summer as a harvest time.

In all periods of business depression the revival comes when somebody begins to supply pressing necessities. In the United States there exists a pressing need for homes. It has been a fruitful source of discussion in the public press so we all know, or believe we know, that because of the concentration of the nation on the business of war 1,500,000 fewer houses were built than would have been built in normal times. Add to this the loss by fire and the number of homes needed runs close to 2,000,000. Depreciation and lack of proper repairs add to the volume of work to be done. There is no doubt at all that in a building revival lies our best hopes for a general revival of business.

Immediate action is needed and the most important thing to do is to de-centralize the loaning power, now concentrated in our banks. This power at present is paralyzed by government needs and is forced to demand usurious rates for the small funds it has remaining for commercial needs. There must be some more inflation of credit but along sound lines. The revelations of the Lockwood investigation as conducted by Samuel Untermeyer showed the lengths to which men felt they had to go to obtain returns on money intrusted to their care. It also showed another most gratifying thing, the gameness of the American home builder when he felt he simply must own his home and free himself from the exactions of landlords, not all of whom are profiteers from choice.

THE Lockwood committee proposed the repeal of laws against usury for sums in excess of $10,000. The repeal of the usury laws will certainly act to bring into the market a great many individuals ready to loan small sums at rates they cannot at present obtain. In the long run the benefits will be great but the country cannot await legislative action Action is needed this year so the building revival will begin by the letting of contracts this winter The most practical method suggested to date is a recourse to co-operative methods such as the people once possessed in building and loan associations before they were absorbed by banking institutions. History is said to repeat itself and building and loan associations grew out of the need for loans to finance home building at a time when banks had to obtain large returns.

Organized labor is friendly, towards the co-operative idea. In fact reports from labor conventions indicate a friendliness of an enthusiastic nature. Material dealers are said to favor concessions in price to all co-operative enterprises, and all that is needed is a start. This could begin by the organization of co-operative banks. They have learned through Mr. Untermeyer just how much men can be made to pay for money and how to get this price without violating the laws against usury. Co-operative banking institutions would be in high favor with depositors for their profits would give them better returns on their savings than they now obtain from banks of the usual type. Borrowers should be limited to depositors who will use the money to build homes and speculative builders should be discouraged. Liberal commissions and high interest will be paid readily for all profits will ultimately accrue to the borrowers themselves, because they are depositors.

The co-operative banks will be needed first, then co-operative purchasing agencies and co-operative contracting associations of workmen. The first effect will be a withdrawal of funds from regular banks to get the co-operative banks started, but as orders flow into the factories the credit machinery will begin once more to operate. It is possible to have again and that very soon, a period of large profits, high wages, high production, accompanied by falling prices as one after another all industries feel the impulse of accelerated demand. All that is needed is to start money flowing so the frozen reservoirs of credit may be thawed out. Co-operation without interference from legislation should bring it about. All necessary legislation is now on the books and the men who have most at stake, the architects and building contractors, should be the leaders in each community. The financial situation today is such that only a start is needed.

THE BUILDING SITUATION in CHICAGO and the MIDDLE WEST

(*Special Correspondence to* THE AMERICAN ARCHITECT)

CHICAGO—Now that everyone has kissed and made up and gone back to work pending the decision of Judge Landis, the immediate building future has assumed a much more cheering aspect than for these many weary months just past. His Majesty, the carpenter alone, so it is said, refuses to consider himself bound by the Landis peace bonds but has returned to labor with the rest of his fellow craftsmen. Although more than a week has elapsed since Judge Landis was appointed arbitrator, he has not intimated what his decision will be. However, those in the architectural and building fields, in a position to know, express themselves as confident that the present cessation of hostilities will be permanent and that conditions will improve rapidly from this time on.

The effects of an immediate resumption of activity all along the line are bound to be far reaching. As an example of this may be quoted the fact that railroad officials are already contemplating putting many of the men laid off recently back at work.

Although chiefly concerned with the sudden brightening of the building horizon the Chicago architect finds time to be very much interested in the fourteenth annual convention of the National Association of Real Estate Boards which opened here Monday, July 11. This, it is estimated, will bring more than 10,000 builders to the city and will be one of Chicago's greatest conventions.

Mayor William Hale Thompson opened the convention of United States realtors at the Auditorium Theatre. The convention program included among other things a smoker for delegates in the dining hall of the Auditorium Hotel, an entertainment for visiting women in the Gold Room of the Congress and a trip by special train to the Great Lakes Naval Training Station. Mayor Thompson issued a proclamation calling upon citizens to decorate their places of business and the Chicago Real Estate Board asked Chicago business men to assist in the reception of the distinguished guests. The list of noted speakers, who delivered addresses before the convention is a lengthy one and included such names as Senator William A. Calder, John S. Hord, tax expert; Melvin T. Taylor, president, First Trust & Savings Bank, and John J. Emery, National Commander American Legion.

UNDER the stimulus given building by the at least partial settlement of labor difficulties, several large projects have been gotten under way within the last ten days. One of the largest of these is a club house for the North Shore Motor Club to be erected between Sheridan road and the lake in Rogers Park.

Ground has been broken during the week for the Lutheran Memorial Hospital, a $360,000 structure of brick and reinforced concrete. The building will be six stories high on 110x142 feet.

Architect J. M. Marzek designed the North Shore club house. Worthman & Steinbach are architects for the hospital.

One of the most encouraging developments of the week is found in the greatly increased number of building permits issued for the week of July 7. These stack up against last year of the same period, 123 to 26. Permits amounting to 234 were issued for places to live, 77 being for individual houses against the normal number of 291 for the week.

BUILDING CONDITIONS on the PACIFIC COAST

(*Special Correspondence to* THE AMERICAN ARCHITECT)

SEATTLE.—Architects, jobbers of building materials and contractors of the Pacific Coast have no reason to complain of conditions in comparison with the East, even though the volume selling is light and the "shoestring" tendency in buying still prevails. Heads of coast jobbing houses now traveling in the East, conversing with fellows of their craft advise that the scene of the nation's commercial activity has shifted from the East to the coast and that actual conditions will bear this out.

Steel prices have fallen on the warehouse basis coast cities, but the market is not yet at bottom, jobbers believe. It is the opinion of the wholesale trade that camouflage is still being used to obscure the real issue, that the mills know it, but are reluctant to give way until forced to do so. Obviously things cannot go on in this way and a brisk inquiry be developed, and it is represented by coast operators that the sooner the mills hit the basic the better it will be for what building is expected for the balance of the current year. It is a genuine conviction that, while this is not the opportune time to go into any extensive building placements, considerable late summer work could be commenced and continued far into the mild winters that prevail in all coast states.

While sheets have fallen, pipe has held firm. A brisk demand for halves and three-quarters has developed without seeming reason and jobbers suddenly find themselves short. It has been necessary for the jobbing trade to fraternize in patching out and in making 100 feet do the work of 200.

The cement market is nominal and production 30 to 50 per cent. of normal in all coast plants. Jobbers in building materials deplore the road-building program in the coast this state, pointing out that had this been deferred in recognition of its inopportune time cement would have declined heavily. It is in road building that cement manufacturers are receiving their greatest revenue. Books and records of jobbing houses show that month to month sales ton basis since Jan. 1 are running 30 to 50 per cent. of the corresponding months of 1920 while decreasing on the approach to the building season. Notwithstanding this, jobbers in sheets, pipe and nails are able to report as large a volume of sales for June as on any similar month during the five-year period before the war.

The country trade is running close to actual needs, although jobbers are urging that business should not be lost because of scanty stocks and over caution. Wheat will be about a dollar a bushel to the farmer. He will discharge debts and cancel paper at the banks, leaving him in a position to borrow more. This will aid the retailer but will not leave any great amount for new construction in the country. It believed that another harvest must come and go before the country is in normal position.

In lime and brick, it is manifestly a buyers' market.

Fir lumber mills are in the midst of their July shut down, an annual occurrence. The mills announce that they will not reopen until the market improves, but wholesalers who have heard this statement before following a lean season smile broadly and predict that before August 1 production will be back to 70 per cent. of normal.

The fir lumber market has held firm. No 2 and better vertical grain flooring 1x4 sold at the mills at $49, slash grain at $20 to $21, finish at $46 to $50, ceiling at $20, drop siding at $21, boards and shiplap at $11.50 and common dimension at $10.50. Wholesalers are keeping cleaned up on orders, refusing to sell short. The movement of firm lumber to the Atlantic seaboard by water is about 2,000,000 to 3,000,000 feet weekly. Orders in the eastern rail or building trade are running 1,100 carloads a week. The newly organized Lumber Terminal Corporation, which lighters, stores and insures lumber for the Atlantic seaboard without charge to the shipper but takes its revenues from the steamships on their saving in shifting from port to port in getting cargo is now a proven success and has stimulated enquiry from the Atlantic.

Architect W. R. B. Willcox, F. A. I. A., of Seattle, has been appointed to make the competitive award of the Peace or Liberty Memorial for Kansas City. He represented the states of Washington, Oregon and Idaho on the national board of the American Institute of Architects.

The first porcelain manufacturing west of St. Louis may be begun here as a result of efforts of the Seattle Chamber of Commerce in communicating with A. F. S. Steele, former official of the Washington Water Power Company of Spokane, who points out the advantageous export position of this city.

Architects Mendel & James, of this city, report a large amount of country work, and predict an early resumption of construction.

To Save the Trees Along Our Highways

THERE has been received from Mr. Willis Polk, architect, of San Francisco, the following communication:

"If public sentiment can be crystallized to the end that further cutting of trees along the highway will be retarded or stopped, a good work will be done. If not, the logical thing to do would be to seek a solution of the problem or a remedy for the evil.

"There is no excuse for cutting these trees, except the ordinary one, founded on thoughtlessness, ignorance, cupidity or stupidity. But to call such action upon the part of private property owners a crime, though it is their right, is not fair. Call it a mistake, if you please, and let it go at that.

"If existing conditions compel the sacrifice of these trees, maybe there is no remedy—maybe these trees must fall in the march of progress—I do not think so, as witness the few charming examples that already exist where the trees have not been sacrificed. However, let us look at the darkest side of the problem and ask ourselves seriously what is the best thing to do. What could be the remedy? If existing conditions are detrimental to trees along the highway, why not adopt a policy for the future?

"The State and the Nation propose vast highway construction projects—would it not be wise that restrictions be fixed that buildings should not be constructed closer than 75 feet thereto? Such a restriction would preserve trees where they exist and encourage the planting of trees where none exist.

"The restricted residence district has in nearly all cities proved successful—if private real estate promoters can profit by restrictions, why should not the State and the Nation profit in like manner?"

Department of Specifications

(Continued from page 52)

called quasi-familiarity as it is well understood that one who prepares drawings—or for that matter specifications—is not quite as competent to check them as one who has not had the opportunity to become so familiar with them that he can visualize them to the last detail when away from the office. It is not the obvious things that require checking nearly as much as the hidden matters that only can be revealed when one is attempting to understand them after being fairly complete.

This is the attitude of the contractor's estimator and if the specification writer can, to some extent, approach the drawings in a similar frame of mind he will find that his specifications will be given a better co-operative relation to the drawings than otherwise. And if this can be brought about there is no reason, except one of gross carelessness or neglect, why the proper spirit of co-operation between the contract documents cannot be had, thus bringing the construction work to a successful accomplishment.

The AMERICAN SPECIFICATION INSTITUTE

IT is extremely gratifying to the Board of Governors to announce that the widespread interest in The American Specification Institute continues with unabated force. There is every indication that the membership will be more than doubled during the next month. All parts of the United States and several Canadian cities are represented in the more recent evidences of a desire to join the Specification Institute.

The American Specification Institute has been organized to promote the unified study by specification writers of the intricate work involved in the preparation of specifications and of all conditions affecting the work in this department of architects' offices. As the membership increases the benefit to be derived from membership in the Specification Institute may be said to increase in far greater proportion. In the past there have been many serious efforts made to improve specifications and there have been other indications that the architectural and engineering professions realize that earnest efforts must be made to perfect this important branch of professional work.

The members are, therefore, urged to bring to the attention of their friends and acquaintances the benefits to be derived from membership in The American Specification Institute, to the end that co-operation may be had from the majority of the architects in North America.

THE Board of Governors wish to begin a study of one particular phase of specifications that already has been the subject of several inquiries from members. This phase is the method followed to specify articles by quality rather than by manufactures' or trade names and how the usual "grandfather" clauses such as "and all other work shown on the drawings" have been eliminated or reworded so that a fair and just attitude as between the architect or engineer and contractor has been expressed. Quite often it has been found, during the stress of construction work, that clauses have been carelessly worded, utterly defeating their purposes. When such difficulty occurs it is only natural that subsequent specifications are corrected and these corrections usually prove effective. Those members who have had similar experiences and have been able to word clauses so that the conditions have been met successfully are asked to send to the Executive Secretary's office such clauses and, in addition, a brief statement of the source of the original difficulty.

ALTHOUGH the semi-monthly bulletins will, for some time, be devoted to the specification outlines, it is desirable that members send to the Executive Secretary's office information of any kind that will be of interest and benefit to members. If members have real interesting articles or books on the history of materials or their production, fabrication and finishing, sufficient information should be sent to enable the procuring of the article or book in question. In any event, members should understand that any data is welcome, even though its value may seem trivial to its possessor.

SEVERAL very interesting suggestions have been received from members with respect to Bulletin No. 1, General Outline for Specifications. They show that a great deal of very careful thought has been given this subject and it will be possible, very shortly, to distribute to the members a resume of these criticisms and suggestions. Those who have not reported their views with respect to this bulletin are asked to do so as soon as possible in order that the periodic continuity of the reissues may be followed without delays.

The American Specification Institute,
127 North Dearborn Street, Chicago, Ill.,
Gardner C. Coughlen, Acting Executive Secretary.

CURRENT NEWS

Happenings and Comments in the Field of Architecture and the Allied Arts

Mark Twain Home to Stand Intact

THE Mark Twain home in Hartford, Conn., will not be demoilished to make way for a new building, the directors of the Kingswood School, which now occupies the homestead, having voted to renew their lease on the place.

To Establish American Shrine for Poets

ACCORDING to press announcements, plans are under way to establish an American shrine for poets in New York, to be known as the "House of Poets." The institution will follow somewhat the lines of the Palace of Song in London, in which the poet laureate lives, and will be the home of the American dean of poets. The house, to be erected at an approximate cost of $100,000, will combine the functions of club and clearing house for all American poets.

Housing Shortage

AN interesting discussion on housing conditions, as affected by the war, in the United States, Great Britain, France and Canada, is found in the report of the Select Committee on Reconstruction and Production, United States Senate. It is issued in pamphlet form by the Government Printing Office, Washington, D. C.

South Chicago to Establish "Friendship Center"

AFTER years of consistent effort, South Chicago has evolved a plan whereby all of its welfare activities will be concentrated. This plan takes the form of erecting a group of buildings to shelter and concentrate this work and its workers. "Friendship Center" is to be the name of this enterprise, which will represent an expenditure of $350,000.

The Art Centre

THE designs for the Art Centre in New York prepared by J. Munro Hewlett, president of the Architectural League of New York, have finally been perfected and approved and the actual work of construction is begun. The first groups of works of art by the best industrial designers in the United States will be shown at the Art Centre in the month of October. The new building will then be formally dedicated to the service of art, as applied to the everyday affairs of the people.

Spite Fences

BILLS designed to prevent the erection of "spite fences" were recently introduced in the New York State Legislature by Assemblyman Edward R. Rayher of New York and Senator Fred B. Pitcher of Jefferson. The bills are intended to declare that such structures are a private nuisance and may be enjoined. Provision is made that the proposed law does not create an easement in light and air and that it will not prevent the erection of buildings.

Pennsylvania State Legislature Approves Plan for Sesqui-Centennial

OFFICIAL recognition and endorsement have been given by the Pennsylvania State Legislature to the plan proposing a Sesqui-Centennial exposition to be held in Philadelphia in 1926. This is the first step on the part of Pennsylvania to arouse what it is hoped will be a nation-wide interest in an exhibition that is intended to eclipse all future industrial expositions.

Tax Exemption in New York Stimulates Building

BUILDING records in the five boroughs of Greater New York show a marked increase in the building of apartment houses. It is claimed that this increase is more than 450 per cent. since the tax exemption ordinance took effect. The average cost of the new apartments is given as $4,689, and they are all designed to fall within the $5,000 limit of the tax exemption ordinance.

Plan to Construct a Model French City

MAJOR J. A. M. de SANCHEZ, chief of the economic division of the French High Commission, stated at the conference on reconstruction in France, held in the Engineers' Club of Boston, that the City of Pinon, a little town about ninety miles from Paris, had been selected to combine all the artistic features that make French villages beautiful and all the sanitary improvements that make American cities healthful. It is believed that the work done in Pinon will influence all of that done in the rest of France for generations to come, and, while retaining as far as possible the picturesque atmosphere of the French village of the past, will add those modern features that are conducive to the comfort of home living and the prosperity of communities.

A Substitute for Cork

A CHEMICAL works at Bruenn-Koenigsfeld has been carrying on experiments with a view to finding a substitute for cork, says a Prague correspondent in the Times Trade Supplement, and these have now led to tangible results. Turf treated by a special patented process furnishes a material for insulation and building purposes that is said to be, in most respects, not inferior, and in some superior, to cork. The product is reported to be equally light, firm, and sound proof, to possess great insulating properties, and to be damp proof.

An Appropriate Memorial

IT is seldom that a memorial to a distinguished man so perfectly perpetuates his life work as the Gorgas Memorial Institute to be established at Panama will honor the memory of the late Surgeon-General Gorgas. According to announcement by the American members of the institute, which is, fittingly, international as was the work of its subject, the institution is to be concerned chiefly with tropical medicine.

The memorial institute, which is to have the cooperation of medical institutions in all the leading nations, will further the research in tropical sanitation and medicine which so largely occupied the career of the famous American scientist.

Chinese to Tax Houses on Height of Structure

NEW taxes are planned by the Chinese Government through the levying of a house tax, to be experimented upon first in Pekin in the provincial provinces and in the trading ports, after which, if successful, it will be extended elsewhere.

The process of this tax will be a monthly collection upon each chien or apartment as a unit, the houses to be placed in three classes, according to height. For the first class there will be a monthly tax of twenty cents, for the second, fifteen, and for the third, ten. Foreign buildings to be taxed in accordance with the area covered and the number of stories.

Bronze Gate to Be Added to "Trench of Bayonets"

AN impressive bronze gate will soon be added to the Rand memorial monument over the famous "Trench of Bayonets" at Verdun. The gate has been designed by Andre Ventre, a Paris architect. Like the memorial itself, the gate is the gift of the late George F. Rand, of Buffalo, N. Y.

This gate will be erected at the entrance of the historic trench about fifty feet from the memorial which covers the bodies of the French soldiers who were killed in the trench, leaving their bayonets exposed above the ground. The gate is of thick bronze, about twelve by eight feet.

Architectural Year Book, University of Illinois

THE Architectural Year Book of the University of Illinois for 1921, published by the Architectural Society, has been received. It has been dedicated this year to Professor Rexford Newcomb in recognition of his loyal devotion to the best interests of the Department of Architecture. The work presents a series of selected drawings, representing the various college years, and is a dignified record of a well-conducted university course in architecture. The results, as shown, are eminently satisfactory, and reflect credit not only on the student body, but on the faculty that so competently directs its efforts.

John Nolen on Common Sense in City Planning

THE Thirteenth National Conference on City Planning was closed by John Nolen with some common sense remarks on the subject. He stated that it was wrong to leave promotion to but one class in the community; to overdo promotion and to expect inadequate promotion to accomplish much good. He recommended a responsible official planning commission having adequate powers; provision for sound legal advice; a solid financial policy sufficiently broad; unremitting education in schools and public meetings; appropriate and timely publicity; a follow up organization keeping persistently at work; an adequate, competent staff and a competent consultant.

Architectural League of Indianapolis Consolidates with the Indiana Artists' Club

WE are advised that the Architectural League of Indianapolis has, by a vote of its members, decided to transfer its strength and efforts to the Indiana Artists' Club, thereby consolidating two organizations having similar aims and ideals.

Restoration at the British Museum

THE present policy of the British Museum where the authorities are seeking to "restore" old Greek sculptures, is roundly censured in the press of London. A correspondent to THE AMERICAN ARCHITECT, commenting, states: "No doubt the museum authorities do not like the Greek marbles in their possession, but why they should translate the masterpieces into something more nearly approaching the Albert Moore ideal of Greek passes my understanding. The Demeter is not only 'improved' with a new plaster nose, but to bring the rest of the head into consistency with this nose, the whole face has been scraped and cleaned, thus destroying the mellow golden patina of centuries. Other important pieces 'improved' are the marble boy extracting a thorn from his foot, and the very fine priestess from Cnidus, so altered as to give an entirely different effect from that it originally had. How long are these vandals to have in their 'care' the golden treasury of sculpture, which at least they might leave untouched?"

A National Housing Division Planned

A DIVISION of Housing as proposed in a bill which it is stated, has the approval of President Harding and is sponsored by Secretary of Commerce Hoover, has been introduced concurrently by Senator Calder of New York and Congressman Tinkham of Massachusetts. It proposes to put the new division and the Bureau of Standards under the administration of the Secretary of Commerce. The purpose of this housing division is to gather the best information on the housing question and disseminate such parts of it as may be helpful to those engaged in the building industry.

Rockefeller Fund to Build Hospital for Belgians

TO centralize, extend and modernize the operations of the faculty of medicine of Brussels University, the trustees of the Rockefeller Fund are contributing a sum of forty million francs. The understanding is that the local authorities shall also do their part in the way of financial help and service toward the realization of this gigantic scheme.

One of the two main existing hospital buildings of the capital and a nearby barracks are to be acquired for the use of the faculty, and here will be centralized operating theatres, classrooms, nurses' quarters, clinics, surgeries, laboratories, students' cantines and various other offices and departments of the medical school.

Course of City Planning and Civic Art at Columbia

REALIZING that city planning is so broad in its scope and the term is so inclusive as to designate it a superprofession, it has been decided at Columbia University to establish a comprehensive course on City Planning and Civic Art.

The lectures will cover the history and development of types of cities in relation to the general development of civilization.

Field work, an important part of the course, will consist of trips of inspection to various types of city development.

Drafting room work will consist of the development of sketches illustrative of principles learned in the class room and from field notes. The course begins October 5, 1921, in the Winter session, and February 8, 1922, in the Spring session.

Brooklyn Chapter A. I. A. Elects Officers

THE following ticket was elected at the annual meeting of the Brooklyn Chapter of the American Institute of Architects: President, John B. Slee; vice-president, Arthur R. Koch; treasurer, William J. Dilthey; secretary, Thomas E. Snook, Jr.

The Rights of Artists

THE Belgian Chamber has just passed a law which will be welcomed by all artists. It provides that they, or their heirs, shall receive a percentage of the proceeds when their works are sold by public auction. The percentage, it is true, is not very high—it ranges from two per cent. in the case of pictures that are sold for £200 or less to six per cent. where the picture fetches over £1,000—but it is sufficient to give an artist a definite pecuniary interest in the public's recognition of his work and in his posthumous reputation. As a rule, a painter's talent develops slowly and his vogue still more slowly. Many of the world's greatest artists have had a hard struggle to keep body and soul together, even when they have reached the height of their powers. Pictures that are worth thousands of pounds to-day have been sold to pay the rent of a garret.

This measure, which is based on very reasonable lines, appears to us a clever method of meeting a great hardship, as it effects its purpose without any real interference with the rights of the owner of the picture in question. In this it is far fairer than the Italian law, which prohibits the exportation of works of art, and so in many cases absolutely penalizes those who have need of the proceeds which the sale of a picture would represent.

Rheims Cathedral

THE fate of Rheims Cathedral has not yet been decided, the commission instituted by the law of April 17, 1918, to pronounce on the future of the public buildings damaged during the war not having up to the present come to any decision with regard to Rheims. The commission will have to decide between two alternatives—the complete restoration of the cathedral as it was before the war, insofar as this is humanly possible, and the leaving of the charred and mutilated building just as it stands, as a memorial of the ruthlessness of the enemy. Both solutions have their partisans. Those who demand the restoration estimate that a sum of 125,000,000 francs (nominally £5,000,000) will be required. Among the many difficulties of restoration, that of the glazing is the greatest, but a master glassworker claims to have re-discovered the qualities of ancient glass, including the luminosity. It is known that this luminosity results from the fact that the two surfaces of the glass are not parallel, the convex and concave surfaces receiving the light in prismatic angles, an effect which in modern glass is to a certain extent recaptured by painting.

PERSONALS

Announcement is made that the new address of Marsh & Peter, architects, is now 1304 F Street, N. W., Washington, D. C., instead of 522 Thirteenth Street.

The office of Walter Thomas Williams, architect, have been removed from 151 Fifth Avenue to 41 East Forty-second Street, New York City.

It is announced that Norman Krecke and Arthur A. H. Janke have opened offices for the practice of architecture and engineering at 107 Buhl Building, 129 Congress Street, West, Detroit, Mich.

S. Wesley Haynes and Harold E. Mason, architects, announce the formation of a partnership for the practice of architecture, under the firm name of Haynes & Mason, with offices at the Park Building, Fitchburg, Mass. They are desirous of receiving manufacturers' catalogs and samples.

Francis W. Cooper, F. A. I. A., and L. A. Desjardins have formed a partnership to continue the practice of architecture at the offices established by the former, 108 Pope Block, Pueblo, Col. Both are Cornell graduates. Mr. Cooper, class of 1874, is the oldest living graduate of that college of architecture still practicing, besides being longest in practice in this state. Mr. Desjardins located at 212 Security Building, Galveston, Tex., since 1911, is a holder of Colorado License No. 1, granted upon passing highest in the first examination to licensed architects in this state.

Bell & Curtis, architects, Vernon, B. C., are desirous of receiving American samples and catalogs.

George B. Olmsted Company has opened a new office at 315 Seventh Avenue, North, St. Petersburg, Fla., and requests samples, catalogs, etc., for its files. The firm is composed of George Ball Olmsted, John Olmsted and Frederick Law Olmsted, and their practice will include architecture and landscape architecture.

Oscar V. Vatet, architect, announces the removal of his offices to 15 East Fortieth Street, New York City.

The offices of Richard Henry Dana, Jr., architect, are now located at 350 Madison Avenue, New York City.

The Board of Education of Columbus, Ohio, has opened new offices at 50 East Town street, to be under the supervision of Howard Dwight Smith.

George C. Harding, of the firm of Harding & Seaver, architects, Berkshire Life Insurance Building, Pittsfield, Mass., it is announced, died on April 23. Henry M. Seaver, the remaining partner, will continue the practice of architecture under the name of Harding & Seaver.

Mauran Russell & Crowell announce that they have admitted to membership William F. Wischmeyer and W. Oscar Mullgardt.

Netcott, Donnan and Netcott, architects, have succeeded the firm of Netcott and Netcott. J. N. Donnan has entered the firm and the offices will remain at 515 Black Bldg., Waterloo, Ia.

Walker & Eisen, architects, have moved their offices from the Hibernian Bldg., Los Angeles, Cal., to the Pacific Finance Bldg., that city.

Chester Oakley announces that he has dissolved the firm of Lansing & Oakley, and will practice architecture with Albert J. Schallmo, under the title of Oakley & Schallmo, architects, with offices at 70 West Chippewa Street, Buffalo, N. Y.

Clinton & Russell, architects, have moved their offices to the sixth floor in 100 Maiden Lane, having for many years been located at 32 Nassau Street, New York City.

A new Chicago firm of architects is that of Minchin, Spitz & Company, architects and engineers, with offices at 19 West Jackson Boulevard. Alexander H. Spitz was formerly located at 105 West Monroe Street, and H. Minchin has up until this time been associated with Minchin & Weller, Inc. Paul L. Francesco is the third member of the new firm.

After having spent three years in the United States service and four months in England and on the Continent, A. K. Mosley, architect, has resumed the practice of architecture at 1887 Frances Avenue, Troy, N. Y., and will be pleased to receive recent catalogs issued by manufacturers.

Word was recently received from Paris of the death of Charles Edwards, a well known architect of Paterson, N. J. He had been ill for about a year, and went to France four months ago, seeking to recover his health. Mr. Edwards is the designer of the Paterson Savings Institution Building, the United States Trust Company Building, the Second National Bank Building, St. Mary's Roman Catholic Church, all in Paterson. He is survived by his wife, Mrs. Margaret Edwards.

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MOSAIC DETAIL IN THE CHOIR OF THE CHURCH OF S. VITALE, RAVENNA, ITALY

THE AMERICAN ARCHITECT

VOL. CXX WEDNESDAY, AUGUST 3, 1921 NUMBER 2373

PLANNING THE HOSPITAL

For Convenience and Economy in Supervision Routing and Operation

By Oliver H. Bartine, *Hospital Consultant*

MEDICINE and surgery have made wonderful strides in recent years, but the planning and construction of hospital buildings have made equally, if not greater, progress. Today the architect is much better qualified to plan buildings meeting the increasingly varied requirements of hospital service.

At the time of the building of the Hospital for the Ruptured and Crippled (New York City, 1911) a member of the building committee desired to obtain literature bearing upon hospital planning that he might have the opportunity of studying the problem. But little literature of a helpful nature was then available. Within the few years since intervening there has been produced an abundance of literature which will be found most helpful to the building committee.

The superintendent and building committee of a proposed hospital should possess all of the information possible on the salient features of other hospitals in order to enable them to analyze their problem and to discuss it intelligently with the architect.

A number of years ago the erection of a large hospital was undertaken in one of the largest cities in the country. The steel construction was up five stories before the hospital's head official personally undertook a detailed study of this particular hospital's problem. A careful study of the plans followed by the building committee developed flagrant errors in plan of such a nature as would constitute serious hindrances to the proper operation of this hospital. Even at this late stage we were able to make several hundred changes in the plans and today this hospital is known as the modern hospital of that city and state.

This paper is not intended to enter into the general planning of a hospital but rather aims to indicate a number of important features which should be considered with special care in planning the hospital for efficiency and economy of operation.

In many hospitals the entrance is a place of great confusion and in others we find in the entrance an air of refinement and the appearance of orderliness. With due consideration of the particular work the hospital is to perform the entrance should be so planned that it may be utilized with the least confusion and with the least number of employees possible. For instance, a satisfactory arrangement is often found to be the placing of a reception room at each side of the main entrance, one for people interested in the work of the hospital, and one for visitors to patients, with a bureau of information located convenient to both while overlooking the doorway and interior hallway. Thus the clerk at the bureau of information controls the situation as a whole, and efficiently directs and distributes all visitors. This clerk in a moderate sized hospital may also operate the telephone switchboard.

It is regrettable that greater consideration is not given to this matter of the conduct of the main entrance of the hospital. Some authorities feel that the method prevailing at hotels is well worthy of adoption.

When one is harshly received upon arrival at the hospital a poor impression is made which it is difficult later to eradicate. In visiting the hospital at Lancaster, Penn., recently, I was received by a lady whose sole duty it is to receive and assist visitors. I observed her work for some time and left the hospital with the most favorable impression concerning this matter of reception. The rich and poor were treated in the same cordial and kindly manner.

The policy of placing the superintendent's office directly at the main entrance to the hospital should be avoided. It may better be located in a quiet section of the building, near the offices. Thus the superintendent will not be constantly disturbed, but he may, with convenience, have complete control of the situation. He must, however, be conveniently located for access by those desiring to interview him. The superintendent's duties are of paramount importance and only if his office is properly located will he have the necessary time for the study of the larger and more important aspects of his hospital.

while maintaining control of the general details.

The record room is more and more becoming an important adjunct to the hospital. It should be conveniently located adjacent to the general office and it should have such facilities that the physicians may be able to study the history of any case without being disturbed.

Ample provisions should be made for the social service department which is today one of the important adjuncts of the hospital. It must be available for both incoming and outgoing patients, also conveniently situated for out-patient department cases.

THE out-patient department, a most important and ever growing feature of hospital work, should be so planned that when a patient is received therein the routing of the patient may be accomplished with the least confusion possible. The necessity for passing through the waiting room in going from one room to another in this department is to be avoided and the outgoing patients should not be required to mingle with the incoming patients.

Too often the boiler plant is placed directly beneath this department and in warm weather the heat becomes unbearable. A separate building for the boilers is very desirable, and with it the laundry may be combined.

The X-Ray department and laboratories should be accessible to both the indoor and out-patient departments. It should be so planned that the transporting of an indoor patient or a specimen through the out-patient department, or vice versa, is unnecessary.

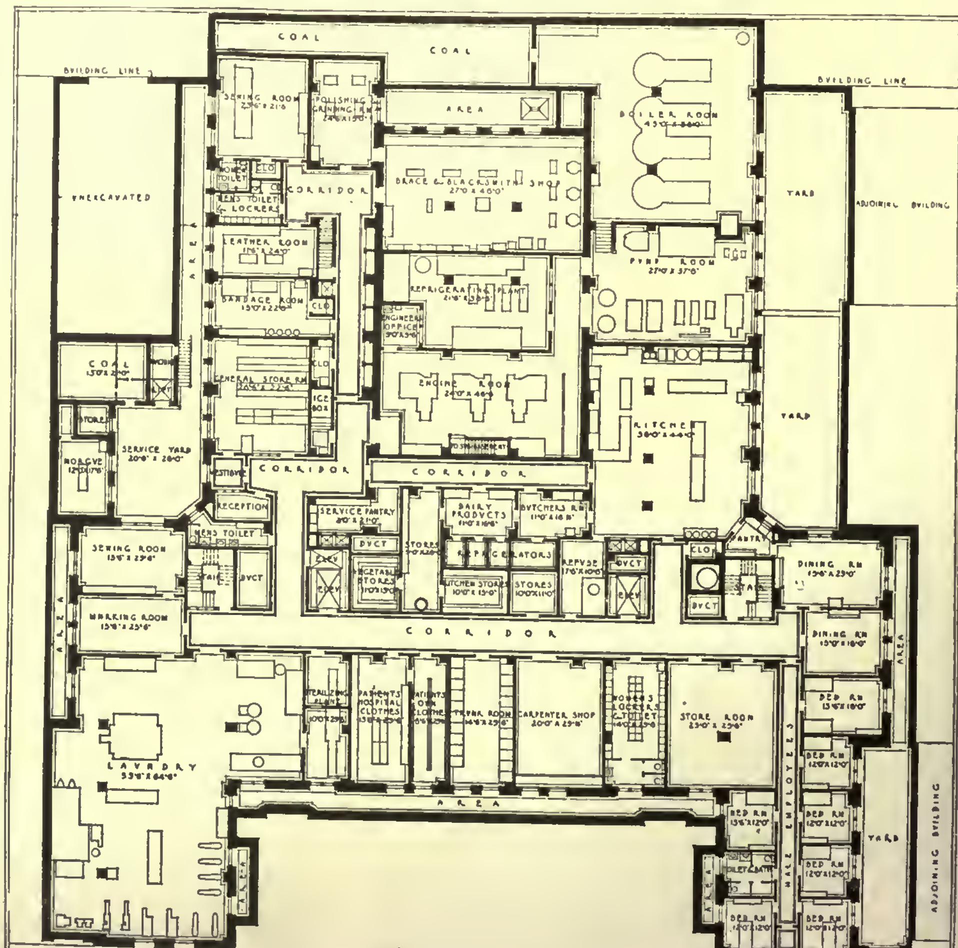
In an out-patient department recently planned by an architect in co-operation with the writer, provision has been made for the use of this department during the evening as a venereal disease clinic, the remainder of the clinic being closed.

The roof should be easy of access and should be so planned that the patients may enjoy its use in all kinds of weather. This purpose may be accomplished by providing a solarium, or by providing a shelter over a portion of the roof, or both.

By planning the various floors, and even the wards, as distinct units entirely closed off, together with the employment of the best method of soundproof construction, the many sounds and noises incident to hospital operation will be confined to the department in which they originate.

The kitchen should be so located and planned as to serve conveniently all departments with the least labor and effort possible. The receiving storeroom and the refrigerators must be ample and in direct connection with the kitchen, so arranged that all supplies may be properly supervised and be handled in a manner avoiding all duplication of effort.

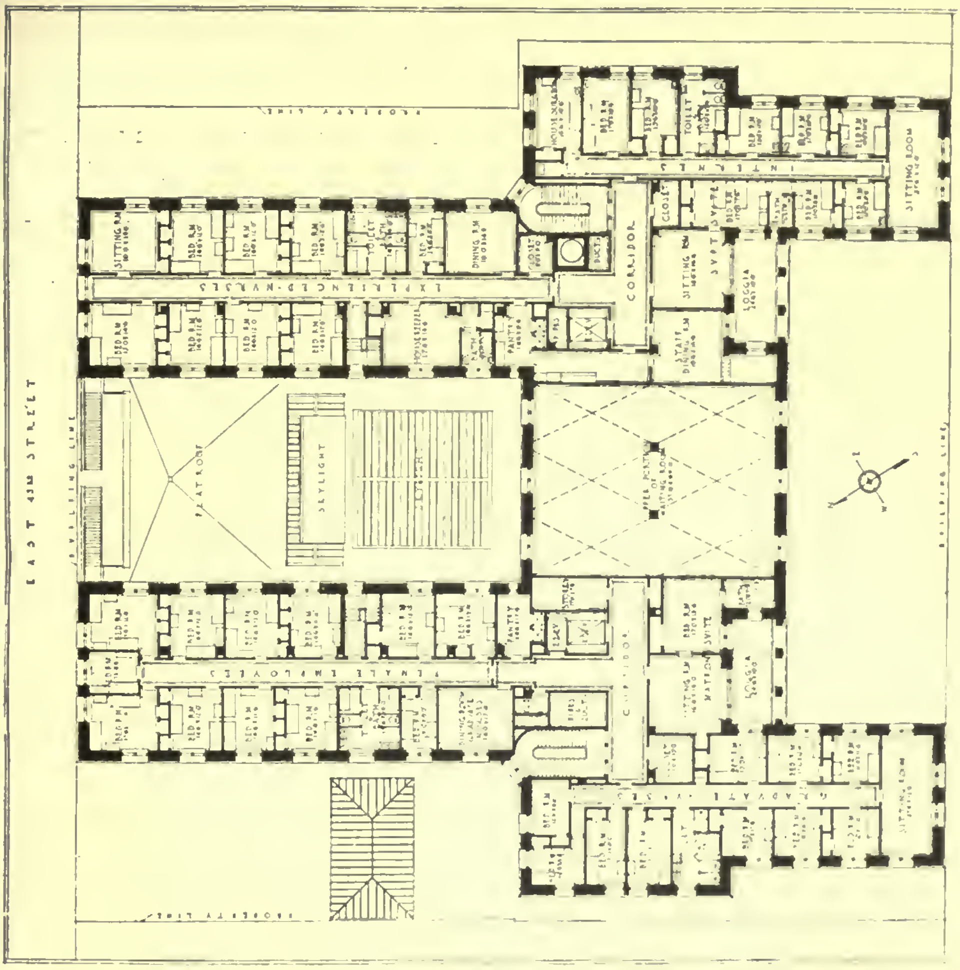
Whether the service shall be cafeteria, preparation of trays or dishes in the kitchen, or whether the food shall be sent in bulk to the ward pantries and service rooms, are problems to be considered. This depart-



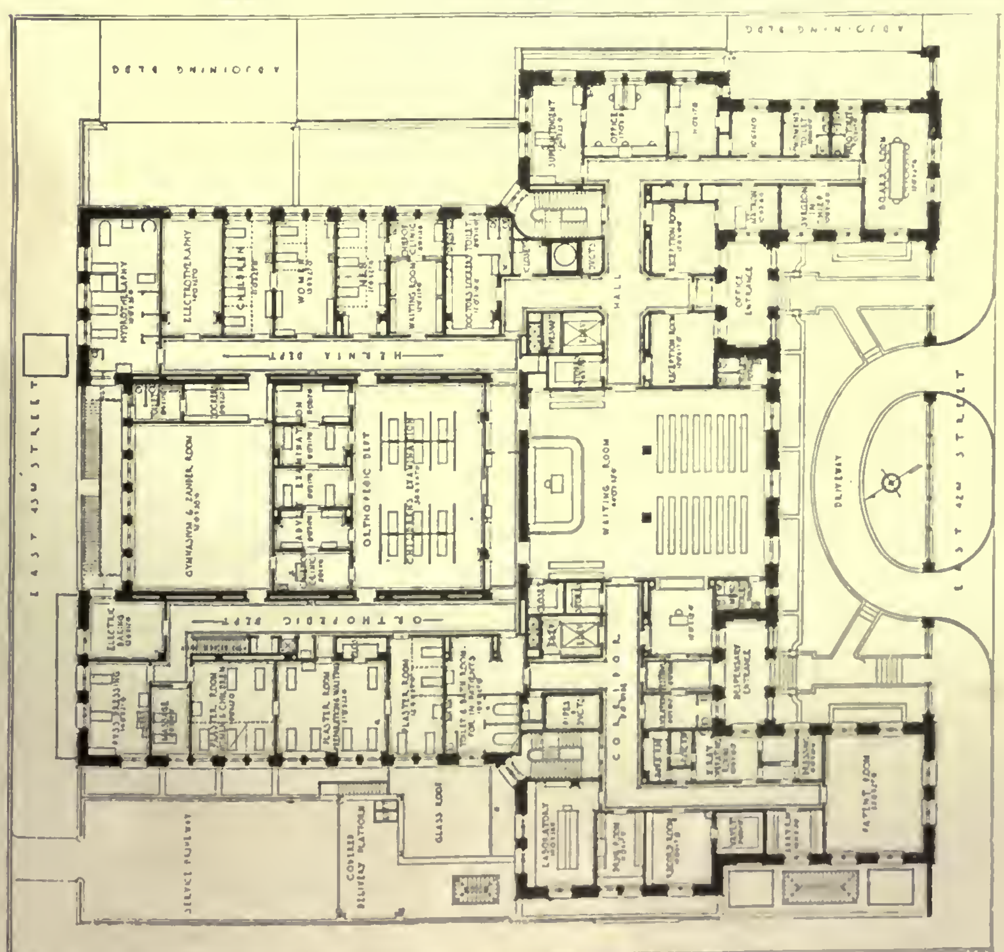
BASEMENT PLAN

HOSPITAL FOR THE RELIEF OF THE RUPTURED AND CRIPPLED, NEW YORK

YORK & SAWYER, *ARCHITECTS*



SECOND FLOOR PLAN



FIRST FLOOR PLAN

HOSPITAL FOR THE RELIEF OF THE RUPTURED AND CRIPPLED, NEW YORK

YORK & SAWYER, *ARCHITECTS*

ment may well be so planned that if it be later decided to change the method of service this can be done within the space allotted. Daylight and ventilation are of the greatest importance in the kitchen.

The ground floor or basement will usually provide the space which may best be utilized for this department, and at the same time provide for economy in operation, while the proper utilization of the remaining space in the hospital is not interfered with. The kitchen and its auxiliary rooms must be planned for the easiest and least possible handling of supplies and foods.

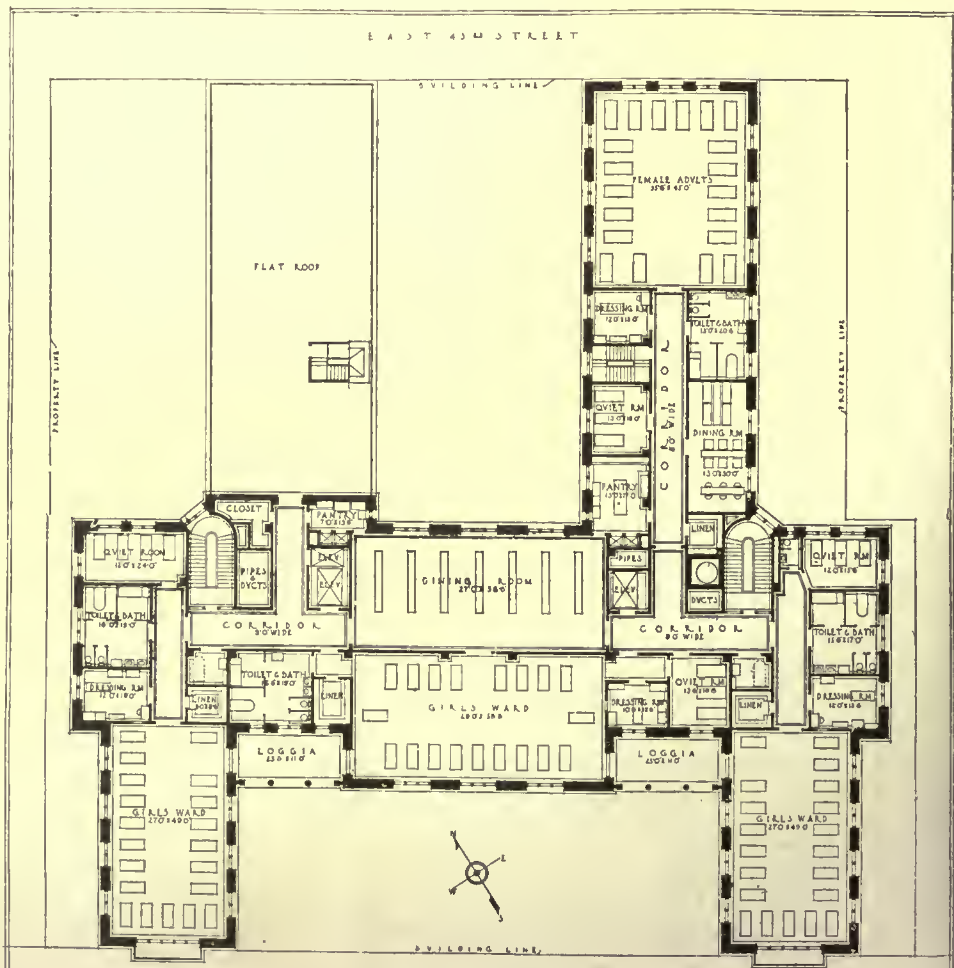
The personnel existing or to be required must be carefully considered in this as in many other details of hospital planning. For instance, shall the dishwashing be done in a central dishwashing room fully equipped with suitable apparatus, or shall it be done in the pantry of each ward, dining room and service kitchen? In some hospitals a maid will necessarily be on service in each department with sufficient time to perform this service. In other cases it will be found that additional help will be required for the washing of dishes in the various departments and in such cases the central dishwashing room will be found essential to a saving in the number of the help and an important factor in reducing operating costs.

The general store room is properly located only when placed near the receiving department. It should be so planned that only the employees of the hospital actually engaged in the store room will know of the supplies on hand. Too frequently will the hospital employee present a requisition for supplies, glance around the shelves, pass word of a large quantity of certain supplies on hand, and thus, in effect, invite requisitions for supplies not actually required. It is quite as easy to plan the store rooms in such a way that only the necessary employees may view the stock. This situation applies to the hospital supply rooms, drug room, linen room, kitchen, storage rooms, etc. The provision of additional future storage space is of great importance also.

THE laundry rooms should be easy of access and be so planned that the soiled linen arrives at the receiving room, passes on to the washers, wringers, dryers, mangles and ironers, and thence to the assorting, repair and delivery rooms, all in a logical order without crossing of paths. The laundry work should be so routed that the employees will do their work with the least possible traveling and effort.

Although this article is not intended primarily to point out economies in hospital equipment, I would like to indicate the opportunities for savings in replacements of glass and porcelain ware offered by metallic equipment. In order to eliminate rust, the objectionable feature of nickel or other plating,

(*Continued on page* 83)



THIRD FLOOR PLAN

HOSPITAL FOR THE RELIEF OF THE RUPTURED AND CRIPPLED, NEW YORK

YORK & SAWYER, *ARCHITECTS*

GROUP OF FIXED DECORATIVE ACCESSORIES AND METAL-WORK OF THE XVII AND EARLY XIX CENTURIES IN AMERICA. THE MANTEL TO THE LEFT IS OF THE THIRD QUARTER OF THE XVII CENTURY; THAT ON THE RIGHT FROM THE FIRST DECADE OF THE XIX CENTURY

A SUMMER EXHIBITION of AMERICAN METAL-WORK and FIXED DECORATIONS AT the METROPOLITAN MUSEUM of ART

THE fittings and appointments of the American house of the eighteenth century were amazingly complete and varied. Then, as today, the standards of living controlled largely each householder in the quality and variety of his household equipment, but the customary life of the period rendered peculiarly uniform the types of these fittings. Aside from the movable furnishings of the house—furniture, textiles, glass, and silver—there were the many details of more or less fixed decoration which really are a part of the architectural scheme of the finest craftsmanship of the times. To show a group of this latter material, a small exhibition was recently arranged in the north end of Gallery H 22 of the New York Metropolitan Museum of Art.

The objects shown were chosen chiefly for their interest and value to the hou ebuilder who is following today in the early American tradition. Interesting treatments of door-hardware, leaded glass transoms, and side-lights, of fireplace and lighting fixtures have been gathered together not with the idea of showing every variation of any type but to include chiefly those pieces which contain good suggestions for modern application and use.

BRASS ANDIRONS OF THE LATE XVII AND EARLY XIX CENTURIES. LENT BY W. GEDNEY BEATTY

The craft of the metalworker has supplied many of both the fixed and the movable appurtenances of the colonial house. About the entrance door is concentrated a pleasing group of wrought or cast brass, bronze, iron pewter, or lead. Among these fittings the knocker is perhaps the most important, for upon it was expended the chief elaboration. From the beautifully modeled S-knockers of the middle of the century to the more sophisticated delicacy of the bail-knockers of Adam or Empire influence the same high quality of design and execution is seen. With these knockers were used fine locks of brass or iron, strap

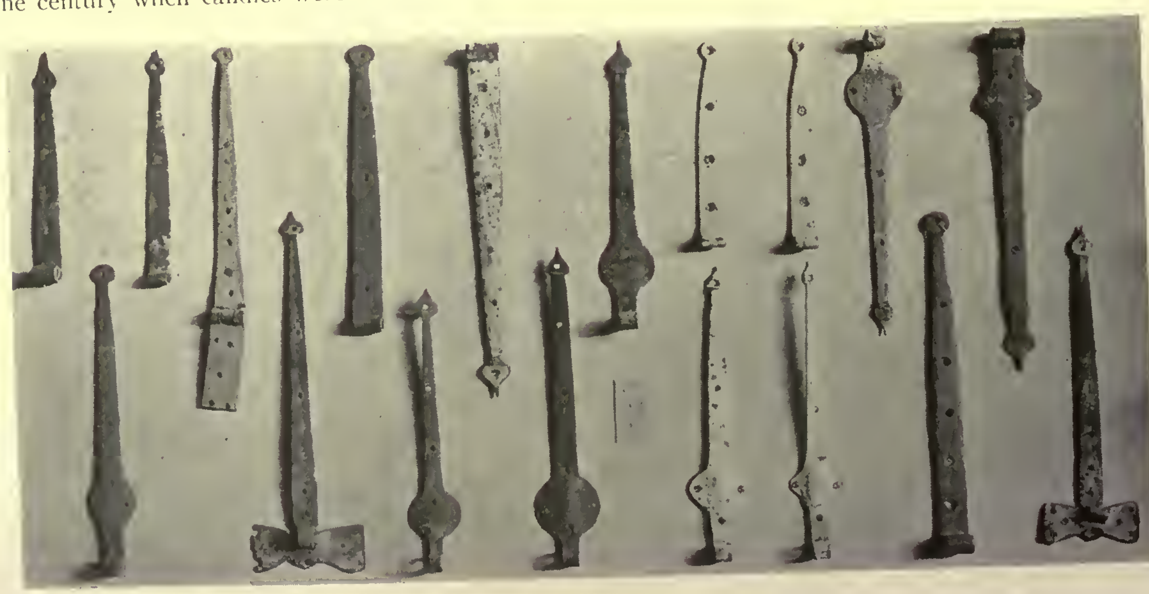
AMERICAN DOOR KNOCKERS IN BRASS. 1790-1810

hinges of various types, and late in the century transoms and side-lights of glass with divisions of lead or pewter in skilful designs. The interior doors were treated with no less careful attention and locks and latches of brass and iron and hinges of the strap, H, and H and L varieties were adjusted to the scale and weight of the woodwork.

About the fireplaces was gathered much of the finest metalwork in the house—andirons, shovels and tongs, cranes and fenders—which form essential elements in the design of the fireplace.

LIGHTING fixtures form a department of beauty and variety in themselves. It must not be thought that the lighting of the more pretentious houses was limited to the simpler fixtures made in the Colonies. Many of the more elaborate examples of sconces and chandeliers were imported. Brass and cut-glass lustres, sconces, and candelabra found a place in many of the handsome interiors. Until well along in the eighteenth century most of the illumination came from portable lights of several sorts. Some of these portable lamps, candlesticks, and candlestands are shown for the suggestions which they may hold for application to modern use. Toward the end of the century when candles were less of a luxury

A GROUP OF FIXED AMERICAN DECORATIVE ACCESSORIES



GROUP OF WROUGHT IRON HINGES OF VARIOUS TYPES OF THE XVII CENTURY FROM NEW ENGLAND AND NEW AMSTERDAM and the economic prosperity of the colonists allowed them more leeway in their study of decorative effects, sconces and chandeliers were used for general lighting.

Among the wall and ceiling fixtures shown are the simple lanterns and Betty lamps, girandoles of wood or composition in which silvered glass used as a reflector gives a sparkle at points on the wall, and hall lights of thin blown glass suspended on chains from the ceiling.

In choosing the objects to be shown, the effort was to limit them to work which bears the stamp of American production. A number of examples of door-hardware—hinges, locks, knockers, and handles —were lent by W. Gedney Beatty, architect, and Alexander McMillan Welch. Mr. Beatty sent several interesting pairs of andirons. With these exceptions, the material is from the permanent collections of the Museum, some of it never having been shown.

Linking Art with the Factory

WITH the object of stimulating the interest of the manufacturing community in the application of artistic designs to industrial uses the Industrial Art Committee, formed under the auspices of the Federation of British Industries, has issued an interesting report, in the course of which it outlines a scheme for bridging the present gap between the art school and the factory. There is a growing recognition of the fact that owing to the predominance of machine production the personal touch of the ma ter craftsman has been lost, while manufacturers experience difficulty in finding designers who have not only artistic qualifications but a practical capacity based on first-hand knowledge of the requirements of industry and its technical processes.

The committee include representatives of the silk, glass, lace, fancy goods, carpet, pottery, jewelry and silversmith, decorating and printing trades. One of the recommendations of the committee is that arrangements should be made by manufacturers to enable their designers to take short "refresher" courses at the college. The course should be for one, two or three months continuously, or, alternatively. A course might allow for alternate periods of residence at the college of a fortnight at a time, the student returning to the works in the intervals. In this way he would be enabled to keep in touch with his industrial work and at the same time the inconvenience to his employers would be mitigated.

The report has been approved by the executive committee of the Federation of British Industries, which has authorized the art committee to make the necessary arrangements with the Royal College and with the trade associations concerned for carrying the scheme into effect. The necessity for a general improvement in artistic design is becoming forced upon British manufacturers by the growth of foreign competition in the cheaper lines of wares, which has the tendency of compelling British producers to specialize more and more in high quality goods. The action taken by the federation is undoubtedly a step in the right direction.

THE FOURTEENTH CENTURY BANQUETING HALL, BRINSOP COURT, HEREFORDSHIRE

ENGLISH HOMES of the NORMAN and PLANTAGANET PERIODS*

THE study of the domestic life of the people during medieval times has always had a fascinating interest. Especially for America as relating to England's castles and baronial halls, the favorite settings for song and story. Some writers have, to a considerable extent, set down the details of the fine buildings that were the homes of England's nobility and have woven about them a glamour which, while not always one of accuracy, has none the less an artistic interest. At one time or another, pictorial presentation of these rare old buildings has been made, but at no time has it been more completely and beautifully done than in a volume just issued. The author, H. Avray Tipping, has approached his task finely equipped, and the work as completed, is one that will appeal to every architect in this country. In fact, it may be safely stated that this sumptuous book will become an essential part of every architect's working library. The period covered is that of Norman and Plantaganet or from 1066 to 1485.

Twenty-five major buildings are illustrated, comprising a remarkable series of more than four hundred illustrations.

"There was," states Mr. Tipping in his introduction to this work, "a housing problem in medieval times and, if the laborer ended the period as he began it, with little more than a rough timber shelter set about a masonry hearth, the landowner in the country and the merchant in the town made large strides in the commodiousness of their homes." So long a time has elapsed since this period that most of these stately buildings are but roofless, picturesque ruins. Those that have through care survived, have through succeeding years been so altered or "restored" that it is not easy to conceive exactly how they were planned or how the people lived in them.

But sufficient remains to enable the student and close observer to rehabilitate these fine old buildings so that, with reasonable accuracy, we may learn of the domestic life and the architectural tendencies of this period.

"By comparison and contrast, we are enabled,' writes Mr. Tipping, "to mark the evolutionary

*English Homes—Period 1, Vol. 1—Norman and Plantaganet. 1066-1485. By H. Avray Tipping. Full cloth, 340 pp., size 11½ x 15. New York, Charles Scribner's Sons; London, Country Life and George Newnes, Ltd.

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EAST SIDE OF KEEP AND TUDOR BRIDGE, HEDINGHAM CASTLE, ESSEX, ENGLAND

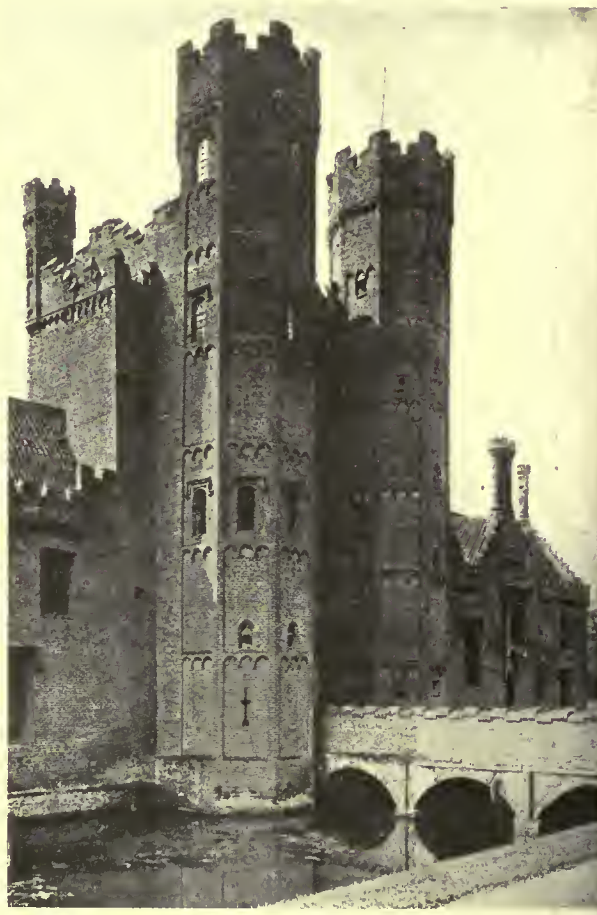
NORTH ELEVATION OF THE FIFTEENTH CENTURY HALL AT COKER COURT

LOOKING DOWN THE STAIR FROM THE KEEP, ARUNDEL CASTLE, SUSSEX

THE GREAT HALL, ARUNDEL CASTLE, SUSSEX

changes in the planning and designing of such domiciles and the differences arising from the builder's purpose, purse and personality."

Beginning with a period when every man's house was not only his castle, but a fortress, within whose widespread area his family and retainers found shelter from assault and safety during periods of petty "wars," and continuing to that time when there was a more peaceful and more domestic people, the evolution and the castle and keeps indicated the social conditions. In the presentation of these buildings in their approximate chronological order, the reader of this book may easily trace this progression. He will find, however, throughout, that the hall was the dominating feature of all these buildings through this period of approximately four hundred years.



OXBURGH HALL, NORFOLK. THE GATE HOUSE
An example of fifteenth century English brickwork

"Although," states the author, "the hall stood almost alone at the beginning, at the close it was no more than the center of a group, yet its importance, its uses, its position, its arrangement, all remained permanent in principle and little affected even in detail from the day of Senloe to that of Bosworth."

The character of the hall indicated the wealth, the high state or importance of its owner. It was here he sat in state to receive his guests or to distribute his favors. It was, in a sense, the high court where justice was dealt out in accordance with the customs of the times. From the hall sallied forth on many occasions the lord of the manor and his knights, bent on some warlike foray, and it was to the hall he returned, either victorious or to find in its massive wall protection from besiegers. Many of these stately halls, in most of their original architectural form, remain today, and it is in a study of their plan and architecture that we shall be able to learn the domestic development of this period.

This book affords a fine opportunity for such study. It enables the reader, both through its text and the finely made photographs, to secure a comprehensive and intelligent idea of the growth and development of architecture through more than four hundreds years of the most picturesque period of English history.

BAMBURGH CASTLE, NORTHUMBERLAND, SEEN FROM THE BARBICON

Portico of "Homewood" Baltimore, Md.

(See reproduction of original sketch by Otto R. Eggers on opposite page)

WHEN Charles Carroll, Jr., built his house in Baltimore in 1804, he had for an architect one of the carpenter-architects who so cleverly built along the Atlantic seaboard during the close of the eighteenth and the opening years of the nineteenth centuries. Unfortunately the names, with few exceptions, of these men are unknown, and equally unfortunately in the present instance.

The subject of Mr. Eggers' sketch has long been regarded as one of the most valued architectural heirlooms. It is a satisfaction to know that it will be carefully preserved. Now the property of Johns-Hopkins University, it is safe to assume that by no chance will this architectural relic be permitted to fall to decay.

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PORTICO OF HOMEWOOD, BALTIMORE, MD.
AMERICAN ARCHITECT Series of Early American Architecture

80a-

EDITORIAL

A Report On the Elimination of Waste

MR. HERBERT HOOVER, before entering the Cabinet of President Harding, was President of the American Engineering Council and appointed a Committee on Elimination of Waste in Industry, popularly known as "The Hoover Committee on Waste."

The report of this committee has been made public and the reaction on the reading public is interesting to observe. Prices in the construction industry showed the greatest per cent. advance of all prices during the recent emergency. Construction materials prices and wages of building mechanics show the smallest percentage drop in the deflation process now going on. What, therefore, is more natural than to attack the building industry as one of the greatest examples of waste in industry?

There was a reason for the high price for construction materials at a time when the government was in the market for practically all the output of every forest, mine, quarry and factory in the country. Ordinary work was suspended and today the commercial demand keeps stocks low even at present prices.

For wages the same reason may be advanced, the proof being that there is apparently little surplus building labor even at present wages. Low prices should properly indicate the existence of surplus goods and labor. Low prices such as the people are getting in some quarters today are due entirely to bank pressure. Commercial surveys show a great amount of unemployment and a shortage of goods, the production of which would produce a temporary shortage of labor.

The public notes approvingly the suggestion of waste in the October redecoration of apartments. In this operation, the report states, 25,000 workmen are employed for a few weeks, when, if properly conducted and spread throughout the year 5,000 men would find continuous employment. This is not the fault of the construction industry but lies in deep-seated habits of the whole people. Redecorating is a bait for tenants and is not regarded by the average landlord as part of the upkeep of buildings. The dating of all leases to terminate on October first alone creates the waste mentioned. No one doubts that the public generally would welcome more freedom to move. The fixing of one day for the termination of leases is a convenience for one class of middlemen and creates opportunities for combinations of landlords.

THE committee stated that in many places there are too many contractors. Cleveland has 4,000 and needs not more than 400. Many of the small ones, lacking technical ability fail. Careful analysis of failures published by commercial rating agencies do not ascribe a large percentage to ignorance, which in fact counts for very little, as few men go into a business they do not understand.

Why say that 400 contractors could serve Cleveland better than 4,000? Napoleon once asked a young lady how many needles of thread it required to make a shirt. She replied, "One, if it is long enough and properly handled." So, as everybody knows, one properly organized and managed contracting company could serve Cleveland, or any other city.

Freedom of competition is necessary to prevent stagnation. The presence of many contractors is not always a sign of waste. The average small contractor earns little more than day wages. He gives, as a rule, good value, and heretofore a large number of contractors in a community was regarded as a healthy sign.

The newspapers regard as quite important the fact that "Carelessness of contractors and workmen who learned bad habits in the war through the cost-plus plan cause great losses (waste)." It is the best argument against limiting the number of contractors. The revelations of waste in the shipping board and in all of the larger operations undertaken during the war proved that concentration under too few heads does not reduce waste. Waste is reduced and efficiency increased with an increase in the number of responsible men whose gain is measured by production rather than by time.

THE committee believes—that twenty-five per cent. of the waste in industry is at present unavoidable; twenty-five per cent. is due to inefficiency and ignorance of labor, and, fifty per cent. to lack of intelligent management. This report was made by men who were selected for their supposed superior fitness to discuss waste. That these men indict the men to whom they look for employment as responsible for at least fifty per cent. of the waste in industry is significant. Is it not probable that inefficient management is responsible for much of the waste at present chargeable to labor? The report will be of great value to the whole country if read as a report on all industry. The singling out of the construction industry for comment is not the way to encourage a revival of building.

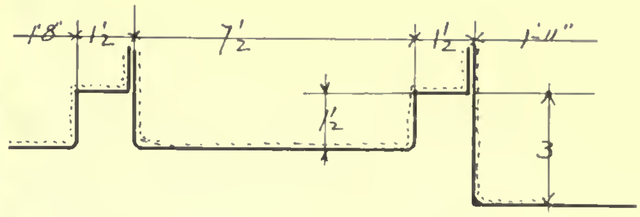
French and Italian Details

Rustication of the Ruccellai Palace, Florence, Italy.

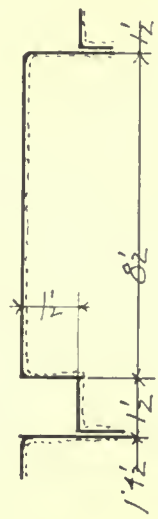
THE Ruccellai Palace was built in 1460 by Alberti. In this building, and for the first time, classical pilasters, in superposed stages, were applied to a street façade. Unlike the Riccardi and the Strozzi the rustication is not varied in the façade, being in this respect similar to the Sal-Concellacia in Rome, which was built in 1495 and attributed to Bramante. The angle of the rustication is abont a right angle and the depth 1½ inches.

Rustication of the Strozzi Palace, Florence, Italy.

THE Strozzi Palace, built in 1490 by Bramante, is in type similar to the Riccardi Palace, built in 1430. It stands with the Riccardi Palace as the best example of the Florentine type of Italian Palace. The drawing is of the rustication of the lowest course. In the central rustication the projection is about 3 to 3½ inches, while in the top, instead of being plain stone jointing as in the Riccardi, there is a slight projection of not over one inch.



3" SECTION · THROUGH · PILASTER ·



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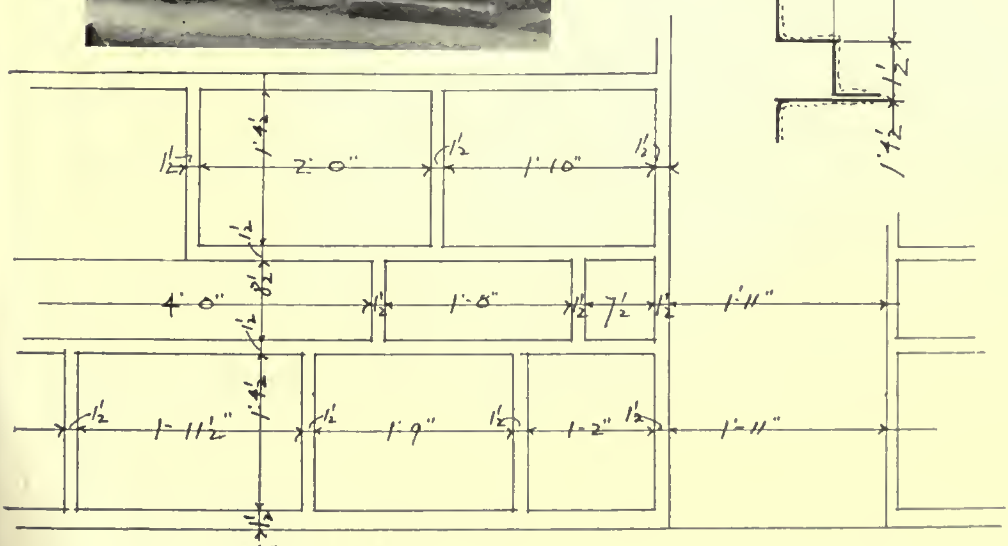


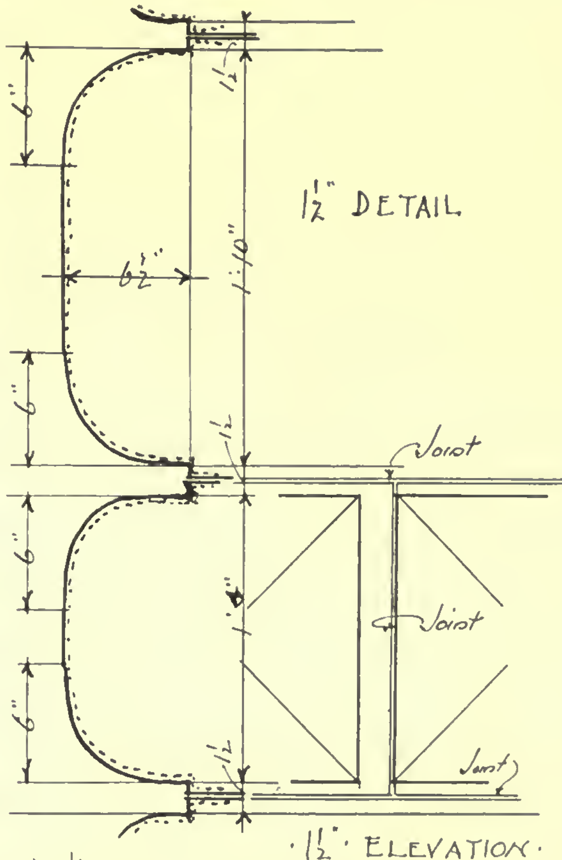
3/4" ELEVATION

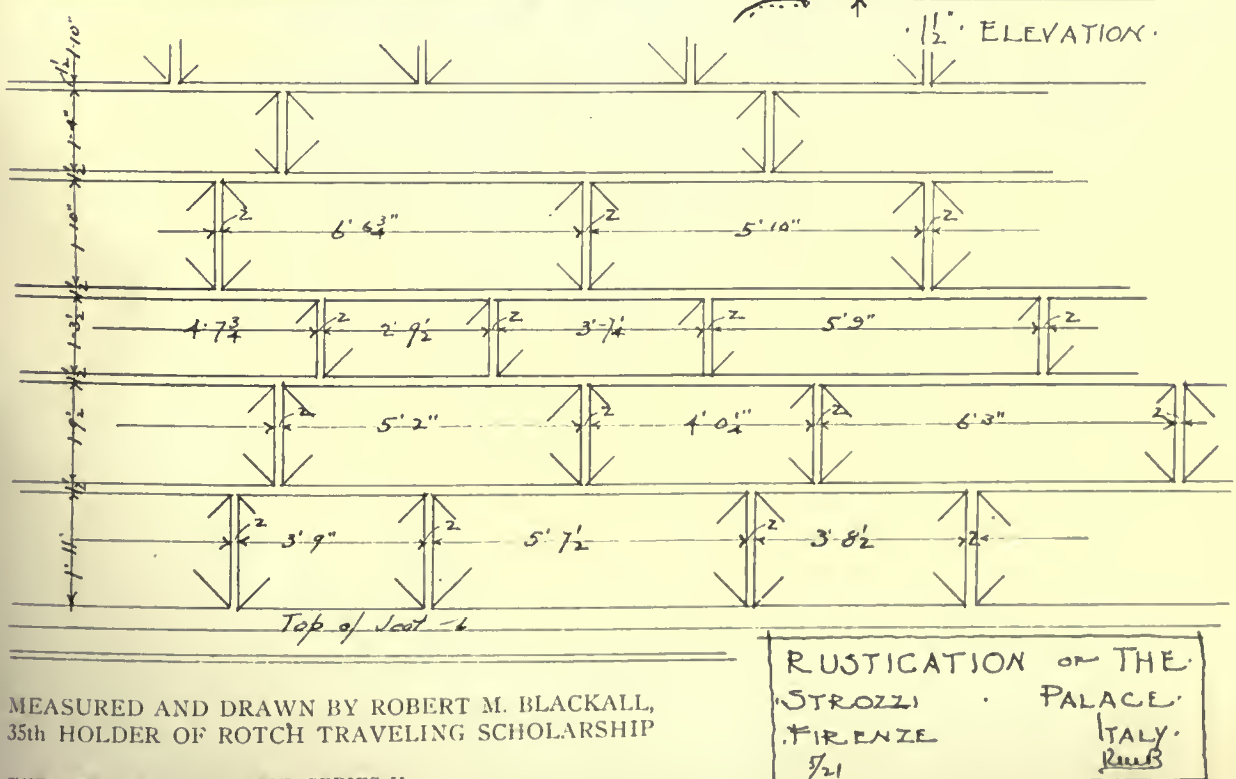
MEASURED AND DRAWN BY ROBERT M. BLACKALL,
35th HOLDER OF ROTCH TRAVELING SCHOLARSHIP

RUSTICATION OF · PALAZZO RUCCELLAI · FIRENZE 5/21 RMB

THE AMERICAN ARCHITECT, SERIES II
FRENCH AND ITALIAN DETAILS

82'





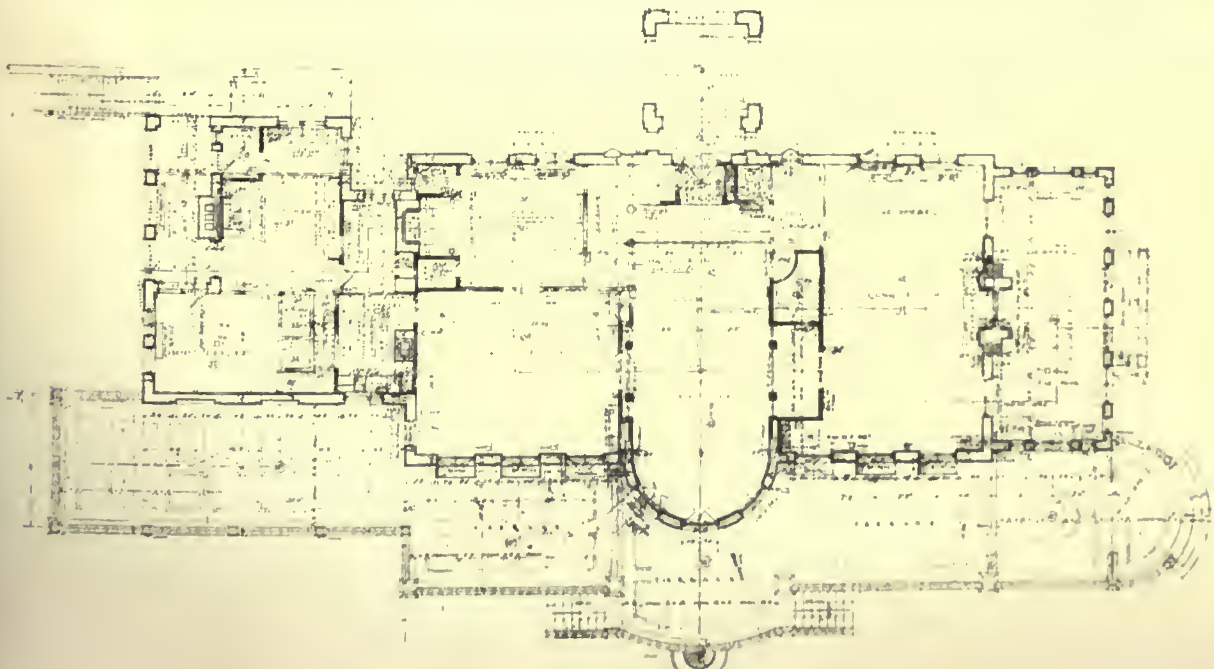
MEASURED AND DRAWN BY ROBERT M. BLACKALL,
35th HOLDER OF ROTCH TRAVELING SCHOLARSHIP

LAWN FRONT
HOUSE OF H. BELLAS HESS, ESQ., HUNTINGTON, L. I., N. Y.
HOWELLS & STOKES, *ARCHITECTS*

TERRACE FRONT
HOUSE OF H. BELLAS HESS, ESQ., HUNTINGTON, L. I., N. Y.
HOWELLS & STOKES, *ARCHITECTS*

DETAIL, TERRACE FRONT
HOUSE OF H. BELLAS HESS, ESQ., HUNTINGTON, L. I., N. Y.
HOWELLS & STOKES, *ARCHITECTS*

LIVING ROOM

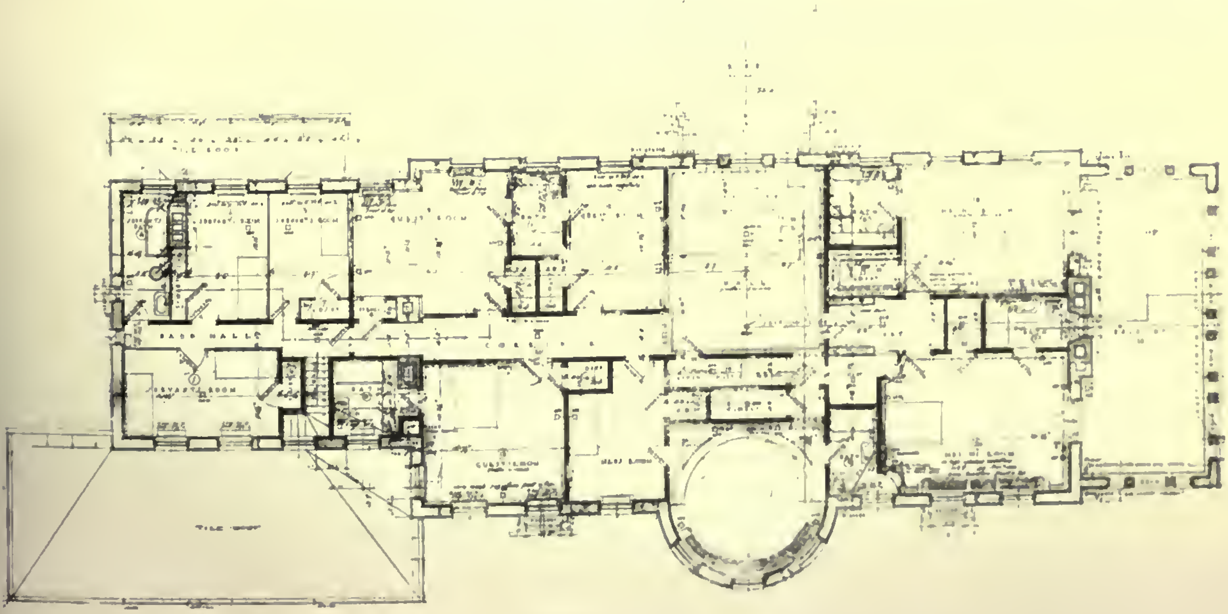


FIRST FLOOR PLAN

HOUSE OF H. BELLAS HESS, ESQ., HUNTINGTON, L. I., N. Y.

HOWELLS & STOKES, *ARCHITECTS*

DINING ROOM



SECOND FLOOR PLAN

HOUSE OF H. BELLAS HESS, ESQ., HUNTINGTON, L. I., N. Y.

HOWELLS & STOKES, *ARCHITECTS*

MAIN HALL

STAIR HALL

HOUSE OF H. BELLAS HESS, ESQ., HUNTINGTON, L. I., N. Y.

HOWELLS & STOKES, *ARCHITECTS*

THE TERRACE

ENCLOSED PORCH

HOUSE OF H. BELLAS HESS, ESQ., HUNTINGTON, L. I., N. Y.

HOWELLS & STOKES, *ARCHITECTS*

GARDEN WALL

VIEW ON TERRACE

HOUSE OF H. BELLAS HESS, ESQ., HUNTINGTON, L. I., N. Y.

HOWELLS & STOKES, *ARCHITECTS*

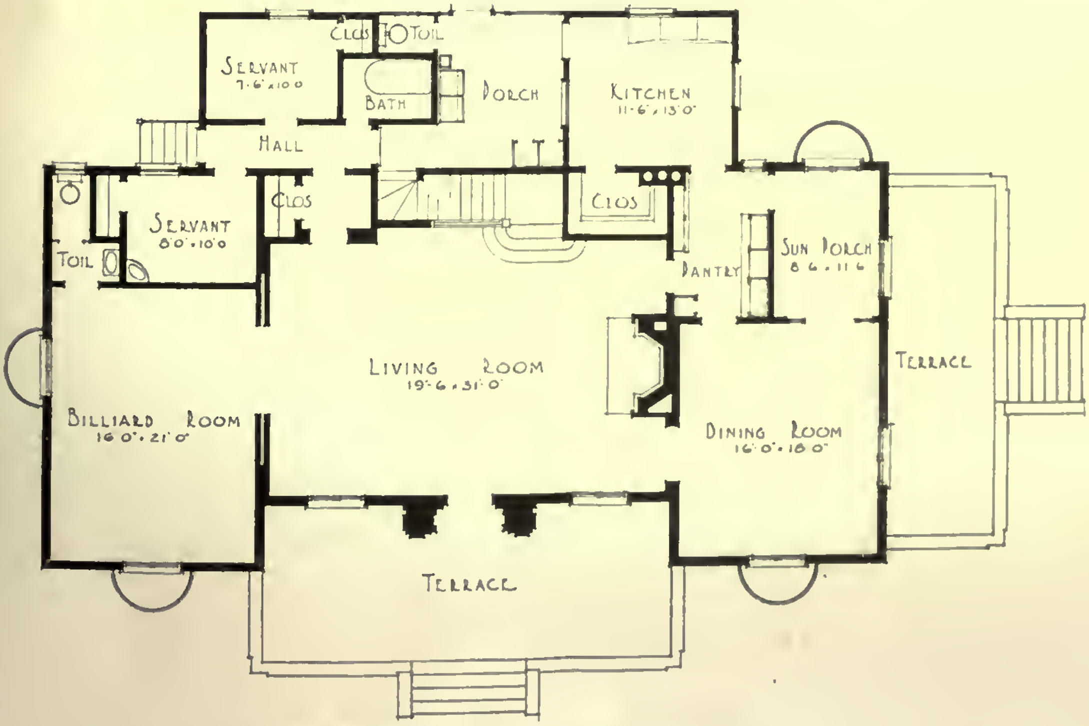
HOUSE OF MRS. LOUIS GASSNER, HILLSBORO, CAL.
SYLVAIN SCHNAITTACHER, *ARCHITECT*

VIEW FROM THE NORTH

HOUSE OF MRS LOUIS GASSNER, HILLSBORO, CAL.

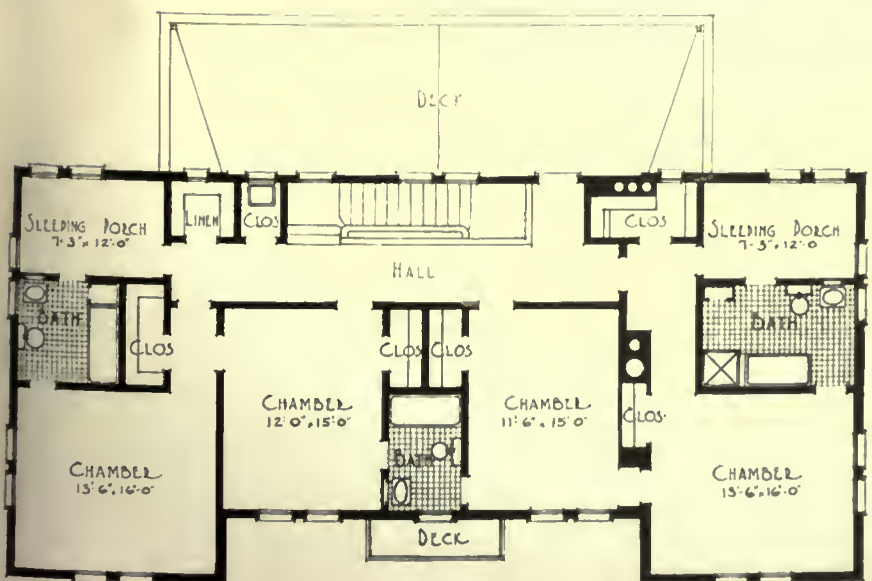
SYLVAIN SCHNAITTACHER, *ARCHITECT*

LIVING ROOM



HOUSE OF MRS. LOUIS GASSNER, HILLSBORO, CAL.
SYLVAIN SCHNAITTACHER, *ARCHITECT*

DINING ROOM



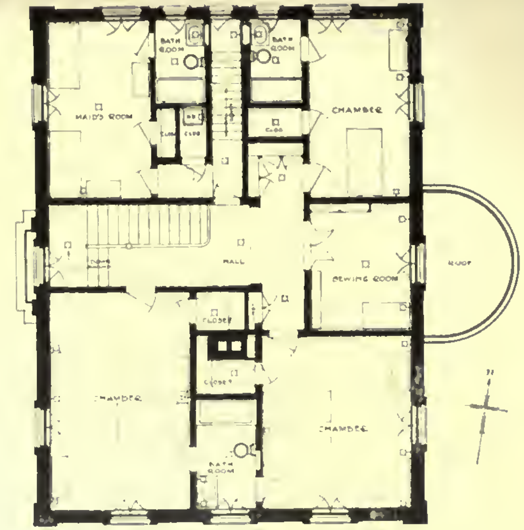
- SECOND - FLOOR - PLAN -

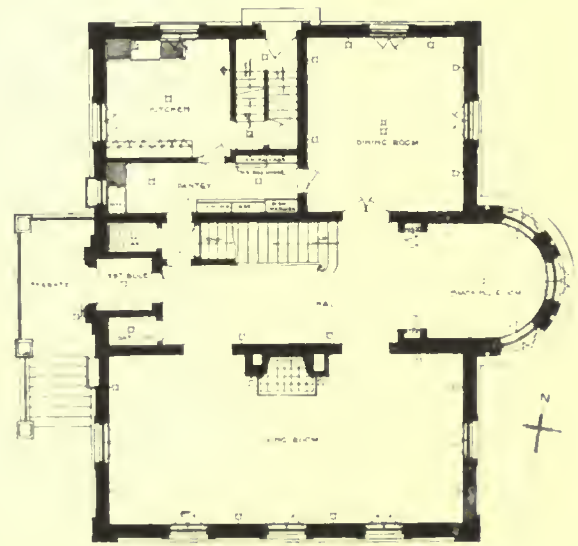
HOUSE OF
MRS. LOUIS GASSNER,
HILLSBORO, CAL.

SYLVAIN SCHNAITTACHER
ARCHITECT

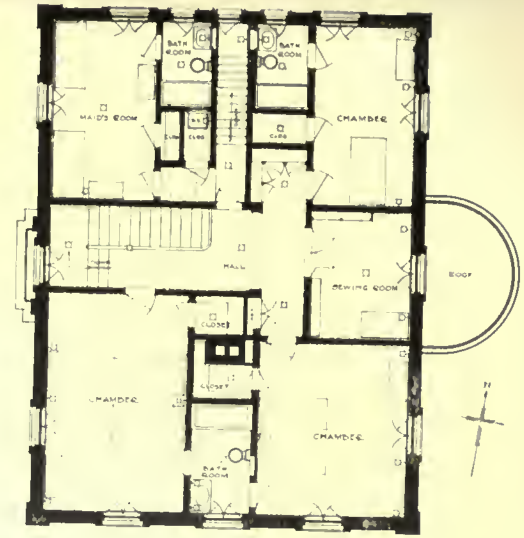
HOUSE OF DR. OTTO J. STEIN, CHICAGO, ILL.

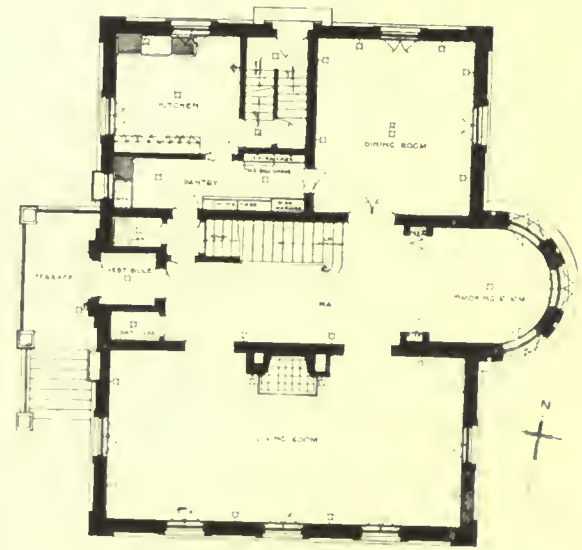
HOLABIRD & ROCHE *ARCHITECTS*





HOUSE OF DR. OTTO J. STEIN, CHICAGO, ILL.
HOLABIRD & ROCHE ARCHITECTS

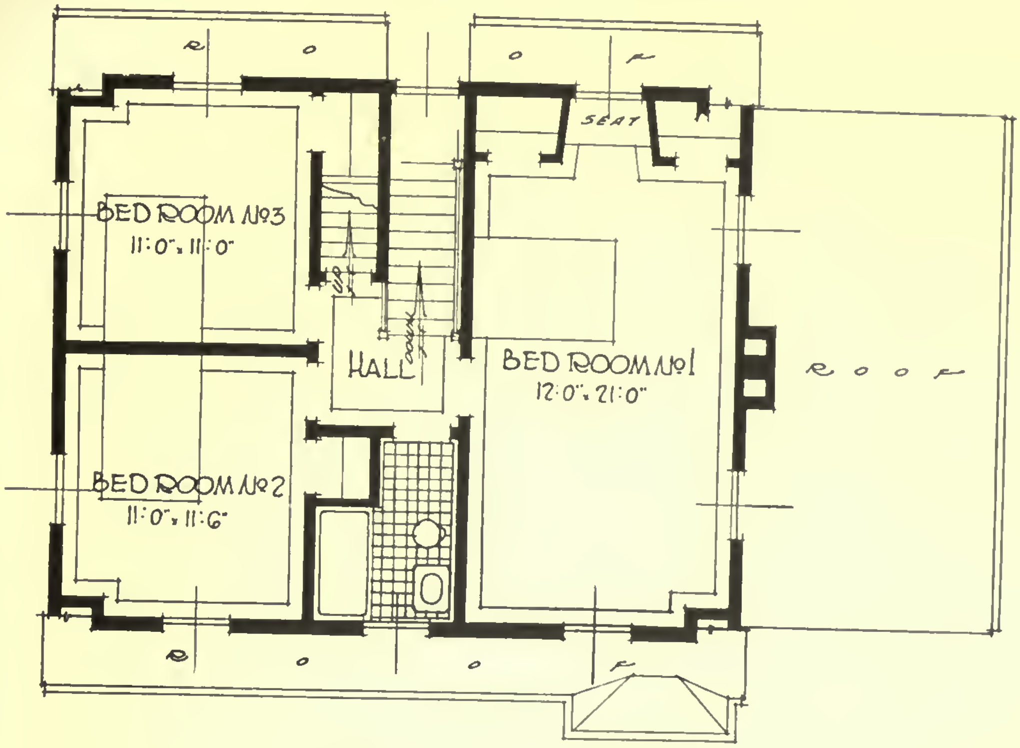




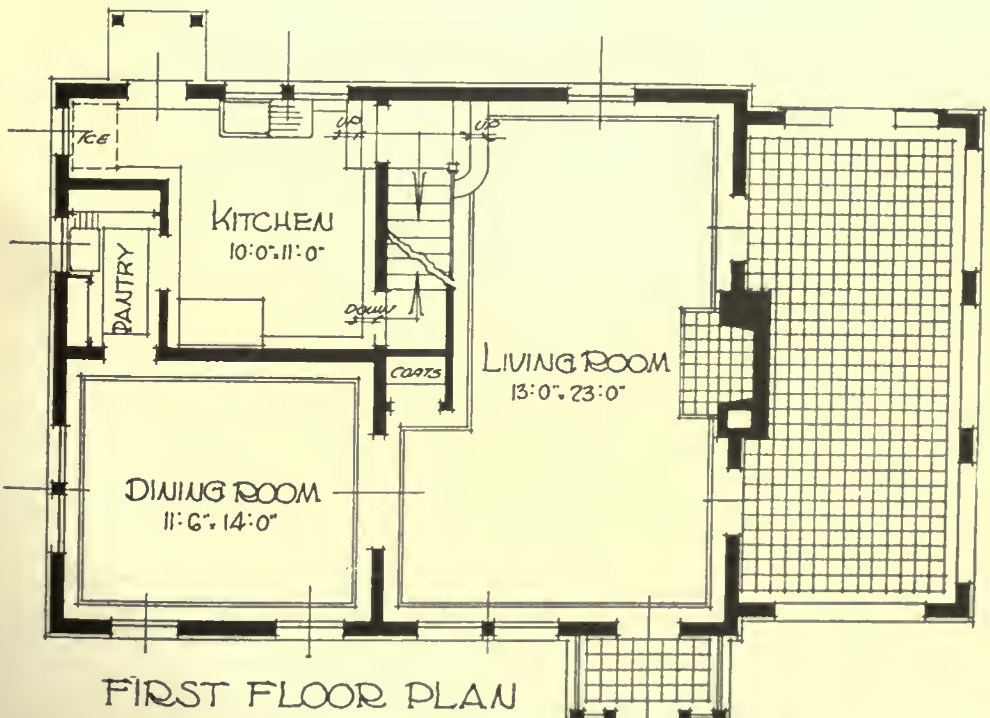
HOUSE OF DR. OTTO J. STEIN, CHICAGO, ILL.
HOLABIRD & ROCHE, *ARCHITECTS*

HOUSE OF F. HOLDERMAN, ESQ., TENAFLY, N. J.

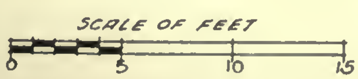
R. C. HUNTER & BRO., *ARCHITECTS*



SECOND FLOOR PLAN



FIRST FLOOR PLAN



HOUSE OF F. HOLDERMAN, ESQ., TENAFLY, N. J.

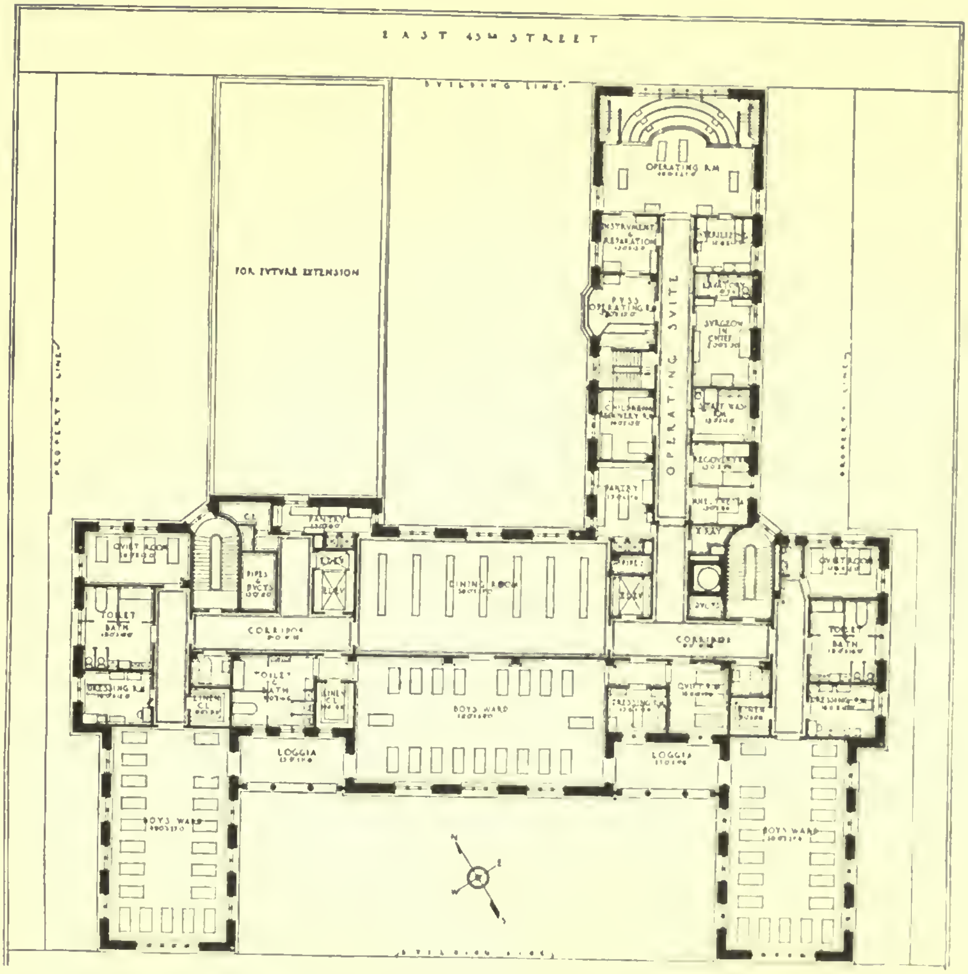
R. C. HUNTER & BRO., *ARCHITECTS*

Planning the Hospital

(*Continued from page 72*)

it is suggested that certain types of equipment be made of Monel metal. This metal, on account of its resistance to antiseptic solutions, food acids, strength and permanence of finish, seems to be ideal for this purpose.

I have elsewhere referred to the planning of the hospital with a long view to the future and to environment. The hospital's neighbors are entitled to consideration also. Whenever possible the hospital should be placed at a considerable distance from residences, that the occupants thereof may not be annoyed by the odors, noises and sometimes unsightly features attendant upon hospital work.



FOURTH FLOOR PLAN

HOSPITAL FOR THE RELIEF OF THE RUPTURED AND CRIPPLED, NEW YORK

YORK & SAWYER, *ARCHITECTS*

Generally accepted as splendidly serving its purpose, economical in operation, and provided with ample opportunities for future expansion, the Hospital for the Ruptured and Crippled of New York City presents a rare opportunity for the study of hospital planning and arrangement of departments.

It was the writer's purpose, in working with the architects, to lay special stress upon the avoidance of unnecessary or duplicated effort upon the part of the staff and employees, with the result that the routing through the individual departments, and the inter-departmental routing has been conducive to freedom from confusion and to the economical operation of the hospital.

Special attention was laid to the reduction of space used for corridors and the elimination thereof insofar as possible.

The principles applied to this building can equally well be applied to a hospital of a general nature and to the hospital consisting of a number of buildings.

In considering the plans of this hospital the writer gave special thought to present efficiency and to economical operation, but future expansion was carefully considered also. Especially was thought given to the avoidance of unnecessary footsteps on the part of the nurses. The Treatment and Linen Rooms are at the entrance to the Ward, next the toilet, and bath room and then the Quiet Room. Had this been a different type of an institution the Utility Room might have been placed adjacent to the entrance to the Ward with a saving of steps and energy as was done in the case of the Adult Ward on the third floor.

Each department and unit in this hospital is complete unto itself and can be operated without going through other departments or units, while each unit can be closed off when necessary by means of fireproof doors. Thus an outbreak of fire or contagion in one department does not prevent the usual operation of the institution otherwise, nor does it necessitate a roundabout travel to the various departments. It has been demonstrated that the working forces from the greatest distance can reach the location of a fire in less than one minute from the time of the ringing of the alarm.

The bed capacity of this hospital is 242. The daily average number of patients in 1919 was 185 and the daily cost per patient was $2.70, which is very low considering the existing high costs and especially the excellent results obtained by this great hospital. These results were made possible by careful thought of convenience and economy of routing, operation and supervision during the period of preparation of plans.

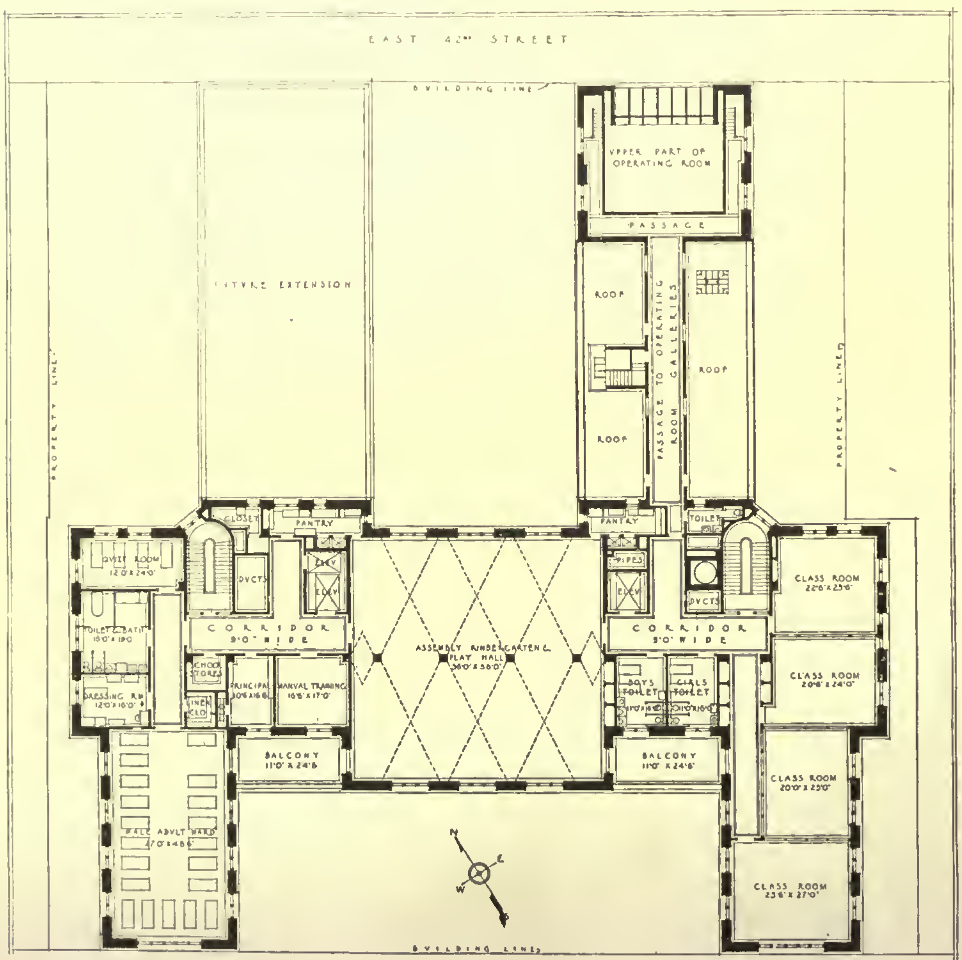
IT frequently happens that plans of new or prospective hospital buildings are brought to the architect by persons interested in a particular field of hospital work. The building constructed on this basis will inevitably be found upon operation to be defective in many respects. It is therefore a pleasure to be able to direct attention to a hospital well planned, convenient and economical in operation and one which is conceded to be one of the best hospitals in the country.

The same principles applied to a smaller hospital are typified in the Mary McClellan Hospital (75 beds) at Cambridge, N. Y. The State Board of Charities of New York points to this building as the model hospital of moderate size within the State of New York.

There recently came to my notice an attractive sheet of prints sketching huge buildings under construction, waterfront developments and busy shipyards. Printed on this, in big letters, were slogans such as "Plan Buildings Now," "The Early Planner Catches the Building Market," "Your Architect Should Plan Now." Even though this be propaganda in the interest of the building fraternity it carries a suggestion to those who sooner or later expect to build hospital buildings.

No type of building should be planned with more searching and careful consideration than the hospital. Its efficiency in serving, its economy in first cost and in maintenance, in fact, its entire value as an instrument of service to the public are determined in the plan and in the study given to the solution of the particular problem involved. Failure in hospital planning has, in too many instances, been the result of a hurried consideration of these problems owing to the pressure applied to the architect and to the building committee, and of their joint desire to get the plans finished and the building started in the shortest possible time. A problem of such great complexity as the modern hospital should be the subject of study for months by those engaged in the making and perfection of the plans. It should be a study given with a free mind, with concentration of attention, and with time available for the study of the successful features of hospitals previously built.

Visits should be made to similar hospitals where the latest and best-studied ideas have been carried out, consultations without number should be held among those interested in the production of the plans, sketches should be made and remade, each room, each part and each detail



FIFTH FLOOR PLAN

HOSPITAL FOR THE RELIEF OF THE RUPTURED AND CRIPPLED, NEW YORK

YORK & SAWYER, *ARCHITECTS*

should be considered from every conceivable viewpoint, and each should be evolved with economy of space, economy of material and with a thorough fitness for present and future requirements.

Efficient planning and building can be accomplished only through systematic organization involving much time. (See "Building the Hospital—Organization and Methods.")

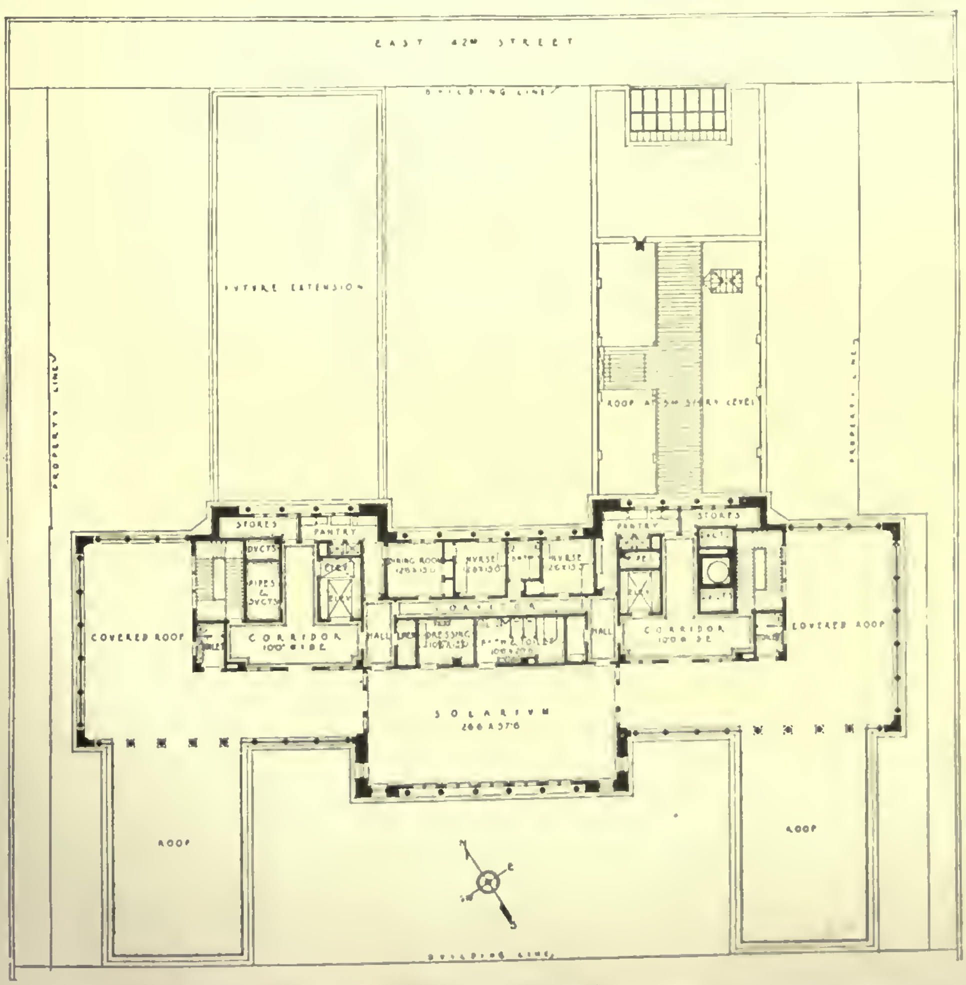
In the case of many hospitals the plans are perfected only after the building is under construction, very much to the detriment of the adequacy and economy of the entire plant. Perfect the plans, then build. Study the thousand and one problems while improvement means only the erasure of a few lines rather than when it involves the pulling down of steel and masonry.

The building of new hospital structures has been long suspended. The demand for hospital accommodation increases. Meanwhile the demand for new school buildings, homes, apartment houses, office buildings and every other class of building increases. Congestion in building construction is easily foreseen. Fortunate will be those who have given months to the study of plans. Reductions in the present cost of building materials and labor will be slight. Such reductions in costs will occur and pass in less time than that required for the preparation of plans and specifications for a building of any considerable size. The sag in the building trades has brought about, through competition, a reduction in the prices asked for building construction that will disappear upon the resumption of building.

The architect's experience in the planning and construction of hospitals during the period of high costs has made necessary the greatest study in the selection of building materials that the maximum of results should be obtained at the minimum of cost. The engineer finds equally important the selection of materials used in the mechanical equipment of hospitals.

The construction of new buildings and the reconstruction of old buildings will soon assume large proportions and will require the services of many architects, engineers and builders.

It would, therefore, seem that every indication points to the wisdom of planning now.



SIXTH FLOOR PLAN

HOSPITAL FOR THE RELIEF OF THE RUPTURED AND CRIPPLED, NEW YORK

YORK & SAWYER, *ARCHITECTS*

BEAUX-ARTS INSTITUTE OF DESIGN

Director of the Institute, LLOYD WARREN

Architecture, RAYMOND M. HOOD — Sculpture, JOHN GREGORY

Interior Decoration, ERNEST F. TYLER — Mural Painting, ERNEST C. PEIXOTTO

Official Notification of Awards—Judgment of March 15th, 1921

PROGRAM

CLASS "B"—III ANALYTIQUE

The Committee on Architecture proposes as subject of this Competition:

"A SEMI-CIRCULAR PORTICO"

A palatial residence is to be built facing a large garden. The principal motif of the façade of the building is to be a semi-circular portico similar, in general conception, to the portico of the White House at Washington.

The residence itself consists of two stories above the basement, the main floor of the house being 4′-0″ above the garden level. The floor of the portico is approximately at the same level as the main floor of the house and is provided with steps or a stairway leading to the garden. The stairway or steps may extend beyond the limiting dimensions given below for the portico. The portico is roofed. The residence and portico are to be built of stone or marble.

In the design of the portico the class orders shall be used; this, however, does not exclude the use of arched openings, or any other forms, provided that the orders be used in conjunction therewith.

The width of the portico measured along the façade of the house is not to exceed 40′-0″.

Jury of Award—W. F. Lamb, H. O. Milliken, F. A. Godley, C. A. Licht, T. S. Holden, A. E. Flanagan and A. L. Guptill.

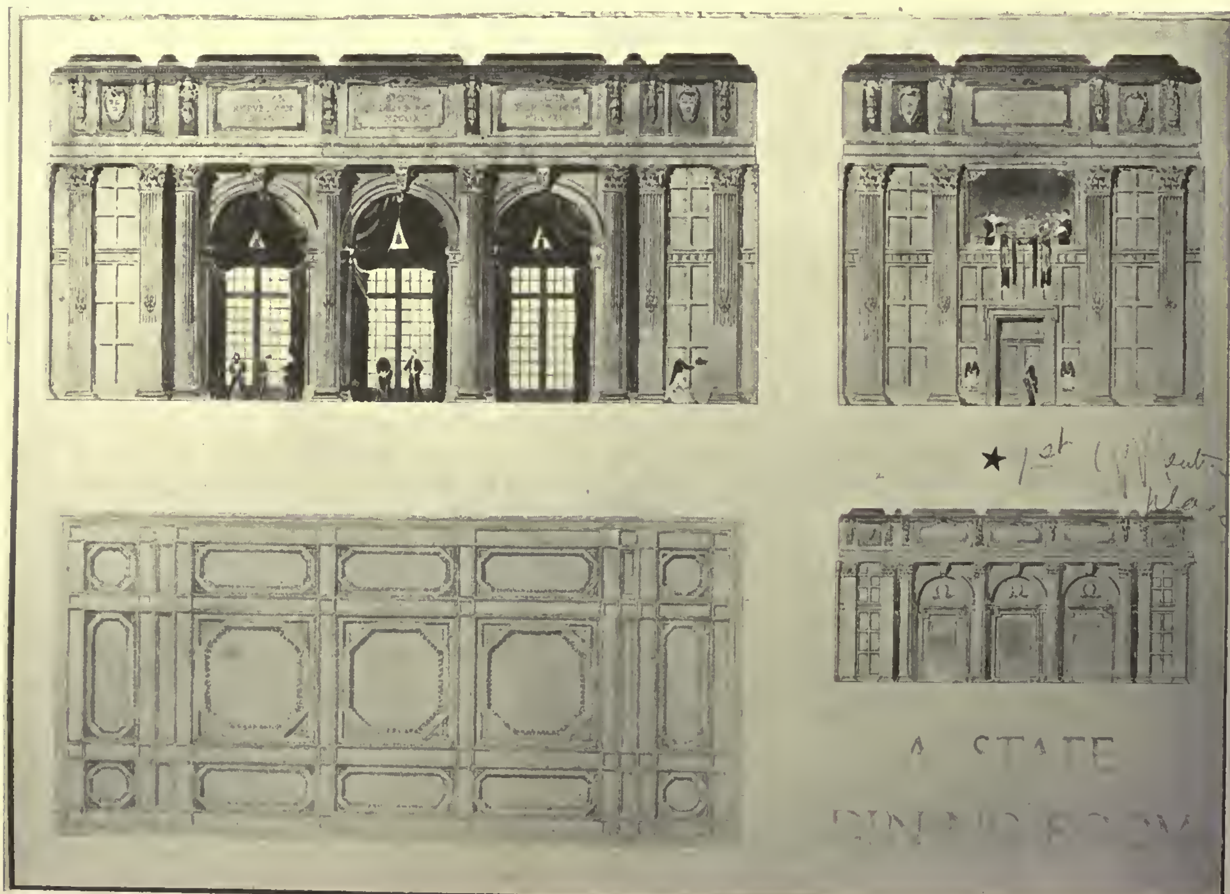
Number of Drawings Submitted—174.

AWARDS:

FIRST MENTION PLACED—J. J. Keil and C. Snyder, Carnegie Inst. of Tech., Pitts.

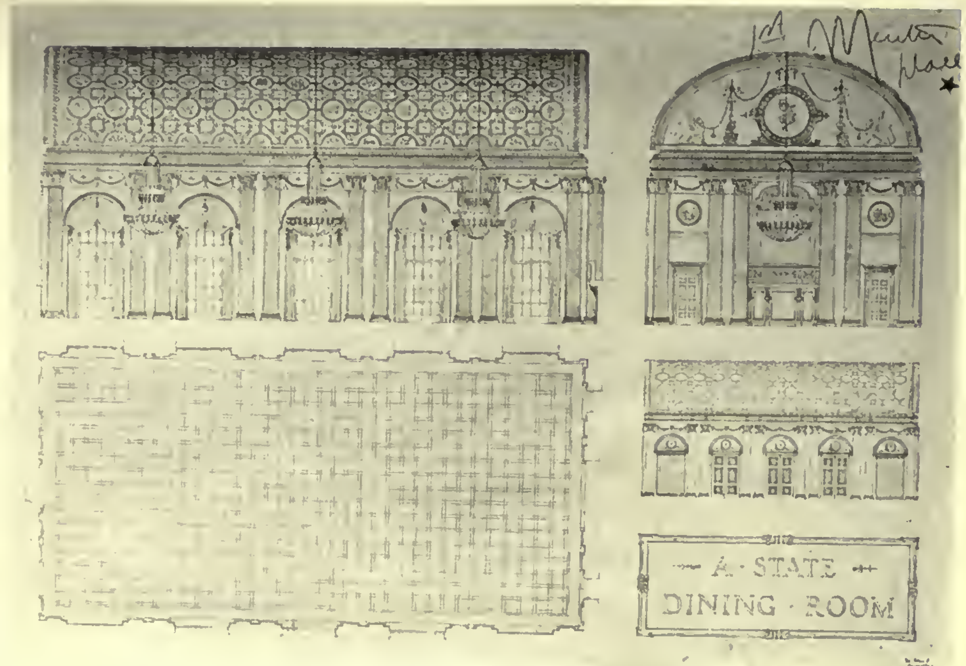
FIRST MENTION—M. G. Uslan and C. J. Billmeyer, Carnegie Inst. of Tech., Pitts.; J. M. Paul, Columbia Univ., N. Y. C.; V. Pribil, Atelier Corbett-Gugler, N. Y. C.; W. H. Speer, Atelier Denver, Denver; J. Garry, 644 Eighth Ave., N. Y. C.; T. Ross, Atelier Parsons-Chicago Archtl. Club, Chicago.

Mention—J. S. Crytzer, E. F. Allodi, E. F. Kennedy and E. Weston, Boston, Archtl. Club, Boston; F. W. Clarke and G. M. Dennis, Atelier Birmingham, Birmingham; J. Delo, H. H. Lefkowitz, G. A. Brink, C. C. Agee, V. J. Schoeneman, G. A. Fister, W. C. Pyle, A. S. Vincent, H. S. Torbert, L. C. Page, P. F. McLean, W. H. Willis, W. Z. Bane, L. B. Blair, H. L. Carter and Louise Barton,



FIRST MENTION PLACED — W. PRATT — COLUMBIA UNIVERSITY

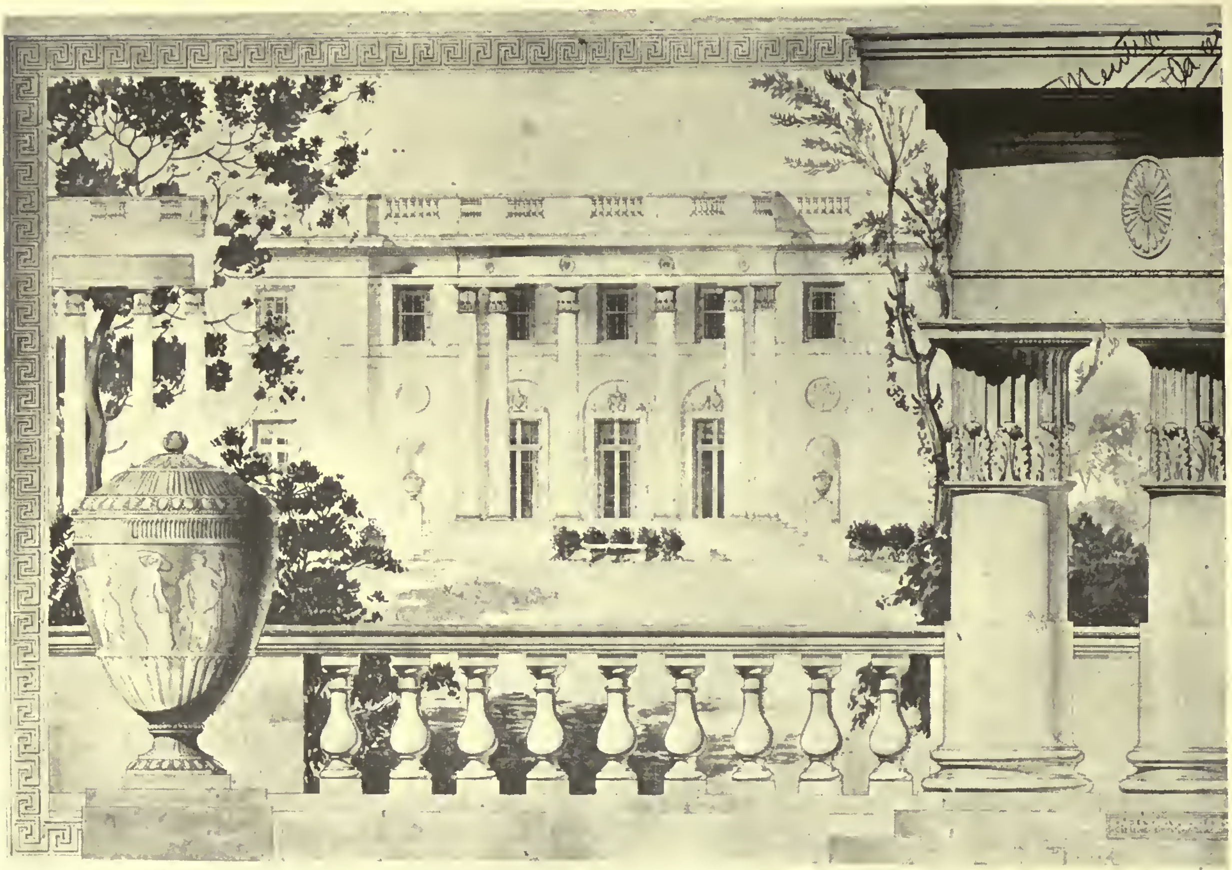
CLASS B, III PROJET—A STATE DINING ROOM



ABOVE: P. HOHORST, FIRST MENTION PLACED
CLASS B, III PROJET—A STATE DINING ROOM

AT LEFT: C. SNYDER, FIRST MENTION PLACED
CARNEGIE INSTITUTE OF TECHNOLOGY, PITTSBURGH

STUDENT WORK, BEAUX-ARTS INSTITUTE OF DESIGN



FIRST MENTION PLACED J. J. KEIL CARNEGIE INSTITUTE OF TECHNOLOGY, PITTSBURGH.

CLASS B, III ANALYTIQUE—A SEMI-CIRCULAR PORTICO

Carnegie Inst. of Tech., Pitts.; A. O. Angilly and A. A. Ehrenrich, Columbia Univ., N. Y. C.; C. Jensen, P. Sanfilippo, Jr., and S. G. Wiener, Atelier Corbett-Gugler, N. Y. C.; R. C. Danis, Catholic Univ., Wash., D. C.; C. F. Bieler, Atelier Denver, Denver; J. Grellinger, Atelier DeGelleke, Milwaukee; L. G. Clarke, A. F. Euston, A. Schablik, O. L. Warady and J. W. Hanson, Atelier Hirons, N. Y. C.; J. H. Jones, J. H. Lapish and C. L. Nutt, George Washington Univ., Wash., D. C.; F. Sakata, E. F. Horley, W. A. Jaeger and D. Nisnosky, John Huntington Poly. Inst., Cleveland; E. A. Gylleck, I. L. Johnson, L. E. Allen, A. R. Brown, D. R. Lundberg and J. G. Rehder, Atelier Parsons-Chicago Archtl. Club, Chicago; A. Zava, M. Barishenkoff, D. Raymond, J. F. Brandt, L. S. Young, Edna E. Voigt and H. O. Williams, Pratt Institute, Brooklyn, N. Y.; L. C. Palmer, F. M. Garey, F. W. Niblet and A. R. Scott, Richmond Archtl. Club, Richmond; H. S. Shaw, A. Bowen, W. H. Lewis, W. M. Haslett, L. Hauf, Jr., and C. A. Langzettel, "T" Square Club, Philadelphia; V. D. Phenix, T. B. Mayhall, E. F. Webster, V. Sauvignet and R. Ainsworth, Univ. of Texas, Austin; A. D. Baker, Univ. of Southern California, Los Angeles; E. Green, Jr., Swain Free Sch. of Design, New Bedford; Eva McCanles, O. F. Nicholson, A. E. Middlekauff, R. A. Herthel and A. B. Harris, Univ. of Kansas, Lawrence; V. N. Jones, Rachel Carter, D. T. Lopp, H. Richardson, V. Edades, Jenness Bonnell, A. E. Fulton, Verle L. Annis and W. Lund, Univ. of Washington, Seattle; A. Harrer and A. L. Brauer, Atelier Wynkoop, N. Y. C.

PROGRAM

CLASS "B"—III PROJET

The Committee proposes as subject of this Competition:

"A STATE DINING ROOM"

This room is to be built in the Executive Mansion of the Governor of one of our large states to serve for official dinners. The decorations should be in keeping with the dignity and magnificence of the functions for which it is destined. A musicians' gallery is indispensable. The dimensions of the room are 40'-0" x 80'-0" with a ceiling height of 40'-0", forming a so-called "double cube," of which there are certain well-known examples. The room is lighted by windows on one of the long sides and the entrance or entrances are on the opposite side.

FIRST MENTION PLACED—P. Hohorst and A. W. Chesterman, Carnegie Inst. of Tech., Pitts.; W. Platt, E. Kaeyer and S. Rockawer, Columbia Univ., N. Y. C.; M. L. Anderson, Univ. of Minnesota, Minneapolis; A. G. Clay, Yale Univ., New Haven.

FIRST MENTION—E. W. Klee and C. F. Bowers, Carnegie Inst. of Tech., Pitts.; W. Conley and J. Aronson, Columbia Univ., N. Y. C.; R. Mira, Catholic Univ., Wash., D. C.; K. Sasagawa, Atelier Hirons, N. Y. C.; Kathryn Harris, George Washington Univ., Wash., D. C.; A. D. Wills, Univ. of Minnesota, Minneapolis; B. S. Georges, Yale Univ., New Haven; L. B. Wamnes, Atelier Wynkoop, N. Y. C.

MENTION—J. E. Linnet, Boston Archtl. Club, Boston; H. A. Page, C. E. Landefeld, J. Franklin, P. C. Reed, F. H. Floyd, L. B. Christman, M. C. Bert, W. M. Burke, L. E Considine, W. L. Gill., Jr., J. W. Minick, J. W. Fritz, A. A. Lewis, W. T. Spann, F. B. Smith, K. E Weber, J. C. Topnick, E. O. Anderson, A. Taormina, R. Patterson, H. Stone, V. H. Stromquist, M. D. Smith, R. A. McKee, G. O. Schoonover, H. Dowden and L. Nusbaum, Carnegie Inst. of Tech., Pitts.; S. Dresser, A. T. Saxe, M. C. Hills, A. Marshall, S. R. Moore, N. B. Mead, Jr., and A. M. Taylor, Columbia Univ., N. Y. C.; J. J. Carey, P. Dowling and E. R. French, Catholic Univ., Washington, D. C.; C. F. Freidhof, Cincinnati Archtl. Soc., Cincinnati; C. H. Kellogg, Atelier Denver, Denver; F. J. Brince, S. M.

Palm and H. Van Der Lyn, Atelier Hirons, N. Y. C.; A. P. Starr, George Washington Univ., Wash., D. C.; E. C. Rising, H. P. Whitworth and L. A. Balicki, John Huntington Poly. Inst., Cleveland; J. N. Maddocks, Penna. State College, State College; W. K. Macomber and R. N. Hazlewood, Post and Lintel Club, Minneapolis; F. K. Cheetham, R. E. Dando and L. E. McConville, Atelier Parsons-Chicago Archtl. Club, Chicago; J. J. Welsh, Swain Free Sch. of Design, New Bedford; B. M. Dawson, Martha V. Dittmar and C. H. Siebert, Syracuse University, Syracuse; A. H. Miller, Thumb Tack Club, Detroit; E. A. Beihl, W. R. Fish and H. A. Allen. "T" Square Club, Philadelphia; E. Larson, H. N. Haines, A. R. Melander, D. J. Deneen, Alice Little, G. A. Stewart, D. Campbell, O. Thorshov and R. Damberg, Univ. of Minnesota, Minneapolis; M. W. Gill, Elizabeth Ayer and W. S. China, Univ. of Washington, Seattle; R. L. White, R. L. Jenkins and Essie Lipscomb, Univ. of Texas, Austin; C. W. Wenger and H. J. Lawrence, Univ. of Virginia, Charlottesville; R. E. Tatum, A. E. Evans and R. R. Hibbs, Univ. of Kansas, Lawrence; V. M. Raynal, H. S. Kelly, W. Douglas, D. M. Campbell, D. Weinstein, C. B. Lewis and P. E. Isbell, Yale Univ., New Haven.

H. C.—T. F. McDonough, Boston Archtl. Club; K Matsunoi, P. Simons and I. Tron, Columbia Univ.; E. L. Babitsky, John Huntington Poly. Inst., Cleveland.

DEPARTMENT of SPECIFICATIONS

The Construction of a Specification

As specifications may be divided into two classes —with respect to the completeness of detail embraced therein—the first essential step in the preparation of specifications is to determine into which of these two classes they will be placed. These classes are (a) specifications to accompany drawings completely detailed, leaving very few matters for later final determination except perhaps the full size details, and (b) specifications to accompany drawings not completely detailed and leaving many matters of major and minor importance for later determination.

The drawings will govern the classification, of course, but it should be understood that at the inception of the work in the drafting room a decision must be made as to whether the drawings will or will not be made as complete and as thoroughly indicative of the desired result as is possible. A careful specification writer, one who appreciates the numerous difficulties that are sure to present themselves on the job, will expect and should insist, to the uttermost, on having the drawings prepared as completely as possible, having in mind the nature of the work that is to be accomplished and the kind of contractor who probably will be called upon to do the work. If he is in charge of the preparation of drawings he will solve this problem as his good judgment dictates, while if the drawings are prepared without his jurisdiction, he will be required to make the decision as to completeness of drawings based entirely on his scheme for the developing of specifications that will assure the desired co-operation with the drawings. It is customary for many specifications to contain the following clause: "The contract documents are complementary and what is called for by one shall be as binding as if called for by all." This does not mean that one sheet of the drawings may be permitted to show one certain material or method at a given place while another sheet may show materials or methods totally different, thus giving the architect an opportunity to make a selection at a later date, probably after construction work has started. It is only an expression of human nature for a contractor to protest against such drawings unless the choice is left to him (a choice usually dictated by financial considerations) and the specifications must be so written, in respect to their "all-inclusiveness" as to obviate such contretemps. Such matters will, however, be discussed in greater detail later in considering the checking of the drawings.

If, during the progress of the drawings notes have been made for future reference in the preparation of the specifications, it will be found convenient to classify them strictly according to the section of work to which they refer, with additional notes elsewhere to recall the text of the note or to bring up some point that must be given attention at a certain time or periodically when writing the specifications for some section in which reference thereto must be made. Written notes should be made in as great number as necessary as the habit of depending on mental notes is, at best, not without faults inherent in mental processes of memory and it is most certainly fraught with potential danger.

The schedule of materials, as described in a previous article should be brought to completion in so far as possible, when the preparation of specifications is to be commenced as it constitutes one of the essential preliminaries. At this stage of the work it must be assumed that all major decisions with respect to materials have been made and that the correlative questions have been considered and their answers determined. Therefore there should be no reason why this schedule cannot be completed and made ready for reference as the controlling determination of the matters embraced therein. The convenience, to the specification writer and to all those concerned in the production of the drawings, cannot be over-estimated and a carefully and thoroughly prepared document will be of the greatest assistance in the elimination of errors and misinformation.

AS the drawings approach completion the preparation of the specifications must be started in earnest. The one, almost universal, method of completing the drawings and specifications by creating a competitive basis for the drafting room and specification department, in order to see which gets its documents completed first, is to be condemned as a vicious practice. Of course, it is natural that these documents be completed with speed, but the amount of pressure brought to bear must be compensated by a desire to have accuracy and thoroughness given as great consideration as rapidity of completion. The best practice in preparing specifications will so time their completion that the drawings will have been ready for publication (or issuance to contractors) several days before their completion. This interim of a few days will permit a final checking of the drawings by the specification writer and, on his part, will tend to eliminate recourse to the excuse that the drawings were changed subsequent to the completion of the specifications, if, after construction work has started, it is discovered that errors have been made that easily could have been avoided if greater care had been exercised. The completion of the specifications must not be hurried the last few days at the sacrifice of accuracy and thoroughness. Ordinarily it is possible for one who has written specifications previously to determine with sufficient accuracy the date when his work can be accomplished and the document then should be started with this date in view. Sufficient time must be devoted to each part of the specifications to insure coherence and accuracy and it is better to advance the date of commencement rather than the date of completion.

When the drawings have been studied sufficiently for the specification writer to gain a clear understanding of them he should start the preparation of an outline for the specifications. This outline should be started with a view to making it fairly complete at this state, leaving room for the insertion of additional items that will present themselves as its preparation progresses. The outline should be carried through from the first to the last sections of the specifications in order that matters in one section that are interdependent with matters in some other section may be noted and, where necessary, given a preliminary study, subject to later, and perhaps more accurate, determination when the scope of the work has been thoroughly covered.

IT will be found that the evolution of the outline from its rough to its finished state will be accomplished with ease if the work be entered upon from a broad viewpoint of the completed document and a thoroughly understood set of drawings, giving attention, first, to the items of major importance and gradually working down through them to the sub-divisions and minor parts and, second, to the interrelation between the sections. No attempt should be made to complete one section of the outline before other related or associated sections have been blocked out in a fairly complete state, as it must be borne in mind that coherence can be gained only through a knowledge of what the specifications will be composed. The only possible deviation from this rule can be the preparation of specifications for a building so nearly a duplicate of one that previously has been built under specifications prepared by the one who is to prepare the new document. In this case the variations probably will be of such a nature that they will be understood and noted without possible error or omission of essential details. The work of duplication will, of course, be guided by the specification previously written, which of itself, will constitute the outline.

However, it is a very good rule always to prepare an outline of the specification regardless of the nature of the work, even though it be a repetition of one previously prepared.

It is well at this time to make a suggestion as to the division of the completed specification in sections or sub-divisions in which will be placed all work of a particular trade or of trades closely associated with the dominant branch except as there may be sufficient work in two closely related trades to warrant a sub-division of the work for particular reasons.

As an example, in many buildings the dominant trade involved will be masonry, including the major branches of concrete masonry, brick masonry, terra cotta or hollow tile masonry, architectural terra cotta masonry, architectural stone masonry, natural stone masonry (such as granite, limestone, marble) and perhaps plastering. It is, of course, unusual for each of these trades to be assigned to a separate section of the specifications, it being common custom to group certain trades wherever local custom makes possible an arrangement whereby all of a number may be placed in the hands of one contractor.

However, each building must be considered by itself for the reason that one structure may be of such a type of construction that it appears desirable to make two main sub-divisions of concrete masonry and brick masonry. In this case the concrete masonry section will include all plain and reinforced concrete work of whatever kind, with a specific exclusion of all other masonry required for the building except concrete masonry. As a corollary it may be deemed expedient to include in the concrete masonry section the furnishing as well as installation of all reinforcing steel or else it may be more desirable to have the furnishing of reinforcing steel made the subject of a separate section with its receipt at the job and placing included in the concrete mason work. The structural steel also may be handled by either of these two methods, except that where the tonnage warrants, it may be best to have the erection of the steel structural work performed either by the contractor furnishing it or by an erection contractor who is equipped especially for an expeditious handling of the work. The exigencies of the particular case will govern the arrangement of these items in the best possible manner.

FOR the second sub-division, that is, brick masonry, it may be good judgment to include in this section, in addition to all brick masonry, the furnishing and installation of granite, limestone, exterior marble work, terra cotta or hollow tile masonry and such other branches that may have been excluded from the concrete masonry section. Perhaps it may be considered proper to have the various kinds of stone made the subject of separate sections so far as the furnishing of the building is concerned, there to be delivered into the care of the brick mason contractor for handling and setting in place. Likewise, for whatever terra cotta or hollow tile work there may be involved in the operation the quantity may be considered sufficient to warrant a separate section for its furnishing and installation, especially where a steel framed structure is to have floor and roof arches and many linear feet of partitions. On the other hand, this work may be so small in scope as to subject it to greater ease of accomplishment if placed in the work of the brick masonry contractor.

Somewhat similar arrangements must be made for other sections of the work except, of course, for such items as interior plastering, glass and glazing, painting (in which ordinary decoration of office area walls and ceilings may or may not be included) and such other branches of the construction industry to which a separate section is easily assignable.

Without having in mind any particular building except that it may be considered almost universal in application the following sections may be determined upon as being a proper sub-division of the work:

Concrete Masonry Including excavations	Cabinet Work — Interior Wood Trim
Brick Masonry	Hollow Metal Trim
Structural Steel	Marble
Reinforcing Steel	Mosaic Tile
Granite	Composition Floors
Limestone	Elevators
Terra Cotta	Hardware—Finish
Ornamental Bronze and Iron	Electrical Wiring and associated work
Miscellaneous Iron	Ventilation—Mechanical
Carpentry—Rough	Heating
Sheet Metal	Plumbing and Drainage
Fire—Retarding Windows	Refrigerated Drinking Water System
Roofing	Vacuum Cleaning
Furring and Lathing	Light Fixtures
Plastering	Interior Decoration
Glass and Glazing	Furniture and Equipment
Painting	

This list is not intended to be complete but is given as an indication of the possible classification of the subject matter of the various sections, arranged somewhat as they will be used in the sequence of construction operations.

THE specification writer must bear in mind the various requirements resulting from decisions of the National Board of Jurisdictional Awards, recommendations of the American Institute of Architects with respect to classification of the several branches of construction work and the recommendations of manufacturers as to how their materials may best be specified, whether in some one particular branch or separately. Local customs will, of course, be a guide and perhaps the most important consideration will be based on the desire of the architect or owner to award contracts under the general contract or separate contract system.

DEPARTMENT OF ARCHITECTURAL ENGINEERING

INTERIOR VIEW OF HOLY NAME CATHEDRAL, CHICAGO; AFTER ENLARGEMENT, BEFORE NEW WORK WAS DECORATED
HENRY J. SCHLACKS, *ARCHITECT*

ENLARGEMENT of HOLY NAME CATHEDRAL, CHICAGO

ADVOCATES of sound construction are gratified wherever a noteworthy operation on a large building justifies their insistence upon good workmanship. The cutting in two and shifting of parts of masonry buildings without damage, test workmanship as nothing else can and such tests advance the cause of good building. It is a fact that for every building which collapses and receives newspaper publicity, thousands subjected to equally severe tests endure them without visible distress. It is the truth that sound construction is the rule. The moving of ordinary buildings having interior partitions which help to stiffen them attracts notice only when the mover's work is badly performed.

The moving of a church with high thin side walls and no cross partitions is no ordinary task, and to perform it successfully reflects great credit on all concerned. Even when ordinary house-moving methods are used and no new inventions are called into play, the fact of the accomplishment is worthy of record to show that it can be done. The enlargement of Holy Name Cathedral, Chicago, involved the cutting in two of the sanctuary back of the transepts and the moving of the rear portion a distance of 14 ft. 2 in., with the insertion of a new panel. The part moved had a width of 130 feet and a height of 100 feet to the highest point of the roof.

VIEW OF SANCTUARY OF HOLY NAME CATHEDRAL, CHICAGO, DURING ALTERATIONS. TAKEN FROM INTERIOR WHEN GAP WAS ABOUT THREE FEET WIDE

The sanctuary, while large enough for ordinary use, was inadequate on great occasions. It was proposed to move the communion railing forward into the church, a perfectly natural idea from the standpoint of men who are not builders. Mr. Henry J. Schlacks, the architect placed in charge of the proposed work, suggested that some other way be studied and presented the following objections to the idea of moving the communion railing: It would extend into the transept; it would displace front pews which belonged to old families of the parish; and, the additional space thus acquired would not be sufficient to accomplish the desired purpose.

Measurements and studies made by Mr. Schlacks showed that an increase in length of the sanctuary equal to the width of one panel, would eliminate the side vestibules which then encroached on the sanctuary space and the area of the sanctuary would be increased one-half. This was what was needed and it was found that there was sufficient space between the rear end wall of the sanctuary and the parochial residence to admit the additional panel. The suggestion was then made that the end of the sanctuary be moved back and the panel be inserted, a solution so unexpected and novel that it was considered long and carefully before approval was given.

It took one year to discuss the matter, prepare the plans, build all required foundations, put the beams, blocking, rollers, etc., in place, and cut the building in two. The actual moving was done in seven hours during one working day. The moving crews were called at intervals for seven weeks before the actual moving day arrived. Each time some unforeseen emergency necessitated further precautionary steps for it was felt that no chances should be taken.

LENGTHENED SANCTUARY OF HOLY NAME CATHEDRAL, CHICAGO. VIEW TAKEN BEFORE NEW WORK WAS DECORATED

On the interior four braced towers were erected, two on each side of, and close to, the cut, to carry temporary trusses which supported the ceiling and roof. The two rear towers moved with the part on the floor of which they stood, to carry the portion of the roof which was separated from the main structure.

Screws seven feet long were used, each being manned by two men. Whistle signals were used, each screw being given a one-quarter turn when the whistle sounded, the time being well regulated and th screws turning simultaneously. The altar, furniture and statuary was moved with the structure without being disturbed.

The contractors had the good fortune to be able to complete all the preparatory work during the summer. The walls and roof were cut when weather

EXTERIOR VIEW OF SANCTUARY OF HOLY NAME CATHEDRAL, CHICAGO, WHEN GAP WAS ABOUT SEVEN FEET WIDE

conditions were at their best. A wooden shed covered with tar paper protected the vestibules and enclosed the space occupied by the enlarged vestibules during the progress of work in the interior. An ingenious arrangement of canvas curtains covered the walls of the sanctuary above the vestibule roof, as well as the roof of the sanctuary. The precautions taken to protect the interior greatly facilitated the progress of the work and prevented delays which might easily have occurred had less attention been paid to many small details.

DURING the progress of the work the architect was asked to examine the foundations of the interior marble columns in which there were fractures indicating movement. The architect found that all the towers leaned slightly in the direction of the tower, the latter being out of perpendicular nine inches to the south and fourteen inches to the west. The trouble was wholly in the foundations of the tower, the settlement of which pulled the walls and connecting structural members of the roof in such a manner as to disturb every interior column.

A decision was reached to put new foundations under the tower. The construction of the State Street tunnel, the top of which was forty feet below street level, was approaching the Cathedral and it was feared that the effect on the tower would be disastrous. Since the tunnel and new foundations would be under way at the same time the decision was reached to support the tower foundations on four caissons going to bed rock, a depth of 140 feet. These caisson foundations were at the time the deepest in Chicago, the average being about 100 feet.

A temporary foundation had to be put in to support a large number of bottle jacks with which to keep the tower vertical and to prevent it from sinking as the sinking of the caissons progressed. This temporary foundation of timbers and needle beams extended well outside the tower walls in order to remove the old foundations and obtain a clear space in which to sink the caissons.

The caissons were sunk in the way such work is usually done in Chicago. Circular holes were dug by hand and lined with vertical staves held in place by iron rings on the inside. These rings are in sections, bolted together at the ends. The excavated material is hoisted in buckets. The pressure of the surrounding clay requires fast work for each section a few feet in depth and the digging must go slightly beyond the lines in order to give time to place the lining. It is stated that the excavated material hauled away from a caisson is about twenty per cent. in excess of the actual contents of the hole. This, of course, together with drainage, causes a sinking of soil in the vicinity. In the case of the tower this sinking amounted to eighteen inches, which justified the expense of the temporary foundation with its jacks, which supported the tower at its original level until the new foundations resting on the caissons were completed. The work of sinking the caissons was continuous and at regular intervals the jacks were turned and the tower pushed back into place.

The spire on the tower is one of the highest in Chicago, and, because of this, together with the fact that the work was done in mid-winter, the operations attracted considerable attention. The total cost of moving the sacristy, putting in the new panel, importing marble for the new work, restoring columns to perpendicular and putting new foundations under the tower was $150,000.

IRON AND STEEL

Concluding a Discussion of Steel Making Processes As Applied to Iron Manufacture *

THE American Society for Testing Materials is conducting a series of corrosion tests in charge of Committee A 5. The inspection report of Sub-Committee III is given in the Proceedings of the Society, Vol. XX, 1920. Sheets of unprotected iron and steel are exposed at Annapolis, Md., Pittsburgh, Pa., and Fort Sheridan, Ill. The exposure at Pittsburgh appears to be the most severe and the results are here considered. The sheets were exposed December 12, 1916, and inspections made after 10, 16, 22, 28, 35 and 41 months' exposure, the latter being made May 11, 1920. The material is divided into two groups, copper-bearing, which has more than 0.15 per cent. of copper, and non-copper-bearing, which has less than 0.15 per cent. of copper. The sheets tested are of No. 22 and No. 16 gauge steel. The latter does not indicate failures as soon as the former, due probably to the greater thickness. The results here given are confined to the No. 22 gauge sheets.

The copper-bearing group consisted of 146 sheets, divided into 15 groups. The performance of the different groups is as follows:

Puddled iron, containing 0.283 per cent. copper

22 months,	17 per cent. failed	
28 "	33 " " "	
35 "	33 " " "	
41 "	17 " " "	
	100 " " "	

Open-hearth steel, containing 0.179 per cent. copper

35 months,	11 per cent. failed
41 "	11 " " "
	22 " " "

Copper-bearing pure iron, containing 0.190 per cent. copper

35 months,	55 per cent. failed
41 "	33 " " "
	88 " " "

Copper-bearing steel, containing 0.227 per cent. copper

35 months,	14 per cent. failed
41 "	36 " " "
	50 " " "

Copper-bearing pure iron, containing 0.260 per cent. copper

35 months,	7 per cent. failed
41 "	21 " " "
	28 " " "

*The first installment of this discussion appeared in the issue of July 6, 1921.

Copper-bearing pure iron, containing 0.304 per cent. copper

35 months,	14 per cent. failed
41 "	21 " " "
	35 " " "

Open-hearth steel, containing 0.185 per cent. copper
41 months, 21 per cent. failed

Those sheets which did not fail after 41 months' exposure are designated, with percentages of copper, as follows:

	Copper
Copper-bearing basic open-hearth steel......	0.244
Copper-bearing Bessemer steel.............	0.252
Copper-bearing acid open-hearth steel......	0.237
Copper-bearing Bessemer steel.............	0.257
Copper-bearing Bessemer steel.............	0.533
Copper-bearing open-hearth steel...........	0.212
Copper-bearing open-hearth steel...........	0.268
Copper-bearing open-hearth steel...........	0.621

The average analysis of these sheets showed the presence of carbon, manganese, phosphorus, sulphur, silicon and copper in addition to iron.

Inspection and comparison of these results show that 53 per cent. of 15 groups indicated no failures and that they are designated as open-hearth or Bessemer steel. The seven groups which had failures showed the average percentage of failures in the steel groups to be 31 per cent., and of the iron groups 63 per cent. Of the groups which had no failures, the first four had from 0.004 to 0.008 per cent. of silicon; the last four had no silicon.

The non-copper-bearing group consisted of 84 sheets divided into 11 groups, which contained less than 0.15 per cent. of copper. The performance of these groups is as follows:

Low-copper open-hearth steel, containing 0.020 per cent. copper
16 months, 100 per cent. failed

Bessemer steel, containing 0.014 per cent. copper

16 months,	94 per cent. failed
22 "	6 " " "
	100 " " "

Low-copper pure iron, containing 0.022 per cent. copper

16 months,	7 per cent. failed
22 "	93 " " "
	100 " " "

Bessemer steel, containing 0.013 per cent. copper

16 months,	33 per cent. failed
22 "	67 " " "
	100 " " "

Open-hearth steel, containing 0.018 per cent. copper
22 months, 100 per cent. failed

Low-copper pure iron, containing 0.024 per cent. copper

22 months,	33 per cent. failed
28 "	67 " " "
	100 " " "

Low-copper pure iron, containing 0.027 per cent. copper
22 months, 100 per cent. failed

Open-hearth steel, containing 0.082 per cent. copper

22 months,	25 per cent. failed
28 "	25 " " "
35 "	25 " " "
41 "	25 " " "
	100 " " "

Low-copper wrought iron, containing 0.020 per cent. copper
28 months, 100 per cent. failed

Copper-bearing pure iron, containing 0.139 per cent. copper

35 months,	50 per cent. failed
41 "	50 " " "
	100 " " "

Bessemer steel, containing 0.133 per cent. copper
No failures

An inspection of the performance of these non-copper-bearing groups does not disclose any material difference in resistance to corrosion between "pure iron" and steel sheets. A comparison of the performance of these two groups of metal indicates that the inclusion of copper in the metal, both iron and steel, has a definite value in the prevention of corrosion. The use of these various materials is largely an economic problem and the final specification will be determined by the cost, based on a true comparison of all the elements involved.

FILING and FINDING of CORRESPONDENCE and DATA

EARLY in the career of every architect the need arises for some way to keep track of prospective business and business in hand. The following method was devised a number of years ago by a man in private practice and it has always worked well. One outstanding benefit is that all letters go at once into the regular file and the necessity for a number of "On hand," "Future," etc., files is done away with.

This man had lightweight sheets, 8 1-2 x 11 in., printed as follows and tabbed:

Structure .... Date ......
City .... State .... Job No...
Owner ....
Address ....
Architect ....
Address ....
Engineer ....
Address ....
Contractor ....
Address ....
Correspondence filed under....................

Remarks:

....

The space for Remarks occupied about half the sheet.

When correspondence begins one never knows when it will develop into something worth while; therefore, every letter should be filed so it may be found readily. When the system here mentioned was started the printed sheets were 4 x 6 inches, and contained no lines for Architect and Engineer and no space for Remarks. The sheet in its present form is the result of experience in the offices of architects, engineers, contractors and dealers in building supplies.

It will be noticed that there are six headings: Structure, Location, Owner, Architect, Engineer, Contractor, of which at least four are of importance. Assume that a prospective client writes a letter about a certain structure, thus beginning a correspondence. A carbon sheet is inserted in the pad and the lines giving information about the structure, the location, the owner and date are filled in; the name of the owner being also written on the line telling where the correspondence is to be filed. After removing the carbon sheet a heavy red pencil line is drawn under structure on the first sheet and under state on the second sheet. Each sheet is then filed in a vertical letter file, as indicated by the red line. Thus, from the start, the practitioner begins folders for structures, the importance of which is only fully appreciated after many years. A folder is also prepared for each state from which letters come, the cities being filed alphabetically in state folders. No folder is prepared with a heading Owner, for the two sheets mentioned serve merely to cross index correspondence with the owner. Thereafter, when a letter is received, the files are searched under name of the writer to determine whether there has been previous correspondence, all earlier letters being placed with the last letter before answering. It is important that all correspondence relating to a job be placed under one name, the one first selected. Letters from other people should have this name and the job written at the top of the sheet in red to indicate where they must be filed.

After a while other names will come in of engineers and contractors connected with the work and new cross reference sheets will be filled with these fresh data, the earlier sheets being removed from the files and destroyed. When all data are filled in there will be the following folders containing only the cross reference sheets; Structures, State (each state), Owners, Architects, Engineers, Contractors and on each sheet under Remarks will be such historical data as one may need. Each sheet points to the name under which all correspondence will be found for each job. To insure each sheet going back into the proper folder a heavy red pencil line is drawn under the proper name, but one red line appearing on each sheet.

The convenience of such a system becomes more apparent the longer it is in use. If an architect is asked, for example, what he has done in a certain state he can open the folder for that state and show his list of structures. Asked what he has done in school houses, the School House folder contains the answer. The name of a structural engineer or perhaps the name of a contractor is mentioned and a reference to folder, Engineers, or to folder, Contractors, tells at once whether he has had business connections with them. The cross reference sheets are made at the time correspondence is answered and are filed in the regular letter file, thus doing away with special index cards of varying sizes, which are seldom properly made out, or, once started, kept up.

In a building material dealer's office, from which a number of traveling salesmen operated, this system was introduced with great advantage. A salesman announcing that he would be in a certain city upon a certain date would find on arrival an envelope from the main office, containing slips of paper, one for each man in that city with whom correspondence had been held, containing a resume of all correspondence with him. Prospects were listed in the same manner, and the data sent to the salesman.

A well-known structural engineer adopted this system several years ago to get business and keep track of resulting correspondence. Later he adapted it to preserving and filing data clipped from periodicals, or, copied from them, in addition to keeping track of his own work. His letter file then became an encyclopedia of work done during the period he has been in business. A number of architects followed the same plan for forming reliable reference lists of active building owners, of engineers, of contractors and of notable structures, in addition to lists of their own former business connections or associates and their own work. The system has proven to be one which may be kept up with a minimum of trouble and is adapted to large as well as to small offices.

Preventing Mortar Stains on Masonry

BROWN stains on limestone masonry arising (presumably) from action of the mortar are being studied at the Bureau of Standards in Washington, where two methods of preventing this staining are under investigation. The first is the use of a colorless waterproofing material on the limestone at the contact face of the mortar, the action of which is to prevent the passage of water through the mortar and into the stone in such a way as to carry the staining material with it. Preliminary tests indicate that most of the staining is prevented by this means. A number of British architects specify a thin coating of pure lime putty to prevent contact of masonry laid up in cement mortar, with Portland stone. This is claimed to work well and has been in use many years. The second method consists of applying a removable porous coating on the exposed face of the limestone wall. The stains then come through the coating, form on its outer surface and later on are removed when the coating is removed, while when forming directly on the stone surface they are difficult to remove because the staining material is insoluble. The method is expected to be of some value, as most of the stains form during the erection of the masonry.

Laminated Beam Tests

CONTINUATION of tests on laminated beams is reported to be under way at the Forest Products Laboratory, Madison, Wis. Reports on the tests, which were carried on last year, have just been printed and are now ready for distribution.

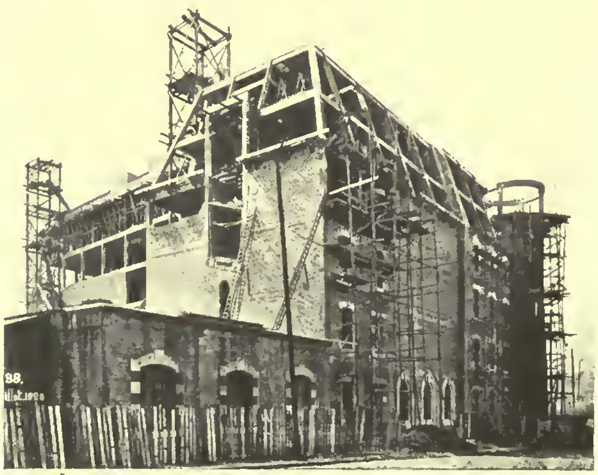
Mill Construction Bulletins

THE National Lumber Manufacturers' Association, Chicago, Ill., have added to their Series E-1 Heavy Timber Mill Construction, bulletins on basement floors, roofs and roof coverings, and floor beam charts for mill construction design.

These bulletins are now ready for distribution, together with pamphlets, which give in convenient form information on maximum joist and rafter spans for conditions met with in ordinary construction.

A FRENCH COLD STORAGE PLANT

THE cold storage plant shown in the accompanying cut was recently built in Paris for the Paris-Orleans Railway Company. The dimensions were not given by our correspondent, who merely stated that the water tank is 100 feet above street level. The type of architecture does not seem suitable for a cold storage plant from the American point of view, and herein lies the difference between French and American cities. In France the city is regarded as an architectural entity and, while allowance is made for some degree of originality, good taste is conserved by requiring in each block a similarity of treatment of facades. If a commercial establishment is erected in a zone reserved for homes a good and sufficient reason must be shown to obtain a permit. The permit is given only after plans are made which harmonize with the surroundings. Even in a strictly commercial zone a building must conform to the architectural treatment planned for the street or open space on which the building fronts.



COLD STORAGE PLANT OF PARIS-ORLEANS RAILWAY DURING CONSTRUCTION

A height limit is fixed for cornice lines in all French cities and above this line additional stories may be built within sloping roof lines fixed by law. This cold storage building has a structural framework of reinforced concrete and the designer's treatment of his roof problem was very simple as the photograph shows plainly. The main point of interest in the building is the wall construction.

ALL walls are carried on concrete girders and have a total thickness of 13 inches, made up of two 4-inch brick shells enclosing a 5-inch space. This space was filled with compressed cork blocks 4-in. thick. Cellular material being ideal for insulation the shells consist of porous cinder concrete brick. Each brick becomes a cellular unit when surrounded by mortar, which prevents passage of air. The interior faces of the hollow space were covered with cement mortar before placing the cork. When the walls were completed both sides were covered with cement mortar. The walls therefore consisted of two shells of small cellular units, each one perfectly sealed and a 4-inch thickness of cork, than which no better insulating material exists.

WITH characteristic French thoroughness an investigation was made of proposed methods of plastering to be certain of having the most dense covering possible. The tests showed that mortar placed by the cement gun was most impervious, possessed the greatest adhesion and when dry was most free from cracks. The saving in cement, which is high priced in France, was about 25 per cent. as compared with cement mortar of the same proportions mixed and placed by hand.

Two cement guns were used, each with a crew of 4 men, each crew covering an average of 2700 sq. ft. in 8 hours. Each coat had a thickness of from ⅝-in. to ⅞-in., that forming the wall surface of inside rooms being trowelled to an even thickness and smooth face. The guns were placed on the ground level near the main entrance, the 300 feet of hose going up through the elevator shaft. The maximum height at which the nozzle operated was 100 feet and the air pressure was about 65 pounds.

COLD STORAGE PLANT OF PARIS-ORLEANS RAILWAY, COMPLETED

All interior partition walls for the storage chambers are of the same construction. Tests made after the work was completed showed that the loss of cold air was remarkably low and for this the extreme density of the air sealing plastering must be given much of the credit.

BOOK REVIEWS

REINFORCED CONCRETE DESIGN. Vol. I, Theory, by Faber & Bowie. (2nd Ed.), 6 & 9 ins., 332 pp., 164 figs. in text. Vol. II, Practice, by Oscar Faber, 6 & 9 ins., 246 pp., 89 figs. in text. Cloth. New York, Longmans Green & Co.

THE underlying theory of reinforced concrete has been so written up and discussed that there is apparently nothing new to be said, for there is a dreary similarity in all text books on the subject and in each case the same authorities are quoted.

The work, however, under review is entirely different from the general run of treatises or texts on reinforced concrete and the reviewer is glad to see the second volume and the revised edition of the first volume. The first edition of the first volume appeared in 1912 and created a mild sensation, for after giving the usual basic facts and taking up the design of ordinary beams and columns it broke into a new field. In the second edition the authors state that few changes have been made and then, with evident satisfaction, state that many of their formulas for bending moments in beams of long spans were adopted by the London County Council, in regulations for reinforced concrete frame buildings. Volume II is a new book.

The new field which the authors entered was one in which adequate treatment was given of the many factors which differentiate the design of monolithic reinforced concrete frames from the design of non-continuous steel frames. Such details were at that time treated in an empirical way, or else discussed in a very unsatisfactory manner in the usual text books, so Faber & Bowie met with a hearty reception. Owners of the first edition of the first volume need not discard their copies but purchasers of the second volume should also own the first because of the many references made to the earlier chapters on theory.

The second volume amplifies the treatment of bending moments in beams and columns, taking into account stiffness of connections, of loading, etc., and gives tables and diagrams by means of which the moment may be found in any part of a beam or column, with any ratio of live to dead load and any distribution of load. In this volume there is also an excellent treatment of a subject usually neglected in ordinary text books, namely that of unequal spans of continuous beams. There is also a discussion of Faber's later theoretical and experimental work on the shearing resistance of reinforced concrete. It is styled "Practice" because of labor saving diagrams used to simplify the application of the formulas presented in the earlier book, now styled "Theory."

This work does not say one word about the design and construction of arch bridges; the section on chimneys is hardly more than a collection of hints of value to a man well posted on the design of reinforced concrete; the chapters on reservoirs, water towers and retaining walls are adequate; there is nothing said about the design of sewers, culverts, high masonry dams, etc. It is a work intended for the designer of buildings and the chief merit it possesses is that it gives in easily understandable form, and with practical methods for handling, the underlying theory of unbalanced moments and handles bravely subjects the average writer of the average text book apparently finds too difficult to present satisfactorily. It is a treatise and manual for the man who likes to know something more about his work than barely enough to handle the simple problems by "good enough, practical formulas." It is the sort of book the up-to-date man likes to read and use. The mathematical demonstrations are placed in appendices, the pages of text being no more difficult to read than are those of any good text book.

THE SLIDE RULE: A PRACTICAL MANUAL. By Charles N. Pickworth. 17th Edition. 133 pp., illustrated, size 5 x 7. New York: Isaac Pitman & Sons.

THIS work has been a standard for so many years that a new edition may be looked for with the unfailing regularity of a calendar. Every type of slide rule in ordinary use is described with directions for use. Used in connection with the usual instruction books given by manufacturers of slide rules, it should enable one to become expert in the use of this indispensable tool.

STRUCTURAL DEFECTS INFLUENCING THE SPREAD OF FIRE. Suggestions for their Elimination and Protection. Boston, Mass.: National Fire Protection Association. Pamphlet; 6 x 9 ins., 18 pp., il.

THIS is a 1921 reprint of a 1916 report prepared by the Committee on Manufacturing Risks and Special Hazards of the National Fire Protection Association. It should be in the possession of every architect.

FACE BRICK BUNGALOWS AND SMALL HOUSE PLANS. Four portfolios issued by the American Face Brick Association. Pamphlets; 8½ x 11 ins. Pub. by the Association, Chicago, Ill.

THESE pamphlets containing from 14 to 20 pages each are interesting examples of trade literature. They deal with houses of from 3 to 8 rooms.

REVIEW of the CONSTRUCTION FIELD

With Reports of Special Correspondents in Regional Centers

Construction Needs a Free Loaning Market

EVIDENCE multiplies day by day that the key to a general revival of industry is the building industry. Construction, as recent government reports show, is one of the principal industries of the United States, twenty-seven per cent. of all expenditures in normal times being for building labor and materials. This important industry is tied up because of ultraconservatism in banking circles. The bankers say they are afraid of a sudden drop in labor and material costs such as occurred in farm products.

Let us examine the facts. The farmer is not able to control his production from month to month and in this one item is at a disadvantage compared with the manufacturer. After the seed is in the ground he gives his farm all the care he can and it is not until the harvesting is under way that he knows whether he wins or loses. His products being at the mercy of uncontrollable causes give gamblers an opportunity to play with him and he is always a victim of speculation and speculators. During the war his production was stimulated by a price guarantee and the sudden ending of the war robbed him of his international market and compelled him to compete with millions of European peasants who turned from fighting to farming. Bountiful crops all over the world with the market reduced from 500 million to 110 million people, the drop in prices of farm products gave new proof of the truth of the law of supply and demand. An important fact is that prices of farm products change quickly and the changes are considerable.

There can be no such sudden and large changes in construction work. The country is four years behind in a normal building program. Before war demands caused a sudden stoppage of private construction reports were constantly being received of a shortage in building mechanics and laborers. These men, the most intelligent of all workmen, found steadier employment in factories and shops, places where intelligence is at a premium. War work made the greatest drafts on his class of labor and nearly all who left the ranks of building artizans will return to such work reluctantly. There is too much lost time in the building trades and the good daily pay does not give a sufficient annual return. The shortage of labor felt in 1914 will be more seriously felt when construction activity is resumed. The men now engaged in construction work are apparently fairly busy all the time. It will take several years to train new workers and the present immigration laws will keep European trained workers out. A marked reduction in wages can hardly be expected for the next five or six years.

Stocks of building materials are low and the immediate resumption of building on a large scale will have as an immediate effect a stiffening, not a lowering, of prices. Prices will remain high until a large demand creates new sources of supply and the market becomes flooded. Natural lowering of prices will occur through competition after the present building shortage is made good and not until then.

BEFORE the war there was experienced a shortage of labor and materials in merely building to meet normal demands. Today we must work on a program twenty-five per cent. greater in order to keep up with normal demands and supply within five years the unfilled needs of the past four years. If we are caught up in five years this fixes the date when prices will be perhaps fifty per cent. lower than they are today. No one believes the country will be caught up in needed construction short of ten years, because it will always be difficult to obtain enough labor and enough materials to supply demands as a resumption of construction will start everything else.

There is something wrong and it can all apparently be laid at the doors of the bankers. These gentlemen claim to be timorous and fearful that money loaned on buildings may be loaned on security constantly depreciating in value, not alone because of ravages of time but because of falling prices of material and lowering wages. This argument would be impressive were it not for the fact that loans are made from time to time at usurious rates. If the loan is safe at a usurious rate it should be safe at a reasonable market rate. If there is extraordinary danger in making loans on new building construction then the bankers should make no loans of this sort.

The country needs about two million buildings today in addition to the normal demand. There are several million workers unemployed. Why not build houses and start the wheels of industry turning so there will be no unemployed to feed in charity this coming winter? The only need is the opening of a freer loaning market. The high cost of money is today a greater drawback to active building work than high wages and high cost of materials. The bankers understand all the conditions and know their loans will mature long before lowered costs will affect buildings started within the next two years. The need for buildings and the present high rents bring new would-be borrowers on the market every day who are willing to pay high interest but who balk at abnormal charges disguised under the name of commissions.

THE BUILDING SITUATION in CHICAGO and the MIDDLE WEST

(Special Correspondence to THE AMERICAN ARCHITECT*)*

CHICAGO is destined to stand supreme among the realty markets of the nation and to enjoy the resultant activity and sane leadership in building and architectural activities.

This is the inspiring message brought to Chicagoans by the fourteenth annual conference of the National Real Estate Boards which recently closed after a most successful meeting. In spite of the heat engulfing the country, making travel of all things most to be shunned, attendance at the convention was the largest in history and all previous records were shattered for similar gatherings of building clans.

The idea of Chicago's coming pre-eminence is not a new one to those within her gates. Realtors, architects and builders have long felt the confidence that this leadership was coming and this confidence which is now molding itself into reality has been recognized by a great national gathering of the trade itself.

Chicago's advancement to first place will, of course, be largely contingent upon her becoming the greatest city in the country. This, realtors declare, will not require more than a decade or so.

In the meantime, the Chicago realtor has to console himself with a steadily, rapidly and naturally developing market.

AFTER devoting a month of study to Chicago builders' pacts and wage agreements, Judge K. M. Landis, in conference, has ordered all existing agreements swept aside in one of the most drastic steps ever taken in the relationship between unions and contractors' organizations.

The Landis plan for a uniform working agreement between employers, union labor and builders has been accepted by all three of these groups, with a few minor exceptions. It is estimated that final settlement will release $5,000,000 worth of building.

William Schlake of the Associated Builders, Thomas C. Kearney, president of the Building Trades Council, and E. M. Craig, secretary of the Building Employers' Association, have all responded to the proposition submitted by Judge Landis.

Uniform agreements have been recommended as a substitute for the separate compacts which have in the past been negotiated with the Chicago Building Trades Council.

Suggested revisions which are expected to be approved within the next few days and which were submitted by Judge Landis include the following provisions: No union man should strike because a non-union man of another trade is employed on the job under penalty of not less than $25.

In case of scarcity of union labor, non-union men should be permitted to work until such time as union men may be secured.

Employers not affiliated with either employers' organizations making this agreement with the building trade, should enjoy the benefits of its provisions upon payment of a sum to be determined later.

Union men should be permitted to do jobs of any trade, providing such work does not require more than half an hour of any day.

Employers and contractors should be permitted to work on their own jobs if they wish.

"I ask you to study these principles and be prepared to fix the terms of your agreements to comply with them as much as possible, and when you cannot agree upon any specific item to submit your several disagreements to me, with explanations attached thereto," says Judge Landis.

Following are the principles as outlined:

Article 1. Monopolistic elements of associations or unions are intolerable unless:

1. The public is served more economically with them than without them.
2. Anyone qualified may join them without hindrance or discrimination.
3. They serve anyone on demand without discrimination.
4. Sufficient apprentices be taught to supply enough skilled managers and workers.
5. Working rules and conditions eliminate waste of time, effort and material; increase in quality and quantity of product; encourage improved methods, materials and appliances; produce increased skill and contentment of the workers; help to preserve peace in the community.

Article 2. Other things being equal, trades should have higher wages, or wages above the average—

1. If the work is more hazardous.
2. If greater skill is required.
3. If a longer term of apprenticeship is required to become proficient.
4. If the work is intermittent or unsteady due to weather or seasonable demand.

CHICAGO'S big show for home buyers opened on August 1 in the Leiter building. The Housing Chautauqua and the Home-Complete Exposition will be a big public school at which the man or woman planning to build a house or the contractor planning to build a whole row of houses can question the experts with the privilege of talking right back at them.

Just the minute that Judge Landis announces that he has brought the contractors and building trades unions to agreement, construction of every kind is expected to start with a rush. Plans should be made ready now, according to Frank E. Davidson, president of the Illinois Society of Architects, who was scheduled to deliver the opening address at the Housing Exposition.

Though the list of speakers is still growing for this conference, it now includes Henry K. Holsman, former president of the American Institute of Architects; Charles Herrick Hammond, chairman of the Institute committee on Small House Planning; Leslie Allen, housing director of the Portland Cement Association; Lionel Robertson, art director of the Tobey Furniture Company.

Completed bungalows and cottages, painted, furnished and surrounded by shrubbery, with price tickets attached, will be in the exhibit.

Architects, contractors, material dealers, union workers and home owners are co-operating in planning this first permanent own-your-own-home show.

Effort is to be made to permit the home seeker to see his house before buying and to order a new home as he orders a suit of clothes by knowing what it will cost and what it will look like.

CHICAGO'S home builders are plugging away despite the tieup of construction work in general and nearly 2,000 residence building permits have been issued thus far during 1921 despite the paralysis of building conditions in general due to the labor and employer war.

Though agreement is momentarily expected among the builders, which will start all construction work booming, at the same time it is announced that further indictment of labor leaders and material men whose names will create a surprise may be expected within a few days.

For the week ending July 21, 175 building permits were issued in Chicago for work which will cost $1,628,000. This shows a most healthy condition when compared with 61 permits for the same week in 1920.

Real estate transfers have fallen off to a very slight extent over the corresponding period of 1920, but some important transfers are reported. Apartment houses are changing hands at good prices in all sections of the city. The sum of $300,000 was paid by Albert Eastman for the Birchwood Beach apartments on Sheridan Road. The Grennan Cake Company has purchased a four-story factory building and five other structures on South Oakley Boulevard.

A million dollars has been paid by S. W. Straus & Co. for the ground under the LaSalle Theatre, loop real estate that in 1882 was sold for $12,500. On this site and the property adjoining at Clark and Madison streets a $6,000,000 bank, theatre and office building is to be erected. A 400 foot tower is under consideration, the same height as the tower of the new Wrigley building. The structure will be 21 stories high, which is the legal limit, and will be in the very heart of the loop.

BUILDING CONDITIONS on the PACIFIC COAST

(Special Correspondence to THE AMERICAN ARCHITECT*)*

SEATTLE.—There have been many changes in the construction outlook during the past fortnight. Lumber is at bottom, the steel market is suffering from too much price cutting to assist the demand and as a result the light inquiry for sheets, pipe and bars has fallen to the minimum. Many jobbing houses and retailers of construction materials have charged off generously in order to help in bringing back normal conditions at an early date, although it is not expected that conditions will show any material improvement to the end of the year. It is felt, however, that the worst has been lived down.

Cement manufacture on the Pacific coast is about 30 per cent. of capacity. Approximately $3,000,000 will be spent by Washington alone in hard surface road construction, and cement manufacturers seem to feel that it would be no object to them to quote lower prices in the building trade to get business which they cannot handle. These plants seem to have discounted any large building activity this season and are holding their market level on the highway basis alone.

There has been increasing activity in offers of Belgian steel for the building trade, but in view of the falling domestic market investors are indifferent. Belgian bars were offered on the coast at $1.75 f.o.b. shipside ready to discharge, but manufacturers' agents got no offers. It was pointed out that before contracts could be closed and delivery made on the coast the Pittsburgh prices would have fallen to this or a lower level.

Cement sales are about 30 per cent of normal, and this 30 per cent figures with rather startling frequency in a number of construction lines, more truly representing the market support and demand than any other.

Inquiries from coast jobbers to a number of the mills as to quotation on several carloads of sheets, pipe and nails brought the answer "Let conscience be your guide." Galvanized sheets have fallen to $4.25 and blacks to $3.25 f.o.b. Pittsburgh. Buyers point out that if the stock has gone so low it will go lower, and they are cheerfully idling. Brick is steady. Cement is now $3.85 per barrel at warehouse, but jobbers say the market should, to fit in with conditions, be $3.

About 50 per cent of the fir lumber mills of the North Pacific coast territory resumed operations following the annual Fourth of July close down. Mills announced on closing that they will not resume until the market had lifted somewhere over net costs of production, but wholesalers say this is "the annual joke" during a lean season. It was estimated that 70 per cent. of the capacity will have been running by August 1.

Production of 107 mills in operation for one week was 49,852,000 feet, or 35 per cent under normal. For delivery into the eastern construction trade placements were 1,165 carloads and loadings 1,275 cars, reducing the unshipped balance for that account to 2,942 cars. Shipments intercoastal to New York and Baltimore were 3,762,000 feet, with new orders totalling 2,712,900 feet for the same account.

Mill prices were $49 for vertical grain flooring, $18 to $25 for slash grain, finish at $52 to $53 and ceiling at $20. Drop siding averaged $21 and boards and shiplap $10.50, common dimension $10.50 and plank and small timbers $13.50 to $14.50.

There has been a good market for store spaces in the business sections of coast cities, but a tendency toward vacancies in the suburban sections. A canvass of 37 principal office buildings in Seattle shows that there are vacancies in these buildings of slightly over two per cent. The percentage of vacancies in all the office buildings will not exceed 3 per cent.

President Harding's Chair

IN view of the fact that the Cabinet chair presented to President Harding was designed, as it of course should have been, by an architect, we wrote Mr. Alfred C. Bossom, the architect who designed it, for a photograph and description of the chair.

Mr. Bossom entertainingly writes with reference to this historical piece of furniture as follows:

PRESIDENT HARDING'S CHAIR
Designed and executed under the supervision of Alfred C. Bossom, *Architect*

"When President Wilson left the White House certain of his friends bought and presented to him the chair he had so many times occupied at the head of the Cabinet table.

"It having become necessary to provide a chair for President Harding, his editor friends all over the country raised a fund to supply a new chair. This chair they asked me to design.

"The wood the chair is made of is a part of the schooner 'Revenge,' one of the first ships of the first American Navy, built on Lake Champlain to repel the advances of the British. This boat was built by the British, but was captured from them and taken to Whitehall by the Colonists and there refitted. It was one of the main vessels on the American side in the battle of Valcour, from which fight it retreated and returned to Ticonderoga in company with two smaller vessels, the 'Trumbull' and the 'Enterprise.' It was one of the ships of Benedict Arnold's fleet when he was defeated by Sir Guy Carlton in the battle of Valcour.

"The chair is symbolic of the collection and distribution of news. These points are symbolized by a hand grasping the electricity out of the air on the one side and a young woman blowing a trumpet, giving the news to the world on the other, under the protection of the American Eagle symbolizing the Government. The leather of the chair came off the hide of an Ohio steer. The chair was officially presented to President Harding on July 13th by a delegation of newspaper men."

The Architect and the School Building

AN architect, accomplished in the art of planning and designing school buildings, decided that the profession would appreciate a comprehensive book on the subject, written wholly from the architect's point of view.* He thereupon began the writing of such a treatise and the task was well under way when he awoke to the fact that his point of view was necessarily that of architects with considerable experience in school design. This was not the point of view of architects of lesser experience and he stopped his work to review personal experience, to place himself once more at the threshold of motive, the guide of good architecture.

He arrived at the conclusion that what differentiated his point of view from that of the junior members of the profession was his superior knowledge of school organization gained through experience. So the book was recast and 19 authorities aided him, for he wanted his treatise to approximate in form the manner in which his own experience

*School Architecture: Principles and Practices, by John J. Donovan, A. I. A., and others. 724 pp. 669 ill. 9x12 in. Cloth. New York. The Macmillan Company.

had been gained. The book has come to this office for review and the writer, who himself has designed a few school buildings, found it so fascinating that it was hard to lay it down. There are 28 chapters by 20 authors, each an authority on the subject treated. The work of the contributors has been used by the architect-author as a basis for the discussion of the architectural features of school planning and design. The illustrations of typical schools for each of the classes discussed are representative of the best work of more than 50 American architects who are recognized as leaders in school architecture.

The author is an architect; one collaborator is a landscape architect; a third is a mechanical engineer; a fourth is an electrical engineer; a fifth is an architect, chairman of the National Education Committee on Standardization of Schoolhouse Planning and Construction; fourteen superintendents, principals and teachers, each one noted as a contributor to journals and as authors of papers on particular phases of school organization and administration.

The work is encyclopedic in scope and well written. No portion of it is dry, for the contributors know how to write and they write well. It is destined to be for many years the standard authority on School Architecture in America and will no doubt have a generous reception abroad where school architecture lags.

Annual Elections by Architectural Organizations

Illinois Society of Architects Elects Officers

AT the recent annual meeting of the Illinois Society of Architects, the following were elected:

President, F. E. Davidson (re-elected); first vice-president, Herbert Hewitt; second vice-president, John A. Nyden; treasurer, John A. Armstrong; secretary, Ralph C. Harris, and financial secretary, H. L. Palmer.

Peoria Society of Architects Elects

THE following officers were elected at a recent annual meeting of the Peoria Society of Architects:

Frank N. Emerson, president; George H. Davis, vice-president; Clark W. Bullard, secretary-treasurer. The three officers with Dudley C. Chaffee and Robert J. Hotchkiss will constitute the Board of Directors.

North Dakota State Architects' Association Elects Officers

AT a recent meeting of the North Dakota State Architects' Association, the following officers were elected for the year:

President, G. R. Horton, Jamestown; vice-president, O. A. Braseth, Fargo; secretary-treasurer, R. R. Boyd, Devil's Lake.

The next meeting of the association was set for next December at Devil's Lake.

A. I. A., Illinois Chapter

AMERICAN Institute of Architects, Illinois Chapter, is the new name of the Illinois Chapter, American Institute of Architects, as changed around by a resolution adopted at a recent meeting.

Officers elected for the year are: Albert M. Saxe, president; Francis W. Puckey, first vice-president; Edwin H. Clark, second vice-president; John A. Armstrong, secretary. H. K. Holsman, retiring president, and Charles H. Hammond were elected to the executive committee.

New Jersey Society of Architects Elects Officers and Directors

AT the recent annual meeting of the New Jersey Society of Architects and the New Jersey Chapter of the American Institute of Architects, the following officers were elected: President, Harry T. Stephen; vice-presidents, Ernest F. Fougner and Clement W. Fairweather; treasurer, John F. Capen; secretary, Hugh Roberts. Fred W. Wentworth, W. P. O'Rourke and G. F. Drew were re-elected directors.

The retiring president, James O. Betelle, was elected director to fill the unexpired term of Mr. Fougner, and Stockton B. Colt will fill the unexpired term of Mr. Fairweather.

Dallas Architectural Club Elects Officers

AT the annual meeting of the Architectural Club of Dallas, Texas, recently held at the Arts Club, the following officers were elected for the year: Ralph Bryan, president; John Dehnert, first vice-president; Maurice Peterman, second vice-president; M. O. Carder, secretary; Walter C. Sharp, treasurer.

PARAPET DETAIL—CHURCH OF S. VITALE, RAVENNA, ITALY

THE AMERICAN ARCHITECT

VOL. CXX WEDNESDAY, AUGUST 17, 1921 NUMBER 2374

NEW FIFTH AVENUE SHOP FRONTS

A Further Record of the Consistent Growth and Artistic Development of New York's Most Important Thoroughfare

THE man born in New York more than fifty years ago regards his city with respect and venerates its traditions. He has been compelled to watch the transformation of localities which during his youthful days formed the most dignified parts of the city. As a young man, he grew familiar with the location of commercial activities. The financial district was always at and near to Wall Street. Down the winding way of Maiden Lane, the jewelers, both wholesale and retail, had their location. Along Front and Water Streets the shipping men had their small warehouses and offices. Here along the river front the lofty clipper ships, the squat coasters and the dingy craft that thronged the harbor, sent their bowstrips across Water Street, forming an arch of spars and loosened rigging. Just to the North, was the swamp where for almost a century the dealers in leather and hides jealously prevented the encroachments of any other class of merchandising. To the North and West, along Broadway, crossed by Leonard and Worth and Franklin Streets, were the dry goods men. Canal Street was the division line in the 50's. South was the commercial city, North the amusement and residential centers.

When the so-called Greek revival in architectural design dominated the better class of domestic architecture in New York, Washington Square became the very hub of aristocracy.

Stretching North from this group of stately houses that fringed "the Square," was Fifth Avenue. New York's "400" owned this street. From

G. A. & H. BOEHM, *ARCHITECTS*

where now stands the Washington Arch, to Twenty-third Street, the ultra rich, the socially prominent had their city homes. There, too, were the many clubs, where the solid business men of New York congregated and where membership was the "hallmark of good social standing." North from Twenty-third Street as the city grew, were built other stately houses, fine churches. When the city's growth had on Fifth Avenue reached to Forty-second Street, the "social climbers" who desired to make their homes in this aristocratic neighborhood were forced to get as near to "the Avenue" as they could, so "Murray Hill," or the Madison Avenue section, sprang into social prominence.

So, then, the New Yorker, as late as 1869 to 1871, could clamber atop of one of the "blue busses" at Washington Square and ride near to Fifty-ninth Street. He would see the houses of every one in New York that was "worth while." He would see the clubs and churches, each of the highest exclusiveness. There was no suggestion of "trade," no atmosphere of anything but the ultra aristocratic.

Fifth Avenue, as it exists today, is so widely different, so changed in aspect and character that it is a source of the most interesting study and provokes these perhaps tiresome reminiscenses from one who can remember this splendid thoroughfare for a period of more than half a century.

HARRY ALLAN JACOBS, *ARCHITECT*

FIFTH AVENUE, known as "the finest street in the world," has earned that title because it has received the most solicitous and watchful care on the part of those who owned it. The Fifth Avenue Association has for years jealously guarded this splendid street. Shopkeepers who have through misguided or incorrect ideas of artistic effect been misled, have been guided into proper paths.

The shop fronts that have from time to time been added, either as alterations to old structures or a prominent feature of new ones, have been influenced, to a great extent, by this valuable society.

The attempts of manufacturing industries to locate on intersecting streets near the Avenue have, after a most strenuous campaign, been induced to seek other locations. In short, the growth and development of Fifth Avenue has been so closely guarded and so intelligently supervised as to afford an example to other cities as to what could be accomplished in civic development when a correct spirit of co-operation had been thoroughly developed.

In a recent issue there was described a new and important building that occupies almost the focal center of Fifth Avenue. The formation of a new investment center in New York was encouraged and made possible because Fifth Avenue had become a street where retail merchandising had reached its most perfect state of development.

The class of shoppers that daily throng Fifth Avenue is, by reason of the high class of the shops, an investing lot of people. To be able to draw needed funds for a day's shopping almost next door to the shop where the day's purchases would commence, was a much appreciated convenience.

Further, the high class of banks and investment companies' buildings that now ornament the avenue, made it certain that the future progress of Fifth Avenue would not be retarded.

To the radical old New Yorker it savors of incongruity to find stores located in the very houses where, as a boy, he was wont to spend many social hours. But the compensation for this change is to be found in the fact that the new occupancy is so dignified and the artistic proprieties correctly carried out.

The illustrations of Fifth Avenue shop fronts accompanying this article are of most recent completion. They have been selected for that reason and

KENNETH M. MURCHISON, *ARCHITECT*

SEVERANCE & VAN ALEN, *ARCHITECTS*

not as isolated examples of the finer shops. The whole extent of Fifth Avenue from Thirty-fourth Street North to Fifty-ninth Street is in keeping and present plans for future developments insure that the Fifth Avenue of twenty years hence will yet be "the finest street in the world."

In conclusion, it may be well to refer to the effect of zoning restrictions on Fifth Avenue. Undoubtedly without these wise enactments even the influential

ROUSE & GOLDSTONE, *ARCHITECTS*

work of the Fifth Avenue Association would not have prevented sordid interests from ruining the aspect and general character of the Avenue in the same way as has been done on other important streets in New York.

The success of a thoroughfare that is the pride of every New Yorker and the admiration of every visitor to this city is mainly due to wise zoning restriction and the valuable work of the Fifth Avenue Association.

NOTES OF A ROTCH SCHOLAR

Conditions in Rome and Expenses of Traveling

By Robert M. Blackall

WITH the building business in America so flat that a great many men are not finding themselves fully occupied, there has no doubt occurred to some that perhaps during this idle period, time can be more profitably spent traveling in Europe until business picks up again. But to many of these has probably also come the thought as to how much such a trip would cost and whether conditions in Italy are such as to be beneficial for study. For this reason, I have jotted down the facts as they exist. All figures that I give have been seen or paid for by myself, and all statements are first-hand. The conditions stated are for Rome only.

General Conditions

Except for the strikes, conditions are exceedingly favorable for study and travel. There are no disturbances of any sort that bother a student. All the museums and galleries are open and permission to work is fairly easy to obtain, if one has proper credentials. Most of the galleries have rearranged their collections and hours of opening so that a Baedeker is of little aid and all galleries and museums have doubled the price of admission, it being now on the average of two lira a person for admittance. Trains run as irregularly as they always did, the fares being from three and one-half to five times what is stated in Baedeker's 1909 Central Italy. Trains are always crowded and the first one into a seat gets it. The fares are being changed faster than the tickets are issued, so that the price on the ticket, whether it be omnibus, train, street car or boat, is never right, and the only check one has is to watch what his neighbor pays. The conductors of trains are fairly honest and usually there is in the stations the latest price list of the tickets so that by a little observation, a check in the price can be kept. One should always allow plenty of time, two hours at least, to make a connection, as the average train is always late.

Living Conditions

Throughout Rome and, I understand, throughout Italy, all hotels, inns, pensions and restaurants have been listed into (1) de luxe, (2) 1st category, (3) 2nd category, (4) all others. Prices for rooms are regulated and posted at the present time in the rooms so that no extra or varying price can be charged. The law requires that each hotel or restaurant shall post the bill of fare in a conspicuous place, so that if one watches, he can check the meal price. The law also fixes the percentage of service, it being 15 to 20% in de luxe, 10 to 15% in 1st category, 7 to 10% in 2nd and 6% in 3rd. To the law enforced last March 1st, is added a governmental tax of 10% for de luxe class, 6% for 1st category, 4% for 2nd category and 2% for 3rd category, the tax being figured on the price of room and food only. This all seems as though there would be no trouble, no argument about the bill, no tips, etc. Well, don't believe it. Tipping has been greatly reduced, and one way to tell a foreigner is by the fact that he tips. The Italian with all the increased costs and service included in the bill, *never* tips. I have watched this carefully and the foreigner always is pounced on. If he refuses to tip, but graciously thanks the man, there will be more respect shown. But suppose we go into a hotel or restaurant. If a room is desired, always demand the price and then ask for a room at less cost and get the price settled. Never leave it until later. The proprietor may lawfully charge you correctly, but he gives you his best room. Proceed to the dining room. Generally there will be no list in sight and the waiter asks you what you will have. If one does not demand the list which by law is required, he will be charged double, as the waiter takes it for granted that you do not know there is a list. *Always ask for the list first.* If these things are done very little trouble will be experienced and costs will be materially reduced.

The cost of living (pension rates) per person per day are 60 lira and up for de luxe, 35 to 50 lira for 1st category, 25 to 40 lira for 2nd category, 30 and less for 3rd class.

While traveling three weeks, my costs for railway fares, 3rd class, and hotel bills only, not including anything else, averaged 48 lira a day.

Clothing

To the expense of room and food must be added the cost of clothing. Like all other costs in Rome, they are increasing all the time. The luxury tax of 10 per cent which went into effect last March 1st has brought everything up and the present tendency is upward. I have listed below the prices of some clothes taken from an average store. More can be paid, and a lower price can easily be found, but for a transient passing through Rome, I think the prices given are average.

Raincoat	500 lira
Overcoat	550 "
Shoes	90 to 190 "
Negligee Shirts	45 "
Golf Cap	42 "
Underclothing, Woolen Shirt	90 "
" Cotton Shirt	75 "

Stockings, Cotton	10 lira
" Wool	20 "
" English long	28 "
Suit of clothes	590 to 875 "
Suit of clothes made to order	1000 lira and up

At practically all the stores, fixed prices are held to and it is the rare exception in the large towns to be able to beat down the prices.

Artists' Materials

Artists' materials are exceedingly high. A sheet of Waterman's double elephant costs 29.50 lira while the same size in Italian paper "Fabriano", which is not as good but the best Italy has, costs 6 lira. Winsor-Newton whole pans cost 30 lira, while a whole tube of Italian colors costs from 2 to 6 lira. The Italian goods are inferior to English, but a great deal less expensive. The rate of exchange has thrown all foreign goods out of sight. Alinari prints which before the war were 50 centesimo are now 2.75. Pencils run from 1.20 to 3.00 lira. Other materials are in proportion. Also, the Italian Government forbids the sale of any scales or measuring rods of anything but metric system. Therefore, bring your own scales, unless you intend to measure in meters.

I have heard it stated that one should allow $150 a month for traveling in England, $100 to $125 a month for France, and $80 to $100 for Italy. These are exceedingly variable figures as no two men travel alike, buy alike or include in their estimate either the whole amounts or the same things. General estimates are not very dependable. I have tried to give actual costs in lira, not dollars, and then each man can figure as he wishes. Personally, I believe it is a splendid time for a man to travel in Italy, France or England, and that conditions will get better, rather than worse. I do not believe there will be any revolution in Italy, and conditions this year are better than last year. With building slacking up in America, the young man cannot do better than to go abroad at the present time.

(NOTE.—The Italian lira, normal value 19.3 cts., was quoted at 5.53 cts. May 19, 1921, and 4.95 cts. on May 19, 1920, in New York.—Editors.)

A Review of American Architecture as Shown in the Recent Exhibition of The Societe des Artistes Francais

AN exhibit of photographs of a great number of notable buildings in the United States, public and private, constitutes an unusual feature of the annual exhibition of the Societe des Artistes Francais, popularly known as the Old Salon. Photographs of more than 300 exhibits from the leading American architects occupy a special section in the exhibition, a thing never before done in France.

The American collection was organized by a committee appointed by the American Institute of Architects.

M. Leandre Vaillat devotes a column and a half in the Paris *Temps* to a review of this exhibition. A correspondent to the Boston *Evening Transcript*, summarizes M. Vaillat's criticism as follows: On the whole his verdict is very favorable. He has evidently made a close and careful study of the exhibit. He speaks first of Major Lenfant's plan of the City of Washington, made in 1792, and then goes on to tell his readers about the so-called Colonial style as illustrated in the domestic architecture of the Atlantic States.

"One sees in the Grand Palais," he says, "few of those edifices which give to the Americans the illusion that they have a past, a past of their own, such as would call for the existence of archæological societies like our Vieux Paris. In the cities lined up along the Atlantic Coast from Canada down to Georgia, that is to say the cities which were first founded by the English colonists, one still finds many specimens of the English style called Colonial, which is nothing but a derivation from the Georgian or Adam style. It is characterized by 'apparent' bricks of a fine red tone contrasting with the decorative elements in woodwork painted white and with the verdure skilfully massed near the building. The woodwork is finely studied, with a profusion of slim columns. A colonnade of columns often precedes the principal body of the building with an effect of hospitable nobility."

"In the West and South," continues M. Vaillat, "in Florida and Texas, which came under the Spanish influence, one notes a different architecture, created by the Catholic missions coming from the Spanish colonies and for that reason called 'the mission style.'

"In the middle of the nineteenth century, Richardson, impressed by Roman art, applied its principles to churches, city halls, schoolhouses, and villas, and he found here and there a logical expression, not without a certain rudeness. Finally, in 1893, Burnham, in composing the ensemble of the Chicago Exposition, directed the attention of the young architects towards ancient Rome. Since that time the Americans have made sojourns in England to study domestic architecture, and in Italy through dilletantism; but they have learned their trade at the Ecole des Beaux Arts, and it is interesting to observe how much this school, so much decried at home, is appreciated abroad. The American architecture of today, that which we see in the Grand Palais, reflects diverse tendencies. But one cannot fail to note, in the work of the Americans, a knowledge of the old styles in their initial purity, and not in their successive deformities, a courageous affirmation of their purity and simplicity, and a superior taste, which makes acceptable certain sacrifices—a way of employing great blank surfaces in order to emphasize a charming and exceptional motive, and an ingenuous sensibility that leads them to treat the monuments of the past with new eyes, as it were, with an art brought back to its primitive simplicity and yet having a modern aspect."

The French writer goes on to speak of the buildings of the Massachusetts Institute of Technology in Cambridge, by Welles Bosworth: "a return to the impressive severity of the Doric; one forgets that upon the Doric have been piled up innumerable complications." So also, the works of the French architect, Paul Cret, now professor of archæology at the University of Pennsylvania: "Compare the Bureau of the American Republics which he built in Washington at the outset of his career there, and his library in Indianapolis more recent; in the first instance . . . he reflects the teachings of the Ecole des Beaux Arts, of which he is a graduate; in the second instance his style clarifies itself under the influence of what he sees about him."

Domestic architecture is exemplified in the American exhibit by examples of country houses, apartment houses, garden cities, workmen's houses, farm houses, hotels, clubs, etc. M. Vaillat speaks with enthusiasm of the villas in the Italian style designed by Charles Platt; of McGoodwin's English cottages; of Walker's and Gilette's Tudor or Sienese houses; of Hunt's 'mission style' houses in California, and of the works of Carrère & Hastings. He describes the Hotel Ponce de Leon in St. Augustine, 1887, in which one sees combined harmoniously the Spanish style and the American execution. He also devotes a considerable paragraph to the Colony Clubhouse on Long Island, by Delano & Aldrich, explaining in detail the scheme of the summer colony, which has no equivalent in France.

"Thus we have in this rapid review something like a faithful mirroring of the image of what the American loves. He readily retires in the evening to the country, which makes such a contrast to the immense building in which he pursues his business during the daytime. There he puts all his soul, heart and poetry. . . . It is a vigorous and necessary contrast to the intensive activity of his day; an expression of that leisure that is disappearing from our civilization. . . . Add a shade of meditation; the American envisages his dwelling as a church; there is in it a sort of mysticism that illumines also his conception of edifices serving the various needs of social life."

Even the much-maligned skyscraper comes in for a word of approval. Of the buildings and grounds of the San Diego Exposition our writer says: "There is a utilization of the terrain, an effect obtained from the hilly surroundings, a picturesque approach to the palaces by a great viaduct thrown across a ravine, which presents a striking and almost theatrical effect."

Summing up his impression, M. Vaillat concludes his review thus: "Veritable intelligence of the ancient styles, adaptation to contemporary life, minute, broad and frank study of the most varied programmes—this is the lesson which is offered by this exhibit. One should congratulate those who have brought it before us, and who have proved by their works the continuity in the United States of the French influence inaugurated by Major Lenfant, that old companion of Washington."

In Memory of J. Alder Weir

THE Century Club of New York, states the Boston *Evening Transcript* in its Art Notes, has published a handsome book on the life and works of the late Julian Alden Weir, containing many illustrations, an exhaustive list of his works, and several essays by his colleagues. Weir was one of the most popular of men among his fellow-artists, and, possibly, through the love and admiration for the man, his friends have been inclined to give to the artist an exaggerated importance. The first of the essays is "Julian Alden Weir" by Duncan Phillips, and this is followed by a discussion of "Weir, the Painter," by Emil Carlsen, "Weir" by Royal Cortissoz, "Reminiscences of Weir" by Childe Hassam, "The Tile Club" by J. B. Millet, "Weir, the Fisherman," by H. de Raasloff, and briefer notes in the form of letters from Augustus Vincent Tack and C. E. S. Wood.

Mr. Hassam's intimate reminiscences of Weir bring to notice many interesting traits and incidents. One of his anecdotes seems to amount to a claim that Weir was the first man to suggest the commissioning of Puvis de Chavannes to paint the mural decorations for the Boston Public Library. It appears that Weir, being in Durand-Ruel's Paris gallery, one day, met Stanford White there. "McKim's doing a library for Boston," said White. "Who's the man to make a big mural painting?" "Why, Puvis, of course," exclaimed Weir. They went from there to the Place Pigalle, found Puvis de Chavannes, "and we know the rest. He painted for Boston one of the most beautiful decorations in the world."

A DIFFERENCE of OPINION

H. Van Buren Magonigle Sharply Resents the Publication of His Competition Drawings and Raises Points That Should Be Seriously Debated.

The following correspondence, together with the editorial reference on page 117 are sufficiently explanatory. No further comment will be necessary.

June 24, 1921.

To the Editor,
THE AMERICAN ARCHITECT,
Dear Sir:

In reply to your letter of June 21st, the only model maker whose name comes to mind just now is Mr. Edwin T. Howes, and whose address is undoubtedly in the telephone book.

I take this occasion to speak to you about a matter which has been on my mind for some time. Last year at the close of the competition for the State Capitol of Nebraska, without asking for my consent you photographed and published some very wretched reproductions of my drawings. It is not with the quality of the reproductions that I am dealing at this moment. It is with a gross breach of the primary professional courtesies, to say nothing of the legal aspect of the situation.

I wish to warn you that if you publish anything of mine again without my personal permission (and I refer in particular just now to the competition for the Liberty Memorial in Kansas City) I shall take steps to determine once for all whether architectural periodicals, which batten upon our profession, may publish a man's work without his permission.

Very truly yours,
HVBM:FC (Signed) H. Van Buren Magonigle.

* * *

June 27, 1921.

My dear Mr. Magonigle:

It is amazing to me that a man who has reached the heights in his profession that you have, should display such crass ignorance of not only the ethics of his profession, but also social ethics as in your letter of June 24th.

The series of photographs used by us in illustrating the Nebraska State Competition, was purchased from the official photographer of the commission, who, we were assured, acted with complete authority. We were solicited by telegram to purchase the entire set. This we were glad to do. No other competitor raised objections. Is it not possible that the objection you so stoutly take is not warranted by any actual invasion of your rights and that under the terms of the program the Commission was authorized to give such publicity to the designs, when their property, as they might elect to do?

Your warning as to what you will do to architectural journals "who 'batten' upon our profession" in case they publish any of your work without authority is further proof that in your evident irritation over a matter that two gentlemen could very easily have amicably adjusted, you lose a sense of proportion and assume an attitude, which on taking advice of counsel, we believe you will find untenable.

Please be advised that covert threats will not deter us from further conducting our business as publishers of an architectural journal along lines which wide experience has shown us are not only strictly legal, but also absolutely ethical.

I am amazed, Mr. Magonigle, that you should have so long held a grudge, as it might easily have been adjusted to your complete satisfaction had you but told us of your state of mind. In fact, it's not too late some day to meet me and let us thresh this out. I shall as stoutly stand up for your rights, as I have always fought for every right of our profession, as I will endeavor manfully to maintain my own. Play the game with me, Mr. Magonigle, man-fashion. Neither you nor I have any differences that may not be easily and satisfactorily adjusted.

Might I say in conclusion that as your letter is addressed "to the Editor" it would be both legal and ethical to publish this.

Yours very truly,
(Signed) W. H. Crocker,
Editor.

* * *

July 5, 1921

Mr. H. Van Buren Magonigle,
Dear Sir:

Supplementing our recent correspondence, I have now the pleasure to congratulate you on having won the memorial competition at Kansas City, and I am bluntly asking you if you will let me have your permission to illustrate this in an early issue of THE AMERICAN ARCHITECT.

I have no disposition in this instance, as I was entirely innocent of any disposition in the Nebraska competition, to do anythng that would provoke your displeasure or be contrary to your wishes.

I feel that there is so slight a difference between us in these matters that it might be easily adjusted if we could come together for that purpose. As you have not replied to my last letter, I infer that you have not yet decided that you are willing to do this.

THE AMERICAN ARCHITECT has always endeavored to be one of the most helpful and constructive papers in its field. While it has, perhaps at times made mistakes, they have none of them been so vital as to cause it to lose your respect and confidence, or to harbor any ill feeling toward its editor.

Will you not let me know if I may secure a set of photographs as I am in this instance, as in the one to which you take exception, offered a set of photographs if I can accompany my order with your written permission. Will you let me have this permission, Mr. Magonigle, and will you let me have an answer "Yes" or "No" as soon as possible, please, that I may either vigorously proceed to prepare this material or, with regret, forget the transaction?

Yours very truly,
(Signed) W. H. Crocker,
Editor.

July 7, 1921.

Editor of THE AMERICAN ARCHITECT,

Sir:

I prefer, so far as I am concerned, to keep this correspondence impersonal.

Replying to your letter of June 27th, I ignore your polite references to my ignorance of professional ethics and social usage. No person whatever had any authority to give or sell you or anyone else any photographs of my Nebraska Capitol design. Several of the other architectural periodicals with the courtesy they always display, asked me to permit its publication and to all of them I replied that all of the competitors had agreed to withhold publication of their designs in the architectural press, pending their publication in a monograph by the Press of the American Institute of Architects.

The eagerness of THE AMERICAN ARCHITECT to score a beat had three immediate issues: 1. It caused the abandonment of the monograph; 2. It led you into a grave breach of not merely common politeness but professional courtesy; and 3. It caused me, for one, the trouble of writing to and calling up the publications I had declined to give the matter to and explain to them that the publication in THE AMERICAN ARCHITECT was unauthorized and not because of bad faith on my part.

In the second paragraph of your letter you fall into another fundamental error. The designs were not the property of the Commission. They were and are the property of the architects. You are apparently unaware that designs and drawings as instruments of service are the property of the architect. That is fundamental architecutral law.

Let me say that I never indulge in "covert threats." Upon occasion I present an unpleasant fact wrapped up, but I never covertly threaten. I am always ready to break a lance for the benefit of my profession and, to avoid any misunderstanding and any imputation of threatening covertly, I repeat—that if you publish any work of mine whatsoever again without my written permission, I shall sue you in the courts to establish the rights of my profession.

As to my use of the expression "batten upon our profession," since you quote it in your reply, it gives me the opportunity to say that I weighed and measured that word and decided that it exactly fits the case. The architectural press could not exist were it not that the most valuable part of what it publishes, the illustrations, is given to them free of charge by the profession, and most of the publications use this material as a lever to secure the advertising which constitutes the major part of their income. Therefore, I repeat, it battens or feeds upon our profession. And in cases like the one of which I complain you abuse the courtesies shown by the profession, by the kind of trick you played. I wrote my first letter on the afternoon of a day when a young man came in here for THE AMERICAN ARCHITECT and began to talk to me about co-operation between the profession and your paper. I told him to go straight back to his office, and tell it that until the editorial office showed some sense of common politeness as a basis for co-operation there was no use of his talking co-operation to me.

Now, as to my holding a "grudge" so long. Permit me to say that I held no grudge. I simply remembered, against the next time—and I should have written you in warning that day whether your young man had come in or not, because I intended the warning should be fresh in your mind and that you would have no excuse to forget.

In answer to your request under date of July 5th for my permission to publish my Kansas City Memorial design, you will hardly be surprised when I decline to accord you the permission. It may be of interest to you to know that there is only one authorized set of negatives in existence and that I have copyrighted every individual drawing.

And finally, I quote the concluding paragraph of your favor of June 27th: "Might I say in conclusion that as your letter is addressed 'to the Editor' it would be both legal and ethical to publish it. I infer you do not desire this." On the contrary, I do desire it, with the proviso that you publish the entire correspondence in full. In fact, I challenge you to do so.

Yours very truly,

(Signed) H. Van Buren Magonigle.

* * *

July 16, 1921.

Mr. H. Van Buren Magonigle,

My dear Sir:

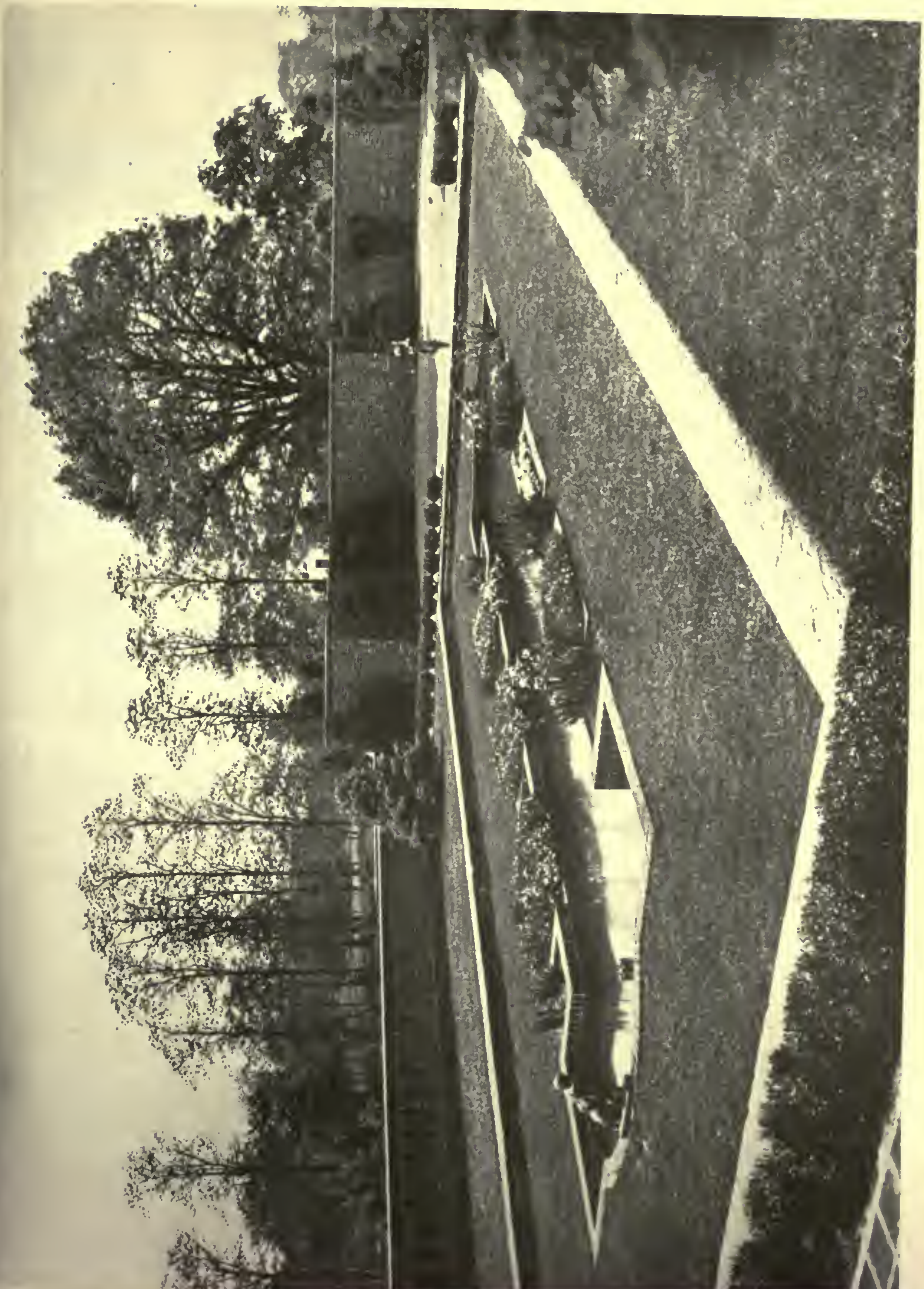
In your letter to me of July 7th, replying to mine of July 5th in which I asked your permission to publish your prize winning designs in the Kansas City memorial, you state, in declining this permission, "that there is only one authorized set of negatives in existence, and that I have copyrighted every individual drawing."

May I be permitted to inquire whether or not you erred in this statement, as I note in a recent copy of the Kansas City "Star" a full page perspective of your design and an extended description of it. These designs do not carry any copyright line and I am, therefore, unable to determine whether this has been through accident, omitted by the Kansas City "Star," or, if possibly there is another set of negatives of which you have no knowledge.

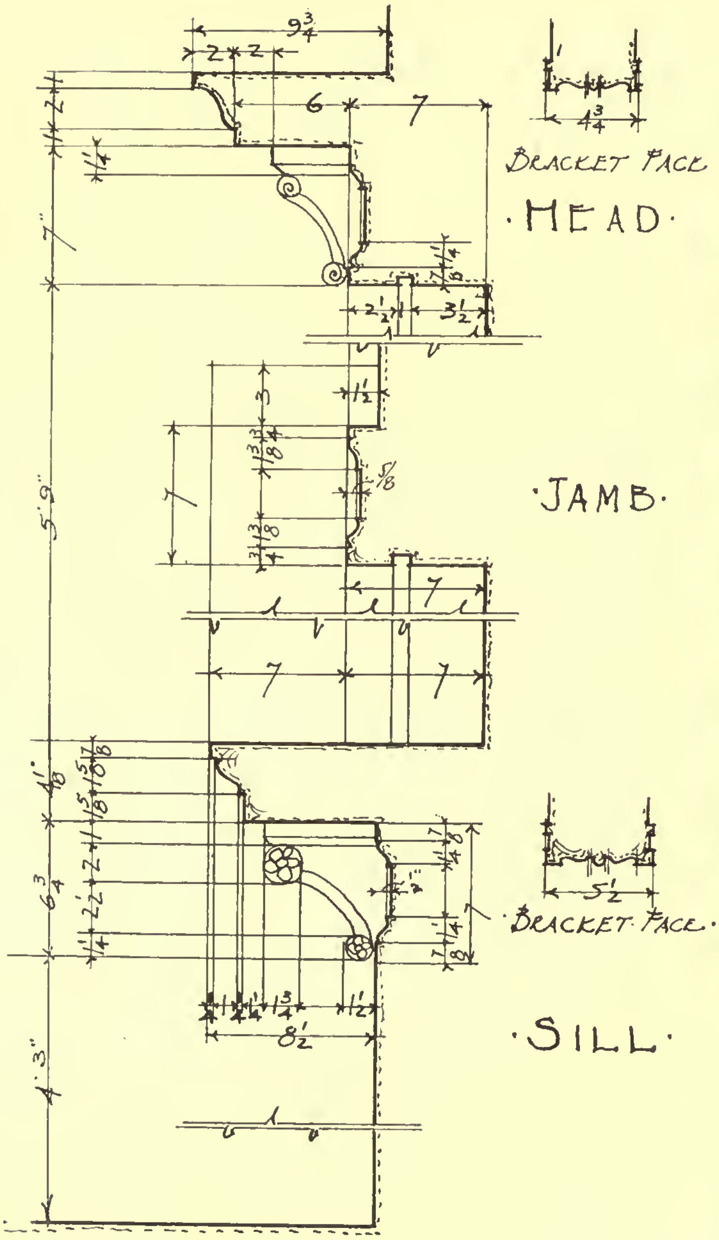
May I ask you to tell me the facts in the case and greatly oblige

(Signed) W. H. Crocker,
Editor.

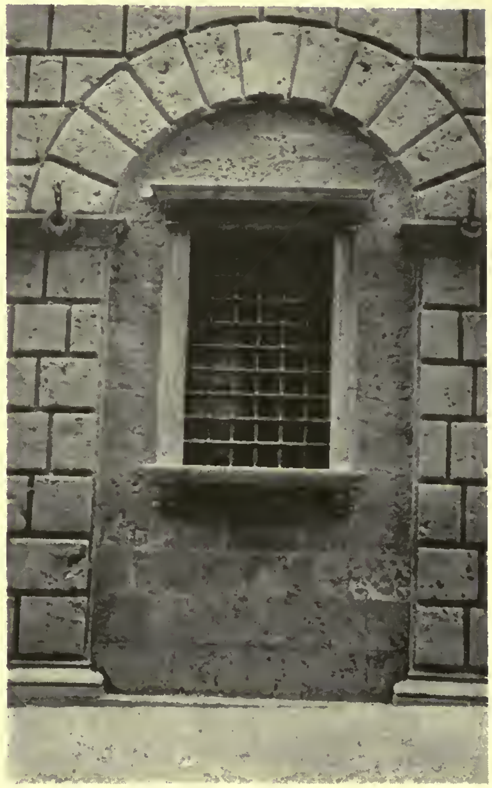
No answer has been received to this letter.



VIEW OF GARDEN
ESTATE OF AMOS D. CARVER, ESQ., LOCUST VALLEY, L. I., N. Y.
TOOKER & MARSH, *ARCHITECTS*
(FOR OTHER ILLUSTRATIONS SEE PLATE SECTION)

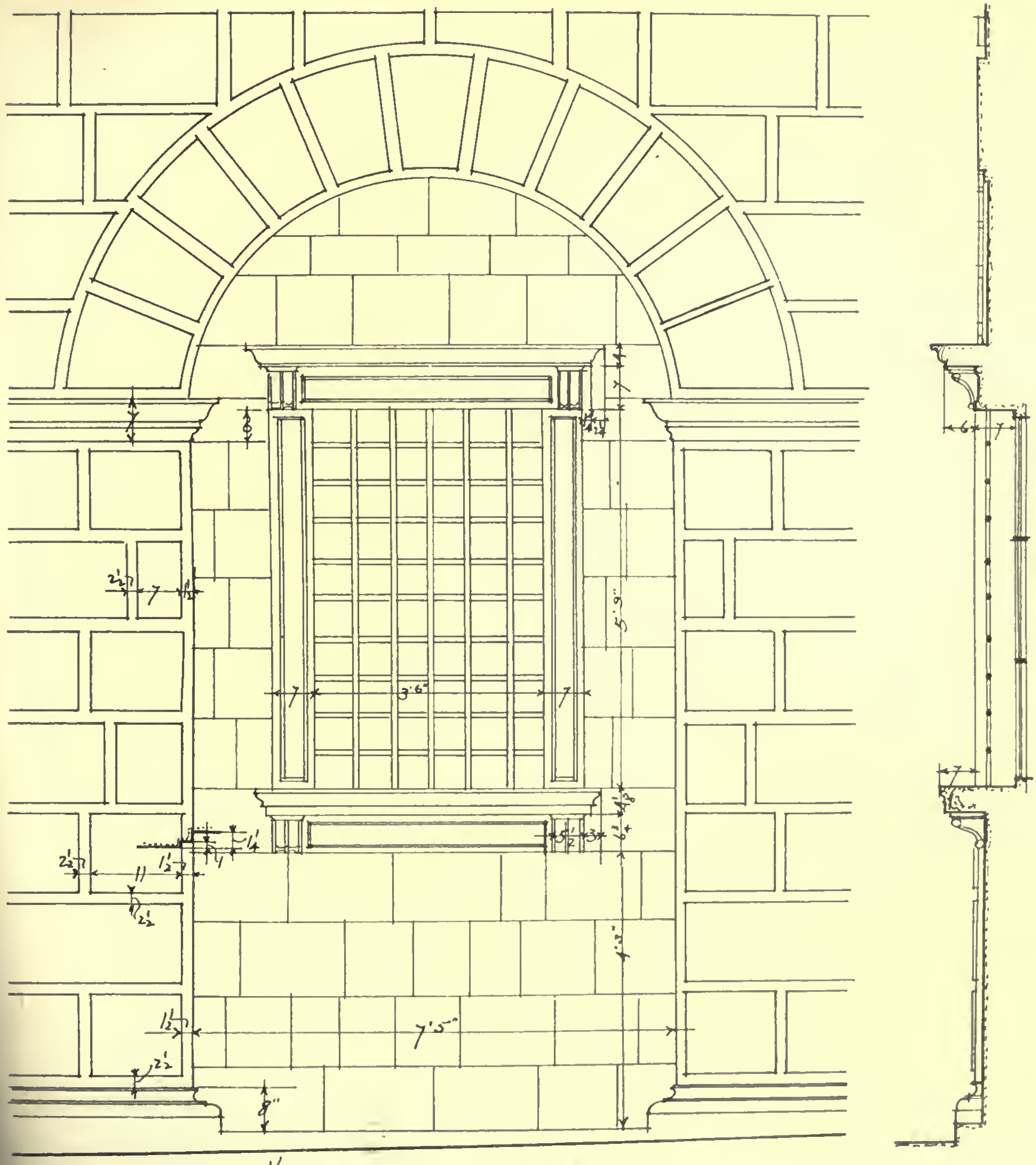


1½" · SECTION ·



THE PICCOLOMINI PALACE, NOW CALLED THE PALAZZO DEL GOVERNO, WAS BUILT IN 1469 IN THE STYLE OF THE RICCARDI PALACE IN FLORENCE. THE ACCOMPANYING WINDOW WAS PLACED IN THE DOOR OPENING LATER, ALTHOUGH ITS DETAIL WAS KEPT IN HARMONY WITH THE DETAIL OF THE PALACE, AND THE STONE USED IS THE SAME AS IS USED ELSEWHERE IN THE BUILDING.

WINDOW IN THE PALAZZO PICCOLOMINI, SIENA
MEASURED AND DRAWN BY ROBERT. M. BLACKALL, 35th HOLDER OF ROTCH TRAVELING SCHOLARSHIP



½ ELEVATION & SECTION

WINDOW IN THE PALAZZO PICCOLOMINI, SIENA

MEASURED AND DRAWN BY ROBERT. M. BLACKALL, 35th HOLDER OF ROTCH TRAVELING SCHOLARSHIP

Old Stock Exchange, Philadelphia, Pa.

(See reproduction of original drawing by O. R. Eggers on opposite page)

THIS fine old building, designed by William Strickland, has seen many vicissitudes. It was built in 1831 *and represents in a most dignified way that period of our architectural development known as the "Greek revival."*

In THE AMERICAN ARCHITECT, *issue of September* 1, 1920, *a drawing by Mr. Eggers of a house at* 7 *State Street, New York, was presented. In the accompanying monograph it was stated that the architect of that building was unknown. Comparison with the present illustration would suggest that it might be safe to hazard an attribution to Strickland. Strickland was born in* 1787 *and died in* 1854. *The house on State Street in New York was built in* 1830, *a year earlier than the present subject, or when Strickland was about* 43 *years old.*

*The correct title of the subject presented on the following page is as stated in the heading above. The error in title was discovered too late for correction on the accompanying drawing.

116[a]

116[a]

OLD COURT HOUSE, PHILADELPHIA, PA.
E AMERICAN ARCHITECT Series of Early American Architecture

EDITORIAL

An Exchange of Courtesies

THERE is published in this issue certain correspondence which has passed between The American Architect and H. Van Buren Magonigle. The publication of this correspondence is made in no spirit of antagonism or controversy. Inasmuch as there seems to be an inference in the last paragraph of Mr. Magonigle's letter of July 7th, that we might be unwilling to publish the correspondence, and in justice to him, also, in view of his request that this be done, the publication is made.

In explaining the correspondence to our readers, there are a few facts which should be stated. The photographs of the plans, as the correspondence indicates, were purchased by us in entire good faith from the Nebraska photographer who had taken them. The photographer in question made the photographs, we are advised, with the definite permission of the Capitol Commission of the State of Nebraska, which had charge of the competition, and at that time was requested and authorized to distribute them as he saw fit. On July 15th, the Commission requested the photographer not to distribute any further photographs. The purchase of the photographs by The American Architect was made prior to this date, and the photographs were billed out of the office of Mr. MacDonald, the photographer, July 7th, 1920. The Commission recognizes the fact that Mr. MacDonald, prior to the new instructions of July 15th, was at liberty to deliver the pictures to any purchasers, as he saw fit.

The Sunday State Journal of Lincoln, Nebraska, in its issue of July 4th, and prior, of course to the publication in The American Architect, published the elevation designs of the nine contestants and the winning design of Mr. Goodhue and a report of the various points of merit in the respective designs which had been considered by the committee, the reasons for its final choice and the like. The profession will recognize the custom, in competitions of this character, whereby the competition plans are regularly published in the press of the locality where they are submitted. It is entirely natural that a commission charged with the preparation of plans for a public building should desire to have the plans submitted made public, and it is certainly in accordance with sound public policy that this be done. We fail to see how the publication of a noteworthy set of plans, with proper credit given to the architect who prepared them, can be in any way a detriment to him, or other than an advantage, in making known to the public the merit of his work. Certainly, The American Architect had no thought, in publishing the present plans, of infringing in the slightest any rights which Mr. Magonigle might have therein or taking any action which he would not approve.

We feel that the question at issue between us is one which should be susceptible of a perfectly friendly discussion, and we appreciate his consent to the publication of the correspondence. Whether the architectural press should be called upon, in the case of public competitions of this character, to secure the consent of the architect before the publication of plans submitted by him, is a question which, so far as we know, has never been raised before, and we should be glad to open our columns to any discussion by our readers or members of the profession on the point involved. We shall, of course, be glad to extend to Mr. Magonigle the courtesy of our columns in making any further statements of his point of view which he may care to make.

We naturally resent Mr. Magonigle's attack on the architectural press and the charges of unfairness by the architectural press which he makes. We hope that he will himself recognize the unfairness of the comments which he has made, not only to The American Architect, but to the architectural press as a whole.

The correspondence refers also to the Memorial Competition at Kansas City. We had no desire to publish Mr. Magonigle's plans submitted in this competition, without his consent, copyrighted or uncopyrighted and entirely irrespective of what our legal rights as a publisher of architectural news might be.

Building Code Requirements

THE up-to-date structural engineer experiences very often a feeling of irritation on reading design requirements in city building codes. Take for example floor loads which vary from 40 lbs. per sq. ft. to 100 lb. per sq. ft. for office buildings in the United States. Kidder many years ago conducted an investigation of actual loads and concluded that nearly all codes were unnecessarily severe. The majority of designers if not hampered by code requirements consider 50 lb. per sq. ft. ample. Floor loads for dwellings vary from 25 lb. per sq. ft. to 60 lb. per sq. ft., but no conditions observed in thousands of occupied rooms seem to warrant a floor load of more than 25 to 30 lb. per sq. ft. for upper floors or 35 to 40 lb. per sq. ft. for ground floors.

An examination of floor load requirements for all classes of buildings shows similar wide variations from loads manifestly too light in about 2 per cent. of the cases to loads about right in, say 10 per cent.; too heavy in 20 per cent.; much too heavy in 40 per cent. and absurdly heavy in about 28 per cent.

In some cities 8 in. brick walls are permitted in certain classes of buildings, while in other cities only 12 in. walls are allowed. A building was erected in one city where the walls had to be 12 in. thick and the same plans were used in another city where walls could be thinner. The steel work was redesigned for the second building and the saving in steel amounted to 260 tons. Floor loads and wind requirements were the same in both places.

The requirements for wind stresses are as variable as any other item. The fiber stresses for all materials and various little items of a somewhat faddish nature all play a part. One is led to believe that special local interests, blind copying of older codes, ignorance and credulity, and at times lack of credulity, all play too large parts in the framing of building ordinances. A building code does not represent the best practice but represents compromises governing "good-enough" practice.

Standardization, co-ordination, and conservation are three principles guiding the work of the National Federation of Construction Industries. The Technical Committee of the Federation has at present under way a study of all the building codes in American cities. A tabulation is to be made of allowable stresses in all building materials as prescribed in the codes as well as in specifications used by accepted authorities when not limited by codes. The waste of materials in many places working under obsolete codes will be shown by comparison with modern specifications. It is hoped by this means ultimately to have but one set of fiber stresses throughout the country. Those who argue that it cannot be done have only to remember that not ten per cent. of incorporated towns and cities have building ordinances and standard specifications are used where no local building ordinances exist.

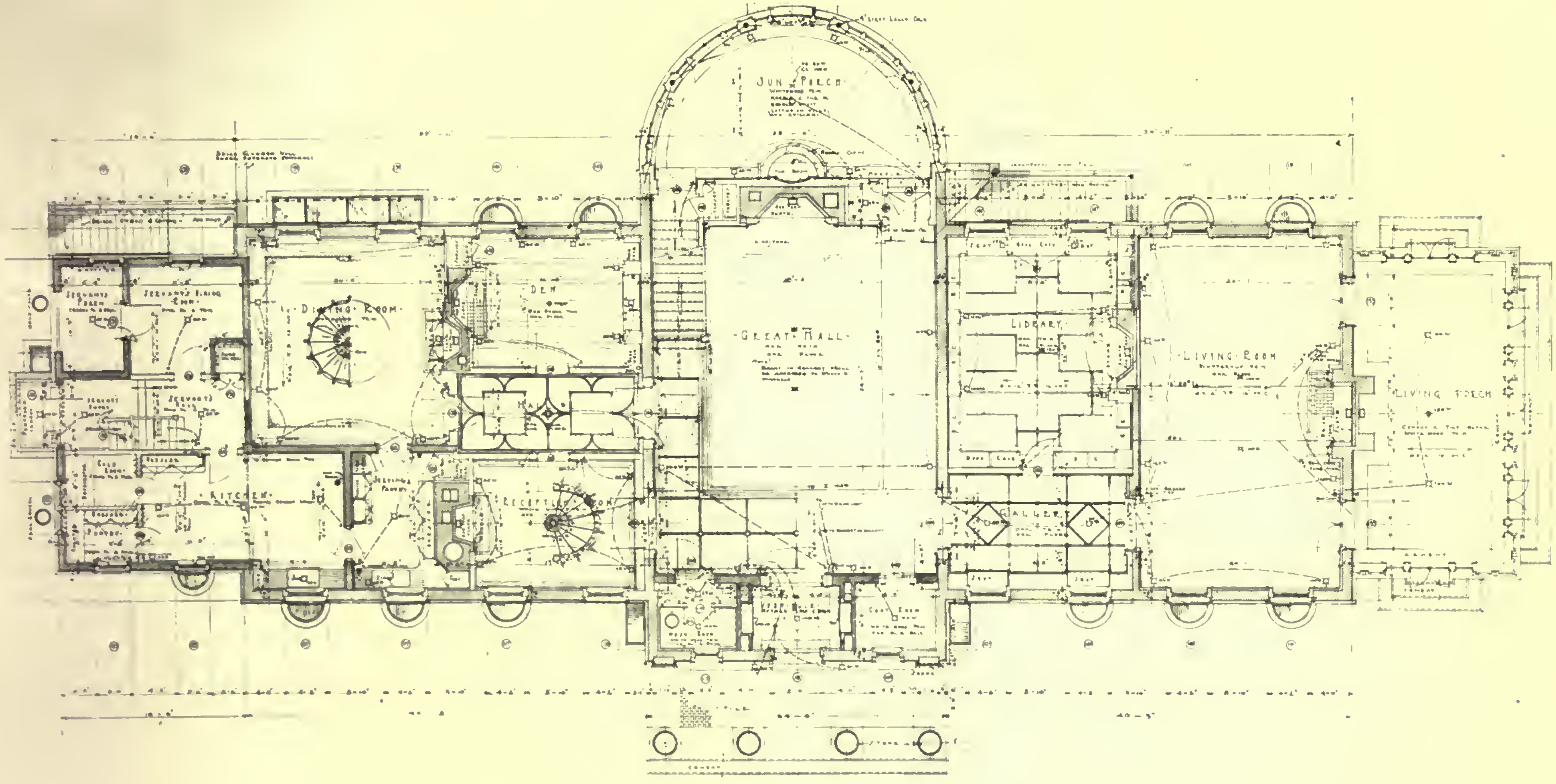
When stresses in building materials are standardized the committee will arrange to standardize wind pressure and wind stress requirements. Then an agreement will be arrived at on floor loadings, if possible. On thickness of brick walls the underwriters will have a great deal to say. A wall having thickness enough to carry loads and supply necessary stability is often too light to resist deformation from the expansion of air in case of fire. Sometimes a thin wall full of openings goes through a fire better than a thicker solid wall. The construction of walls will, to the end of time, be governed by empiricism in design, for strength is often greater than necessary, stability is determined from centuries of experience and pressure from sudden expansion of air within the building cannot be computed. The members of the Technical Committee of the National Federation of Construction Industries invite the co-operation of all men engaged in the construction industries; they have our best wishes and need the prayers of all good men.

GATEWAY
GARDEN OF AMOS D. CARVER, ESQ.,
LOCUST VALLEY, L. I., N. Y.
TOOKER & MARSH, *ARCHITECTS*

HOUSE OF AMOS D. CARVER, ESQ., LOCUST VALLEY, L. I., N. Y.
TOOKER & MARSH, *ARCHITECTS*

GARDEN FRONT

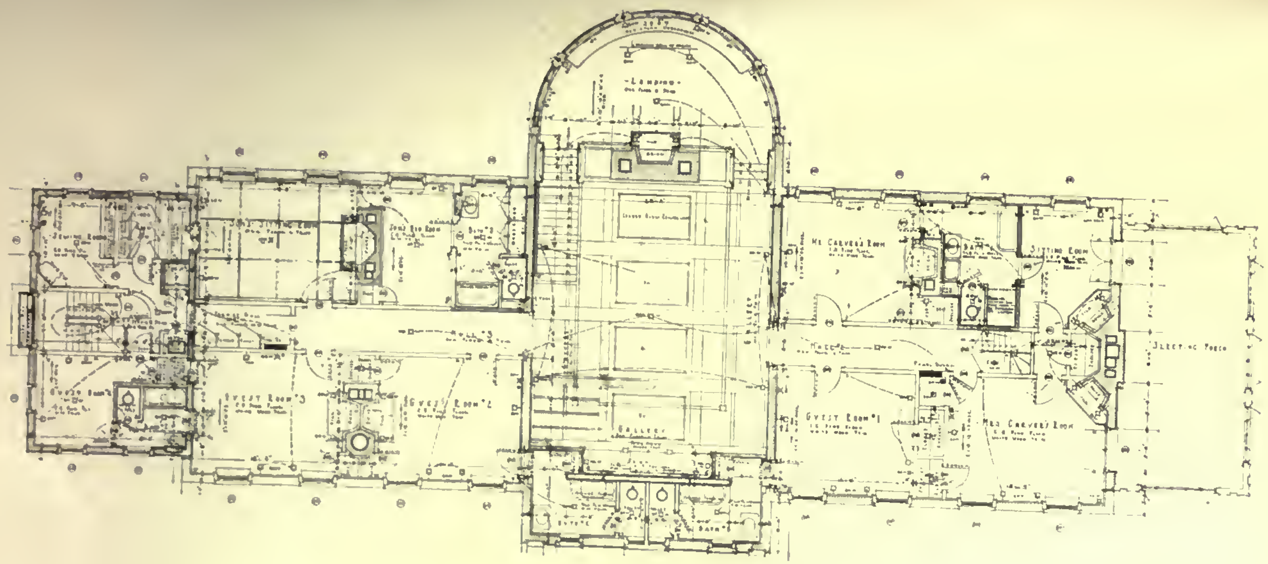
HOUSE OF AMOS D. CARVER, ESQ., LOCUST VALLEY, L. I., N. Y.



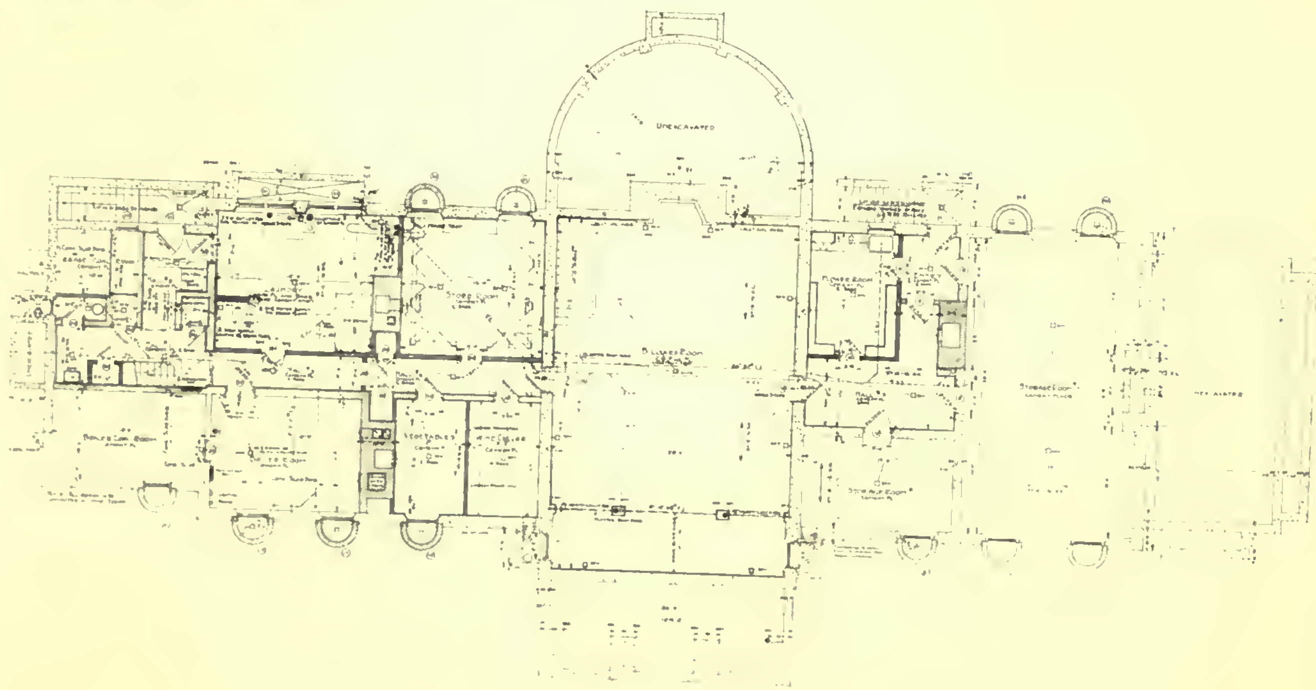
FIRST FLOOR PLAN

HOUSE OF AMOS D. CARVER, ESQ., LOCUST VALLEY, L. I., N. Y.

TOOKER & MARSH, ARCHITECTS



. BASEMENT AND SECOND
FLOOR PLANS



HOUSE OF
AMOS D. CARVER, ESQ.,
LOCUST VALLEY,
LONG ISLAND, N. Y.

TOOKER & MARSH, *ARCHITECTS*

MAIN ENTRANCE DOORWAY
HOUSE OF AMOS D. CARVER, ESQ., LOCUST VALLEY, L. I., N. Y.
TOOKER & MARSH, *ARCHITECTS*

THE GREAT HALL
HOUSE OF AMOS D. CARVER, ESQ., LOCUST VALLEY, L. I., N. Y.
TOOKER & MARSH, ARCHITECTS

HOUSE OF AMOS D. CARVER, ESQ., LOCUST VALLEY, L. I., N. Y.
TOOKER & MARSH, *ARCHITECTS*

TWO MANTELS IN HOUSE OF AMOS D. CARVER, ESQ., LOCUST VALLEY, L. I., N. Y.
TOOKER & MARSH, *ARCHITECTS*

TWO MANTELS IN HOUSE OF AMOS D. CARVER, ESQ., LOCUST VALLEY, L. I., N. Y.
TOOKER & MARSH, ARCHITECTS

HOUSE OF AMOS D. CARVER, ESQ., LOCUST VALLEY, L. I., N. Y.
TOOKER & MARSH, *ARCHITECTS*

HOUSE AT ELIZABETH, N. J., DESIGNED AND OWNED BY H. G. MORSE, *ARCHITECT*

WINDOW DETAIL
HOUSE AT ELIZABETH, N. J., DESIGNED AND OWNED BY H. G. MORSE, *ARCHITECT*

INTERIOR VIEWS IN HOUSE AT ELIZABETH, N. J.

DESIGNED AND OWNED BY H. G. MORSE, *ARCHITECT*

TERRACE FRONT
HOUSE OF G. S. GAYLORD, NEENAH, WIS
CHILDS & SMITH, *ARCHITECTS*

HOUSE OF G. S. GAYLORD, NEENAH, WIS.
CHILDS & SMITH, *ARCHITECTS*

BEAUX-ARTS INSTITUTE of DESIGN

DIRECTOR OF THE INSTITUTE, LLOYD WARREN

ARCHITECTURE, RAYMOND M. HOOD — SCULPTURE, JOHN GREGORY

INTERIOR DECORATION, ERNEST F. TYLER — MURAL PAINTING, ERNEST C. PEIXOTTO

Official Notification of Awards—Judgment of April 12th, 1921

PROGRAM

THE MUNICIPAL ART SOCIETY PRIZE

Through the generosity of the Municipal Art Society of New York City this Prize will be awarded annually on the fourth Class "A" Projet of the season.

FIRST PRIZE—$50.00 SECOND PRIZE—$25.00.

CLASS "A"—IV PROJET

The Committee on Architecture proposes as subject of this Competition:

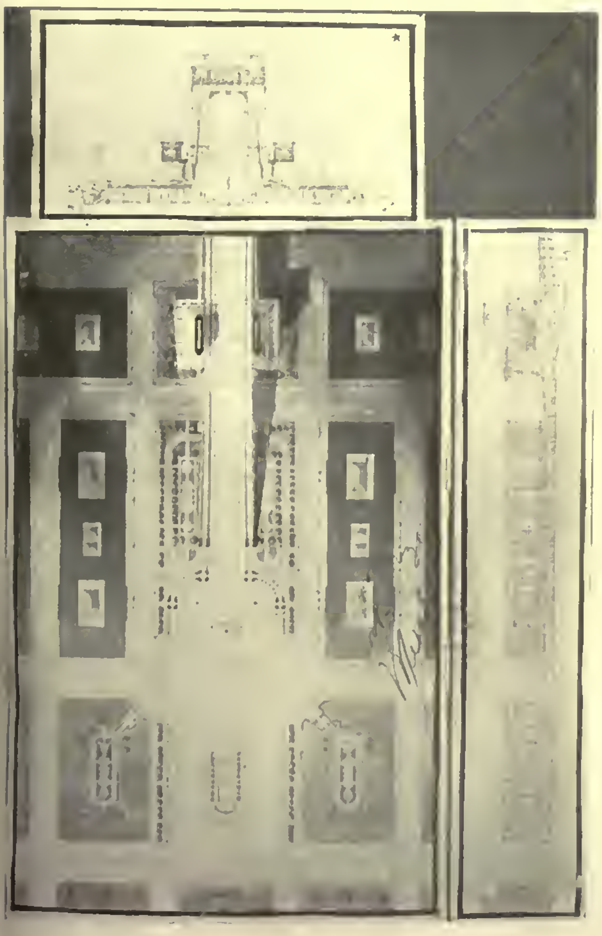
"A BRIDGE PLAZA"

Two adjoining, rectangular blocks have been set aside for the development of a suitable approach to a huge suspension bridge in one of our large cities. For convenience, designating the two blocks as Block I and Block II, and referring to the three parallel avenues defining them on the east and west as Avenues A, B and C, respectively, the two blocks may be described as follows:

The two blocks are level and symmetrically disposed about a main axis running east and west, the long side of each block being parallel to the main axis. Block I, between Avenues A and B, is 500′-0″ long and 300′-0″ wide. Block II, between Avenues B and C, is 300′-0″ long and 200′-0″ wide. Thus the crosstown streets at the north and south sides of the plaza are not straight continuous streets, but have an offset at Avenue B. Including the sidewalks, the avenues are 90′-0″ wide and the crosstown street 60′-0″wide. The total length of the plaza measured within building lines is therefore 1070′-0″. Its total width within building lines is 420′-0″ across Block I and 320′-0″ across Block II.

The bridge itself is 100′-0″ wide and provides for the circulation on a single level of street cars, vehicular and pedestrian traffic. The bridge, which is on the axis of the two blocks, starts at a point in Block I, 200′-0″ distant from Avenue B, and crosses Avenue A at a height sufficient to give a clearance of 14′ for the traffic on Avenue A. The street car lines on the bridge terminate in the plaza in a loop, so arranged that a transfer point can be established with the crosstown car lines, which also loop in the plaza.

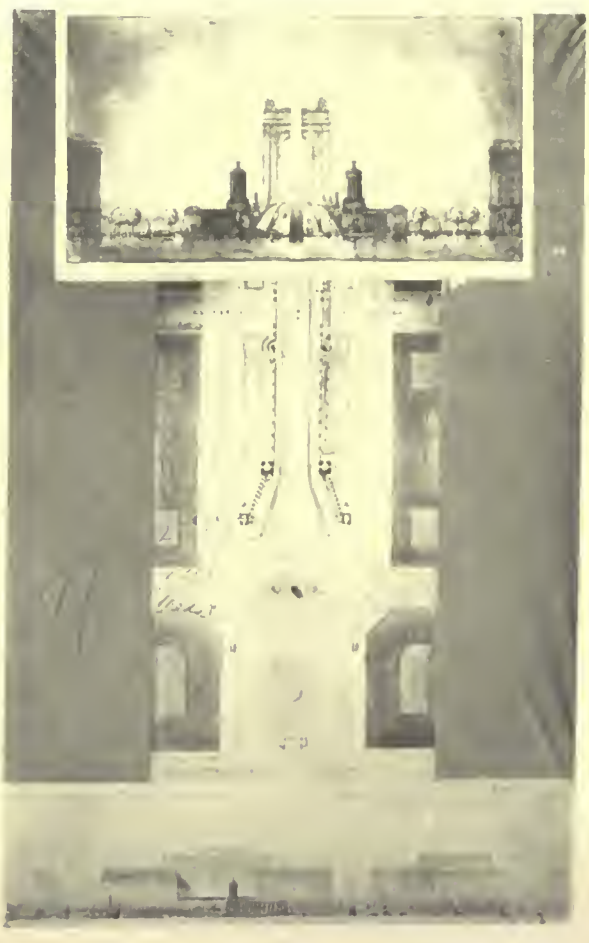
The owners of the properties bordering on the plaza



H. T. ASPINWALL — CARNEGIE INSTITUTE

FIRST PRIZE AND FIRST MEDAL
MUNICIPAL ART SOCIETY PRIZE

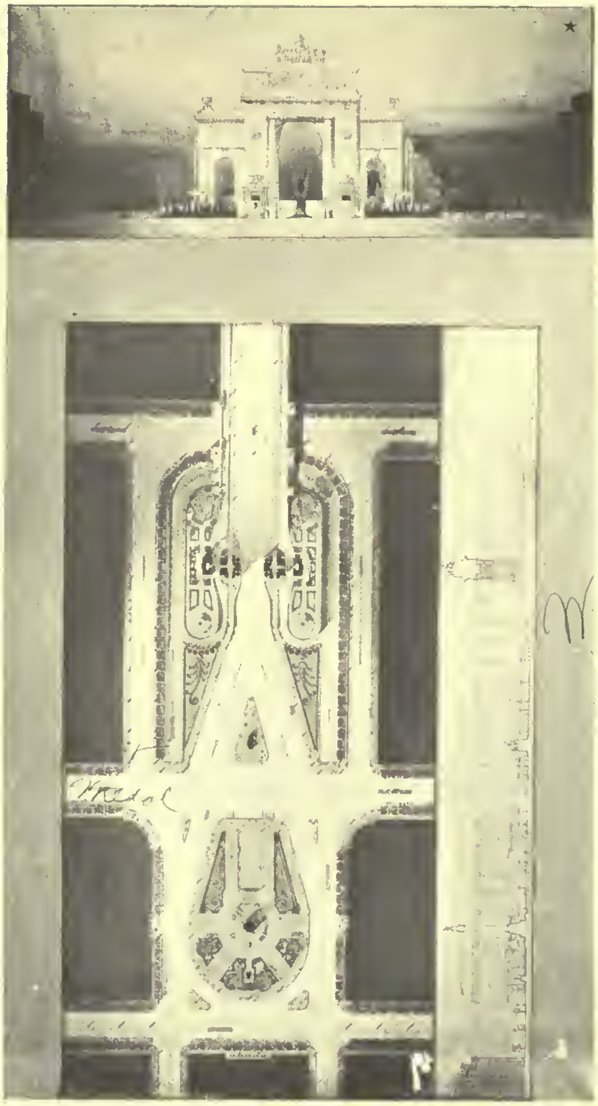
CLASS A—IV PROJET. A BRIDGE PLAZA



R. F. LARSON — UNIVERSITY OF PENNSYLVANIA

SECOND PRIZE AND FIRST MEDAL
MUNICIPAL ART SOCIETY PRIZE

CLASS A—IV PROJET. A BRIDGE PLAZA



L. HAMILTON YALE UNIVERSITY
FIRST MEDAL
MUNICIPAL ART SOCIETY PRIZE
CLASS A—IV PROJET. A BRIDGE PLAZA

have united to build new façades to their buildings, so that they shall have a uniform character suitable to such a place. All the buildings are of a business or residential type, and according to a municipal building regulation cannot exceed 90′-0″ in height on the plaza. They may, however, go beyond this height by terracing back, provided they are kept within a plane sloping backwards at 60 degrees from 90′-0″ level.

The problem therefore is the treatment of the bridge plaza thus formed, including the façades of the surrounding buildings.

Jury of Award—R. M. Hood, C. F. Hirons, H. Hornbostel, D. Barber, E. V. Meeks, Mr. Sterns, G. H. Bickley, C. W. Killam, L. P. Burnham, J. H. Hunt, C. W. Stoughton and G. B. deGersdorff.

Jury for Awarding of Prize—R. M. Hood, D. Barber, J. H. Hunt, C. W. Stoughton and G. B. deGersdorff.

Number of Drawings Submitted—119.

AWARDS—

FIRST PRIZE ($50)—H. P. Aspinwall, Carnegie Inst. of Tech., Pitts.

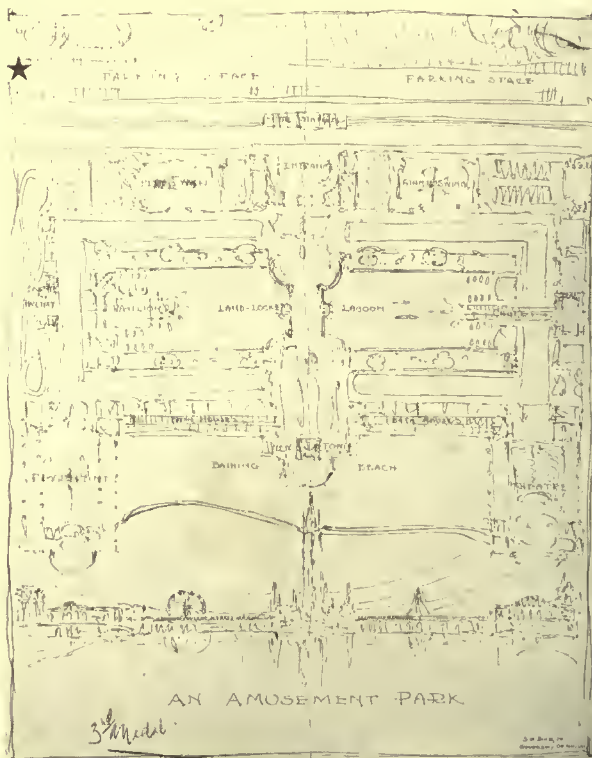
SECOND PRIZE ($25)—R. F. Larson, Univ. of Pennsylvania, Phila.

FIRST MEDAL—H. T. Aspinwall, Carnegie Inst. of Tech., Pitts.; F. L. Abreu, Cornell Univ., Ithaca; R. DeGhetto, Atelier Hirons, N. Y. C.; R. F. Larson, Univ. of Pennsylvania, Phila.; L. Hamilton, Yale Univ., New Haven.

SECOND MEDAL—P. F. Simpson, Carnegie Inst. of Tech., Pitts.; L. P. Botting and S. E. Lunden, Mass. Inst. of Tech., Boston.

MENTION—C. W. Hunt, R. W. Schmertz, K. A. Snow, A. P. Herrman, L. H. Rank, S. Jamison, M. W. Pohlmeyer, F. K. Draz, N. D. Kutchukian, R. M. Crosby and E. A. Earley, Carnegie Inst. of Tech., Pitts.; E. K. Hunter, E. B. Mason, T. L. Eschweiler, W. H. Harrison, R. G. Allen, J. D. Rivers, G. Fraser, H. Nolan, L. R. Chapman, R. D. McPherson, K. Carver, H. G. Spielman, V. S. Swan and A. A. Weber, Cornell Univ., Ithaca; M. B. Loewy and A. L. Muller, Columbia Univ., N. Y. C.; N. J. Schlossman, Chicago Sch. of Archt., Chicago; M. Jaeger, Jr., Atelier Hirons, N. Y. C.; L. C. Holden, Jr., J. Carlson, F. J. Wilder, L. A. Kruse, F. A. Kleinschmidt, I. Rosenfield, W. Williams, R. Ruhnka, F. S. Owen, K. G. Cowles and N. Brazer, Harvard Univ., Cambridge; W. T. Vahlberg, A. Kruse, E. R. Harman, R. F. Flather, R. E. Goddard, W. E. Caisse, H. D. Seaver, M. F. Farren, M. A. Spencer, F. W. Peers, A. G. Stanton, J. J. Stanton, H. T. Dennison, C. F. McGill, S. W. Ross, I. G. Smith, W. E. Church and A. L. Williams, Mass. Inst. of Tech., Boston; L. Z. Slawter, R. A. Fisher and E. Z. K. Schmidt, "T" Square Club, Phila.; E. R. Armstrong, E. J. Matthewson, R. S. Potter, C. E. Jenkins, A. B. Baumann, Jr., D. A. Royer, K. A. McGrew, C. W. Pollitt, O. M. Olsen, H. J. Toombs, G. P. Turner, G. A. Barry, G. K. Geerlings, S. J. Laschenski, L. H. Price, R. Gleason, T. H. Hewlett and I. Clavan, Univ. of Pennsylvania, Phila.; W. M. Icenhower, Univ. of Kansas, Lawrence.

H. C.—Mary L. Abbott and C. Contreras, Columbia Univ., N. Y. C.; Miss Nelson and Miss Kimball, Mass.



S. W. BIRH, JR. UNIVERSITY OF KANSAS
THIRD MEDAL
CLASS A—IV. ESQUISSE-ESQUISSE
AN AMUSEMENT PARK

Inst. of Tech., Boston; G. K. Trautwein, Univ. of Pennsylvania, Phila.; R. B. Thomas, Yale Univ., New Haven.

G. A. HACKER — ATELIER SIBLEY
PRIZE AND FIRST MENTION
SPIERING PRIZE
CLASS B—IV. ESQUISSE-ESQUISSE
A VILLAGE SHOP FRONT

PROGRAM

CLASS "A"—IV ESQUISSE-ESQUISSE

The Committee on Architecture proposes as subject of this Competition:

"AN AMUSEMENT PARK"

The planning and architectural treatment of a high class amusement park has all the artistic possibilities of a world's fair in miniature with its grouping of buildings and its effects of night lighting.

This particular amusement park is situated on a level tract of land facing the sea. It occurs between the beach and a boulevard which runs parallel to the beach. The frontage of the park on the boulevard is 1000′-0″ and its depth, between the boulevard and high water, is 600′-0″.

Located on the boulevard will be an imposing entrance to the park, in conjunction with which there shall be rest rooms, waiting rooms, etc. The trolley cars which run along the boulevard will have a station near this entrance. The parking of automobiles will be provided for on land along the boulevard on the opposite side from the amusement park.

Within the park the following are the chief features to be arranged:

1—A Promenade along the Sea.
2—Bath Houses.
3—A Land-Locked Lagoon, at one end of which shall be a Chute-the-Chutes and at the other end a pavilion arranged to accommodate people indulging in all sorts of Water-Sports, Canoe-Jousts, etc.
4—A View Tower.
5—A Restaurant and Dance Hall.
6—A Summer Theatre.
7—A Scenic Railway.
8—Other features, such as Ferris Wheels, Captive Balloons and other various "Side Shows," may be included as the student desires.

In considering this problem it will be seen at once that the circulation should be ample, direct and continuous, as nearly everyone who visits the park wishes to enjoy the major part of the attractions.

Jury of Award—F. A. Godley, L. Warren, H. O. Milliken, B. W. Morris, H. R. Sedgwick, P. Sawyer, E. H. Klaber, W. B. Chambers, H. W. Corbett, D. J. Baum, J Wynkoop and T. S. Holden.

NOTE:—This Jury also served as Jury of Award for the Class "B"—IV Esquisse-Esquisse, Class "A" & "B" Archaeology- IV Projet and Class "A" & "B" Archaeology—IV Measured Drawings.

Jury for Awarding Spiering Prize—F. A. Godley, L. Warren, H. O. Milliken, B. W. Morris, P. Sawyer, E. H. Klaber, W. B. Chambers and H. R. Sedgwick.

Number of Drawings Submitted—38.

AWARDS—

THIRD MEDAL—A. L. Muller, Columbia Univ., N. Y. C.; T. E. Ash, "T" Square Club, Phila.; S. W. Birh, Jr., Univ. of Kansas, Lawrence.

MENTION—P. F. Simpson, Carnegie Inst. of Tech., Pitts.; G. Fraser, Cornell Univ., Ithaca; R. K. Galbraith, Archtl. League of Indianapolis, Indianapolis; W. L. Hin-

D. A. ROYER — UNIVERSITY OF PENNSYLVANIA
THIRD MEDAL
CLASS A & B—ARCHAEOLOGY—IV PROJET
A NORMANDY SHOP FRONT

denach, "T" Square Club, Phila.; R. F. Larsen and C. F. Jenkins, Univ. of Pennsylvania, Phila.

PROGRAM

SPIERING PRIZE COMPETITION

A Prize founded in memory of Louis C. Spiering, from funds bequeathed by him to the Society of Beaux-Arts Architects and given for the best solution of the fourth Class "B" Esquisse-Esquisse of the season.

PRIZE, $50.00

CLASS "B"—IV ESQUISSE-ESQUISSE

The Committee on Architecture proposes as subject of this Competition:

"A VILLAGE SHOP-FRONT

A small merchant, dealing in dry goods and notions, has acquired, on the main business street of a country town, a piece of property 35′-0″ wide, upon which he proposes to build a shop for the sale of his goods, and, above, living quarters for himself and his family. He desires to make the street front of this building as attractive as possible both to induce patronage and to enhance the charm of the town in which he takes considerable pride. His property abuts two other buildings of about the same height as the one he proposes to erect.

The shop, which will occupy the entire ground floor with the exception of the entrance and stairs leading to the living quarters, will include a show window and an entrance direct from the street. Its height is to be 12′-0″ in the clear. The living quarters above are to be in two stories. Otherwise entire freedom in the design and choice of materials is left to the architect.

Number of Drawings Submitted—53.

AWARDS—

PRIZE ($50)—G. A. Hacker, Atelier Sibley, Palisade, N. J.

FIRST MENTION—W. Conley, Columbia Univ., N. Y. C.; L. Rombotis, H. F. Hunter and L. F. Fuller, Los Angeles Archtl. Club, Los Angeles; G. A. Hacker, Atelier Sibley, Palisade; W. Douglas, Yale Univ., New Haven.

MENTION—I. Tron, Columbia Univ., N. Y. C.; E. H. Carleton, Cincinnati Archtl. Society, Cincinnati; G. B. Howell, Cornell Univ., Ithaca; W. J. Perkins, Carnegie Inst. of Tech., Pitts.; W. K. Macomber, Post and Lintel Club, Minneapolis; D. M. Campbell and C. B. Lewis, Yale Univ., New Haven.

PROGRAM

CLASS "A" AND "B" ARCHAEOLOGY—IV PROJET

The Committee on Architecture proposes as subject of this Competition:

"A NORMANDY SHOP FRONT"

The heart of every village and town in Normandy is the market square with its fountain or monument in the center. The most important situations on the square are occupied by the church and the town hall, with the houses of the principal citizens and the shops of the merchants grouped about them, forming a picturesque sky line of gable roofs and attic stories. The fronts, huddled together in this desirable location like a jostling crowd at a parade, present a charming variety of richly carved timber work, sombre flint, fanciful ornament cut in Caen stone or pattern brick.

In one of the largest towns famous for its tapestries and textiles, a merchant, late in the fourteenth century, built a house fronting the market square. This house was to be both a shop for the display of his textiles and a home for his family.

The subject of this competition is the design of the front elevation of this house. The frontage is 30′-4″. On the first floor is the shop and above it three stories of living quarters, the upper one in a gable or attic.

Number of Drawings Submitted—24.

AWARDS—

THIRD MEDAL—G. D. Conner and T. M. Hofmeester, Jr., Chicago Sch. of Archt., Chicago; A. Westover, Jr., J. H. Geissel and E. A. Beihl, "T" Square Club, Phila.; D. A. Royer and C. E. Jenkins, Univ. of Pennsylvania, Phila.

MENTION—I. Tron, Columbia Univ., N. Y. C.; R. J. Nedved, W. S. Sponholz, F. M. Baldwin, I. J. Loeb, M. F. Winiarski and H. L. Fassett, Chicago Sch. of Archt., Chicago; W. K. Macomber, Post and Lintel Club, Minneapolis; W. L. Hindensch, "T" Square Club, Phila.; C. H. Siebert, Syracuse Univ., Syracuse; R. Alsup, R. L. White and Essie Lipscomb, Univ. of Texas, Austin.

PROPOSED FRATERNITY HOUSE AT ITHACA, N. Y.

WILLIAM DUNBAR, *ARCHITECT*

DEPARTMENT of SPECIFICATIONS

The Construction of a Specification—Part II

WHEN the specification writer has gathered together the various items for the outline and is satisfied that he has checked over the drawings with sufficient thoroughness to have grasped the details of the work shown on the drawings, he is well prepared to start what one might aptly call "the fabrication" of the document.

The outline should be checked over to make sure that the customary preliminary paragraphs, such as

Scope of Work
Work Not Included
Quality of Workmanship
Quality of Materials
Inspection of Materials
Storage of Materials

are placed in logical sequence, followed by the succeeding steps of the work included in the particular section. It is well here to call attention to several important points which, if recognized and given their proper consideration, will help to organize each entire section and reduce materially the task of writing the specifications.

The first paragraph in each section should be given the caption, "General Conditions," should consist only of a reference to the general conditions of the contract and should carry a requirement that this document should be read by each one submitting a proposal for the work of that section.

The second paragraph should be captioned "Scope of Work," and should schedule, either in general terms or in detail, all work that is to be included in the section.

As heretofore mentioned, the paragraph captioned, "Work Not Included," is quite as important as the second paragraph and, because of its nature, should follow the latter. Certain sections of the specifications, such as "Roofing," ordinarily will not require this third paragraph, but it is well to put it in the outline for later elimination should it be deemed unnecessary when the final draft of the specifications is written.

Separate paragraphs should be devoted to "Quality of Workmanship," "Quality of Materials," "Inspection of Materials" and "Storage of Materials." If this is done and if they are prepared with care the specification writer will have presented to the bidders and contractors the major considerations that justify the writing of specifications. The bidder will have called to his attention the general conditions of the contract to which he must subscribe, the work that is to be included and excluded from his proposal and he will understand the quality of workmanship and materials that will be demanded by the architect. If the "Scope of Work" is scheduled in fairly complete detail the schedule will, in itself, be an outline of the work that is to be done, and when the construction operations have started, or at any time, whether in field or office, questions respecting the work included can be answered without thumbing through page after page, as is so often the case.

The logic of grouping, under one caption, all materials and the requirements as to qualities can not be questioned. The only other course open to the specification writer is to specify the kind and quality of materials in the paragraphs of the specifications that have to do with their fabrication or installation, and, in this way, repeating clauses that just as well may—and should—be used once under "Quality of Materials." This alternate method is wholly undesirable and should not be practiced.

The specification writer then should proceed through his outline, rearranging the several items as seems best to him, the only consideration on which to base judgment as to position being the sequence of construction operations. Where one or two items do not fit into the scheme of sequence but should be placed in a certain position because of their intimate relation to other items, it will not be an error to give them what appears to be their proper place. It is not to be expected that perfection in logical arrangement can be accomplished, especially where numerous separate operations are to be performed, and the specification writer must be expected to do what appears to be best in each case.

When the proper arrangement of the outline has been accomplished the sections should be put in proper sequence, as near as may be done, and each section given a number. This numbering arrangement will be treated in greater detail later when the composition of the specification is discussed.

THE next step for the specification writer will be to start the preparation or "fabrication" of the first section of the specifications. It is considered best to start with the first specification for the reason that the writer will find its composition will proceed with greater smoothness if he starts his narrative at the same place the constructor will start the construction of the building. At times it may be more convenient, or when the available time demands, it may be quite proper, to write some later specification, such as that for "Structural Steel," or for "Architectural Terra Cotta," first, in order to get the work requiring a long period for shop fabrication or manufacture under way so it may be delivered promptly when needed. If, however, the specification writer has given the work its proper attention he will have prepared the outlines for all sections prior to the time he writes these hurried specifications and will have the work so well in hand that he can write them with complete assurance of their accuracy. Should he write these first sections hastily, without an adequate preparation of outlines for the sections affected, even remotely, by them he will, very probably, regret later that he made the all too common error of writing incorrect specifications and must then have recourse to an addendum and thus confess his mistakes to everyone who reads the documents.

When writing the final draft of the specifications the master specification, specification data file, catalog file and file of old specifications will, in most cases, be consulted for specific data. The specification writer, if he has organized his work with these "tools" and has kept them up-to-date, will find them of the greatest convenience, and he will be more sure of accuracy in the special requirements if these files are referred to for all information.

The use of standard paragraphs in the master specifications must, however, be mixed with extreme caution in respect to their complete accord with the requirements of the drawings or of local conditions. Certain paragraphs may be used time after time, but every time they are used they should be reread and studied for the applicability to the case in hand, otherwise a somewhat innocent clause for one building may be wholly misleading for another building. Too great emphasis cannot be placed on this rule in the use of the master specification, for it must be understood that it is not the *last* word in specifications for current work but is the last word written for specifications of the past that proved their value in actual use in construction operations.

If the paragraphs in the master specification have been numbered and the paragraphs are to be used verbatim it is only necessary to refer to them in the new specifications for copying by the typist. If, however, some changes are to be made in the standard paragraph it is best either to rewrite the paragraphs as they should read for the work in hand or else refer to this standard with a note that it will be corrected by dictation when being written up.

In order to maintain the master specification as an invaluable reference the specification writer should make notes on the backs of pages opposite the standard paragraphs that have been revised, so that when future reference is made to such clauses the various revisions, any one of which may be more desirable than the one in the book, may be found readily. Then, when sufficient revisions have been made to warrant the preparation of new pages this can be done and the master specification thus kept in the best possible shape for future uses. It is hoped the reader will pardon this and other digressions, as they seem necessary to call attention to matters supplementary to the thoughts under discussion.

If paragraphs in the master specification have been prepared from specifications written by manufacturers or by trade associations or national technical society committees it behooves the specifications writer, in the interest of accuracy and keeping in touch with latest developments, to ascertain if these paragraphs or the data on which they have been based have been revised or altered in such a way as to make the standards so prepared somewhat unreliable. The time to investigate these questions, to a certain extent, is when a specification is being written. Even though correspondence with those who furnished the original data that is the basis of the paragraph may delay matters somewhat, the preparation of the specification need not be delayed. In such cases the writer usually is sure of what he wishes but simply lacks confirmative or supporting data and, upon such an understanding of the problem, he may proceed without introducing errors in subsequent work.

In the use of specifications prepared by manufacturers the specification writer must be careful in adopting the manufacturers' phraseology or trade terms in order that he may avoid unpleasant controversies with the contractor or the owner because of an incorrect use of the words or terms in question. If it is the intention of the specification writer to specify definitely the products of a certain manufacturer it is more honorable to state definitely that such and such items are to be as manufactured by the one whom he wishes to favor. If, however, the specifications are being written for public work, where it is impossible to specify articles by such means unless a certain number of similar articles of other manufacturers are specified, or if he wishes to introduce competition among several manufacturers either of whose products will be acceptable to him, he should state the conditions that must be met and the work that is to be performed by the article in question rather than describe any one manufacturer's article with a wealth of detail that will identify it to competitors as clearly as if the favored producer's name has been written out.

The blind use of manufacturers' or trades associations' trade terms may lead one into difficulty because of local interpretations that may be placed on these terms, which interpretations are not at all in accord with the interpretations placed on them by the author of the original specifications. It used to be customary in certain portions of the country to specify "trap rock" for use in concrete work and so far as known "trap rock" has never been used as an ingredient of concrete in those sections because it is not available without long and expensive freight hauls. In this case specifications for broken stone of a certain geological character available in the locality in which the building is to be erected is much more desirable and the specifying of "trap rock" for work in localities where it is not available is due either to ignorance of local conditions or to a belief that if it is available in one locality it surely must be available in any other locality. Indolence has a great deal to do with such errors, and the specification writer must be on his guard constantly not to give usage to terms subject to wrong or ambiguous interpretation.

Many manufacturers or trade associations prepare their specifications in such a way as to reveal a strong bias for peculiarities of the device they produce. Such bias is excusable and is to be expected from such sources. It is not to be condemned for the reason that it is excusable, but a specification writer who blindly copies such specifications without analyzing them is to be condemned as a grossly negligent member of the technical professions.

IN the preparation of new paragraphs that are to cover conditions peculiar to the operation, it is quite proper for the specification writer to write these paragraphs with a view of entering them in the master specification as a standard paragraph without further revisions. There are, of course, instances where a new paragraph or clause must be prepared that cannot be used in a standard paragraph for subsequent jobs, but the inclusion of it in the master specification with a note of caution in its use in subsequent jobs and a statement as to the reasons for such use will be helpful in accumulating reference data covering all possible situations that may arise in the specification work.

In the preparation of new paragraphs the catalog file and the specification data file should be referred to wherever possible instead of trusting to memory of past experiences or attempting to anticipate a condition that may not be true so far as the methods of manufacture and fabrication or construction are concerned. The only purpose in maintaining the specification data catalog file is to give to the specification writer when he so desires it the accumulated information of previous years and perhaps the more modern tendencies in certain fields of work. If by any possible chance an indecision is apparent, either one of these files will undoubtedly present matter that will clear up the question or will indicate how further data may be secured from manufacturers or associations that are interested in work of a correlative nature.

In the use of specifications written by other architects or engineers caution to as great an amount must be exercised in copying verbatim phrases, clauses or paragraphs as has been recommended in the use of specifications prepared by manufacturers. It is not unusual in writing specifications that are to be published for bidding and construction work to have in them numerous typographical errors which may be copied blindly without conveying any meaning at all in the new specification. One architect a number of years ago wrote specifications for year after year in which he said that the glass for wood-sash should be "springed" in the sash. Curiosity impelled an investigation for the reason back of the use of this word and what it meant, and it was discovered that some years before some one in his office copied a specification written by another architect in which the word "sprigged" was misspelled. While this error did not entail any bad results, nevertheless to an intelligent estimator or contractor it indicated a certain carelessness that might at times give just cause for a general disbelief in the good intentions of the architect. Another illustration — in some sections of the country the piece of wood, marble or metal that is placed between the door jambs and with a slight projection above the floor level is called a saddle. In other sections of the country this is called a threshold. In the sections of the country that call this article a threshold the triangular shaped flashing that is placed between a pitched roof and the side of the chimney forming an acute angle with the roof is called a "saddle." In other sections of the country this "saddle" is called a "hog back." A blind use of the term saddle then may lead to complications of one kind or another unless the contractor wishes to read into the word as written the thought in the mind of the author of the specification.

IN the use of the standard specifications adopted by the technical societies, such as the American Society for Testing Materials, the American Society of Civil Engineers, or the American Concrete Institute, it is much better not to copy verbatim the specifications that it is desired to incorporate in the completed document but to make reference to them in such a way as to identify them without difficulty. It is not necessary that they be copied, as it is always possible for those who are using the specification to obtain copies of the standard specifications, and, as a matter of fact, almost every wide-awake contractor or manufacturer has them in his office files and is thoroughly acquainted with them. It may be suggested that reference not be made to specifications as adopted on a certain date but simply to say "the Current Standard Specifications."

The question of the advisability of specifying material under the name of the manufacturer is still open to debate and probably always will be. This is a matter that must be determined by the individual in each specific case, or a certain rule adopted by him for general guidance in his work. The use of the words, "or equal," has been condemned time without number and still it persists. There is no excuse for the use of this phrase, and it is impossible to understand why specification writers continue to use it in the face of all the opposition of previous years. Most of the opposing reasons that have been advanced are good and the specification writer should come out into the open, as suggested hereinbefore, and name one manufacturer. name several, or revert to a general description of the item desired that will convey to the mind of the manufacturer what is wanted.

The method of describing articles without mentioning particular names is to be commended because of the difficulties inherent in the use of one name only, and if the description is based on what is to be accomplished and the material that is to compose the article rather than on specific description of some certain article the resulting specification should accomplish a good solution of the problem.

CHINESE PAVILLION IN ST. LOUIS (MO.) ZOOLOGICAL GARDENS
T. B BARNETT & CO., *ARCHITECTS*

DEPARTMENT OF ARCHITECTURAL ENGINEERING

The FOUNDATIONS of the HOTEL PONTCHARTRAIN, DETROIT

A Study of the Utilization of Old Foundations for New Buildings

TO every architect there comes from time to time a problem as old as the building industry itself,—the advisability of using the foundations of a razed building for a newer building on the same site. This problem came to the architects and engineers for the 24 story building for the First and Old Detroit and Central Savings Bank of Detroit, Mich., which is being erected on the site of the old Hotel Pontchartrain. The solution may serve as a useful precedent, in similar cases.

The foundations of the Hotel Pontchartrain were placed in 1906 and attracted a great deal of attention from residents of Detroit as well as from visitors. The site was a central one and the execution of the work was difficult, the operations being commented on by the popular as well as the technical and legal press. The original plans called for an ordinary spread foundation. Trouble commenced soon after the excavation was started, for the material encountered was soft clay which not only forced in the sheet piling around the property but kept rising in the bottom of the excavation. This caused settlements in the adjacent streets and also settlements and bad cracks in adjacent buildings on both sides. The resulting lawsuits brought by owners of the adjacent buildings were long drawn out with consequent disturbance of building operations. A different type of foundation was then designed by the firm of Westinghouse, Church, Kerr & Company and was finally installed.

THE HOTEL PONTCHARTRAIN, DETROIT, MICH., ERECTED IN 1907, AS IT APPEARED IN MAY, 1920

It is typical of building work in general that records of work done, which would be of great value in future operations on the property, are usually hard to obtain when needed and this work was no exception. For example it appears that a test load sank six inches and was deemed to have been of no value, but there are no records of the amount of load applied nor of the area covered. It is known that borings carried to a depth of about 40 feet below the general excavation or about 75 feet below the curb, gave unsatisfactory results. The borings appear to have been made without a pipe and reports state that great difficulty was experienced in pulling out the auger, because of the closing up of the bore holes. The material encountered to the depth bored was principally wet clay with some sand.

Several test piles were finally driven and satisfactory information was obtained. The decision was reached to cover practically the entire site with wood piles spaced about 2 ft. by 2 ft. 6 in. to carry a reinforced concrete mat which would distribute the column loads to the piles. The material was of such a nature and the piles were driven so close together that many of them were forced up about two feet when other piles were driven alongside. All attempts to redrive these piles developed new troubles so they were finally cut off to a fairly uniform elevation. No thought being given to the possibility that the foundations might possibly be utilized later for a heavier structure, a few small areas contained no piles and here the mat was thinner than in the load bearing sections. The general thickness of the mat was three feet and it was nowhere less than two feet thick. Reinforcement was scientifically and liberally used to distribute loads and very heavy retaining walls, damp-proofed on the side in contact with the earth, were built on the edges of the mat to enclose the site. No settlement of this foundation was ever reported and the building gave no evidence at any time of disturbance in the foundations.

Time passed and the building reached the hoary age, from the American business property dividend paying standpoint, of 12 years when it was considered that the site was too valuable to be used longer for hotel purposes. The decision was reached to remove the building, now called "old," and erect in its place a bank and office building. The architects and engineers for the new structure were Albert Kahn and Associates, Mr. J. Giaver of Chicago being later called in as consultant for the foundations finally adopted. Careful consideration was given to the possible use of the old foundations. The preliminary designs contemplated the use of terra cotta exteriors, to avoid weight, and the columns of the new structure were so located that they could utilize the reinforcement placed in the mat to distribute the old column loads. The weight per square foot of the full construction was less for the new than for the old building and it was possible to utilize the old foundations with their uniform pres-

STARTING THE CAISSONS FOR BANK AND OFFICE BUILDING ON THE SITE OF THE OLD HOTEL PONTCHARTRAIN, DETROIT. IN THE FOREGROUND THE CONCRETE MAT IS BEING CUT FOR A CAISSON sure over the whole area, despite the fact that the new building was several stories higher than the building it was to replace.

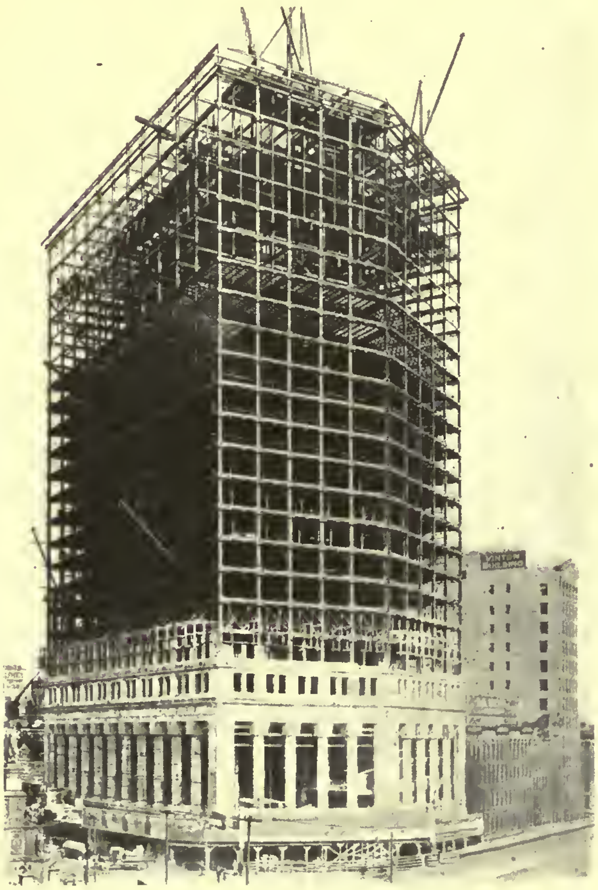
Then the changes which every architect knows are inevitable, came, and the whole scheme was changed. The number of stories was increased to twenty-four and an additional wing was added to the rear of the building. The decision was reached to use stone instead of terra cotta for the street fronts and the column spacing was changed better to suit the ground floor occupancy. This so increased the loading over the area that it would have been necessary to drive piles in the few small spaces in which piles were considered in 1906 as not needed. The driving of additional piles, however, would not suffice as it would also have been necessary to provide an extensive system of grillages to transfer the new column loadings to the piles, since the reinforcement in the mat was designed to distribute the former column loads and did not contemplate any shifting of columns. This is an item of considerable importance and one often neglected in the design of mats. When a mat is scientifically designed the steel is placed to take care of shearing stress imposed by the column loading and shear reinforcement is omitted in other portions of the mat. The possible re-use of old foundations furnishes a good argument for reinforcing all mats in the top and bottom with a uniformly spaced network of steel, with one or two more layers properly spaced to resist shear in case it is decided to shift the location of columns.

In the building under consideration another question came in to settle finally the type of foundation, namely the possibility of the construction of subways in the adjacent streets. This, together with the thought that the great height and weight of the building should call for a deep foundation, led to the adoption of the open caisson type, known as the "Chicago Caisson." These caissons were originally designed for a depth of ninety feet below the curb but after they reached a depth of eighty-five feet it was decided to stop them at that point. Most of them consist of a shaft with three bells, the type usually adopted for deep foundations for buildings in Detroit.

CONCRETING THE CAISSONS FOR BANK AND OFFICE BUILDING ON THE SITE OF THE OLD HOTEL PONTCHARTRAIN, DETROIT

A Chicago Caisson is really a column of concrete serving as a foundation for building columns. The term "open caisson" indicates the method of sinking, which is that adopted for working in caissons but without an air chamber, the sinking being accomplished in stages of a few feet, the excavated portion being lined with vertical wooden planks held in place by iron rings. In the two illustrations of the sinking of the caisson foundations the short pieces of planking are shown piled ready for use and near the foreground in one view is seen a pile of the rings. Each ring is in two half sections with ends turned out to form abutting joints which are held together with bolts. Around each hole a platform is built to carry a windlass and a frame supports a canvas covering for protection against rain and too strong light. A cable operated from a central engine turns the windlasses which bring up the buckets of excavated material. Whether the wooden lining is left in place or removed before the concrete is poured depends entirely upon the character of the material, which, when very soft has been known to flow into unlined holes with such pressure as to squeeze the concrete into something resembling a string of sausages.

A caisson foundation usually goes to solid rock because of fear that future excavations in the vicinity below the basement level of a building, may drain the soil of ground water and cause settlement. This was considered in the case of the bank building here described but was given up because of experience in sinking similar caissons in the Ford Building, Detroit, where a water bearing stratum was encountered which carried considerable gas. The water was under such pressure that it rose into the building through the caisson shafts and two workmen in the basement were asphyxiated by the gas which accompanied the water. It was feared that the same difficulty would be encountered in the foundations here described so the bell type of caisson resting on soil was adopted.



IN APRIL, 1921

IN JULY, 1921

BANK AND OFFICE BUILDING ON HOTEL PONTCHARTRAIN SITE, DETROIT, MICHIGAN

The caissons were designed for a soil pressure of 9,000 lbs. per sq. ft. for the column load plus the weight of the caisson. Being in effect a spread foundation, a discussion arose as to whether it would be best to have one bell at the lower end, which would necessitate quite a chamber, or to have the same area in three smaller sized bells. It was decided that since the character of the soil at the elevation of each of the three bells was practically the same, there could be no difference in bearing pressure except the slight difference caused by depth, which of course is an indeterminate factor. The difference in expense was in favor of the three bells and the caissons were therefore of that type.

Holes were cut in the original concrete mat of the size required for the caissons and as the excavation proceeded the piles which were encountered were cut off, this being a troublesome matter. An attempt was made to draw the piles but as it required a force of sixty tons for each pile this method was abandoned. Nothing was said as to whether a water jet was used in connection with the attempts to draw the piles but it is presumed that this was done, although the pulling force mentioned seems large in connection with properly arranged jets. No difficulties were encountered in the sinking outside of the cutting of the piles. With some minor alterations the entire mat and enclosing walls of the basement and sub-basement of the old building were allowed to remain and become a part of the new structure. At the time the information was received no settlement had been observed, although the building was practically completed so far as the heavy construction was concerned.

Wage Differential for Building Trades Mechanics

FROM E. T. Thurston, secretary of the General Contractors of San Francisco, comes a memorandum on wage differentials, taking into account the relative skill and responsibility of the various trades involved, the hazards of employment, and the personal equipment of tools required, as stated in the June 23, 1921, issue of *Engineering News-Record*. For the purpose of emphasizing the inequities of prevailing differentials he takes the carpenter as the most essential, skilful, and responsible, as well as the most expensively equipped workman in the building trades and refers all other workmen to the carpenter as a base, as indicated in the accompanying table.

An index number set opposite any craft is intended to indicate in rate per cent. the relative position of workmen in that craft to the carpenter, with respect to the considerations noted above. Thus, the required skill and responsibility of the common laborer is nil; that of the bricklayer 80 per cent. of that of the carpenter.

Ratings as to skill and responsibility and equipment are based upon a brief inquiry into the information and experience of members of the contractors' association. The ratings as to hazard are based on the experience of insurance companies as reflected in the current premium rates for workmen's compensation insurance, except in the case of composition roofers, who are not distinguished in the insurance rating manual from plate and tile roofers, whose work is far more hazardous.

The fourth column of the table shows the combined averages of the ratings for each craft, and the fifth column a scale of daily wages based on $7 for the carpenter, but recognizing a minimum of $3.50.

The table here given is merely a tentative one, based upon as complete information as was at hand at the time of the compilation.

WAGES IN THE BUILDING TRADES TAKING INTO ACCOUNT SKILL, RESPONSIBILITY, HAZARD AND EQUIPMENT

Trade	Skill and Responsibility	Hazard	Equipment	Combined Ratio	Scale of Wages
Bricklayers	80	72	12½	55	$3.85
Carpenters*	100	100	100	100	7.00
Cement finishers	80	60	12½	51	3.57
Concrete labor	10	100	0	37	3.50
Electrical workers	80	19	25	41	3.50
Elevator constructors	80	93	0	58	4.06
Engineer, hoisting	50	53	25	43	3.50
Hod carriers, brick	10	72	0	27	3.50
Hod carriers, plaster	15	53	0	23	3.50
Housesmiths, ornamental iron	90	65	25	60	4.20
Housesmiths, reinforced concrete	50	100	5	52	3.64
Laborers	0	100	0	33	3.50
Lathers	50	53	5	36	3.50
Marble setters	75	11	25	37	3.50
Painters and glaziers	75	120	5	67	4.69
Plasterers	90	53	12½	52	3.64
Plumbers	80	27	12½	40	3.50
Roofers, composition	10	60	0	23	3.50
Sheet-metal workers	80	83	25	63	4.41
Steel workers	50	252	5	102	7.14
Stone cutters	80	25	25	43	3.50
Stone setters	80	72	25	59	4.13
Tile setters	75	11	5	30	3.50
Teamsters	10	30	0	13	3.50

* Carpenter used as base with per cent. of 100.
Minimum daily wage, $3.50.

Cements for Emergency Repair

HOSPITAL superintendents, particularly those connected with outlying institutions are frequently called upon to make emergency repairs and the following suggestions are given by *The Modern Hospital*:

Freshly prepared curd from soured skim milk is mixed intimately with one-fourth its bulk of lime, which has been slaked by adding just enough water to cause it to fall to a powder. This cement, which is good for wood, marble, metals, and glass, should be used immediately as it soon sets to a hard mass. When used on marble or wood, it is advisable first to paint the surface with a solution of casein (curd) in borax solution or ammonia, to fill the pores.

Powdered and sifted quicklime mixed to a paste with white of egg quickly sets to a hard cement that can be used on ivory, marble, glass, porcelain, etc.

A waterproof cement for cisterns, casks, etc., is made from glue, mixed with one-fourth its weight each of boiled linseed oil and red ochre. The glue is soaked and melted in as little water as possible and the other ingredients are then thoroughly mixed in. The cement should set in two or three days.

Powdered whiting or air-slaked lime mixed with hot glue will adhere to wood and metals. Liquid glue containing acid should not be used.

Litharge and glycerine mixed to a paste form a cement that adheres strongly to metals, glass, etc. It is not softened by heat and resists the action of water. Beeswax and rosin melted together in the proper proportion for the desired consistency form a cement that will adhere strongly if applied to warm metal or glass surfaces. It may be mixed with whiting, etc., to give it more body.

Shoemakers' wax and shellac melted together at not too high a temperature give a more tenacious cement than the preceding. The metal or glass to be cemented must be hot enough just to melt the cement. By changing the amount of shellac from one-half to two and one-half or three times the weight of the wax resulting cement will vary from moderately ductile to quite hard and brittle form.

An excellent aquarium cement is made by mixing ten parts each by volume of litharge, fine sand, and plaster of Paris and one part of powdered rosin with enough boiled linseed oil to make the mixture somewhat stiffer than ordinary putty. The quarium can be filled with water in three or four days, even though the cement may not have set hard.

Rubber cement is made by dissolving crude rubber in gasoline or benzine (benzol). Other ingredients, such as dry mineral fillers, gums, or resins, are sometimes added to adapt the cement for particular purposes.

In cementing two rubber surfaces together they should first be thoroughly cleaned with gasoline. This is absolutely essential to secure satisfactory adhesion. If the surfaces of the rubber are very smooth, they should be roughened slightly with sand-paper and again cleaned. A small quantity of cement is now spread over each surface, and after allowing a few minutes for the major part of the solvent to evaporate the two surfaces are stuck together and kept under pressure for several hours to give the solvent time to evaporate completely.

NOVEL CONCRETE ROOFING CONSTRUCTION

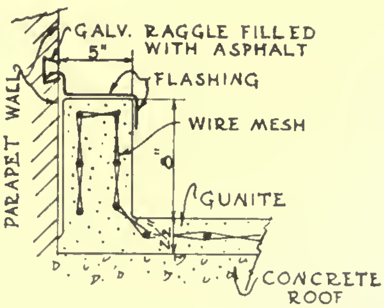
IN 1916-17 a roof covering was installed on Building A of the Ford Motor Company at Detroit. The conditions are so severe and unusual, the construction so novel and the results so satisfactory that those interested in roof covering will find this description worth careful consideration. The roof of this building is 85 ft. wide and 900 ft. long. It is divided into panels 85 ft. square which pitch, with a fall of 18 in., to a sump in the center. Above the roof, supported on small brick piers, are two lines of large pipe to which are attached revolving spray heads. Through these heads the water used to cool the large gas engines is pumped, projected into the air and in falling to the roof is cooled. The water returns to a reservoir and is recirculated. Thus the roof is subjected to a continuous flooding of hot water during the working days of the week and is dry on Sundays when in some instances the thermometer has registered 20 degrees below zero. These are very severe conditions to be imposd on a roof covering.

GENERAL VIEW OF COMPLETED ROOF SLABS. SLAB IN FOREGROUND IS ON ONE OF THE BAYS FIRST TREATED, SHOWING FENCES AND SPRAY PIPING IN PLACE

A number of bays were covered with several plies of asphaltic felt and pitch, aggregating about ⅝ in. in thickness. Elevator pent houses projected above the roof, brick piers were built on the structural 6 in. concrete roof slab and numerous humps were made where shafting hangers were attached to the roof. The felt and pitch roofing was made continuous over the ridges between the several bays and was flashed into the parapet wall on one side, into the pent house walls and the brick pipe support piers. This roof covering failed and leakage through the concrete slab if allowed to develop would cause serious damage in the pattern and dynamo winding shops, moving picture laboratories and other occupancies. Mr. John V. Schaefer was invited to undertake the rehabilitation of the roof covering by the use of the cement gun.

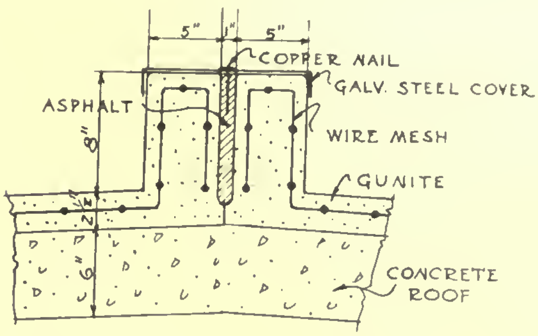
Two bays were covered to a depth of 2 in. with a 1 to 3 concrete reinforced in two directions with 0.04 sq. in. of steel per foot of width in the form of wire mesh, in two layers. The roof was covered with pitch and the two layers of wire mesh were laid on it, after which the concrete was shot on while the wire was raised well into the body of the slab. At the ridges curbs were constructed, the construction joints filled with mastic and the curbs covered with flashing. Flashing was also used along the wall.

Some small cracks opened after a time and there was slight leakage, which, however, could not be traced to the surface cracks. The work was so satisfactory that two additional bays were treated in the same manner and are still in use.



SECTION SHOWING ARRANGEMENT OF FLASHING WHERE CURB COMES AGAINST PARAPET WALL

In 1917 four additional bays were added to the building and the same general method was followed, excepting as here described. The 6 in. concrete roof slab was finished smooth and over this was placed a ½ in. layer of sand which was covered



SECTION THROUGH EXPANSION JOINT BETWEEN ADJOINING BASINS

with a layer of tarred felt to prevent the sand from being blown away by the cement guns. On this, with suitable spacers, were placed the two layers of wire mesh as before, and in addition there was used a ¼ in. square rod 18 in. centers in both directions. Through this was shot a 2½ in. layer of 1 to 3 mix concrete. The brick pipe-support piers were built on top of the concrete and curbs and wall flashing were constructed.

In this way the finish concrete slab was kept entirely free, except at the sump, from the roof slab and the parapet, and free to expand and contract at will without reference to any other structure. These basins have no surface cracks and no leaking has been reported to date.

Contraction and expansion occur in concrete as in all other materials. In this case, the finish concrete slab was attached to the roof structure at the sump and at no other place, which left it free to move except for the frictional resistance between it and the substructure. This frictional resistance on such a large area is considerable, and to prevent disruption of the slab due to temperature changes, steel is needed to distribute and equalize the stresses. When the edges of the concrete slab are fixed, by attachment to a wall or otherwise, contraction causes a shortening of the slab and if this stress is as much as 300 lb. per square inch, the slab cracks at one or more points and the sum total of the width of the cracks is equal to the total amount of contraction.

The designing of the finish slab was based on this theory. The co-efficient of expansion of concrete being known, the total probable stress was computed. Based on a tensional stress of 300 lbs. per square inch in the concrete the thickness of the slab was determined. The amount of steel was also determined on the basis of the total stress due to assumed temperature changes, for, when the concrete cracks the steel must carry all the stress. Steel and concrete have practically the same co-efficient of expansion and the embedding of the steel in the slab is equivalent to making a new material. By placing the steel in mesh form in small units closely and uniformly distributed, cracks which may appear in the concrete will be microscopic in width and be so shallow that water cannot go through the slab.

By the use of the cement gun, the concrete slab is impacted in place by compressed air and is an extremely dense, uniform material. It does not have a smoothly finished surface and it is probable that if the surface were troweled smooth, it would result in such a disarrangement of the particles that it would materially reduce the density of the surface with resulting loss in resistance to the penetration of water. The natural surface is satisfactory for roofing purposes. The record of this roofing under very severe exposure, entitles it to careful consideration for places where a permanent roofing is necessary.

National Egress Code

THE National Fire Protection Association was requested by the American Engineering Standards Committee to undertake the preparation of a National Egress Code covering the subject of egress in all of its ramifications. The Association accepted this invitation, and asked the Committee on Safety to Life to undertake the work. This follows the successful operation of the Factory Egress Code approved in 1918, and the presentation of a report on Proposed Egress Requirements for Department Stores at the annual meeting in June, 1921. The subject of egress requirements for schools, it is expected, will be completed in time for action at the annual meeting in 1922.

The tentative plan of the Committee is to provide standards for every means of egress, and to establish the egress requirements for all important classifications of buildings. It is expected that the work will take several years to complete, but it is hoped to complete one or more divisions each year.

BOOK REVIEWS

HANDBOOK OF BUILDING CONSTRUCTION. Editors in chief, Geo. A. Hool and Nathan C. Johnson, assisted by 44 specialists. Two volumes; 1474 pp., illustrated, 6 x 9 in. flexible binding. New York, McGraw-Hill Book Co., Inc.

A TIME arrives in the career of every man when he feels the need for classifying his working data and indexing it for instant use. How little is really needed by any individual is seen on examining his personal note book, provided he had a good basic education in his vocation. In 1884, Mr. Kidder issued in handbook form the notes he had found useful as an architectural engineer and builder and the book became popular and in time well nigh indispensable. Today it is fat and represents the work of a number of men who keep it up to date since the death of the author.

The work under review is a twin to Kidder, for it covers the same ground. The difference is that the first edition of Kidder appeared when there were few architectural schools in the country and before the skyscraper was invented. Technical data required by architects and builders were simple in character and were given whenever possible in the form of tables, formulas usually being in arithmetical form rather than algebraic. In all the later editions the original plan has been closely adhered to, the work not being so much a treatise as a working manual kept up to date. This new two-volume treatise edited by Hool & Johnson is the work of 46 men, each a specialist in his line and faithfully represents conditions as they exist today. An endeavor has been made to omit nothing which can possibly be of value to an architectural engineer; which endeavor has met with success. One can imagine that the two editors-in-chief sat down with a specification reminder before them and then selected the contributors, each for his special fitness to deal with an assigned subject. In spite of the large number of contributors it is to all intents and purposes a single treatise, which implies a tremendous amount of well-directed labor on the part of the two editors-in-chief. It is a work for technical men employed in the offices of architects having a large practice and for them it is a good treatise on architectural engineering from the design of the structural frame to the design and installation of plumbing, heating, lighting, ventilation, refrigeration, etc., with all finishing of surfaces, as well as discussions on the principles involved in the layout of special purpose buildings such as schools, colleges, churches, museums, railway stations, etc. The general practitioner in small and medium sized cities who does most of his own work and whose schooling did not include a college course in mathematics and mechanics will find many of the pages terrifying in appearance. Two thirds of the work, however, is non-mathematical and the numerous worked examples in the stiffest looking chapters do much to reassure those who are afraid of mathematical expressions.

ENGINEERING CONSTRUCTION IN MASONRY AND CONCRETE, by William Henry Warren, LL.D. 500 pp., 200 figs. in text, 6 x 9 in., cloth. New York: Longmans, Green & Co.

THIS book contains Part II of a two volume treatise, Part I dealing with Steel and Timber. The author is Challis Professor of Engineering and Dean of the Faculty of Engineering, University of Sidney, N. S. W. It is an engineering treatise on design in which American data are so freely quoted and used that the nationality of the author may be forgotten, for he has not written a book useful only to British engineers. There is a chapter devoted to stress-strain relationship in brickwork, concrete and stone masonry compared with steel, followed by a discussion of earth pressures against retaining walls. The second chapter discusses the stresses developed by earth pressure in the bracing of trenches and tunnels, with the design of sheet piling, tie rods and anchorages. In four chapters the author takes up limes, cement, mortar, brickwork, building stones, clay and concrete pipes and properties of concrete. Reinforced concrete building design fills four chapters followed by a chapter on retaining walls and one on stresses in grain bins. A chapter is devoted to high masonry dams; one to bending with axial forces; one to reinforced concrete arch ribs with fixed ends; one to abutments and piers and one to foundations. In an appendix is presented a method of analysis in the rigid arch rib which has been developed by W. A. Miller, Lecturer in Civil Engineering, University of Sydney. It is an admirably written and well arranged basic text book on the subjects treated.

PROPOSED SPECIFICATIONS FOR AN OFFICE BUILDING, GRADE E. Pamphlet; 6 x 9 in. 10 pp. Pub. by National Fire Protection Association, Boston, Mass.

THIS pamphlet is the report of an endeavor to meet an ever increasing demand to render ordinary "non-fireproof" commercial buildings reasonably "slow-burning." A typical joisted brick building has been selected as the first example to be treated. It is intended to represent the highest grade of fire safety reasonable to be secured in such construction. It is believed that if such a building were under the protection of even a moderately efficient fire department, a fire could be confined to one story.

CURRENT NEWS

Happenings and Comments in the Field of Architecture and the Allied Arts

Frank E. Davis, One Time Baltimore Architect, Dies in California

WORD has been received in Baltimore of the death of Frank E. Davis, one of the architects of the old school.

Mr. Davis retired some years ago because of ill health and moved to California to make his home with his sons, Francis P. and Walter Swindell Davis, well known practising architects in Los Angeles.

Mr. Davis, besides his local practice in Baltimore and other cities in Maryland, did much work in Virginia and lower Pennsylvania, including many churches, schools and public buildings. He studied with the old firm of Lind and Murdock and was later associated with Thomas Dixon; in the later years of his life he was also associated with his brother, Henry R. Davis.

He died in his 82nd year and is survived by his widow and five children.

Chicago Gets Biggest Architects' Library

THE Buy Your Home in State Street Exposition, Chicago, is to install a library and clubrooms for architects, to be operated free. Leading architects are to meet to arrange for the purchase of books, photographs, magazines and foreign studies to make the library the most complete in America.

One section will be devoted to works on landscaping, interior decorating, city planning, financing and lines related to architecture.

Landscape Architect Ernst G. Frodenstrom is beginning to get the bare 400x200 floor into shape. Hundreds of evergreen trees in tubs are being set up, hedges are being planted, flower boxes are in the windows. About $100,000 is to be spent in transforming the floor into a suburban village. In the exhibit material dealers, architects, real estate men and every line having to do with home building will rent space permanently.

Housing in Pittsburgh

A MOVEMENT is under way in Pittsburgh, sponsored by the Chamber of Commerce of that city, to build, this year, 1,000 houses at a moderate price, to be sold to families on easy terms. The Pittsburgh Chapter of the American Institute of Architects and the Pittsburgh Architectural Club have offered their services without charge in preparing the plans, and material dealers have offered marked concessions in prices.

Similar action in other cities will do much to effect the much needed relief in the housing situation existing today.

Javanese Show Engineering Skill in Rope-Bamboo Construction Work

THE Javanese attain remarkable accomplishments with the use of the bamboo. An interesting specimen of the possibilities of the material and the people is to be seen in a bridge which has been in constant use on the island for a great many years with no more attention than a little patching once in a while. These people have no nails, no iron, no true wood; they are forced to rely entirely upon bamboo for the structural parts, and upon a rope of their own manufacture to effect the junctures.

The span is almost 150 feet, and the width of the roadway some four feet. The bamboo columns at either side of the stream are built up of a double length of from fifty to sixty bamboos, tied up with a rope and firmly pressed together by forcing a quantity of wedges between rope and bamboos. Such columns are found to be of unusual strength and elasticity.

The original element which the Javan natives have brought to the construction of these bridges is the rope. This is made of a fiber taken from the native aren-palm, which grows all over the island. It makes a rope that resists effectively the heavy, decaying action of the hot and damp tropical climate with its legions of fungi; in fact, it lasts for many years without any indications of rotting. So between this rope and the bamboo the natives are able to achieve a semi-permanent structure for which it would be hard to find a peer on the ground of cheapness and durability.

Will Rebuild Ruins

Mexico to Reconstruct Great Pyramids of Ancient Tribes

AN appropriation of $50,000 for reconstructing the ruins of San Juan de Teotihuacan has been approved by President Obregon.

San Juan is the site of the two great pyramids of Mexico, one to the sun and the other to the moon. Adjacent to these piles is a buried city which flourished probably 4,000 years ago.

Concerning Russian Architecture

Russian Style Is Not to Be Mistaken; Slav Touch Is Apparent

RUSSIAN architecture is unmistakable, states the *National Geographic Magazine*. A house, a church, a factory, or just a plain shed will show the touch of the Slav. Russian elements are noticeable in the windows and doors, in little and big lines of decoration, as well as in the general plan and shape of a building. No matter how poor the cottage may be, there is something distinctive about it. Even those miserable little refugee shacks built of tin cans filled with mud "sported" a Russian cornice, or a Russian window frame, though these racial architectural touches meant much extra labor. The Russian architecture is unique, in that it can carry a lot of what we call "gingerbread" and not appear cheap, trashy or bizarre.

Seeks $2,000,000 Archives Building

AN appropriation of $2,000,000 for a government archives building at Washington, D. C., would be authorized under a bill introduced in the House recently by Representative Elliott, of Indiana. At the present time documents of priceless value ranging all the way from the Declaration of Independence to the draft records of 4,000,000 men are exposed to destruction.

The bill would make the librarian of Congress custodian in charge of building, and in it would be preserved all historical documents, records or relics, now owned or to be acquired by the government.

A "Model Town" for Canada

THE town of Nicola, British Columbia, has recently been sold to a former member of the British parliament, who plans shortly to convert it into a model English town, a perfect village green replacing the present business section. In addition to acquiring the town he purchased twenty thousand acres in the immediate vicinity. Plans under contemplation include the construction of a summer resort for tourists and an irrigation system.

Time Honored Wall Papers

Those in Old Houses of Portsmouth, N. H., Present Marvelous Scenes

THE antique wall papers (found in the Colonial "mansions" of Portsmouth, N. H.), marvelously preserved, are too animated for restful companionship, states Agnes Repplier in a recent issue of *Harper's Weekly*. Only a nerveless race could have gazed all their lives upon such a monotonous variety of incidents.

Thomas Bailey Aldrich tells us that a typical paper, familiar to his childhood, displayed over and over again a group of English country people wearing Italian hats and dancing on a lawn which ended abruptly in a sea beach, on which stood a fisherman angling for a whale, and wisely indifferent to the issue of a terrific naval combat which was being fought just beyond the reach of his fishing rod.

Grander in scale, but as irrelevant in detail, is a very handsome paper on the walls of the athletic club, where we behold gaily dressed ladies and gentlemen passing under Virginia's Natural Bridge to get a good view of Niagara Falls, and turning from the barbarous splendor of an Indian war dance to witness a drill of West Point cadets.

The painted walls of the Warner house, discovered by chance in 1850, present a wide choice of disconnected subjects. Abraham prepares to sacrifice Isaac under the supervision of Governor Phipps, and foreign cities of impossible picturesqueness stretch before the eyes of fair Priscilla at her spinning wheel.

Grant LaFarge Honored by Princeton

AT the 147th commencement of Princeton University, C. Grant LaFarge, of New York City, was awarded the honorary degree of Master of Fine Arts. Dean West, in presenting the candidate for honorary degree, used the following formula:

"Christopher Grant LaFarge, former vice-president of the American Institute of Architects, past president of the Architectural League of New York, trustee and secretary of the American Academy in Rome, an artist of constructive originality, with brilliant and versatile gifts, tempered by sound historical judgments; designer of impressive civic, domestic, academic, and ecclesiastical structures; the incisive critic to whom his fellow-artists gladly come for searching review of their plans, widely read in literature, a writer of vivid and graceful style, a lover of outdoors—at home on swift water or in the winds, a living impulse in the American Academy in Rome, a humanist ardently devoted to the cause of art and letters for the ennobling of American life."

Paris to Have a New Latin Quarter

University City to Be Founded Outside of City, According to Plan Under Way

IT is announced that the long discussed project for the transfer of the students' quarter of Paris from the old Latin quarter to the outskirts of Paris on space made vacant by the demolition of the wall of Paris appears to be on the way to realization.

The city of Paris will sell about twenty acres of land for the building of a students' city, including lodgings, recreation grounds and gymnasium.

The University of Paris will undertake the construction of the necessary buildings.

It is not expected that this will greatly change the aspect or the characteristics of the Latin quarter, but it will provide accommodations for many foreign students who, unable to find lodgings, are practically excluded from the university.

"Roosevelt House"

Erection of Building at Harvard University Is Proposed

A PROPOSAL for the erection at Harvard University of a building to be known as "Roosevelt House" was made in a recent report to the Associated Harvard clubs by a committee of alumni.

The building, as proposed, would contain a working floor for the use of departments of the university, and particularly for conferences between tutors and students, together with a memorial reading room where Roosevelt memorials of all kinds would be kept.

The committee suggested that all books and state papers written by the former President, and books written about him, together with hunting trophies and other material relating to him, should be kept in the reading room, with the hope that his room "would be resorted to by all who wished to know or write about him."

The chairman of the committee which presented the report is Charles G. Washburn of Worcester, classmate and biographer of Col. Roosevelt.

Win Fellowships in Academy in Rome

AWARDS in fellowships in architecture, painting and sculpture in the 1921 competition for the Prix de Rome were recently announced by the American Academy in Rome.

Winners were Frank H. Schwarz, New York, painting; Edward A. Amateis, sculpture, New York; V. L. S. Hafner, architecture, New York. The fellowships carry three years of post-graduate study in the Academy, with liberal allowances for travel and other concessions amounting to $1,000 a year.

Book Notes

THE ENGLISH VILLAGE CHURCH: EXTERIORS AND INTERIORS. By ALFRED HOPKINS. 112 plates. Full cloth, size 9 x 12. William Helburn, Inc., New York.

DURING an extensive trip awheel through rural England, Mr. Hopkins visited most of the churches that are illustrated in this book. With this intimate knowledge of the various structures, he has been able to select the pictures that illustrate them with particular reference to the best points of view.

Naturally a topic so alluring as the English country church has been many times discussed and often illustrated. That feature of the present book that sets it apart, and in some measure above previous books on this subject, is exactly in the better taken views and their selection as to the correct accentuation of the architectural interest.

The work has a very decided suggestive value and should be a part of the architect's working library.

ITALIAN RENAISSANCE FURNITURE. By Wilhelm von Bode. Translated by Mary E. Herrick. Full cloth. Size 7 x 10 inches, with 134 illustrations. New York, William Helburn, Inc.

THE very considerable interest shown by architects and connoisseurs in period styles in this country has made the publication of this interesting series of photographs of the best types of furniture during the period of the Italian renaissance most timely. Aside from its suggestive value in matters of design, the book is of interest on account of the literary character of the accompanying article on the production of furniture and the perfection of its design in Florence and Tuscany during the Middle Ages.

THE BOOK OF BUNGALOWS. By H. Randall Phillips. Full cloth, 160 pp., size 6 x 8½. London, Country Life, Ltd. New York: Charles Scribner's Sons.

THIS book treats the bungalow in design, plan and general equipment, entirely from the English point of view. It is purely for the prospective bungalow builder and contains little not already known by architects and builders. Many of the designs are, however, of interest as they present the livable and thoroughly domestic elements that are essential in this type of dwelling.

SHADES AND SHADOWS. By DAVID C. LANGE, M. S. Full cloth, 135 pp., size 5½ x 8½ inches. New York: John Wiley & Sons, Inc.

THIS book has been compiled for use as a text book on shades and shadows by architectural students. As architectural students in many colleges receive their early training under engineering teachers, an attempt is made to serve such students by assuming the point of view at the outset of such engineering training, thus leading them directly to the more artistic point of view.

The subject is treated by the author with complete authority and the book will be useful to the student in architecture.

The AMERICAN SPECIFICATION INSTITUTE

127 No. Dearborn St., Chicago

It is exceedingly gratifying to the Board of Governors to be able to announce that the roll of membership is increasing steadily, the responses coming from all sections of the country. It is felt that the organization of the American Specification Institute has been accomplished at an opportune time, for many architects and engineers have now time available to devote to their share in the activities of the Institute.

There is evidenced a strong sense of appreciation of the value of co-operation among the members and prospective members in the creation of a national organization for the study and improvement of specification writing. The Board of Governors earnestly requests the members to assist them in spreading the news of the creation of the Institute and to present to men eligible for membership the advantages that are to be derived from such an association. The list of members published in The American Architect, issue of June 22, together with the list of additional members given below should be studied, and members located in the same vicinity should arrange meetings for the discussion of the activities of the organization and of the bulletins and other work submitted to members for their information and criticism.

When the membership in any one city warrants it, the Board of Governors wishes to organize a chapter or section as it is realized more concerted action and perhaps greater enthusiasm for the work to be done will be possible under such a scheme of organization. The Executive Secretary's office will endeavor to render all possible assistance in the organization of such regional groups, and it is hoped that by next fall several sub-organizations of such character may be formed.

The members enrolled since the last publication are as follows:

J. R. W. Ambrose, Engineer, Toronto, Canada.
Buck & Sheldon, Engineers and Architects, Hartford, Conn.
T. E. Billquist, Architect, Pittsburgh, Pa.
John T. Comes, Architect, Pittsburgh, Pa.
Sigmund Braverman, Architect, Akron, Ohio.
Winsor Soule, Architect, Santa Barbara, Cal.
J. William Beal Sons, Architects, Boston, Mass.
J. Edward Keirn, Architect, Pittsburgh, Pa.
Eugene John Stern, Architect, Little Rock, Ark.
David S. Castle, Architect, Abilene, Texas.
William Rice Pearsall, Architect, New York City.
Frank Oliver Adams, Jr., Architect, Tampa, Fla.
W. M. Vories & Company, Architects, Omi-Hachiman, Japan.
Louis H. Jordan, Architect, Winnipeg, Canada.
Arthur Van Horn, Architect, Bismarck, N. D.
Lewis W. Foster, Architect, Boston, Mass.
J. A. Fouilhoux, Architect, New York City.
Leslie McQuilkin, Architect, Toledo, Ohio.
Herbert D. Rushmer, Architect, Utica, N. Y.
H. F. McCray, Architect, Reno, Nev.
George E. Conrad, Architect, Chicago.

Work on the bulletins has been delayed somewhat because of the length of time some members have had to take to formulate their suggestions.

While all members have not responded there are quite a number of very excellent criticisms and suggestions which are now being studied and tabulated by the Board of Governors for later submission to the membership. Subsequent bulletins will be issued with regularity upon the understanding that criticisms or suggestions must be submitted at the time set in the letter accompanying each bulletin. It is understood, of course, that many members find it difficult to devote time to these matters during office hours, and it is hoped the work of the Institute eventually will so co-ordinate the routine work having to do with specification writing that time will be available for consideration of the Institute bulletins.

Attention is directed to our new member from Japan, W. M. Vories & Company, who have expressed an appreciation of the objects and aims of the Institute and a desire to share in the benefits to be derived from membership.

The Executive Secretary's office has received from a nationally known trade association one of the most thoroughly prepared specifications, accompanied by supplementary notes and explanatory data, that has ever been produced. A request has been made that a certain number of copies be made available to members of the Institute, arranged for filing in the members' loose leaf cover if they desire it placed there. The Specification Institute will endeavor always to have placed in the hands of its members all similar data, especially when it has been prepared as well as the series under discussion.

[illegible]

TOWER—RAVENNA, ITALY

(A purposely constructed leaning Tower)

THE AMERICAN ARCHITECT
The ARCHITECTURAL REVIEW

VOL. CXX WEDNESDAY, AUGUST 31, 1921 NUMBER 2375

EARLY BRICK HOUSES of SALEM COUNTY, NEW JERSEY

BY HAROLD DONALDSON EBERLEIN

THE early brick houses of Salem County, in New Jersey, constitute a distinct episode in the history of American domestic architecture. The interest attaching to them centres about their straightforward sturdiness, the quality of the brickwork they display, and the obvious connection of their details with the traditions brought overseas by their builders.

John Fenwick, the founder of the colony, having acquired the interests and privileges formerly granted to Lord Berkeley in that part of West Jersey, arrived in 1675 and, as lord proprietor of the region, proceeded to establish his settlement on the banks of Salem Creek. In addition to the English colonists whom he brought out with him, and whose numbers were augmented from time to time by fresh immigration, there was a certain number of Swedish settlers in the neighborhood, who had established themselves at a considerably earlier date but now readily yielded their adherence to the new order. These Swedes, however, kept up close relations with their Swedish kinsmen, settled on the opposite shores of the Delaware River and farther to the north along the Jersey shore, and the results of this intimate intercourse are to be traced in the fabric of the houses erected, as we shall presently see.

These old brick houses of Salem County were nearly all completed by 1730 or, at least, within a very few years after that date. For this reason they display a singular uniformity of character and present a mass of material for examination sufficiently homogeneous to avoid perplexity but with enough diversity to ensure interest. Incidentally they embody enough suggestive value to make their examination worth while, and afford an additional justification for their discussion.

So far as plan is concerned they are exceedingly simple and of such character that a measured reproduction of their arrangement would be of little interest or utility. Many of the houses consisted of a "high part" and a "low part," to describe them according to local parlance. The "low part," which was entered at the ground level, and oftentimes was the first portion of the house to be built,

West end, House at Hancock's Bridge on Alloway Creek, near Salem the "high part," which was more commodious, being added a few years later as the settler's means increased and a growing family demanded more accommodations. In the "low part" is found the spacious kitchen, with an enclosed staircase leading to one or two chambers in the storey above. It is locally said that the "low part" had its floor at ground level so that a horse, drawing a great back log by a chain, might be led in at one door and out at the other. One can understand the necessity, or at any rate the convenience, of horse-drawn back logs upon seeing these old kitchen fireplaces which had openings anywhere from seven to eleven feet in width. Not all of the early houses had high and low parts, as we may see by the Denn House on the banks of Alloway Creek, but the division was generally prevalent.

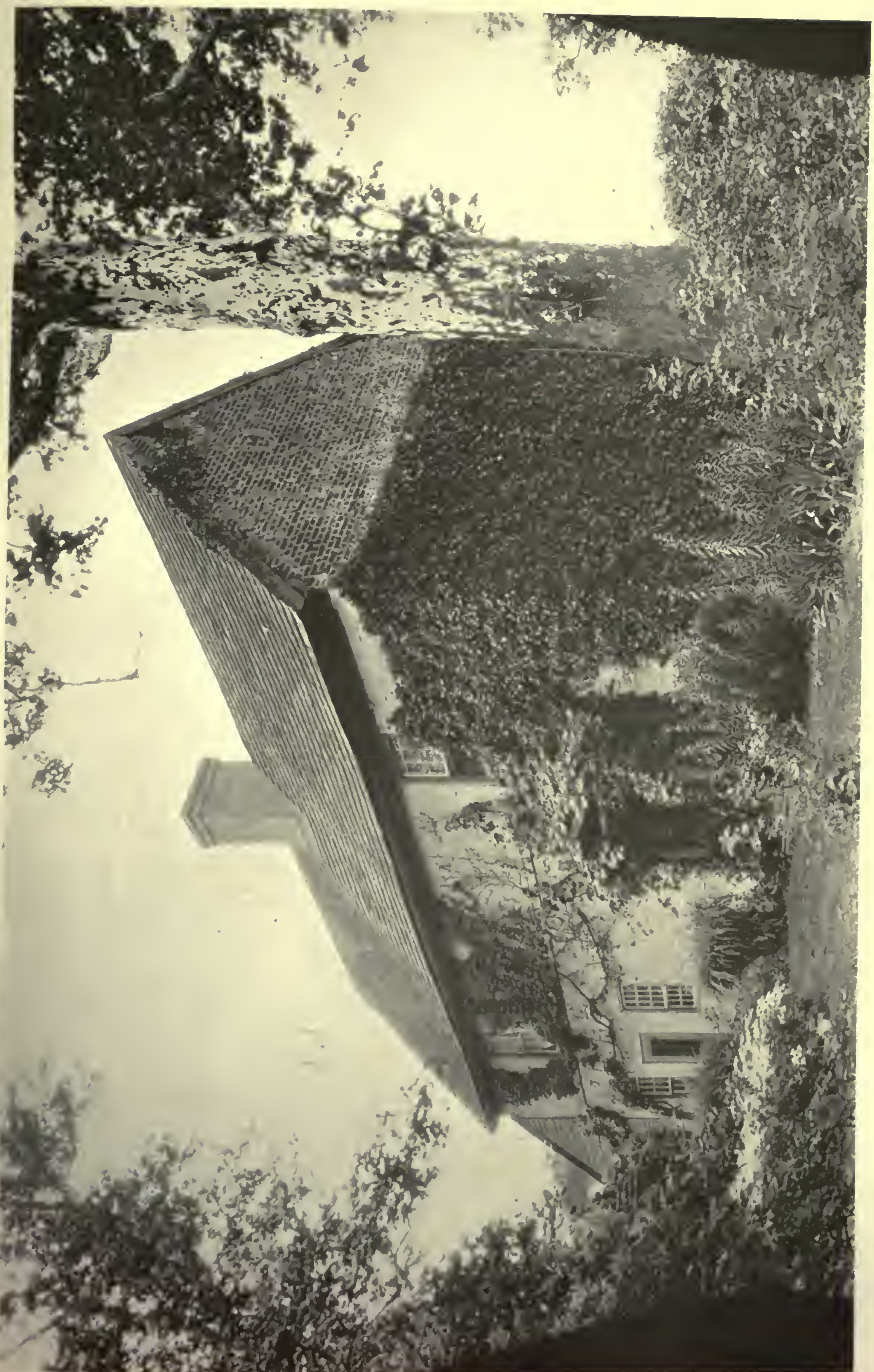
Denn House,—(frontage towards water) on Alloway Creek, near Salem

The "high part," with its floor raised two or three feet above the ground, and a cellar underneath, ordinarily contained two rooms—a large room into which one could enter from the outside and an enclosed staircase leading to the rooms on the floor above, and a smaller room that had no outside entrance. The larger room corresponded in a general way to the old English hall and the smaller room to the withdrawing room. The "high part" and the "low part" were connected on the ground floor by a short run of steps; abovestairs there was usually no connection.

These houses had steep-pitched or else gambrel roofs. Of the four houses illustrated, the house at Hancock's Bridge and the Denn House belong to the former class, while the Pledger House, just outside of Salem, and the Mecum House, on Finn's Point Road, are of the gambrel roof type. In the case of the Mecum House it will be noted in the picture of the gable end that the line of the old gambrel is plainly discernible in the brickwork, the low-pitched gable being of much later construction when the house was altered somewhat and enlarged. Within the past two or three years a "progressive" owner has bestowed upon the Pledger House a brand new roof, cornice, and dormers, and a veranda. The mutilations are perfectly obvious, and the eye can easily trace the line of the old gambrel in the brickwork at the end of the house so that it is not a difficult matter mentally to reconstruct its pristine aspect. The little windows now bricked up — we see them in the ends of the Hancock's Bridge, Pledger, and Mecum Houses—were never intended to light the rooms but admitted light to the powder closets, where wigs were duly powdered, and were closed at the time of the window tax.

Brickwork, Denn House (1725) on Alloway Creek, near Salem. Some of the stretchers are nearly ten inches long

The bricks of which these houses are built are of an exceptionally rich, deep red and in



West Front—Denn House (built 1725) on Alloway Creek, near Salem texture they show the presence of a considerable quantity of sand. The vitreous glaze of the headers varies in color from a deep blue or blue-black to a light greenish gray, the abundant diversities of hue imparting both an unusual and agreeable effect to the walls. The size of the bricks was regulated by a law passed in 1683, and it was then ordered that "the brick to be made must be two and three-quarters inches thick, four and an half inches broad, and nine and an half inches long, to be well and merchantably burnt." They were to be viewed and appraised by two persons authorized by the court, and if they found the bricks faulty, they were to be broken, and the makers of them fined by the court.

West end, Mecum House. The lines of the original roof may be seen in the brickwork

This stipulation, however, did not produce absolute uniformity of size, although the quality is universally good. The variations in size from the standard set by this early law are probably to be ascribed to the fact that in many cases the bricks were made and burned at the spot where the house was to be erected and the workmen engaged in brick making seem to have judged by eye rather than by a set rule or measure. Even in the same house the bricks are by no means always of the same size. The writer has measured a great many of them, in different houses, and found them ranging from two and a half to nearly three inches in thickness, three and three-quarters to five inches in breadth, and seven and a half to nearly ten inches in length. In the latter case the workman evidently had some lurking recollection of the old Tudor bricks. In almost no instance do we find the modern two by four by eight-inch measurement. Not a few bevelled and specially moulded bricks were also made to cap the weather courses.

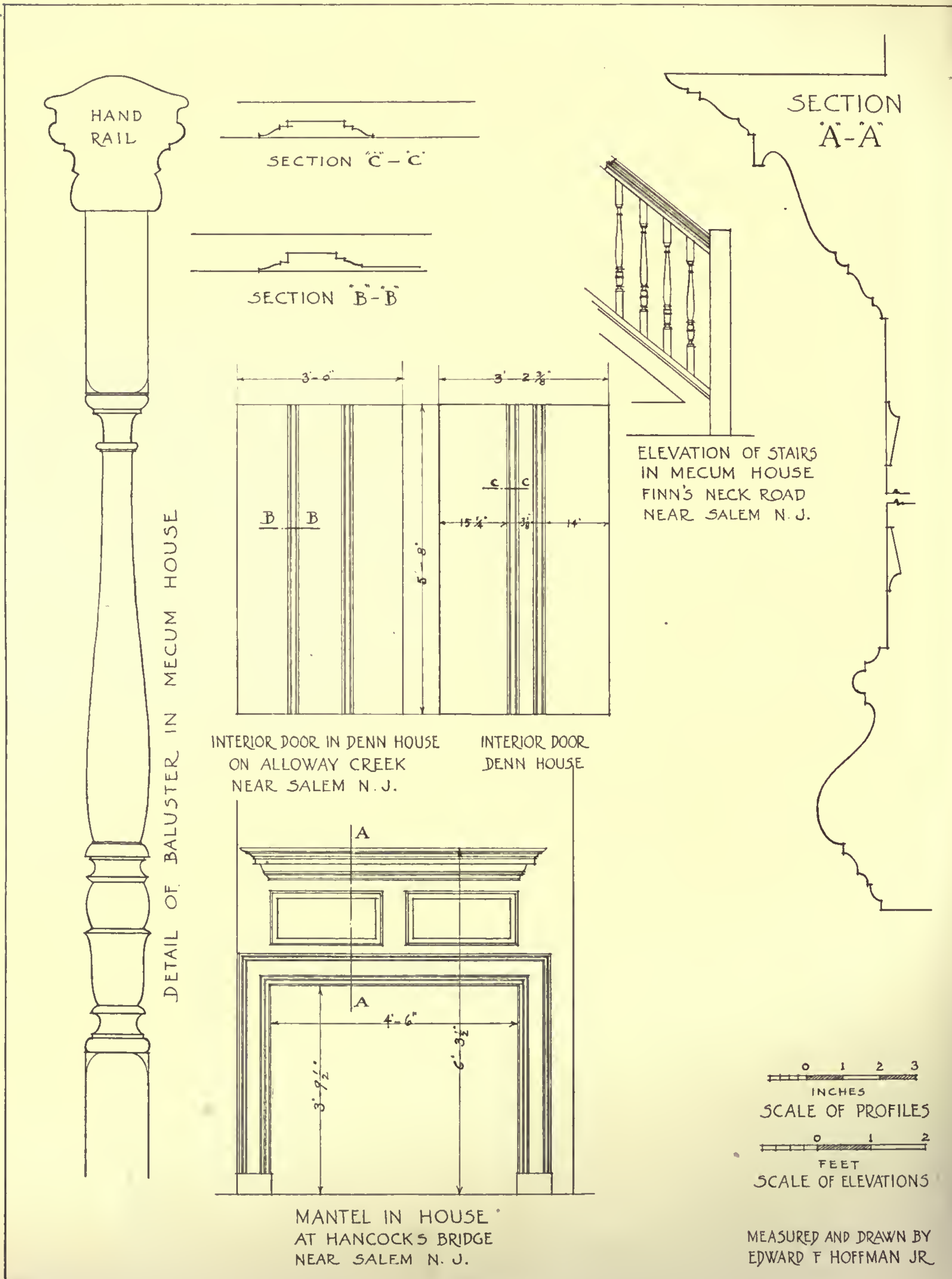
In nearly every house the brickwork is as staunch and perfect now as it was the day the workmen left it. Flemish bond was commonly employed except where it was desired to produce some especial decorative effect in the way of letters, figures to commemorate the date of erection —nearly all the houses are thus dated—or some more ambitious ornamental device, a practice evidently much in favor in that neighborhood. On such occasions the workmen resorted to sundry ingenious bonds without, however, diminishing the stability of the wall, as the test of time has proved. One of the most striking pieces of pattern work thus executed is seen in the herringbone design on the end wall of the Hancock house where zig-zags cover the entire surface from bottom to top, save in the space within the gable reserved for the owner's initials and the date figures. The narrow chevrons, the letters and the figures are wrought with glazed headers. At the Denn House the gable ends show some lozenge forms and a narrow stepped border, besides the initials and date, but the whole scheme is much simpler.

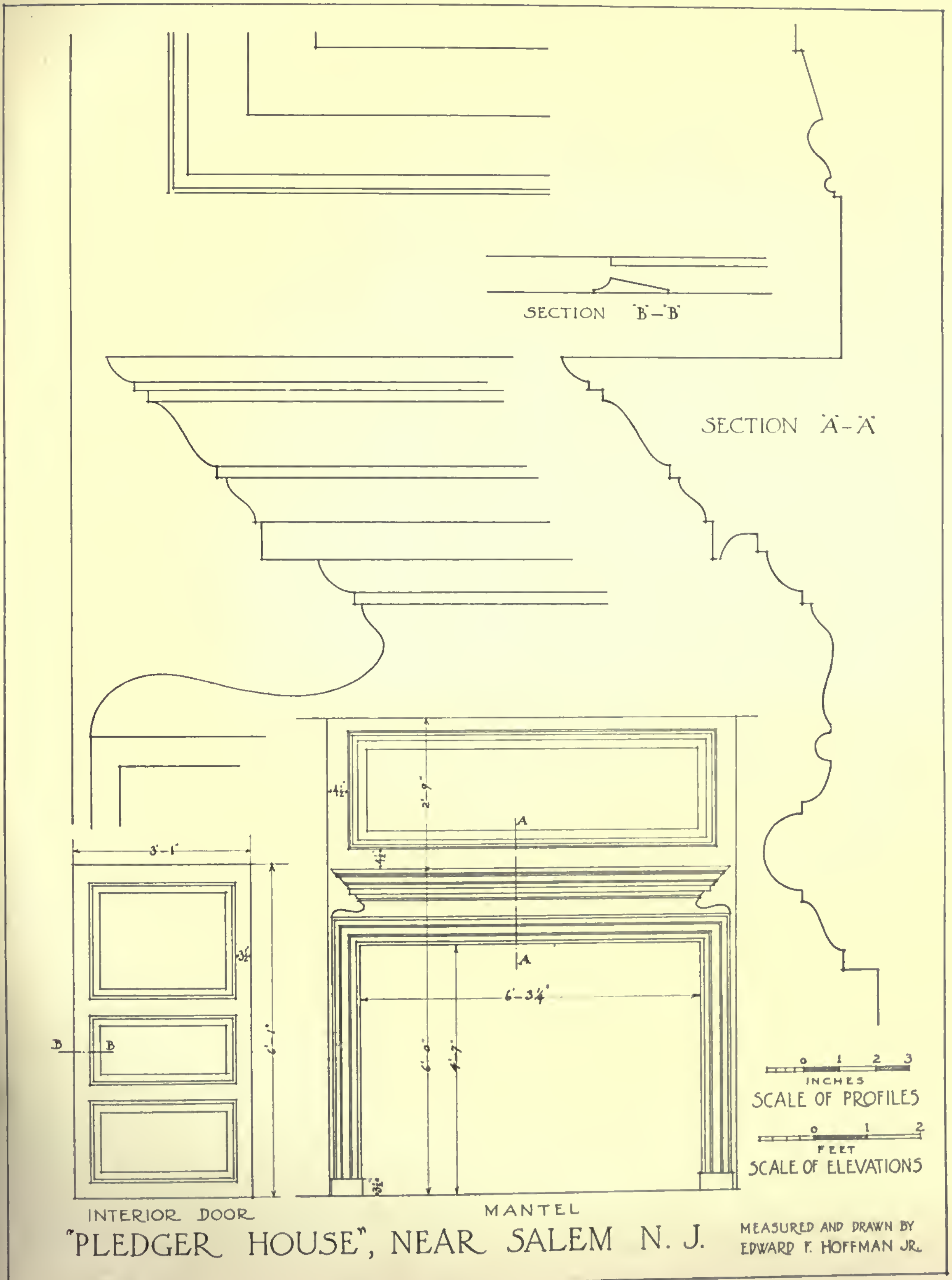
Liverpool bond occurs now and again, sometimes in conjunction with Flemish bond, sometimes by itself. The Mecum House, for example,

East end and North porch, Pledger House, Salem

South front of a house at Hancock's Bridge, Alloway Creek, near Salem

South front and East end, Pledger House, Salem


HAND RAIL
DETAIL OF BALUSTER IN MECUM HOUSE
SECTION "C"–"C"
SECTION "B"-"B"
SECTION "A"-"A"
ELEVATION OF STAIRS IN MECUM HOUSE FINN'S NECK ROAD NEAR SALEM N. J.
3'-0"
3'-2 3/8"
5'-8"
15 1/4"
3 1/8"
14"
B B
C C
INTERIOR DOOR IN DENN HOUSE ON ALLOWAY CREEK NEAR SALEM N. J.
INTERIOR DOOR DENN HOUSE
A
A
4'-6"
3'-9 1/2"
6'-3 1/2"
MANTEL IN HOUSE AT HANCOCKS BRIDGE NEAR SALEM N. J.
0 1 2 3
INCHES
SCALE OF PROFILES
0 1 2
FEET
SCALE OF ELEVATIONS
MEASURED AND DRAWN BY EDWARD F HOFFMAN JR


SECTION "B"–"B"
SECTION "A"–"A"
3'-1"
3½"
6'-1"
B
B
4½"
2'-9"
A
4½"
A
6'-3¼"
6'-0"
4'-7"
3½"
0 1 2 3
INCHES
SCALE OF PROFILES
0 1 2
FEET
SCALE OF ELEVATIONS
INTERIOR DOOR
MANTEL
"PLEDGER HOUSE", NEAR SALEM N. J.
MEASURED AND DRAWN BY
EDWARD F. HOFFMAN JR.

has a base of Liverpool bond, while the wall above it, in the front of the house, shows Flemish bond. The end wall, however, is altogether in a species of freely interpreted Liverpool bond in which the number of stretcher courses between the header courses seems to have depended entirely upon the whim of the bricklayer, so that in places it is virtually running bond.

The frequent occurrence of lozenge and chevron ornaments, wrought in glazed headers, can probably be attributed altogether to English precedent, although one cannot help suspecting that the Swedish element in the colony may have given the practice some impetus. At any rate, the same methods of decoration occur at Wilmington and at other places on the opposite shore of the Delaware where the Swedish element was especially strong. Certain it is that the Swedish touch can be seen in the many gambrel roofs. Whatever the ultimate provenance of the diapering, it was a spontaneous amenity that showed the pride of the builders in their handiwork. The admirable brickwork of these houses is their most distinctive and engaging feature.

Fireplace, Pledger House, near Salem

Another common characteristic, exhibited by all four of the houses here illustrated, was the use of a penthouse on either one or both of the long sides above the ground floor. The Mecum House had one on the back, the "high part" of the Hancock's Bridge House had one on the front, while the Denn House and the Pledger House had them both front and back. All of them have long since been amputated.

The Denn House, which is a peculiarly interesting example of early work, had a balcony breaking into the penthouse, above the house-door on the water front, originally the principal entrance. The traces of this feature are still plainly discernible. A doorway, where there is now a window, opened upon this balcony and, furthermore, there is evidence that the windows were formerly wider and contained leaded casements instead of the present double-hung sashes.

While the other three houses are of the two-chimney type, the Denn House has a single central chimney and in other respects, also, evidences a strong clinging to earlier precedent. The full length of the house, from central chimney to the ends, is traversed by stout chamfered and stopped oak summer beams of archaic lines. There is now little else left of the original interior woodwork, but on the upper floor there still remains a battened door, of exceptionally pleasing pattern, with vertically grooved and moulded divisions.

The interior woodwork in the other houses, though not without interest and sometimes amusing, is not particularly edifying, barring a few exceptions. The best of it is shown in the accompanying measured drawings and even these examples, here and there, betray serious shortcomings

Cupboards with ventilating perforations, Pledger House, near Salem

SOUTH FRONT

DETAIL OF DOORWAY

MECUM HOUSE, BUILT 1737, ON FINN'S POINT ROAD, NEAR SALEM

THE WINDOW AND DOOR TRIM DATE FROM THE LATE 18TH CENTURY, WHEN THE HOUSE WAS ALTERED AND THE PITCH OF THE ROOF CHANGED.

in the shape of ill-considered and faulty profiled members incorporated amongst otherwise good and vigorously conceived mouldings. One is inclined to suspect that the carpenters, who certainly were not lacking in ambition and the will to do, were working from imperfectly remembered details they had seen before their emigration.

Close students of the subject are coming more and more to realize that not all the carpenters and joiners of the colonial era were paragons of good taste and skill, and here we have some striking confirmations of the fact. Of these it has not been considered desirable to present drawings. There were both good and bad; the modern student must exercise discrimination in judging their work. The examples shown, however, display a vigorous conception and some originality peculiar to the region, and for that reason they are given.

As types of composition, these houses are full of interest and embody considerable suggestive value, especially when we visualize them in their pristine state, a thing not difficult to do, in view of the many plain and unmistakable evidences left us of what they once were.

North doorway. Pledger House, Salem

A SURVEY of EXISTING COLONIAL ARCHITECTURE in MAINE, PART X*

BY FREDERIC HUTCHINSON PORTER

Winner of The Architectural Review Travelling Scholarship in 1918

THERE is another Bucknam house, much older than this, called the John Bucknam House, which, it is claimed, was built in 1792 or 1793. It is not particularly interesting, as there is no detail of much worth. The front door is quaint, in that it is in two parts. The single half of the door is rather narrow but is used mostly rather than open up the whole opening, and several of the more loquacious gentlemen of the place gleefully told me of the amusing experiences of a former tenant who, being rather stout, was often the cause of much merriment in his efforts to squeeze through the small opening.

Near this is the Lippincott House, built by a Mr. James Bailey about 1820-21. The side doorway is rather good.

Another doorway that is interesting, though more simple, is on the Dorr House, the pilasters in this case being bellied with an entasis to the lower part. The handling of the tooled frieze of the main cornice is unusual in its relation to the door-head.

A house with a peculiarly local treatment of the bracket over the pilaster, is seen in the entrance to the Old Columbia Tavern. This house was built by one Gowen Wilson some time before 1838. It is of the gabled, five-bay, two-chimney type.

The Nash House, built by Elisha Nash about 1930, has a rather unusual door. The high frieze is something seen quite often in this section. The plan is similar to the old tavern.

The Collins House, Cherryfield, Me.

The next town west is Cherryfield, which contains just a few scattered specimens which can be recorded briefly. The Colonel Joseph Adams House was built between 1806 and 1810. The side entrance is the better one. There is one good mantel of plain detail in the house. The Nash House, with its queer series of horizontal accents to the entrance, was built about 1825. The Upton House, date and history unknown, is still another good example of the type. The Old Naragagaus House or Tavern was built about 1830, and at one time was quite a hostelry. It had then a wing to the left symmetrical with the present one, forming a court at the rear. The Collins House on the Millbridge road is much defaced, but one side still remains as it was built, about 1820. The door-head and window treatment are unusual. The pilasters would seem to indicate a later date than was given me.

I found nothing at Millbridge, Franklin or Gouldsboro, nor on Mt. Desert Island. At Sullivan there is the Moseley House built about 1820. It has undergone alterations recently. At West Gouldsboro is the Wayside Inn Hotel, built by Elisha Jones. It has been a hostelry for over fifty years. There is a good door, but it is covered by a modern porch. The parlor is rather good, having the customary trim with a judicious use of tooling.

*This is the last installment of Mr. Porter's report of his survey. The earlier parts have appeared in *The Architectural Review,* the last preceding one in June.


Moseley House, Sullivan, Me.

At Ellsworth I found the Black House, built, some say, in 1824; while others place it much earlier, by Colonel John Black. I was told that it was three years in the building and that the bricks were brought from Philadelphia. It has a wonderful setting in the midst of extensive grounds and commands a beautiful view. The interior is quite plain and appears to be of later date. The rooms are beautifully furnished with many rare pieces. The present library building was built for a residence by Colonel Meletiah Jordan in 1817. The porch shows a later influence. A house of similar appearance is the Grant House, though it is a three-bay front and has a better porch. I could not determine when it was built. It has a well-house, still standing at the rear, in which the detail of the cupola on the house is repeated. The Dutton house is claimed to be the oldest house in Ellsworth, though none could tell me when it was built. It was quite plain, and had been deprived of what might have been a good side doorway.

I found nothing at Ellsworth Falls nor between Ellsworth and Bangor, nor in Bangor itself. At Hampden and Hampden Highlands on the Penobscot River, south of Bangor, there was one house of a type I have reported often. There were a number of pretty fences in front of houses that have been much altered, and a typical post of one of them from an old cemetery there was shown by a photograph in the preceding instalment of this report.

Orrington contains nothing. At Searsport there were more examples of the small story-and-a-half house but nothing exceptional. My survey was completed in Belfast, which also was disappointing, having nothing of special interest. In conclusion, I wish to again thank all who have helped me in this work. I sincerely hope that my efforts have been fruitful of good, that the results measure up to the standards hoped for by the Founder and the committee. I also hope that the


Nash House, Cherryfield, Me.


Nash House, Columbia Falls, Me.

Black House, Ellsworth, Me.

continuance of the scholarship may be assured, and, if my experience will aid future scholars in any manner, I shall be very glad to render any service asked of me.

The Architect as Artist*

MR. JOSEPH HUDNUT, A. I. A., in a discussion on the planning of church buildings says that "men, being unable to live on bread alone, are always dissatisfied with buildings that are merely well-planned and well-constructed." The church is taken as an example, the universal demand being that a church shall possess, besides these practical qualities, some attributes of beauty.

Therefore they demand of the architect that he must be an artist, as well as a planner and builder. He must have some genuine enthusiasm and love for beauty in buildings. He must possess in that particular field, a superior taste and judgment, and know something of the technique by which beauty may be achieved.

Unfortunately too many architects forget that their beautiful building has a function to perform and that it must be more than a monument shaped with a view to its impressiveness rather than its use. Such architects are apt to be hostile to developments in plan and structure such as are advocated by Dr. Tralle.

The great churches of the past appeal to us almost always in a monumental aspect. We forget that they were ever meant to be used. We are apt to think they were designed entirely, or at least in large degree, with the single desire for beauty and impressiveness.

The awe, mystery and aspiration which we read in older churches are somewhat in conflict with the striving after efficiency sought by the administrators in Protestant Churches. There has thus come about a feeling, akin to misunderstanding, "suppressed and little talked about, yet unmistakable, between the artist, striving for beauty" and the administrator of modern religious impulses.

Mr. Hudnut believes such a conflict is unnecessary; that architecture is an outgrowth of utility, and, that there is at present a spirit of evolution in architecture which will do for the church what it has done for business structures and school houses. He writes, "I believe it is our business as architects to study and to understand, first of all, the trend of Christian thought in our country, to learn the needs of the new church, its spirit and aims; and then, forgetting for the moment the churches of the past, we should try to work out a practical economic plan for a church-building suited to the new conditions. After that, we should think of some way of making that building beautiful and expressive, turning for guidance and inspiration to all the great architectures of the past—just as the men of Amiens turned to the Byzantine manuscripts, the Roman ruins, to Palestine and to Syria, and to the ruder architecture evolved from the Teuton forests. Good taste, restraint, significance, are just as possible for us as for them."

The little book "Planning Church Buildings," for which Mr. Hudnut wrote a chapter on "The Architect as Artist," is a worth-while production. Written as a text for church building committees it should be studied faithfully by architects who design churches. The art of church architecture will not advance if church planning is studied only by the layman. The conflict, mentioned by Mr. Hudnut, is inevitable under such circumstances. When the architect, however, understands fully the requirements of his clients and can help them with his artistic ability he begins to function as a true architect. Mr. Hudnut very happily differentiates between the architect who is an artist and the artist who practices as an architect.

**Comments on a chapter by Joseph Hudnut, A. I. A., in Planning Church Buildings, by Henry Edward Tralle, M. A., Th. D. 162 pp., Ill., 5x7 in. Cloth. Philadelphia, The Judson Press. Distributors, American Baptist Publication Society, Philadelphia.*

Portico, Lee Mansion
Arlington, Va.

(See reproduction of original sketch by Otto R. Eggers on opposite page)

THIS mansion and the lands embraced in the Arlington National Cemetery surrounding it, marks one of the most important locations in American history. It will always remain closely associated with the name of General Robert E. Lee, the commander of the armies of the Southern Confederacy, for it was here that he made his home during thirty years. He left it to join the armies of the South, never to return to it.

In the early days of the Civil War this mansion was taken over by the authorities and after much litigation, finally became legally the property of the Government and the grounds which surrounded it were acquired for purposes of a national cemetery.

This historic building receives the utmost care and has been preserved so as to retain all the aspects of the day when it was the central feature of the estate of one of the most representative Virginia families.

TICO, LEE MANSION, ARLINGTON, VA.

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WEST ELEVATION, LOOKING ACROSS POND

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT

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SOUTH ELEVATION, SHOWING GARDENS

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT

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NORTH ELEVATION, SHOWING ENTRANCE COURT

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT

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VISTA INTO COURT THROUGH ENTRANCE GATES

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT

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GABLE OF DINING ROOM

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT

NORTH ELEVATION, SHOWING ENTRANCE DOORWAY

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT

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DOOR FROM TERRACE TO ENTRANCE HALL

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.

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DETAIL OF MAIN ENTRANCE

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT

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DETAIL OF DOOR IN LIVING ROOM

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT

152"

ENTRANCE HALL

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT

LIVING ROOM

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT

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LIBRARY

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT

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GATEWAY IN GARDEN

HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.

JAMES W. O'CONNOR, ARCHITECT

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VILLA DATTA ROSA--BATTAGLIA

VILLA MATCONTENTA

VILLA MEDICEA

ITALIAN GATEWAYS

REPRODUCED FROM PHOTOGRAPHS BY ROBERT M. BLACKALL

THIRTY-FIFTH HOLDER OF ROTCH TRAVELING SCHOLARSHIP

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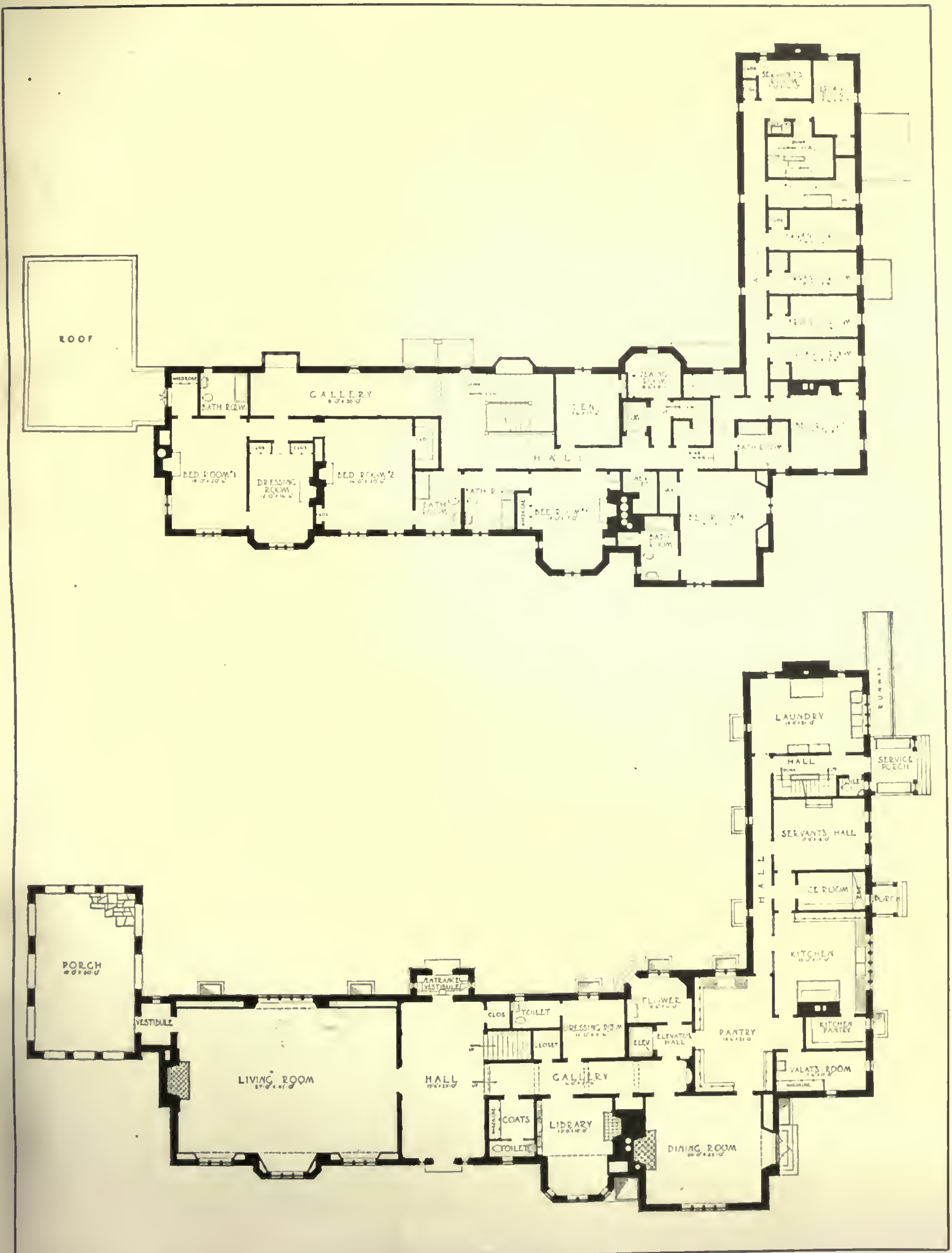
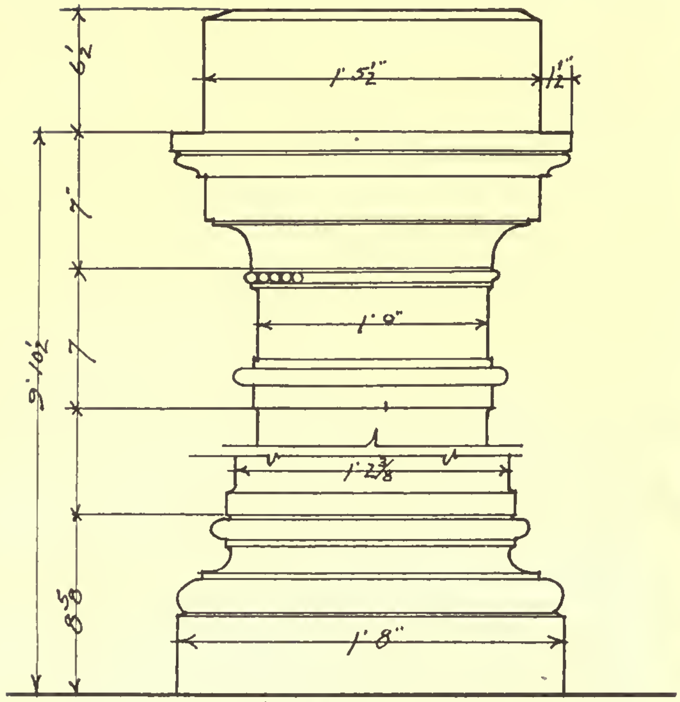
ITALIAN ROAD-SIDE SHRINES, NEAR FLORENCE

REPRODUCED FROM PHOTOGRAPHS BY ROBERT M. BLACKALL
THIRTY-FIFTH HOLDER OF ROTCH TRAVELING SCHOLARSHIP

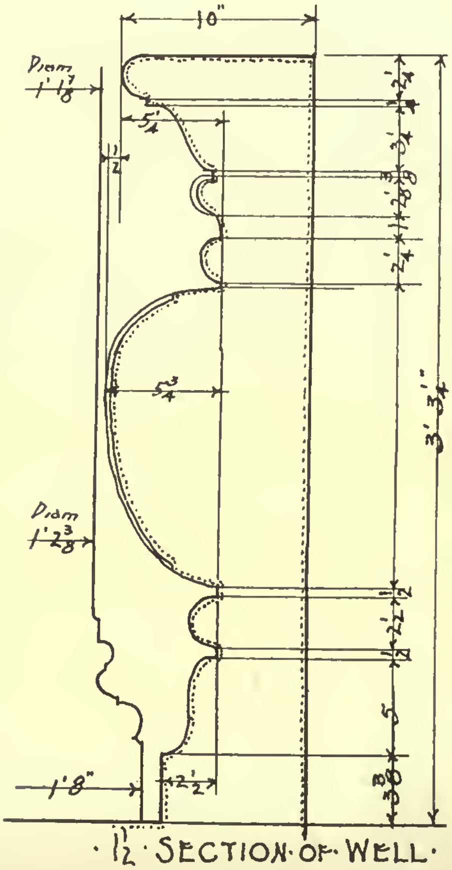
152 17



FIRST AND SECOND FLOOR PLANS
HOUSE OF L. H. SHEARMAN, LAKEVILLE, L. I., N. Y.
JAMES W. O'CONNOR, ARCHITECT



1½" · DETAIL · OF · ORDER ·



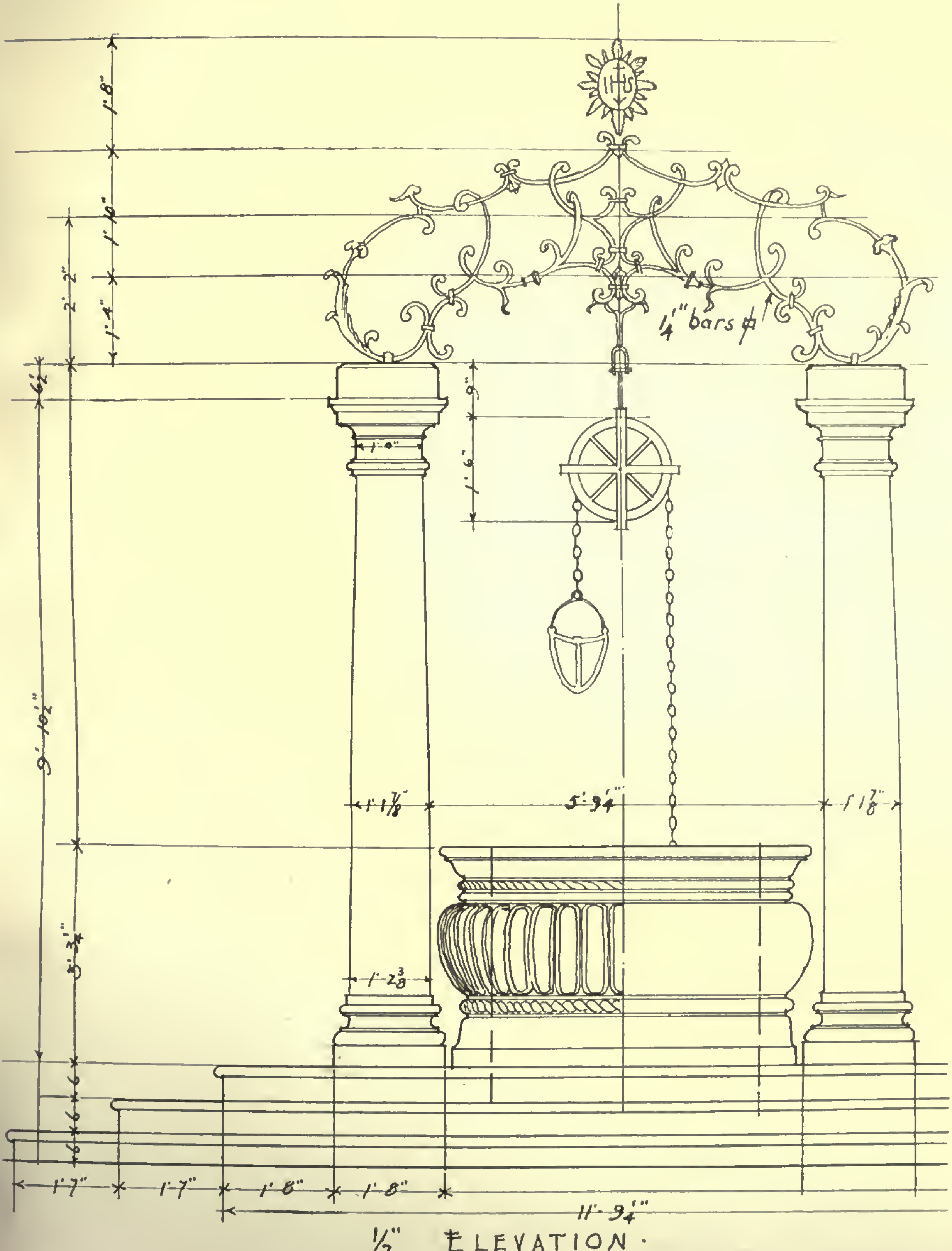
· 1½ · SECTION · OF · WELL ·

This well is placed in the center of the large cloisters. The architect was Michael Angelo. The material of the columns and well is the grey pietra serena which is so universally used in Florence, while the iron work about is wrought. The plan of the steps and well head is circular.

WELL IN THE CLOISTERS OF THE CERTOSA DI VAL D'EMO, GALLUZZO, NEAR FLORENCE, ITALY

MEASURED AND DRAWN BY ROBERT M. BLACKALL, 35TH HOLDER OF ROTCH TRAVELING SCHOLARSHIP.

THE AMERICAN ARCHITECT, SERIES II.
FRENCH AND ITALIAN DETAILS



WELL IN THE CLOISTERS OF THE CERTOSA DI VAL D'EMO, GALLUZZO, NEAR FLORENCE, ITALY

MEASURED AND DRAWN BY ROBERT M. BLACKALL, 35TH HOLDER OF ROTCH TRAVELING SCHOLARSHIP.

THE AMERICAN ARCHITECT, SERIES II.
FRENCH AND ITALIAN DETAILS

·EDITORIAL·COMMENT·

The American Architect and The Architectural Review

WITH this issue The American Architect, founded in 1876, and The Architectural Review, founded in 1887, are joined in one publication. This consolidation is in fact the merging of the two oldest architectural journals in the United States. It is the purpose of the publishers to continue those features of each journal that have rendered it distinctive, and thus produce a publication that will be more comprehensive and valuable to its readers than either has been heretofore. The present fortnightly schedule of The American Architect will be maintained.

It is hoped that the greater service which the consolidation enables the publishers to render will result in entire satisfaction to the readers of the combined publications. It is fully realized that without the approval and co-operation of its subscribers no journal can prosper or long endure.

A Department of Legal Information

WITH this issue there is begun a department of legal information. This will be a monthly feature, appearing in the last issue of each month.

Mr. Clinton H. Blake, Jr., who will conduct this department, is favorably known to our readers through the series of articles under the title, Architectural Quicksands, which appeared during the early part of this year.

In the article appearing in this issue, Mr. Blake has outlined the general policy of this department. We believe that the information set down from month to month will be of great value. Suggestions as to subjects which may helpfully be discussed is asked, and these suggestions we hope will be forthcoming. This department will resume the publication of recent legal discussions. These, in the past were found to be of great assistance to architects in solving problems arising in practice.

Another Effort to Remove the Old Post Office Building

JUST now the New York daily papers are giving much space to a discussion of the movement to remove the unsightly old Post Office from City Hall Park and the restoration of that historic locality to its one time condition.

Probably if the matter were one entirely under the City's control, this monstrosity would have been taken down long ago. But, unfortunately, the site of the old General Post Office was many years ago purchased by the Federal Government. The Post Office authorities are endeavoring to ascertain just what are the requirements of the postal service on Manhattan Island and to decide definitely whether to sell the site back to the city or construct a new and more modern building. These matters move slowly. In fact, so slowly, that it does not seem possible for one administration to decide on the case, and each new one starts its inquiry at the very beginning.

The shifting of trade centers in New York has during the past decade been so very marked that there remain no good reason for the location of the City's General Post Office so far down town. In fact, its continuance there works a hardship on the business community, the center of which is far to the north of the present City Hall.

But, as a committee of representative and patriotic citizens have now taken up the matter, there is hope that this building will soon be removed.

Up to the time of the formal opening of Central Park in 1853, City Hall Park was the largest park area on Manhattan Island. It was a meeting place on patriotic holidays and a general resort for all the people.

The City Hall was then, and probably is to-day, the finest example of Georgian architecture in this country. From the steps on the south side one might then look down Broadway to the Bowling Green, while from the steps on the north there was to be viewed the growing city. Now the beauty and scale of this fine structure are sadly marred. To the north the Court House of unsavory "Tweed Ring" fame, and to the south, this awful bulk erected by the National Government as a General Post Office.

While we might, with reason, also urge the razing of the "Tweed Court House," as removing a structure that will always revive memories of the most corrupt periods of this City's history, it is not so vitally objectionable on the basis of bad architecture as the Post Office. For that building there can be no possible excuse. It simply is not fit to live.

Changing Habits in Habitations

There was a time when every man in America dreamed of owning his home. It was to be his only, devoted to his family; surrounded by grassy lawns bordered with trees and terminating at the rear in a kitchen garden. In those days the "Own Your Own Home" movement contemplated only single family houses.

The Civic Development Department of the

Chamber of Commerce of the United States conducted an investigation of building operations in this country, for the year 1920 and some of the findings have been recently published. The report would indicate that the habits of the people are apparently changing. The figures show that of the families going into new residences in 1920 seventy per cent. got one-family dwellings; eleven per cent. two-family dwellings and nineteen per cent. of apartments in multi-family dwellings. According to the report, the figures indicate that the proportion of multi-family dwellings provided last year was largest in the small cities, where this type of dwelling is comparatively new.

It will be cause for regret if the American people voluntarily abandon the picturesque, comfortable and sane one-family dwelling to live in blocks of apartments like those to which city dwellers in continental Europe have been accustomed for centuries. The two-family house sometimes enables a family to pay expenses and well designed, it gives each family access to a yard and insures plenty of air and light, preserving at the same time all necessary privacy. It is regrettable that in small cities in which the residence district is close to the business district, the multi-family house is gaining a hold. In cities of more than half a million inhabitants the apartment houses may be a necessity, but only avarice excuses its presence in a small town.

There was more dwelling house building in proportion to population in the smaller than in the larger cities. In cities of from 25,000 to 100,000 population, one house, flat or apartment, was provided for every 258 inhabitants, while in cities of more than a million population it was one for every 591 inhabitants. The average for all the cities listed was one for every 350 inhabitants.

It is shown that 1920 was the record year for sale of bath room equipment despite the small amount of new residence building. An investigation showed that a great deal of this equipment was used in the conversion of one-family dwellings into multi-family, that is, tenement houses. The economic and social significance of these alterations, the report says, is of first importance.

Close crowding of people under one roof does not promote neighborliness. In apartment houses one may live for years without knowing the names of people on the same floor, despite daily contact in elevators. The janitor, the telephone operator, the elevator boys exercise a tyranny, more or less mild and one cannot move without consciousness of supervision. There is on all sides a surrender of freedom to move, which in time affects the nervous system. The effect upon children and upon family life is what Americans should consider seriously and the tendency toward living like bees in a hive or troglodytes in caves should be fought in all small and medium sized cities.

The medical statistics of the recent war are very illuminating on the effect of city life on health. Among the men drafted for our armies the rejections for physical defects were practically proportionate to the population of cities. In large cities nearly one-half the men were rejected for physical defects incident to city life: the smallest per cent. of rejections being in states where the home ideal is a one-family dwelling surrounded by open spaces.

Airplane View—Lincoln Memorial, Washington, D. C.
Henry Bacon, Architect

DEPARTMENT of SPECIFICATIONS

The Composition of a Specification

WHEN the specification writer has completed his outline and has determined the order of sequents of the various sections of the specifications he must commence their composition. The study and careful selection of the component parts of the outline produces, in a great measure, the desired well-organized whole and it is therefore, highly important to give the necessary time to the scheme of outline.

A rhetorical composition, to be accepted as good and to be effective in use, must be so well organized that the mind of the reader will travel from paragraph to paragraph smoothly and with a feeling that there has been expressed perfect clarity of thought. This principle must be adhered to in all the major and minor sections and subdivisions of sections throughout the composition and the various parts, must be so related, one to the other, that no hindrances to the even flow of the reader's thoughts are present.

The specification writer must remember that he is giving instructions to a great number of persons of varying degrees of intelligence and that some of these persons might find it convenient or useful to their ultimate gain, to discover some slight error in terminology, phraseology, punctuation or general arrangement of sentences, clauses or phrases. The rule of the three "C's." viz. Clearness, Conciseness, Coherence, if understood and followed faithfully, in addition to a careful selection of what has been termed "Engineering English."

It is understood by every specification writer that specifications which are indefinite, ambiguous or incomplete result, first, in contingent sums being added to the proposals and, second, in creating very disagreeable and sometimes disastrous conditions during construction work. The specification writer must guard constantly against lapsing into a belief that these errors are not creeping into his work because he is using sentences or paragraphs that have been proved to be correct for previous operations. Seemingly analogous conditions may not always be described in identical terms.

While it is desirable to follow the general rules of English composition (with which the specification writer should be acquainted) he will find it essential to clearness to violate some of these rules. Eupbong, while condemned in good English composition often times must be discarded for the sake of technical clearness but, wherever possible, synonymous words should be used. Redundance, likewise, must be allowed to creep into the specifications for the same reasons. The specification writer must, however, in every case weigh the reasons pro and con and attempt to adhere to the rules of rhetoric wherever possible. Otherwise his quick judgment in dictation or in long hand writing may be blunted to such an extent he is somewhat ignorant of what he is doing to his work.

Brevity is at all times very desirable in specifications but not at the sacrifice of conciseness or clearness. To be brief does not imply that the fewest words necessary to make a complete sentence should be used but that only those words used that will express the thought completely, without ambiguity and with smoothness in reading. It is much better to be somewhat verbose if the attempt to be brief makes one "lean backward" as it were.

Terminology must be studied and the various meanings one term may convey to the readers' mind should be understood in order that there may be no possible chance of reading into the work thoughts that were never intended to be given expression. Certain of the national associations and technical societies have developed fixed meanings for words that are used frequently and the specification writer is assured to have become acquainted with them.

Each specification writer should have in his library a copy of Professor Daniel W. Mead's work on "Contracts, Specifications and Engineering Relations" as he will find therein a very clear and able presentation of fundamental laws with respect to his work. While this book has been written for engineers the general tenor of suggestions it gives applies with equal force to the architect. The following sections on "Clearness," "Indefinite Specifications," "Indeterminate Specifications," "Ambiguous Specifications," "Arbitrary Specifications," "Unfair Specifications," and "Unnecessary Severity" are taken from this book in the belief that no better advice can be given the specification writer.

CLEARNESS: Clearness in all details, both in plans and specifications, is a protection both to the owner and to the contractor, as in one case the contractor is unable to do improper work or avoid the execution of essential features, and on the other hand he is enabled to understand exactly what is desired by the engineer, and can regulate his bid in accordance therewith, without the addition of a percentage to cover uncertain work which he may be obliged to do but which is not clearly specified. Nothing is gained to the party letting the work by uncertainty in the understanding of what is desired, for if such uncertainty exists a careful contractor will add a percentage to cover such contingencies, while an unscrupulous contractor will take advantage of such uncertainties to secure the contract and depend for his profit on his ability to avoid the execution of such portions of the work.

Specifications not only describe the character of the work that the contractor must perform and that the owner must accept, but they also serve as the instructions to superintendents and inspectors as to what requirements they are bound to enforce. It is therefore desirable that the specifications should be susceptible of a literal interpretation not only for a clear understanding between the two parties to the contract but also that the inspectors or superintendents in charge of the work shall know what requirements to impose.

Where much is left to the engineer's judgment, or where unnecessary or practically impossible specifications are imposed (which is always undesirable and inexcusable) friction may perhaps be avoided if the engineer is experienced and is continually at hand to give his interpretation of obscure clauses, or his permission to disregard inexpedient requirements. An inspector has no such prerogative, unless the same has been especially delegated by his superior and must usually insist (unless fully instructed by the engineer, which should always be, but seldom is, the case) on the fulfillment of the letter of the contract. When the inspector does insist on carrying out an irrational specification, and an appeal is taken to the engineer, is experienced, he must decide in favor of a reasonable interpretation of the specifications which he has prepared. In so doing, the engineer must reverse the decision of the inspector, to his great embarrassment, and to the injury of his confidence in his instructions (the specifications), and of his future usefulness. Clearness and exact language in sufficient detail to meet all reasonable contingencies and suitable for literal interpretation, will not only prevent disputes but will add to the efficiency and effectiveness of supervision and inspection.

In order that a specification shall be clear and definite, its paragraphs and clauses should be arranged, so far as practicable, in logical order. Each element should be discussed completely and in detail in a single paragraph or sentence devoted solely to that single feature, and when fully covered should not again be mentioned unless necessary for defining its relation to other features. More than one element should seldom be described in a single paragraph, as such reference tends toward obscurity.

Indefinite Specifications: Carelessness and ignorance of the detailed requirements, which should be included, often lead to indefinite specifications. Such specifications are also sometimes inserted with dishonest or vicious intent. There is often a temptation to write such specifications rather than to take the trouble to consider and to determine the necessary requirements, at the time the specifications are being prepared. As it is usually provided that the engineer shall interpret or explain any clauses not clearly stated, there remains an opportunity for the engineer to decide the matter later, and this also involves an uncertainty and a chance for a considerable variation in expense. Such uncertainties may be and sometimes are used for the purpose of dishonest favoritism. Such uncertainties are manifestly unsatisfactory and unfair, not only to the contractor but to the client of the engineer as well, for they almost always add unnecessary expense. It is only through ignorance, carelessness or dishonesty that specifications are left so indefinite that the contractor cannot know exactly what is expected and required, or those which are unnecessary or undesirable are included.

For dishonest purposes, specifications are sometimes drawn so indefinite that no bidder can determine what is required, unless he has inside information, and so many matters may be left to the decision of the engineer that no contractor, unless he knows he will be unduly favored, dare bind himself to the uncertainties involved.

Indeterminate Specifications: When the amount of material or work to be done under a contract is expected to be small, it is customary with some engineers to cover the same with only a brief clause in which the work done and material furnished are to be "as the engineer shall direct." This practice is less objectionable when only a limited quantity of such work or material is to be furnished, but as in most cases there is an uncertainty as to the amount, the practise seems entirely inexcusable.

It may be regarded as proper to give no great amount of space to the specifications for a certain class of material or work where only a small quantity is to be used, but while brief, the requirement should be clear and exact. If the work is worth doing, the contractor has a right to know the exact requirements before he bids for the same, and should not be held subject to the uncertain requirements of an engineer, possibly unknown and inexperienced.

Even when an attempt is made to draw briefly such specifications, it sometimes occurs that the engineer may, in his haste, specify the material of a greatly superior quality to that which is actually needed in the work. This may prove serious if through an unexpected increase the quantity required is actually large.

Ambiguous Specifications: Unnecessary or unreasonable requirements are always ambiguous and are uncertain as to what is actually desired, and what will actually be required by the engineer. Under such conditions responsible contractors will add materially to the price for the work done under such specifications. Not only does this unnecessarily increase the cost of work, but such specifications also brand their maker as ignorant of the practical requirements of the work, and are a notice to unscrupulous parties that the writer of the specifications is one who may perhaps be manipulated or bluffed into reasonable requirements, or even to extremes in the other direction. It is only too easy to prepare in the office specifications which are impossible to carry out in the field, or which, if carried out, will prove undesirable or expensive.

Specifications that cannot be reasonably enforced except under particular and peculiar circumstances, should be eliminated for where they are included they practically must be ignored except where an absolute necessity for their enforcement arises. This calls for an arbitrary decision by the engineer which a subordinate can seldom be permitted to exercise, and in the exercise of which by the chief he is left open to criticism.

Arbitrary Specifications: While it is necessary for the engineer to be able to exercise such control over the work that he can secure its proper performance and completion, it is unwise and unsafe for him to endeavor to exercise unnecessary and arbitrary control over any part of the work. If the contractor is to be held responsible for the work, or for the results obtained, or as to time of completion, safety to the public, etc., he must not be relieved of responsibility through arbitrary specifications, by means of which, the prerogatives of management may be usurped by the engineer.

Unfair Specifications: Occasionally in specifications it would seem the purpose of their writer is not only to protect his client in every legal way but also to hamper the contractor by unfair and uncalled-for restrictions. Such restrictions can result only in unnecessary expense as they must of necessity limit completion, make the contracting parties doubtful of the good faith of the party preparing the specifications, and suspicious of the treatment which he will actually receive should he be awarded the contract for the work. Such clauses should be eliminated entirely as they have no place in the contract. It is, and should be, the purpose of every attorney or engineer who may be preparing a contract to see that his client is entirely and fully protected, but anything beyond this can give only unsatisfactory results.

Unnecessary Severity: In drawing specifications for a material only the average requirements which characterize a good material of the class desired should usually be embodied. It is undesirable to make the limiting requirements too severe, unusual or extravagant, as such requirements may materially add to the expense, prevent intelligent bids by driving responsible contractors from the field, prevent the execution of the work, or involve a confession of error and have to be modified to the embarrassment of their writer. Too often the minimum limits of a specified test are fixed at or near the maximum that has been secured from tests of the best of similar material. Frequently the results specified are impossible to obtain on the average, especially when a material is new on the market. Such severe requirements are usually in error and are seldom ever necessary. The requirements for a good average material are more readily enforcable, and any additional safety required should, if possible, be secured by improvement in design.

The mechanical composition of the specifications should be given some thought in order that they may present a neat and orderly appearance and thus create a good impression on the readers. In the first place the sheet should be the standard letter size sheet, eight and one-half inches by eleven inches in order to conform with practices that are becoming almost universal among architects.

Specifications that are arranged in sections should have each section started on a new sheet of paper and should bear the title of the operation and the date of publication. Subsequent sheets should have, either at the top or bottom of the sheet, the name of the operation, together with the office order or file number, the name of the section and its section number and page number. Upon completion of the specifications, if it seems desirable for the indexing of the entire specification the consecutive page numbers may then be placed at the upper or lower right hand corner. Such an arrangement will identify each sheet and will permit the breaking apart of the specifications and their re-assembling as often and in whatever manner exigencies may demand.

LEGAL DEPARTMENT

Conducted by

CLINTON H. BLAKE, Jr., of the New York Bar

THE average architect is now appreciating more keenly than heretofore the importance of the business side of the profession. He is coming to understand that he is not properly equipped to protect either his own interests or the interests of his clients, unless he has some adequate understanding of the basic legal principles governing the conduct of his profession. He is approaching a realization of the fact that the present day architect must needs be grounded in the fundamentals of business, as well as in the fundamentals of art, if he is to avoid difficulties and loss.

I have already discussed in "The Law of Architecture and Building" and in "Architectural Quicksands" the legal aspects in general of the relationships of the architect, the owner and contractor. It will be my purpose in the present column to discuss from month to month any new developments, in the laws of this and of other countries and in the laws of the various states, as they affect the architect; to refer now and again to decisions old or new, which are of special importance under existing conditions or developments, and to keep the architect posted generally on the trend of the courts in so far as it concerns his practice and his relations with his clients and with contractors.

It is desirable, above all, as I see it, that the column should be divorced from ordinary dry and formal legal discussion, and made responsive to the needs of the readers of this journal as they may develop. To this end, I shall welcome suggestions from readers of subjects which they believe may helpfully be discussed, and shall avoid purposely any attempt to discuss the topics treated, in any special order or sequence. This will give the legal page a helpfulness and flexibility of discussion which could not otherwise be secured. Consistent with the desire to avoid any unnecessary formality of discussion and to treat matters in a simple and non-technical way, no special point will be made, in the monthly articles, of the citation of authorities. The pertinent facts will be given and such comment added as may be desirable.

Each month, however, following the special discussion, there will be a page of citations of cases affecting the relations of the architect, the client and the contractor. In the main, these will consist of recent decisions. The facts and decisions of the courts in each case will be briefly summarized, so that the reader may easily grasp the essential points involved, without being burdened with the consideration of extraneous matter.

The monthly discussions, as distinguished from the digest of recent decisions, will quite probably be based, in large part, on cases which have arisen in my own practice. They will have to do, therefore, with situations which have actually confronted architects in the practice of their profession, rather than with the theoretical or suppositious states of facts.

The practices of different architects naturally vary and present different problems. Nevertheless, the fundamentals in each case, from the legal point of view, are surprisingly similar and the discussion of a problem or difficulty, which has been experienced by one, will serve as a warning or aid to others.

As I have elsewhere written and repeatedly said, there are few, if any, relationships of which I know, business or professional, where the maxim that "an ounce of prevention is worth a pound of cure," is more applicable than in the profession of architecture.

IT is my hope, that our monthly chats together may produce, at the least, sundry ounces of prevention—prevention of friction between architect and client; of disputes between client and contractor, and of very many of those difficulties which naturally flow from a failure to realize and correctly measure the simple but important legal and business principles governing these various relationships.

It happens that many of the more recent decisions affecting the practise of the architect and the rights of the contractor and owner have to do with liens. It is important, in reading these, to bear in mind the fact that a lien is a special right, created by and dependent entirely upon statutory enactments. The lien statutes in the different states vary in many and in important respects. A decision, therefore, under the lien statute of Minnesota, for instance, may not be at all applicable to a case in New York, and vice versa. Each decision is based upon the wording of the lien laws in effect in the jurisdiction where it is rendered, and can not be taken as a precedent in another jurisdiction, unless the lien laws of the two states are substantially identical on the points involved.

Inasmuch as the "American Architect" enjoys a national and foreign circulation, it is in order to include decisions in any of the states and in some foreign countries. In reading them, however, remember, whenever they are based on statutes, lien or otherwise, that they can not safely be accepted as the statement of the law generally. They are directly applicable in the jurisdiction, wherein the case arises. Outside of that jurisdiction, they are to be read and their importance weighed in the light of local requirements and statutes.

A decision which is not based primarily on statute, but on principles of general or common law, is material, as a precedent in any jurisdiction, and hence has a wider field of effectiveness. Of this class, are many of the decisions dealing with questions of contract or of agency. The law of contracts and the law of agency are both involved continually in cases of architectural and building law. In practically every job undertaken. when superintendence is involved, the architect is called upon to a greater or less extent, to act as the agent of the owner. Similarly, in almost every instance, there is involved a contract, express or implied, between the architect and his client, or between the client and the contractor. or the contractor and the subcontractor or materialman.

One additional point should be noted preliminarily. The parties to many of the cases cited will probably not be architects or contractors. This will not mean that the cases are not pertinent on questions of architectural or building law. For instance, a case dealing with the relationship of an attorney and client may be directly material, because of the similarity of the professional relationship between attorney and client and between architect and client. Again, a question of agency or of contract may arise in some purely mercantile case between two business men, and the decision be material on some point of agency or of contract which is involved in the dealings of architect and client or client and contractor. In other words, the substance of the decision is the important thing to be noted, rather than the character and identity of the litigants.

In other articles, I shall have occasion to discuss particular cases and states of facts involving the principles of contract and of agency, and the other legal principles involved in the mutual dealings of the architect and the parties to the ordinary building operation.

A contract is "an agreement which creates an obligation * * * such an agreement may be defined as the concurrence of two or more persons in a common intent to affect their legal relations." An offer which is of such a character that it can ripen into a contract upon its acceptance, must be certain and definite, and the acceptance, to be effective, in changing the offer into a contract, must in every respect meet and correspond with the offer. The rule that under certain conditions the meaning of a written contract may be construed by the jury in a court proceeding is only applicable in those particular cases where the language of the contract is such as to raise some real doubt as to the intention of the parties and the meaning of the instrument, or where there is a real ambiguity inherent in the written agreement. Where the language is clear and without ambiguity or subject to different constructions, the contract as written must control, and the question of what the contract means should not be left to the determination of the jury.

Buffalo Pressed Steel Co. v. Kirvan (*Court of Appeals of Maryland*) 113 *Atlantic Reporter* 628.

WHERE an account is rendered, stating a balance to be due and showing the amount thereof and the indebtedness as it appears on such account is acknowledged to be due by the person against whom the balance is charged, there results what is known in the law as an "account stated." Under such circumstances, the person rendering the account and to whom the indebtedness is due may sue the debtor upon the account stated, and will not be called upon to prove the various items or details making up the amount of the indebtedness as shown in the account.

Delaware Eng. Co. v. Pusey & Jones Co. (*Superior Court of Delaware*) 112 *Atlantic Reporter* 371.

THE fact that one of the parties to a contract of employment is given the right to terminate the contract does not bar the other party from recovering the amount due him for services rendered under the contract prior to the termination thereof.

Clinton Crane Co. v. French, et al. (*Supreme Court of Michigan*) 183 *Northwestern Reporter* 68.

THE Mechanics' Lien Law is in derogation of the common law, and dependent upon special statutory enactment. It will, therefore, be strictly construed, and every step essential to the creation and enforcement of a valid lien must be taken in accordance with the provisions of the statute, in order to give a good lien title. Where the lien law provides, therefore, that the claimant must make an affidavit to the truth and correctness of his claim and of the facts stated therein, he should, in substance, state that "The above claim and the facts therein stated * * * are true and correct." If he merely swears that the "statement and the facts alleged therein are true to the best of his knowledge and belief," he has failed to conform to the requirements of the law and his statement of lien is defective.

Heitz v. Sayers (*Superior Court of Delaware*); 113 *Atlantic Reporter* 901.

DEPARTMENT OF ARCHITECTURAL ENGINEERING

The INSPECTION of CONSTRUCTION in CONCRETE and STEEL

BY ELWYN E. SEELYE

In this article Mr. Elwyn E. Seelye, Consulting Engineer, Member of the American Society of Civil Engineers, and of the Society of Terminal Engineers, follows up his article in the July issue of THE ARCHITECTURAL REVIEW *with a discussion of the most important points in the inspection of construction work in which concrete and steel are combined. This article is one of a series that began in the issue of* THE ARCHITECTURAL REVIEW *for January, 1921.*

THE following are essential points to be watched in steel inspection:

It is assumed that the structure has been properly designed and that the shop work has been properly executed. It should be emphasized at this point that shop inspection and mill inspection are very important. The reasons for that are numerous. Some of the most important of them are as follows: Where steel is being rolled and some orders are being inspected the rejected material is apt to be unloaded on the purchaser who does not have inspection. In fabricating, if there is no inspection, the plans may not be followed accurately, causing delay and expensive field charges at the site, also as will be noted later in the article, certain errors of fabrication are not apparent after the fabrication is complete.

Now presupposing the steel has been shipped in perfect order and is arriving on the site, the inspector should first look it over for damages, due to shipment. These will generally appear as bent plates or members. All these damages should be rectified by straightening, and, if necessary, by reinforcing, before the erection is allowed to proceed. If damage is serious an expert should be called in to pass on it. Where no shop inspection has been made, the field inspector should go over the riveting and see that surfaces in direct bearing are milled and in contact.

The important thing in the erection of bases, either grillages, steel plates or cast iron, is to see that they are properly grouted. This can best be done by pouring the grout into a funnel raised high enough to produce a hydraulic pressure. The space between the concrete foundation and the iron should also be rodded to eliminate voids. It is very important that the bases be set level, faced on the top and that the column be faced to provide a full and even bearing between the bottom of the column and the base. In unimportant columns, a discrepancy may be wedged with thin steel wedges, but in important work the full bearing without wedging should be insisted upon. This facing or milling can be done with great accuracy and its omission on bearing surfaces is cause for rejection of the member.

When the erection starts the inspector should keep in mind the functions of the connections and the way the stress is carried from one member into another. This will put him in a position to check the work up in a practical manner. For instance, he will notice that some steel beams rest upon seats which were riveted up in the shop. The additional field rivets are really for the purpose of holding the beam in place and not to take a load. Other connections will be directly from the beam through the connecting angles to the column or girder by means of field rivets. It will readily be seen that the rivets in this last connection are very much more important and should be more carefully inspected than the field rivets in a seat connection.

The inspector should bear in mind that a rivet is supposed to hold by its shearing and bearing values, but that it also performs a very important function if tight, by holding the two surfaces together and producing a large frictional resistance between the plates. He should also remember that the process of riveting induced a certain amount of internal tension in the shank of the rivet and thereby renders the rivet unreliable for additional tensile strains, and, therefore, bolts with lock nuts should always be substituted for any rivets that are supposed to act in tension.

Having pointed out the essentials of having a tight rivet the question is how to get it. It is absolutely necessary to inspect steel work before riveting and see that the holes in the plates are concentric, for if a rivet be driven with ½-inch eccentricity, it may be a very poor rivet, but it may be tight, and therefore impossible to detect after the riveting is complete. I would say that all differences of eccentricity of over 1/64 of an inch should be reamed, although this practice might be made less rigorous on unimportant rivets. The use of a drift pin to make the holes concentric by forcing action is to be condemned. In the same way the cutting of extra holes by means of an electric or other torch is to be severely condemned. Having inspected the joint and found the holes concentric, the riveting may proceed. If the rivet is tight and the head full, it should be passed, but if it is loose it should be cut out. Here again, the riveting should be closely watched, as a rivet may be inadequately tightened up by what is known as calking, which consists of the use of a hammer and chisel, to wedge under the rivet head. The rivet may have the fault of too short a stock and the heads will be flat. This should not be confused with heads which are purposely flattened or countersunk for clearance. Another method of ineffectually tightening the rivet head consists of raising the plate surface under rivet by driving the rivet snap sideways against the plate. Hence where the plate has been injured or shows a ridge around the rivet the rivet should be cut out.

Cold hammering of heads should never be allowed. It is easy to detect this because a smaller snap is used on a head when cold hammered. The testing of a loose rivet can best be done with a small hammer. Place the finger on the opposite head while striking. Also strike the rivet head up and then down and note if there is any vibration. A small tile hammer with a personal die cut in the head by annealing it soft and hard again will serve the purpose of surely marking defective rivets.

Another duty of an inspector is to see that the size and weights of beams called for on the plans are furnished. Owing to the Bethlehem and standard shapes having a number of different weights, the flanges should be carefully scaled to detect any substitutes. Where a beam or girder rests upon a wall, care should be taken to see that it is amply supported by the masonry and anchored thereto.

Painting is a very important matter in the preservation of steel work, and all portions where paint has been removed by shipment should be repainted before erection. The field coat should be of different color than the shop coat.

Cast iron members should be carefully inspected for visible defects.

All cast iron columns should have at least two holes drilled in the columns for the purpose of checking the thickness of the column. Often the core is displaced in pouring, rendering the column thinner on one side than the other. A discrepancy of more than twenty-five per cent. should be cause for rejection.

All bearing surfaces in cast iron should be milled. Columns which are crooked should be rejected.

The cast iron beam seats should slope down outwards to make the beam bear as close as possible to the column and eliminate flexure in the seat.

A double lug generally engages the web of a beam through which a single bolt is passed. On one job these bolts held the beams up off the seat and necessitated field changes.

All steel should be marked for identification in the field and the shop inspector's mark should also appear. The most intelligent field inspection can be made by a representative from the designer's office, as he will be able to follow the designer's intent.

The inspector should co-operate with the erector in safeguarding the structure from accidents during erection. He should see that the derrick base is secured from the horizontal kick of the boom in any direction. The steel carrying the derrick should be strong enough and have sufficient connection for the erection stresses involved. He should exert a check on dangerous practices, such as lifting too heavy a load for the strength or counterties of the derrick, booming out too far or the splicing of booms.

Guying and bracing of steel in the process of erection against wind bracing is important. In this case it is well to remember that serious accidents have occurred through the shrinkage of guy ropes when wet. To sum up: 1. See that your steel is inspected by a competent bureau in the mill and shop. 2. See that your bases have a proper masonry contact. 3. See that columns bear directly on bases with full bearings; that columns bear directly on columns with full bearing, and that all stiffeners are milled to bear. 4. See that the steel is repaired and straightened where injured during shipment. 5. See that all rivets are tight and driven in concentric holes. 6. Look out for a good two-coat paint job. 7. Be sure that beams have proper wall bearing. 8. Inspect cast iron for workmanship and flaws. 9. Safeguard the erection against accidents.

THE following instructions are intended for the guidance of an architect who has charge of superintending reinforced concrete construction.

First and most important is the cement, which should be Portland, manufactured preferably by a well known company. Cement should be tested as follows: From each shipment after it has arrived at the site, take one sample of a quantity of about two quarts, made up by taking a small handful from every tenth bag. Ship this to a cement testing laboratory and request chemical and physical tests specified by the Am. Soc. for Testing Materials. The laboratory report will call attention to any deviation from the standard requirements.

Slow setting or too rapid setting of concrete are faults met with in the field. The causes are often obscure. A rapid set is objectionable because the time for placing same may be too short and the coefficient of shrinkage is apt to be too high, causing cracks. Cement may not be set up properly because it has become partially hydrated. Consequently cement should be tested *after* arrival on the site and shortly before using and should always be stored in a waterproof shed. Another cause of slow setting and a serious one is the occurrence of organic matter in the sand.

Sand should approximate a clean quartz and it should not contain more than 7 per cent. loam. The percentage of loam may be determined by mixing sand with water in a bottle and allowing same to settle. The relative heights of sand and loam may then be scaled off and the relative amounts determined. The occurrence of mica in sand is objectionable as it is liable to cause disintegration. The occurrence of pyrites is objectionable because of possible chemical action. If sand is very fine, it is to be looked on with suspicion because it is liable to lead to disintegration. Sand formed by breaking up soft rock is to be avoided.

Broken stone should be of a clean hard rock, preferably trap. The occurrence of mica or pyrites renders stone objectionable. Gravel should be of a clean quartz or hard waterworn pebble. Broken blast furnace slag should be looked upon with suspicion because of its high porosity and possible chemical reaction. The maximum size of stone for reinforced concrete requiring a distribution around the steel should pass a ¾-inch sieve or a 1-inch wing. The material is preferably graded from a small to a large size. A well graded aggregate produces a denser, more waterproof and stronger concrete than one in which the aggregate is of uniform size. Aggregates should be free from loam as the latter is injurious to concrete. They should be free from sand to simplify the process of proportioning. The specifications generally call for a ratio of one part cement, two parts sand and four parts stone or gravel by volume for reinforced concrete. The subject of proportioning the mix in relation to the percentage of voids is one requiring the services of an expert.

Permit the concrete to flow around the steel and fill the forms aided by proper tamping, keeping in mind that the dryer the mixer the stronger will be the concrete. The mixer should be what is known as a "batch" mixer. It generally consists of a drum in which the ingredients are placed and rotated. The process is assisted by curved guides and should be continued for at least one minute, and always until the mixing becomes homogeneous, and until the particles of sand are covered with cement and the stone or gravel are well coated with mortar. A practical method should be adopted to insure that the correct proportions shall at all times go into the concrete. Here lies a danger. A standard batch mixer will hold two bags of cement, four cubic feet of sand and eight cubic feet of stone or gravel. Both bags of cement should be introduced at one time, as if introduced alternately, one may be forgotten. Cement bags should be well shaken out. Often the cement and sand is measured by bringing up barrows of material, and depending upon the number of these to measure the amount of the coarse and fine aggregate in each batch. This is a very loose method, and the author prefers two hoppers, which are filled, one with sand and the other with stone. The storage bins must be entirely closed off before the aggregate is admitted to the mixer, otherwise more than the allowable aggregate will find its way into the batch, especially if the contractor has a tendency to economize on cement. Many other methods of proportioning are in vogue, and the inspector must use judgment in approving a method.

A common cause of accident is the use of improperly designed forms. The dead weight of concrete should be calculated, and all compression should be proportioned accordingly. The unsupported height of such struts should be taken into consideration, and where this is excessive, bracing at the middle or third points should be resorted to.

The caps and joists should bear directly on top of the vertical members, and in no case should heavy loads be carried by spiking. The lateral pressures due to the hydraulic qualities and wedging action of spading should be duly taken care of by means of wire ties and bracing. This is especially great in deep girders and in columns. Columns should be poured slowly for this reason. Forms should be constructed to remain tight as a loss of the finer particles is injurious to the concrete and tends to produce voids. If forms deflect, the finished work is unsightly. In the case of the first tier where the uprights rest on soil, there is grave danger of settlement due to the load applied and the gradual softening of the ground. If this settlement occurs after the initial set, serious cracks will occur. To obviate this, mudsills should be placed under all uprights and opposed wedges placed between the uprights and the struts. The forms should be carefully watched with a level and any points indicating settlement should be wedged up. This wedging should not be carried on after the concrete has obtained its initial set. The interior surfaces of the forms should be oiled to obviate swelling and warping.

On the exterior of a concrete structure and elsewhere where it is desired to have a finished surface free from marks and imperfections, it will be essential to expose the surfaces for the finishing mason while the concrete is still friable. For this purpose the forms should be so constructed that they may be removed without disturbing the main supporting members. The concrete surface should be rubbed with a wooden float or carborundum brick to break down the surface film. This work may be assisted with a calcimine brush dipped in a solution of neat cement and water. The concrete elevating tower and its guys should be free from the structure so as not to cause vibration, during the process of setting. It should be borne in mind that the failure of any portion of the forms will cause impact on the floor below and may result in a serious accident.

Before allowing concrete to be placed it is highly important for the inspector to assure himself that the beam and column forms are according to the sizes shown on plans. Plumb all column forms. An interior column should not be more than ½ inch out of plumb and face columns where sash is to be placed should be plumbed and spaced with the utmost accuracy. The sizes of beam and girder forms should be checked up with that shown on the plans.

The size of steel should be carefully checked with special attention being paid to the effective depth of the beam, i.e., the distance from the top surface of the concrete to the center of gravity of the reinforcing steel. The beam steel should be wedged up with concrete blocks cast for the purpose or suspended upon stirrups so that the requisite space will be maintained under the bars for the concrete soffit protection. Bars should be carefully separated so that no voids will occur between the bars and so that the bond will be developed. All stirrups and bars should be accurately spaced and wired to insure against displacement during the concreting operation. The main reinforcement should extend well on to the column or wall bearing. Indeed, it is advisable for this reinforcement to lap or be spliced with dowels, as the shrinkage stresses before the beam is stripped may cause a crack in the underside of the beam at the column. It should be borne in mind that the compression area of a beam or girder extends well into the slab, and consequently openings should never be permitted adjacent to both sides of a girder or beam and on but one side only where called for on the plans.

Great pains should be taken to see that the reinforcing steel footing is placed in the right surface. A cantilever footing requires reinforcement in the bottom, while a combined footing requires it in the top. It is reported that on one job after a floor was poured, an extra beam frame was left over and it was discovered that the beam where this was to have gone was poured without it. All column forms should be provided with a slide door at the base for the purpose of removing shavings. This should be kept open until the barrow of concrete is standing over it ready for pouring. Particular care should be taken to see that the footing is free from loam, as in another instance it is reported that a six-story building column was found to be supported on the steel bars because an inch of loam covered the column footing when it was poured. Column forms should be tight at the bottom as accidents have occurred by the fine aggregate seeping out and leaving the column at the base standing on a loose gravel. This is an important point, and many columns when stripped show a tendency to this fault. Columns and beams should be flushed out with water before pouring to clean the surfaces and improve the bond. Column concrete should be tamped from the top with a long wooden strip, and great care should be taken to see that the concrete flows around the outside of the reinforcing bars and hooping. There is a tendency for the concrete to catch on the horizontal ties and leave voids just beneath same. A column should be poured slowly so that the process of setting may relieve the hydraulic head and prevent the bursting or warping of the forms.

As to freezing weather, the writer feels that the pouring of reinforced concrete where the temperature is below 32 degrees Fahrenheit or likely to fall below 32 degrees Fahrenheit should never be permitted unless protected by canvas and heated. In the case of mass concrete the heating of the water, sand or aggregate, or the use of calcium chloride in the water, will permit concreting at temperatures below freezing. However, the use of calcium chloride or other anti-freezing materials must not be used in reinforced concrete work because they will tend to corrode the steel. If concrete is frozen before initial set, it will never recover, and should be replaced. If it is frozen after initial set, but before final set, it may recover 80 per cent. of its normal strength if it thaws out gradually.

After the concrete has been poured, watch the processes of removing the forms, finishing and testing. This is a danger zone and the following "don'ts" might be suggested: 1. Don't remove forms until the concrete is thoroughly set and rings like a stone when struck with a hammer. 2. Don't mistake frozen concrete for concrete thoroughly set. 3. Don't remove permanently shores under beams and girders for at least three stories below the next floor to be poured. 4. Don't permit the placing of a cinder fill on the roof until the roof concrete is thoroughly hard. 5. Don't permit heavy sections of ceiling forms to be dropped onto the floor below. 6. Don't permit heavy concentrated loads of material or machinery on "green" concrete floors. 7. Don't accept structural work which exhibits considerable voids or places where the cement and sand is lacking around the coarse aggregate. If the inspector is in doubt about the quality of a portion of the work he should order a test. This test should be made by a load of at least 1½ times the live load. A beam should not show a deflection of more than one six-hundredth of a span. The test should be conducted with due regard to the safety of all concerned and the writer suggests the use of shores slacked off about ⅛ inch from the beam soffit. The deflection may be measured by a level or by a lever pointer which will magnify the deflection. 8. Don't attempt to construct concrete exposed to salt water without the services of an expert. To sum up: Watch the ingredients. Watch the mixing. Check the placing of steel and sizes of forms. Watch the strength of forms. Avoid frozen concrete. Never strip concrete until it gives physical evidence of having set. Test a doubtful construction or condemn it. With these points carefully watched and assuming a proper design, the architect may expect to spend a lifetime in constructing reinforced concrete buildings without a failure.

ECONOMY IN STEEL DESIGN

THE designer of structural steel when starting a job should remember the old professor of mathematics, who said, "Given five minutes in which to solve a problem, one can profitably use three in settling how to go about it." The point for the designer is that oftentimes a designing job is started after too little time given to deciding how to go about it.

The idea to be kept in mind is economy. A paper by R. Fleming, C. E., of the New York office of the American Bridge Company, appeared in the June, 1921, issue of the Journal of the Western Society of Engineers, Chicago, in which economy in steel design was well discussed. Mr. Fleming in his numerous articles in technical papers has done a great deal to stress common sense in engineering design and we hope his writings will some day be collected into book form. In this article we will endeavor to present the main points stressed by Mr. Fleming, not always in his own words, but holding throughout closely to the text.

When loads and unit stresses are fixed by building ordinances or rigid specifications which cannot be departed from, the designer must look elsewhere to reduce costs. This requires careful study of the spacing and best types of trusses, beams and columns.

Economy in weight of steel is important, but beam work is fabricated cheaper than riveted work, hence it is often advantageous to increase the spacing of trusses. This reduces the amount of riveted work and increases the amount of beam work. The truly careful designer will have before him a schedule of pound prices for beams of all weights, together with cost data on cutting and riveting.

Trusses should be as simple as possible in order to cut shop costs to a minimum. To guard against deterioration caused by corrosion certain minimum sizes are used for web members, which often give these members an actual strength greatly in excess of requirements. This excess weight may often be thrown into a few members and the fewer members in a truss the cheaper it can be fabricated. Mr. Fleming states that in one case in a large number of saw-tooth roofs he reduced nine web members to two. It added about 15 per cent. to the weight of each truss, mostly in the top chord to provide for bending stresses, but it was necessary to do so to lessen the work of fabrication.

Occasionally, when foundation conditions are bad, the number of foundations may be reduced and the weight of steel increased. When such an alternative is forced on a designer there is all the more reason for him to limit as much as possible the cost of the steel by cutting fabrication costs. When a design calls for six or seven sizes of angles, make a study to see if three sizes will do as well. Increased weight may result but decreased cost of fabrication may more than offset the cost of the additional steel. Rafters, instead of trusses, at the ends of an industrial building weigh less than full roof trusses, but the trusses by their saving in detailing and duplication in fabrication will usually be cheaper besides being better for any extension that may come up.

The Details

Mr. Fleming recommends the following rules for detailing (taken from various sources). Like all rules they must occasionally be departed from when it is judged best so to do. No rules can be always followed literally.

Floor joists, if possible, should be framed into beam and plate girders so that they are coped neither at top nor bottom.

All unnecessary bevel cuts on plates and angles should be eliminated.

Do not use unnecessary rivets in fastening together the component parts of columns and girders.

Stiffener angles are to be omitted on columns under beam and girder seats unless the load exceeds 20,000 pounds.

Bracing connections that will necessitate cutting and splicing of web plates and slotting of cover plates on columns should be avoided.

Re-entrant cuts should be avoided.

Do not use unnecessary countersunk and chipped rivets in fastening cap plates and base plates to columns and base plates to girders and pedestals.

Both shop and field rivets are preferably driven by machine and if possible should be so located that a machine may be used.

On mill buildings when purlins are bolted, purlin clips and rod connections may also be bolted.

Avoid slight variations in details.

Avoid different sized holes in the same piece.

See that ample clearances are allowed.

Girders which frame into webs of columns should have when necessary, their flanges notched to clear rivet heads in outstanding legs of columns. This will permit erection without spreading of columns.

Entering connections should be avoided.

If practicable, arrange details of a member so that it may be reversed in erection.

Make field riveting a minimum. Consider how each bolt and field rivet will be entered and fastened.

The writer would add, as a result of many years' experience, that all purlins should be placed with leg of angle or channel on lower side to eliminate continuous dust pocket. In many industries dust is a real menace.

Compression Members

For rivets not subject to any calculable stress and that are used only to fasten together component parts of a member where loading is symmetrical, the following specifications prepared by F. L. Castleman, Plant Engineer, American Bridge Company, Pencoyd, Pa., are recommended by Mr. Fleming:

The rivets through cover plates should be spaced in the direction of the stress not farther apart than 16 times the thickness of thinnest plate involved, plus 2 in., with a maximum spacing of 9 in.; at right angles to the line of stress the rivets through cover plates should not be spaced farther apart than 32 times the thickness of thinnest plate, plus 2 in. The distance from rivet lines to edge of cover plates should not exceed eight times the thickness of plate plus 2 in. Where a channel is used as a cover plate the rivets through the channel should not be spaced farther apart than 12 in.

The rivets through web plates and angles where web is enclosed between two angles, should not be spaced farther apart than 12 in.

The rivets fastening together the angles of a two angle strut separated with washers should be spaced a maximum distance apart of 2 ft. 6 in.

The rivets fastening together the angles of a two angle strut, angles in contact without washers, should be spaced a maximum distance apart of 2 ft. 0 in.

The pitch of rivets at ends of compression members should not exceed four times the diameter for a distance equal to 1½ times the width of the member.

At points where loads are applied to compression members and where compression members are subject to bending stresses, the pitch of rivets should be increased so that sufficient rivets are provided to distribute the load and to take care of stresses involved.

Fabrication

Mr. Fleming after discussing fabrication, says that with the processes of fabrication and the economics of shop management the engineer, as such, has little to do. Both designer and draftsman, however, should have a competent knowledge of the shop equipment, that they may be guided by its limitations.

(To be continued.)

Symbols for Electrical Equipment

IN conformity with the request of a conference of interested national organizations the American Engineering Standards Committee has designated the American Institute of Architects, the American Institute of Electrical Engineers, and the National Association of Electrical Contractors and Dealers, joint sponsors for a sectional committee on Symbols for Electrical Equipment of Building and Ships.

A Study of Air Seasoning of Wood

IN coöperation with the sawmills and wood utilization plants throughout the country, the Forest Products Laboratory, Madison, Wisconsin, is organizing an extensive field study on the air seasoning of wood. The purpose is to determine the piling practice which will result in the fastest drying rates consistent with the least depreciation of stock, the least amount of required yard space, and the least handling costs. The study will be carried on concurrently on both hardwoods and softwoods. All the important commercial woods of the United States will eventually receive consideration.

No systematic attempt has ever been made to work out the exact conditions under which drying time and drying costs can be reduced to a minimum. The new object will furnish a comparison of the effects of such piling variables as sticker heights, the spacings of boards in layers, the heights of pile foundations, and the directions of piling with relation to prevailing winds and yard alleyways.

The study is expected to decide whether from a business standpoint lumber should be dried partly at the mill and partly at the plant of utilization, or whether it should be completely dried at the mill. The data collected will also go a long way toward showing whether air seasoning or kiln drying is the more profitable. A mailing list is being compiled of all who wish to receive bulletins of progress.

Fire Tests of Building Columns

IN 1910 experiments were begun on building columns to determine the safety of various types when exposed to fire. In 1914 the assistance of the Government was obtained and the tests were continued under the joint supervision of the Associated Factory Mutual Fire Insurance Companies, the National Board of Fire Underwriters and the Bureau of Standards. The fire tests were made at Underwriters' Laboratories, Chicago, Ill. The final test was completed in December, 1918, the series consisting of 91 fire tests and 15 fire and water tests, a total of 106 tests. The final report has been printed in a 375 page bulletin, No. 184 Fire Tests of Building Columns in Technologic Papers of the Bureau of Standards, Washington, D. C.

Management Engineering

THERE was a time when management was management and men grew to be managers. The recent report of the Committee on Elimination of Waste in Industry, blamed management for 50 per cent. of all waste. It seems time, therefore, that the principles of applied science be put in operation in business organizations, and this requires the aid of teachers, psychologists, technicians and engineers. To insure a right beginning The Ronald Press Company of New York City has begun the publication of a new monthly journal named "Management Engineering, The Journal of Production." The first issue appeared in July under the direction of Mr. L. P. Alford as Editor. The sixteen articles cover a wide range from "The Pioneer Spirit in Engineering," to "Training for Proprietorship," and "Classifying and Indexing the Clipping File." The contents are good and the journal is well printed and pleasing in appearance. It has entered a good field and the best wishes of The American Architect are extended to the editor and publisher.

National Electrical Safety Code

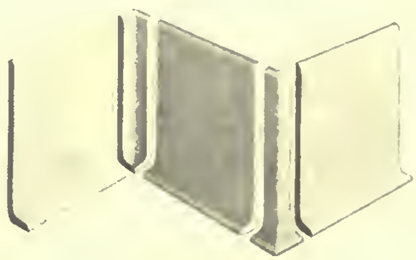
THE Bureau of Standards, Washington, D. C., has issued No. 4 of the Handbook Series of the Bureau of Standards, containing a discussion of the National Electrical Safety Code. This discussion covers the third edition of the code, the bulk of which is materially reduced by the publication of the discussion in a separate volume.

Temperature Effects on Concrete

THE Iowa State College Engineering Experiment Station, Ames, Iowa, has issued a pamphlet entitled "Effects on Concrete of Immersion in Boiling Water and Oven Drying." The experiments were undertaken to check laboratory methods to determine the effect of freezing and thawing on concrete.

A New Sanitary Wall Base

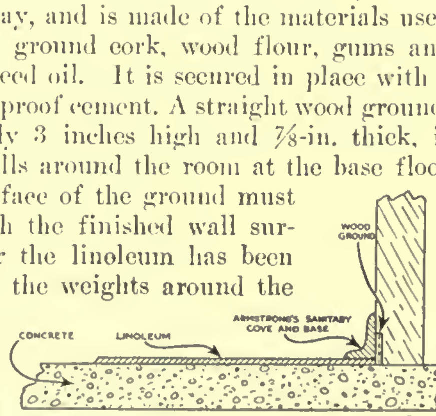
THE AMERICAN ARCHITECT some time ago illustrated the use of linoleum as a safety stair tread.* More recently the use of linoleum as a structural feature was discussed and illustrations given of its application.† Another application is



Units of Sanitary Cove and Base

illustrated in the accompanying figures showing a sanitary cove and base to be used in connection with linoleum-covered floors.

This cove and base comes in three colors, brown, green and gray, and is made of the materials used in linoleum; ground cork, wood flour, gums and oxidized linseed oil. It is secured in place with a special waterproof cement. A straight wood ground, approximately 3 inches high and ⅞-in. thick, is set in all walls around the room at the base floor level. The face of the ground must be flush with the finished wall surface. After the linoleum has been laid out and the weights around the edge removed the six-inch high base is installed. It is coved at the lower edge and comes in 18-inch lengths. The concave and convex corner pieces are made separately as shown. Properly installed no moisture can get between the floor and the base or between the wall and the base, so the claim that the base is sanitary is properly made.



Detail showing use of Sanitary Cove and Base in connection with a linoleum floor

*July 7, 1920. †May 11, 1921.

BOOK REVIEWS

The Design of Concrete Structures*

IN his "Dictionary of Architecture and Building," Sturgis defined the division between the architect's and engineer's work as follows: —"whatever is traditional in form and in structure, whatever is admittedly safe, whatever is known to all practical builders as well within the limits of danger, comes within the architect's province; . . . All that is so new or complex as to require careful scientific examination based upon mathematics is the province of the engineer."

Point was given to the foregoing classification of work when steel frame construction after 1885 made possible the construction of buildings to heights to that time not believed possible within the limitations imposed by economic returns. It was not long however until the things that were new and complex became standard and commonplace. Plainly written texts and carefully prepared tables and diagrams standardized the subject and the architect is once more "The Master Builder," in control of the situation. He is not so plagued in his quest for beauty with utility by the uncompromising worshipper of utility, the steel designer. Steel is now a material handled by the well trained architect as readily as wood, stone or brick.

Reinforced concrete followed steel and, because it was new and complex, the engineer again threatened the architect. The engineer however cannot be restrained from telling what he knows and he is remarkably generous in publishing tables and diagrams used in his private practice. In a new book by George A. Hool, Professor of Structural Engineering at the University of Wisconsin, and Charles S. Whitney, a structural engineer who specializes in reinforced concrete design, tables and diagrams are presented which make possible the rapid designing of reinforced concrete structures in accordance with the most approved codes. It is remarkably complete and will help the architect in his reinforced concrete work in the way the steel manufacturers' table books helped him in handling steel design. It is not a text book but is a work which will save hours of laborious computation and by means of which one may check computations. Let the architect rejoice that the engineer is rapidly eliminating all that is new and complex in building design and thus removing himself as a rival in the field which architects have occupied from earliest times without rivalry.

**Concrete Designers' Manual, by George A. Hool and Charles S. Whitney. 276 pp., 6x9 in., Ill. Fabricoid. New York, McGraw-Hill Book Co., Inc.* $4.00.

Estimating the Cost of Buildings*

COST estimating," said Mr. Wm. Arthur, "is very simple. It is only necessary to multiply the units by the unit prices and add the totals. All the difficulties arise in obtaining the number of units and the unit prices." John Richards, an authority on the economics of construction a generation ago, said, "Men as a rule are paid according to production. The rate of wages affects very slightly the total amount paid for wages on any job." He held that the Chinese laborer was paid ten cents, the Hindoo laborer five cents, the Mexican laborer forty cents, and the American laborer one dollar (remember, this was a generation ago) per day, because the performance of each had the value represented by the wage given. His contentions were fortified by published data on road, railway, levee and harbor construction in many countries and the cost per mile, or other large unit adopted, differed but little, the rate of wages differing greatly.

The old school of contractors believed implicitly in "sizing up a job" and giving a lump sum bid based entirely on their experience on similar work. It explains why the newer type of contractor, who adapts himself to monthly, weekly and daily changes in condition, is rapidly supplanting the contractor of a former generation. The new contractor determines the number of units, finds the unit price, multiplies them together and adds the totals. He has discovered that the organized labor of today must be reckoned with and he must know fairly accurately the out put per man and the rate of wages, or he will lose money. To this, however, must be added the ability to check all estimates by comparison with costs of similar work; "sizing up a job" in fact. To reason must be added something closely resembling instinct.

Mr. Walker in the latest edition of his standard reference book for estimators has carefully revised all data and tables. Everything is now based on output per working day of building tradesmen. This is an agreeable change from the usual style in estimating books of giving costs of certain typical jobs so that estimates for fairly similar work might be made by comparison. The book contains data of great value to specification writers and designers and may be recommended to all men interested in building construction as worth while. While valuable for experienced men the warning needs to be made that the most perfect instructions can never supplant experience. Green men cannot safely handle cost data, no matter how well presented they may be. Good tools should be reserved for competent hands.

**The Building Estimator's Reference Book by Frank R. Walker. 2931 pp., 4½x6½ in., Ill. Fabricoid. Chicago, Frank R. Walker Company.* $10.00.

A REVIEW of RECENT ARCHITECTURAL MAGAZINES

BY C. HOWARD WALKER

IN THE *Architectural Record* for June are three articles with many illustrations to each; the first upon "Newer Fifth Avenue Retail Shop Fronts," by John Taylor Boyd; the second upon "Tendencies in Apartment House Design, Remodeling," by Frank Chouteau Brown; the third, "Early Architecture in Pennsylvania, Part VII, Windows and Shutters," by A. Lawrence Kocher. This last article is interestingly illustrated with typical examples. All these articles are well written. The shop fronts have done more to consistently embellish New York's avenues within the last decade than any other single feature of design. Twenty-five or thirty years ago New York sidewalks were cluttered with a harlequinade of show cases and signs. Now Fifth Avenue is an interesting succession of well designed show windows and the bill-board is conspicuously absent—would that it might be so upon our roadways. Mr. Boyd considers the shop front an American contribution of Modern Art. If he had said it was an American expansion of the shop fronts of France and of England he would have been nearer the exact truth. The examples given by Mr. Brown of remodelling buildings into apartments are excellent. The Portfolio of Current Architecture illustrates Little Orchard Farm, White Plains, N. Y., by Frank J. Forster. It is deliberately and successfully picturesque and has the irregular shingling which can easily be carried to excess.

From "The Architectural Review," London

Saloon Fireplace of Yacht "Nyria"
Hepworth & Wornum, Architects

From "The Architectural Review," London

Decorations in the entrance hall at High Royd, Honleys
George Clausen, Painter

The Western Architect, April, 1921, has its opening article upon Denver, Colorado, by Arthur A. Fischer. It shows the marked improvement in Denver architecture and the development of the civic center. The new work is severely and simply classic in character, excellently proportioned in most cases, and consists of the admirable Federal Building and the United States Mint by Messrs. Tracey & Swartwout and Mr. Litchfield, the Public Library by Albert R. Ross, the Colorado National Bank, which has a slightly inadequate cornice, and the International Trust Company, which has too little height in the epistyle for the frieze story above. Both of these bank buildings are by W. E. and A. A. Fisher. Mareau & Morton's Cheesman Memorial is excellent. Their Colonnade of Civic Benefactors has too broad a center motive, and entirely too great a span between the columns in antis. Some of the Denver schools have already been mentioned, such as the very charming design by I. B. Benedict. Varian & Varian have a good design for a small branch library. Warren & Wetmore's Broadmoor Hotel, Colorado Springs, is picturesque and well composed and McLaren & Hetherington's little Spanish Pauline Chapel is attractive and good, outside and inside. Part XIX of "Spanish Renaissance Architecture in California," by Rexford Newcomb, is devoted to the Mission of San Juan Bautista. It is one of the most interesting of the Spanish missions.

The Journal of the Royal Institute of British Architects, June

11, opens with Mr. Robert Atkinson's paper read before the Institute upon "The Design of the Picture Theatre," illustrated with American examples, most of them by Mr. C. Howard Crane. He states that little has been done in theatre architecture as far as the interiors are concerned and that roofing has been the principal difficulty encountered and he concludes that the cone system both of plan and of section has been proved to be the most logical. All of which is common sense. My own feeling of dissatisfaction with theatre interiors is based upon the fact that there is too extensive a use of Renaissance precedent in the wall and ceiling decoration and as a result we find a collection of different shaped arches and panels of inharmonious scale and columns and pilasters also of different scales, which are purposeless and unnecessary. The proscenium opening requires a frame only, not an arch, and literally there is no logical need of a column nor of a pilaster in a theatre; neither does the ceiling or roof demand caissons. For acoustic purposes, certain surfaces should be broken in their planes, but this can be done without recourse to the orders of architecture. Mr. Bartle Cox, pupil of Laloux, writes upon "Professorship and Public Recognition," interestingly—summing up that "effective professorship is the only road to public recognition." Though I am a teacher, I differ with Mr. Cox in his opinion, and feel that fine achievement obtains and holds recognition. The eye teaches more in the appreciation of architecture than does the ear. An appreciation of Sir R. Rowand Anderson, who died June 1st, at the age of eighty-seven, should be reprinted in our journals.

From "The Western Architect"

Public Library, Denver, Colorado

Albert R. Ross, Architect

The Architectural Review, London, is, as always, interesting but the writer has very little liking for Mr. George Clausen's decorations for the entrance hall, High Royd, at Honley near Huddersfield. They do not, it is true, destroy the surface upon which they are painted, and in that respect follow Chavannes' good, commonsense practice and Mr. Moore's perfectly ordinary dictum, but in all other respects they fall short of distinguished quality as Chavannes' have in the Boston Public Library. They have little or nothing to do with the spaces they occupy, and have no consistent harmonic arrangement in the lunettes. "Morning" has a banal balance of two figures in each of the lower corners and space over the opening. "The Golden Age" has figures above the opening over a thin lintel and space in the corners. "Evening" returns to the arrangement of "Morning," but with seated figures only. To be sure, it is opposite "Morning." There are no border lines. The scale of the figures is too large for the room and the technique, as shown in the colored frontispiece, is of a spotty character. It all means well, but has not arrived. Compare it with the masterpieces of the Florentines or the Venetian, or with Bernardino Luini in Milan. W. G. N. had a good time in Montepulciano. I am sorry he went there in a motorcar without a silencer and am sufficient of a Pharisee to pride myself upon having pedalled up, twenty years ago, quietly on my wheel, late on a cool January afternoon, and to have seen the sun set over the campagna, and had spiced wine after dinner, and a cage like a lobster pot with a jar of hot charcoal, the whole thing called a "prete," put into the bed to warm it before I tumbled in. A wonderful place

From "Emulation," Brussels

Church of St. Walburge, Furnes

is Montepulciano, and Sangallo's S. Biagio opposite his house outside the walls, is an example of the just proportioning of a comparatively small building producing an effect of grand scale. Messrs. Hepworth and Wornum have designed some charming interiors for Mrs. Workman's racing yacht, Nyria. They are a little too feminine to entirely suit a salt-water sailor, and the writer earnestly wishes to enter protest against a fireplace at sea—even if, as in the illustration, it is merely made the receptable for a pot of flowers.

From "The Architectural Record"

Millinery Shop, West 57th St., New York

Kenneth M. Murchison, Architect

Art Shop, 16 East 56th St , New York

Trowbridge & Ackerman, Architect

Vell-i-nou, Barcelona, Spain, Number XIV. Barcelona, probably with justice, takes itself seriously. It has thrown its hat into the ring for everything revolutionary and to its mind. new. It shows no discrimination as to accomplishment; an intention is to it a reason for praise, and its desire is to be different from all others. I wish Vell-i-nou were published in good Castilian Spanish, one of the noblest languages in the world, and not in a Barcelonian offshoot. Senor Pico finds in Rafael Benet's work, "flourishing intensity under an appearance of timidity"; I find only a stirring of pigments into mud-pies. There is a good article on Spanish Furniture by August Mayer, director of the Alte Pinacotek, Munich, and an excellent historical account finely illustrated of the sculpture of Santa Maria de la Mar (presumably in Barcelona, which all the world should know), the article says nothing about the location, plan or character of the church but is written for local consumption.

From "The Architectural Record"

548—Fifth Avenue, New York

Carrère & Hastings, Architects

L'Emulation, March, 1921, published in Brussels, is devoted to the reconstruction of Furnes, much shattered in the war, and the isolation of the church of Ste. Walburge, which fortunately was little injured; it is an excellent article, well illustrated.

La Construction Moderne, May 29, 1921, contains illustration of a projet for a palace at San Salvador by M. J. Richard. The exterior is very ordinary, the interior florid but somewhat better. June 17th, Projet of M. Charles Nandin for a Victory Monument opposite the Invalides. It has a monumental plan, effective mass from front only, a center arcade that is interesting, well proportioned and with banal detail. The tops of the pavilions are shapeless and overdone, as is the cornice of the pavilions. The small isolated pavilions are superfluous.

From "The Architectural Record"

8 East 45th Street, New York

Walker & Gillette, Architects

THE AMERICAN SPECIFICATION INSTITUTE

127 No. Dearborn Street, Chicago

As heretofore produced specifications for building construction and equipment have been, to a great extent, the product of individual effort and as such, have varied in many features that can be conventionalized so as to be common to all. This does not mean, necessarily, the standardization of specifications so that one is like all others, for such an attempt would be absurd and of no value as it would stultify individuality and accomplish no results of pleasing and lasting benefit.

It is believed, however, by the Board of Governors of *The American Specification Institute* and by many of its members that, if the efforts of individual specification writers can be directed along lines that will lead to a more easy and happier accomplishment of their work through the mutual study of the Specification Institute members, a very great deal of good will come from a centralized and critically directed fountain-head of specification ideas.

Owing to a present lack of means for collecting and distributing information concerning specifications and the writing thereof, there is a needless duplication of study, research and labor on the part of specification writers. This condition tends to make the work seem arduous, as it quite often is if there has been no great effort expended towards meeting the conditions present in the individual office. Those specification writers who have had sufficient vision to take the time to analyze the problems they must meet and who have attempted to organize their work in some more or less methodical fashion have been gratified to find the time so spent has been well spent, as it has come near to lifting their routine duties out of the slough of an arduous task.

Practically all other professions are so organized that the interchange of knowledge peculiar to their profession, such as the deliberations of committees which formulate proposed standards for basic operations and the results of researches undertaken by scientific laboratories, is effected in such a way as to result in the improvement of the quality of specifications produced and, consequently, in the professional and business standing of their authors.

The American Specification Institute has been organized to improve all those conditions surrounding the writing of specifications and to bring to specification writers the benefits that are to be obtained from the organized efforts of men accustomed to study and write these essential documents. The scope of the specification Institute already has assumed a national character and the co-operation, through membership, of all specification writers is cordially invited.

The kind of specifications that are to be studied and for the preparation of which informative data is to be compiled and distributed to members include those for buildings, engineering structures and all works whatsoever in which materials of construction and labor are used; those for the installation and use of mechanical, electrical and sanitary apparatus and equipment; those for the fabrication and installation of all furnishings and furniture; those for all exterior and interior ornaments and ornamentation; those for road paving, planting, embellishing and improving of landscapes, estates and waterways and all those miscellaneous matters and things that are produced and offered for sale under specifications written by the architect or engineer.

The American Specification Institute will not attempt interference with any of the present organizations of national or local character, such as The American Society for Testing Materials, The Structural Service Committee of The American Institute of Architects, The American Engineering Standards Committee, The American Society of Heating and Ventilating Engineers or the numerous manufacturers and trade associations but will endeavor to carry forward the activities of such and give additional assistance to specification writers. Arrangements for complete co-operation with all these organizations either have been effected or in process of accomplishment and members thus will benefit by all the valuable work that has been and will continue to be done by them.

It is anticipated that the benefits that are to be gained by the architectural and engineering professions through the work of the Specification Institute will tend to eliminate cause for guesswork and arguments and lower the cost of building construction and equipment. Further it is believed that professional recognition of the importance of having trained specification writers will result in a more careful study of the requirements of the drawings and specifications and will obtain a more equitable balance between the two documents.

The membership of The American Specification Institute is divided into four classes, as follows: Active, Associate and Honorary grades and Patrons. Active members are those persons who devote their entire time or a part thereof to the writing of specifications. Associate members are testing and laboratory engineers and instructors in specification writing in architectural and engineering schools. Honorary members are persons who have rendered distinguished service to the art or science of specification writing. Patrons are those persons who contribute to the financial support of the Institute in addition to any dues they may pay as members. Only those who are interested in specifications from the professional point of view are eligible to the grade of Patrons.

The American Specification Institute is incorporated under the laws of the State of Illinois and is governed by a constitution and by-laws. The general activities of the Institute, such as researches, are under the direction of the Executive Secretary who in turn acts under the advice and direction of the *Board of Governors.*

The American Specification Institute has divided its activities into two general classes, that is—(a)—study of materials used in building and engineering construction and equipment, embracing the production and physical properties of raw materials, methods of manufacturing, fabrication and finishing and a study of relative values of materials as based on appearance, initial cost and maintenance, effect of combination with other materials and proper materials for various types of buildings of varying grades and—(b)—a study of the methods of writing specifications. In this latter class there will be studied the means of accomplishing complete co-operation between the drawings and specifications and to determine what methods of construction and installation should be used under given average circumstances, what the drawings should show or indicate and what should not be shown or indicated on the drawings for inclusion in the specifications.

The development of an outline or checking list will be given attention. This subject already has been made the subject of several bulletins and has proven to be of very great interest to the members. The arrangement of specifications so as to conform to the sequence of construction and installation work, the writing and composition of specifications that are clear, concise, coherent and that can be understood by law courts and the principles of contract law as it affects the writing of specifications all will be subjects of bulletins.

All bulletins will be issued in loose-leaf form to be placed in the cover which is furnished by the Institute. This will permit the re-issuance of obsolete bulletins and the insertion, in orderly sequence, of all subsequent sheets. These bulletins will be made in the standard letter size sheet as has been recommended by The American Institute of Architects and it is expected that eventually there will be available to members a most valuable and highly useful text-book of data respecting the preparations of specifications.

PERSONALS

Woodson & Vaughn, architects, have opened offices at 1353 U Street, N. W., Washington, D. C.

It is reported that William Bohlmeyer has established an architectural office in the Post Office Building, Summit, N. J.

Emile G. Perrot, architect, Parkway Building, has moved his offices to the Boyertown Building, 1211 Arch Street, Philadelphia, Pa.

John A. Thompson, architect, has moved his offices from 105 West Fortieth Street, to 103 Park Avenue, New York City.

Announcement is made that I. B. Lowry has recently moved his architectural offices from Phoenixville, Pa., to Danbury, Conn.

The offices of Sil, Buckler & Finhagen, architects, have been moved to 325 North Charles Street, Baltimore, Md. They were formerly located at 11 East Pleasant Street, that city.

It is announced that E. S. Kent, formerly head draftsman for F. A. Patterson, architect, Bangor, Maine, has opened an office for the practice of architecture in that city at 32 Webster Avenue.

Announcement is made that Cass Gilbert, architect, 244 Madison Avenue, New York City, has been selected to draw the plans for West Virginia's new Capitol.

Edward Schoeppe, formerly of M. Ward Easby, Inc., has opened an office for the practice of architecture at 315 South Fifteenth Street, Philadelphia, Pa., and is desirous of receiving manufacturers' Catalogs and samples.

The firm name of Minchin & Weller, Inc., architects of Chicago, Ill., has been changed to Weller & Rippel, Inc. They will continue the practice of architecture and structural engineering in the Marquette Building, that city.

J. A. Larralde and William Barber, architects of Los Angeles, Cal., have dissolved partnership. Mr. Barber will retain the old office of the firm, 1123 Story Building, and Mr. Larralde's office will be located at 1018 Story Building.

Orlando K. Foote and Charles A. Carpenter, formerly of the firm of Foote, Headley & Carpenter, architects, announce the opening of offices at 154 East Avenue, Rochester, N. Y., to continue the practice of architecture under the firm name of Foote & Carpenter.

John N. Tilton, Jr. of Marshall & Fox, architects, announces that he is continuing the practice of architecture established in 1882 by his father, the late John N. Tilton. His offices are located at 721 North Michigan Avenue, Chicago, Ill., and 123 South Kensington Avenue, La Grange, Ill.

N. G. Walker, architect of Rock Hill, S. C., and Marion N. Cornwell, of Chester, S. C., announce the opening of offices at Chester, S. C., under the firm name of Walker & Cornwell. Mr. Cornwell, who is a graduate of Clemson College, has been with Mr. Walker for two years.

E. Bickham Christian and Henry E. Schwarz announce their association for the practice of architecture under the firm name of Christian & Schwarz, with offices at 805-6 Ardis Building, Shreveport, La. They are desirous of receiving manufacturers' catalogues and samples.

Announcement is made of the death of G. Wood Taylor, for many years an architect in Springfield, Mass. Mr. Taylor was the designer of a number of public and private structures in that city, among them being the Wesson Memorial Hospital, the Nayasset Club, the Country Club, etc.

H. W. Witcover, Harrison S. McCrary, Jr., and E. Lynn Drummond, architects of Savannah, Ga., announce the formation for the practice of architecture of a co-partnership under the firm name of Witcover, McCrary & Drummond, with offices in the Artillery Building at Bull and President Streets, that city.

It is announced that Harold P. Bergen has opened an office at 607 Worcester Building, Portland, Ore., for the practice of architecture. Mr. Bergen is a graduate of Columbia University of New York City, and has lately been associated with Thomas W. Lamb as manager of his Canadian office.

The partnership existing between Willis Polk, Raymond W. Kinne and L. Gerstle Mack, under the firm name of Willis Polk & Co., architects of San Francisco, Cal., was recently dissolved, and the interest of L. Gerstle Mack was purchased by Willis Polk and Raymond W. Kinne, who will continue the partnership under the firm name of Willis Polk & Company.

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CHAPEL IN ARCHBISHOP'S PALACE, RAVENNA, ITALY

THE AMERICAN ARCHITECT
The ARCHITECTURAL REVIEW

VOL. CXX WEDNESDAY, SEPTEMBER 14, 1921 NUMBER 2376

REMINISCENCES of an ARCHITECTURAL PRACTICE

An interview with Electus D. Litchfield

Illustrated by details from the work of Electus D. Litchfield Rogers, Architects

THOSE in the profession of architecture who intimately know Electus D. Litchfield, will appreciate the difficulties of an interviewer who called on him for the twofold purpose of securing examples of his work for illustration and of learning something of the mental attitude of the man.

Mr. Litchfield spent his student days among the great men in the profession. His connection with individuals and architectural firms whose work is standard everywhere in this country has imparted many of the characteristics that every thoughtful man acquires from such association. Approachableness is one of these.

Every man who engages in architectural journalism early learns to group the profession into two classes,—one that may be easily and freely approached and one that affects the utmost exclusiveness. And having arranged these classes and studied their personnel, he arrives at the conclusion that the big men, those who do the worth while things, are kindly and courteous, always willing within the bounds of reason to give of themselves, modestly and thoroughly.

The first class keep their appointments with the humble editor as punctiliously as with their most important client, the second are so keen to impress their importance that all other matters become secondary.

But, this very approachableness in men of the first class has its drawbacks when the editor seeks an interview, for, as in this present instance while we were trying to explain to Mr. Litchfield what we desired to have and to know, there was constant interrup t i o n. This is always true when the head of a successful organization is his own executive, as he, of course, should be.

Between the many interruptions and the telephone's vulgar "butting in"—is there anything more ill bred than a telephone?—we managed to learn the facts as to Mr. Litchfield's work that are here set down.

"While I am an architect," said Mr. Litchfield, "my earliest training was that of an engineer, in which profession I seriously engaged for a few years after leaving college, but almost at the outset of my engineering experience I became connected with important construction operations."

"Why, then," we interrupted,—int e r r u p - tions seeming to be so much in style,—"did you abandon engineering for the practice of architecture?"

The reply, with a characteristic shrug of

Tower designed to mask a tank for a water-system for Steinbach Stores, Asbury Park, N. J.

the shoulders was, "I knew that was where I belonged." Studying the man and thinking back over the important work in his present profession of architecture with which he has been identified, there is no question that the answer was a correct one.

Successful men in any profession are successful because they feel the "urge" towards the expression of certain things that give the possessor no rest until they are expressed. This is true of painters and sculptors, prose writing and poets and of architects.

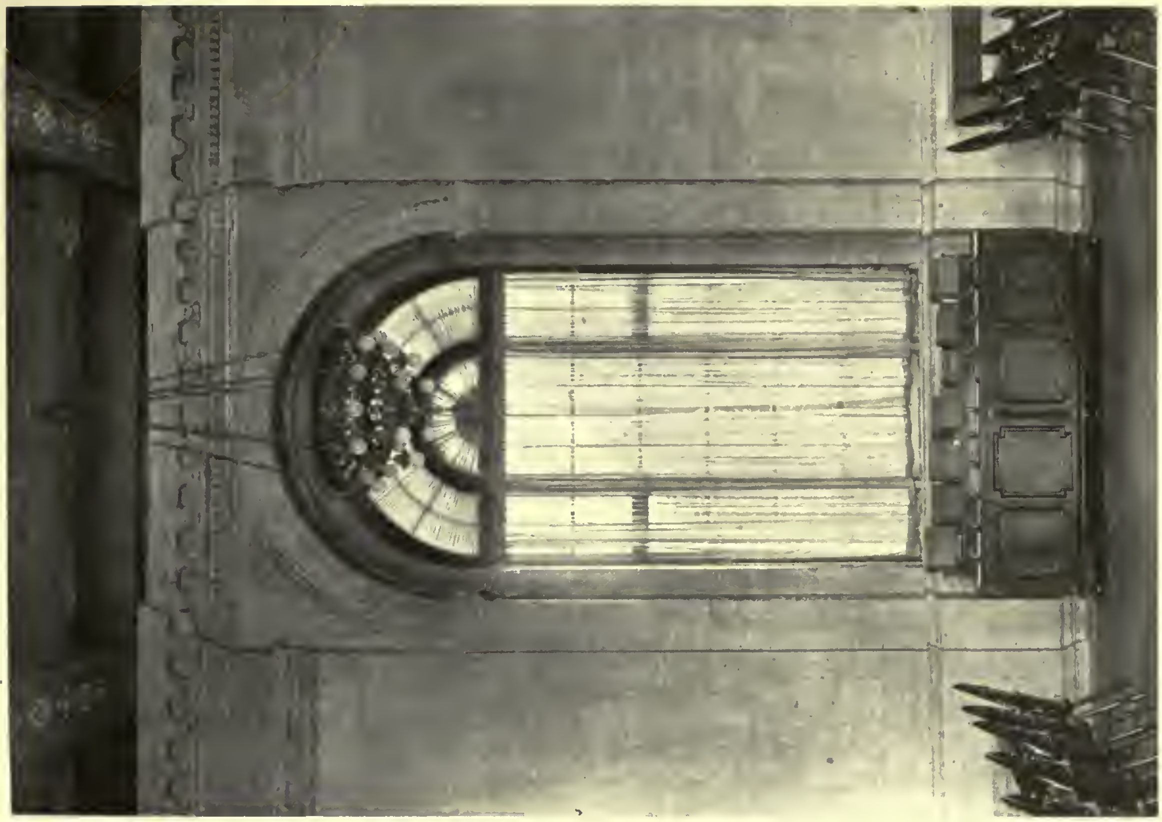
It would not be possible to imagine a man of Mr. Litchfield's artistic impulses chained to the mathematics of engineering practice. Yet, if questioned on this point, Mr. Litchfield would probably stoutly contend, as have other men whose early training has been in engineering, and we have met many of them, that whatever of success he has achieved is largely due to the solid training he received as an engineer. One might digress here to some purpose in a discussion of methods of architectural education.

When Mr. Litchfield, urged by the interviewer, took up the subject of his artistic training in the profession of architecture, he became thoroughly interesting. He said:—

"When I abandoned engineering to take up an architectural career, I had the good fortune to enter upon my new profession with the firm of Carrere and Hastings, and under the direct tutelage of John M. Carrere himself. At that time their office was the rendezvous of a great group of brilliant young architects, students, and in many cases graduates of the Ecole Des Beaux Arts, who were to spread the gospel of the broad vision and the logical planning which has been the great gift of this school to the architecture of the world. The ever recurring motif in the teaching of both Carrere and Hastings, was that art, and in particular architecture, to be alive must be modern; that all art is a development and that while the architect might go back for inspiration to any of the great periods of the Renaissance, that never should the precedent be slavishly followed, but the work of today should be the logical development in accordance with the needs, materials and methods of the hour. The conditions which produced Gothic architecture, they felt, had entirely passed and modern Gothic, they held, was an anacronism. While I am inclined to believe that the so-called modern Gothic of that day was a dead thing, the kind of Gothic which we find in the work of Ralph Cram, and at any rate in that of Bertrand Goodhue, is a living thing. In those days McKim, Mead and White were in their zenith, and to a beginner, the refined, restrained and distinguished character of their work, based on Roman, Italian, Georgian and American precedent, was in strong contrast with the florid French architecture, which the American students had imbibed in Paris, together with their finer basic training in architectural planning.

Detail in Court, St. Paul Public Library

"The logic of the French principle of design and plan at once appealed to my mind with its engineering training, but the influence of a four years' residence in Philadelphia and its environs, and an ancestry in which Philadelphia and Salem were largely linked, were perhaps responsible for a greater enthusiasm for the detailed architectural expression of the work of McKim, Mead and White than for that of the other school. Following my experience in Carrere's office, ensued a period of eight years, first as associate and then as partner with Austin W. Lord and J. Monroe Hewlett. Few architects have as great ability in plan as Lord, and few more all around capacity than Hewlett. They were just recovering at that time from architectural dyspepsia incident to feasting upon Senator Clark's Fifth Avenue mansion, with the result that for a time their work



PUBLIC LIBRARY, ST. PAUL, MINN.

EXAMPLES OF ARCHITECTURAL DETAILS FROM THE OFFICE OF ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

was inclined to be ascetic. No one has more delightful appreciation of textures, colors, stuffs and other materials than has Hewlett, and in my association with him, I learned to appreciate the possibilities of brickwork, and the wonderful opportunities in the use of color, both in exterior and in interior design. In those days Stanford White was building Dr. Parkhurst's Church at Madison Avenue and Twenty-fifth Street, and from my office window, I could see him experimenting with the brickwork, the terra cotta, the tiles and the bronze electrolier upon the dome. Here was an ocular demonstration that a great master in architecture develops his design long

Stair Hall in house of Mr. Samuel Outerbridge, Oyster Bay, L. I., N. Y.

after the plans have been made and the contract let. From a commercial point of view, this can well be overdone, but I became convinced long ago that no great work of art in architecture is produced without the constant and affectionate interest and direction of the artist during the course of its construction.

"For five years I was a partner in the firm of Tracy, Swartwout and Litchfield and during this time, among other things, we won and built the United States Post Office in Denver. Tracy and Swartwout, like Lord and Hewlett, are graduates of the office of McKim, Mead and White and carried much of their traditions with them. Swartwout, too, was a careful student of the architecture of Greece and Rome and of the early American architecture as well.

"I first met Pliny Rogers when I entered upon this partnership. He had graduated from Cornell in 1906, and after short experiences in other offices had located with Tracy and Swartwout two years before I joined them. Later on when the firm of Tracy, Swartwout and Litchfield was dissolved and I decided to go it alone, Mr. Rogers came with me as associate, becoming a partner a few years later.

"As a result of our training and experience, there are a few basic principles which we hope are expressed in our work.

(1) That the principle of the dominating and logical plan for buildings as taught by the French School is absolutely basic in its correctness.

(2) That no work of lasting and living art can be produced in architecture unless there be built into it the actual soul and affection of the architect.

(3) That no work of a commercial nature is a real success architecturally unless it is a success financially.

(4) That beauty in architecture bears no definite relation to cost; that it is more valuable to decorate with brains than with gold leaf.

(5) That the type of architecture appropriate to the American country side is the same type which has been historic in that country side and has given it its characteristic flavor; that for our American cities, the choice of McKim of Roman for governmental buildings and the Italian Re-

Detail of doorway of a house in Jamaica, L. I., N. Y.

STAIRWAY DETAIL

PUBLIC LIBRARY, ST. PAUL, MINN.

LIBRARIAN'S ROOM

JAMES J. HILL REFERENCE LIBRARY, ST. PAUL, MINN.

EXAMPLES OF ARCHITECTURAL DETAILS FROM THE OFFICE OF ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

naissance for other buildings for the fine arts, such as libraries, museums, etc., is good.

(6) That in its so-called Colonial work, America has a style as real as the French or Italian Renaissance, (and for that reason we have studied it deeply, searching it out, and in our country houses and smaller public buildings have developed it, endeavoring to obtain the charm so universally found in the work of the very early American architects.)

At this point a final interruption occurred. An insistent call terminated the interview.

To illustrate the work of Electus D. Litchfield and Rogers would require the space of a large bound volume. These architects seem never to despise the day of small things. Some of their smallest work has been so interesting that it has received publicity equal to other work of much greater bulk and general importance. Among the latter, we find factories, office buildings, the James J. Hill Reference Library and the Public Library at St. Paul, Minnesota, the preliminary drawings for the Roosevelt Memorial, the Denver Post Office, and that great war work, Yorkship Village, one, if not the only really successful housing development during the war.

HOMES MUST REPLACE SLUMS FOR THE GOOD OF INDUSTRY

IT is not in the slums of the Old World, but in the immigrant colonies of American cities that the homeless condition of the workers is the dreariest. This is the conclusion of a distiguished visitor who has just made a housing survey of the United States and Canada.

This investigator knows whereof she speaks, for her work has been in the Whitechapel district of London for many years. She is the widow of Canon Barnett, founder of the original Social Service Settlement, an institution so successful that 400 similar settlement houses have been established in this country. In an interview in the New York *Evening Post,* Mrs. Barnett said:

"They are only practical investors who insist that the industrial classes shall be lodged hygienically, in houses in which they can take pride and enjoy security. We"—she referred to her fellow workers, many of them capitalists—"expect to get back with incalculable interest the money we have put into bonds. These millions are not spent for a gentle whim. The time has come when the worker must be housed or industry cannot go on.

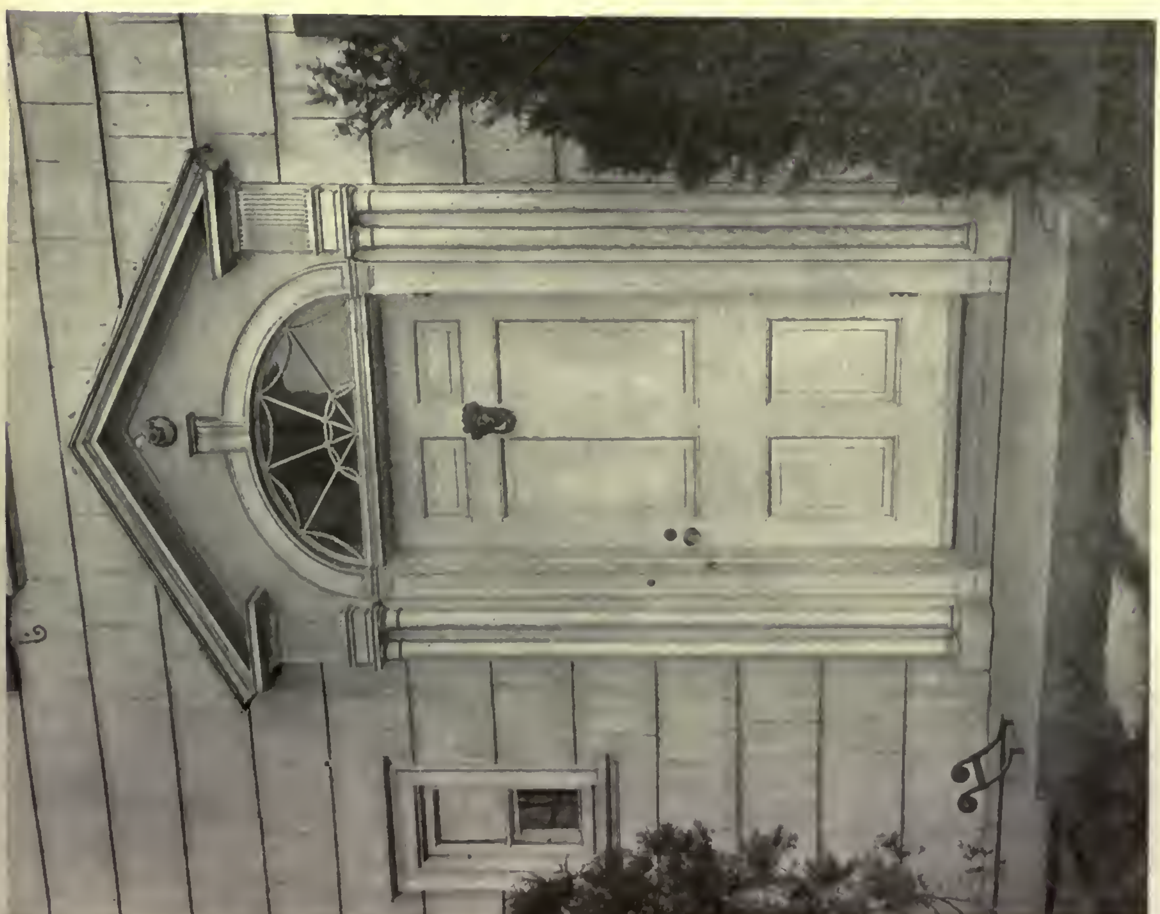
"I was shocked in going through the foreign settlements in New York to learn what they are charging these newcomers for a corner of a dark room. How can you hope to 'Americanize' a man who is not able to get a bed, let alone a home? It is as bad in your other great cities.

"Of course, the immigrants flock to the cities. You are making no organized effort to help them to get homes in the country. It is only natural that they should seek out those who, although they cannot share with them money, food or lodging, can at least speak their own language, pray with them according to their own religions and save them by comradeship from despair in their strangeness.

"Whatever were the other disadvantages of their home lands, the Italians, Spaniards, Armenians, Greeks and the rest had their sunshine. If their homes were dreary they could go out into cheery streets. Here they have no escape from the sordid misery of their surroundings.

"Every worker ought to have and can have a cottage, with a bath room and garden. I am surprised that you do not see how far a garden would go to Americanize these disillusioned immigrants from the south.

"People here have said to me—only think! 'Why, these foreigners are used to nothing better. They live voluntarily in these bad conditions. Every one has a chance to improve his home if he tries.' I cannot refrain from censuring this complacent social attitude, because it is the great reason why nothing is done, and out of this indifference and aloofness has come your terrible housing situation. In France, Belgium, Italy, in almost every progressive country, the state, having seen the necessity long ago, is building. You are better able than the rest to do it, but apparently you are waiting for a crisis before you begin. I think, after my travels here, that the crisis has come."



DETAILS OF DOORWAYS, HOUSE OF MR. SAMUEL OUTERBRIDGE, OYSTER BAY, L. I., N. Y.

EXAMPLES OF ARCHITECTURAL DETAILS FROM THE OFFICE OF ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

THE ART GALLERY OF OLD LYME, CONN.

CHARLES A. PLATT, Architect

An art gallery erected by a group of distinguished American painters, on the picturesque Main Street of a New England town, aptly called the "American Barbizon"

OLD Lyme in Connecticut, is on the East bank of the Connecticut River. It is about thirty-five miles East of New London. The picturesqueness of the town and its surrounding country has for many years lured the best of our American artists, many of whom have built their studios there and made Lyme their Summer home. It is now more than thirty-five years since the late Henry W. Ranger, one of our leading landscape painters first settled in this neighborhood. Following Ranger came other men, many of whom have also become famous painters.

Before proceeding to a description of Mr. Platt's admirable gallery, admirable because it exactly and artistically typifies the purpose of its erection, it may be well to write of Old Lyme and try to describe the characteristics of this fine New England town and its equally fine environment.

Years ago, when the nation was young, up and down the New England coast were many small towns whose chief industry was whaling. Sag Harbor, across the sound is one of these towns, New London another, but none could compete with New Bedford, which flourished until the discovery of mineral oil marked the passing of the whaling fleets. Many of these prosperous families whose fortunes were the result of successful whaling voyages, sought the towns that were located along the coast where they might build their stately houses.

Many of these families came to Lyme. The most influential and perhaps the wealthiest were the Griswolds. "Boxwood" was the principal house of the Griswolds, and it stands embowered in trees but a few paces from the fine old Lyme church, said to have been originally built from designs by Sir Christopher Wren.

Lyme during the late eighteenth century was, as it is today, a village of one street. But, on this one thoroughfare the villagers of Lyme have always lavished the most affectionate care and shown the finest respect for the town's traditions.

This street is embowered by the finest growth of elms to be found in any New England town. They cast throughout the entire day in summer a grateful shade and make the many well-designed Georgian houses, with their green shutters, a vista of beauty and set forth the refinement that has always characterized New England towns.

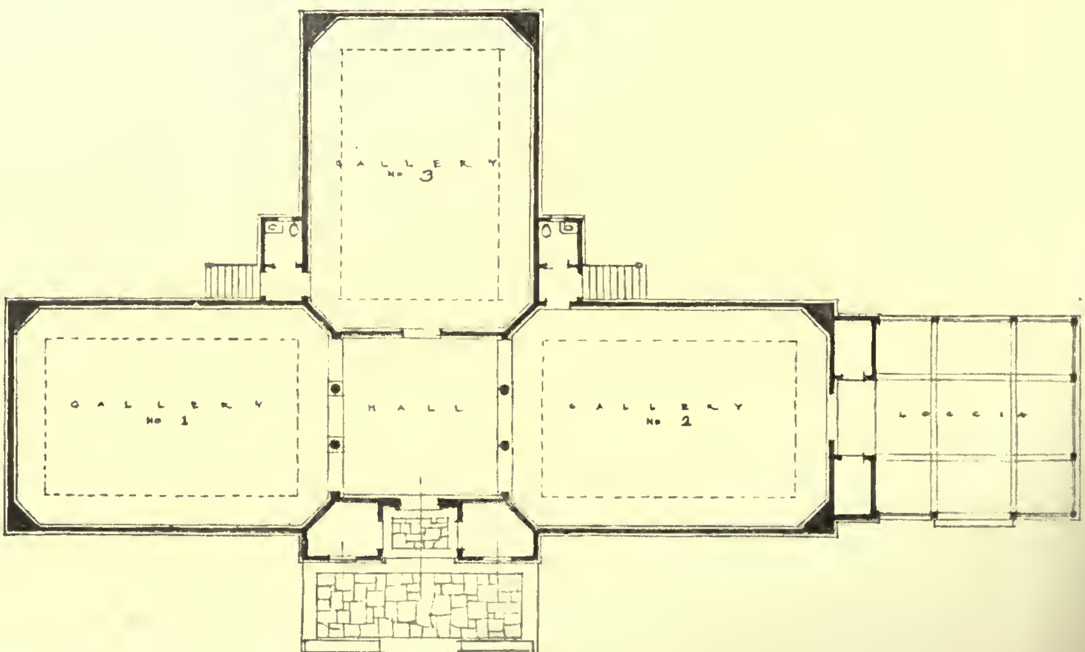
It is on this shaded street and amidst the most picturesque surroundings that the art gallery designed by Mr. Platt has been placed. There are of course many larger galleries than this, but there are not any, more correct in their architecture, more perfect in their setting, or better adapted to the purpose of their erection.

Any gallery designed for the exhibition of pictures when the lighting both natural and artificial has not been studied will not be a success. In this small gallery, Mr. Platt has, with characteristic artistic effort, given the most painstaking study. Artists declare the lighting is perfect. An overhead lighting has been planned, and so successfully that all trace of sunlight has been eliminated and every foot of wall space of the same exact value.

Naturally the people of Lyme take great pride in this architectural gem. Annual exhibitions to which only Lyme artists contribute have become the feature of each artistic year.

Some one has happily called Lyme "the American Barbizon." It is such in fact. Its wonderful wealth of picture making material, and that it is the home of many of our best known artists, make the simile very apt and proper.

FRONT ELEVATION



PLAN

SCALE OF FEET

LYME ART GALLERY

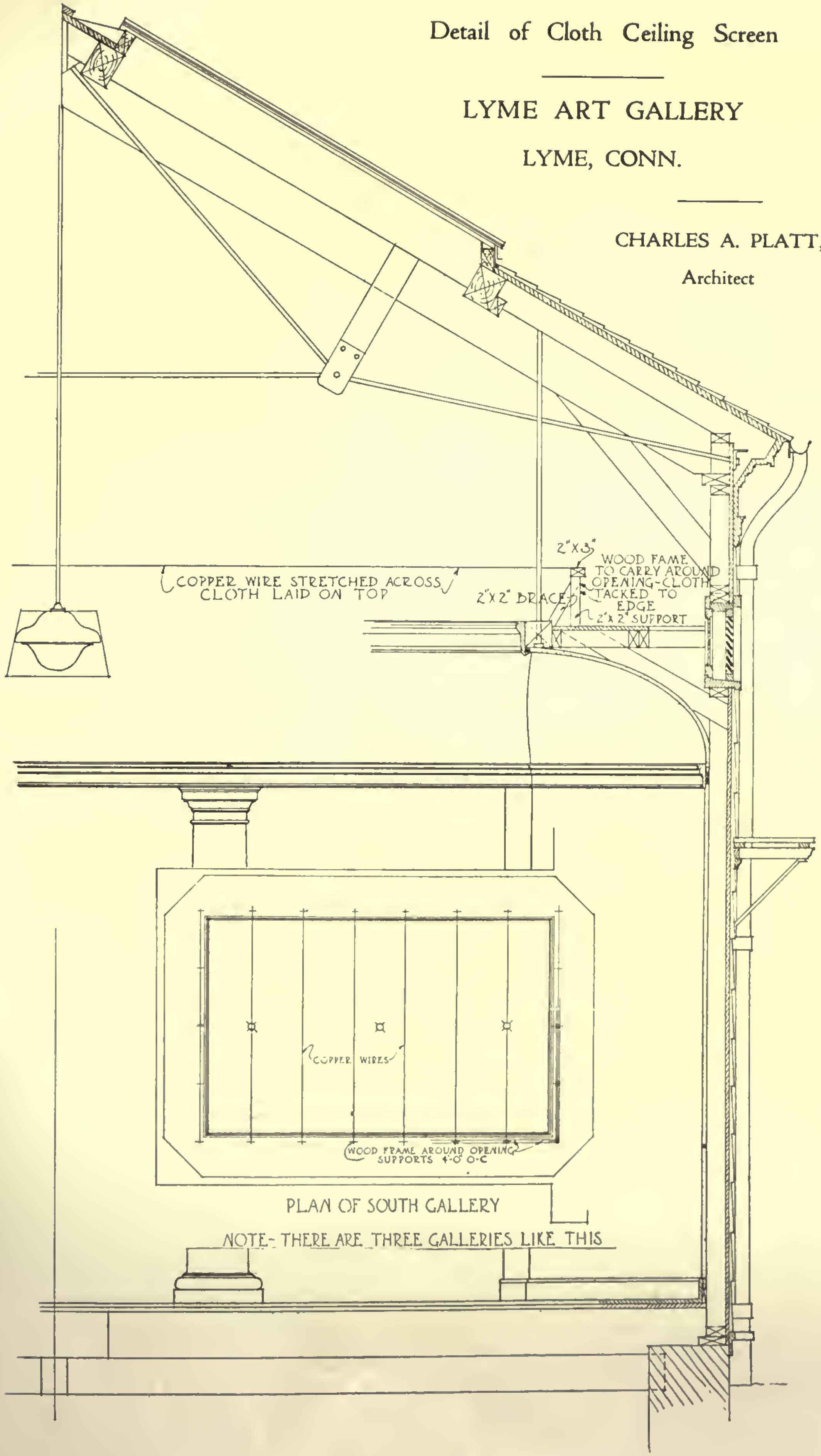
Charles A Platt Architect

Detail of Cloth Ceiling Screen

LYME ART GALLERY

LYME, CONN.

CHARLES A. PLATT,
Architect



Detail of a Church on Charles Street, Baltimore, Md.

(See reproduction of original sketch by Otto R. Eggers on opposite page.)

THE venerable church shown on the opposite page is the First Presbyterian Church of Baltimore. It was erected about 1817, from plans by M. Godefroy, Architect.

Baltimore abounds in notable ecclesiastical structures, and those dating during the early years of the nineteenth century have the attributes of good architecture that marked the period.

The artist who has drawn this notable series of early American architecture, and the writer who has added these brief notes of description, have, by intimate association with the work of these clever designers and builders, acquired a deep respect for it. If the publication of these sketches serves to impress on those who scan them, the great merit of the early architectural work in this country and the necessity for its careful preservation, the object sought has been attained.

58'

188'

A CHURCH ON CHARLES STREET, BALTIMORE, MD.
THE AMERICAN ARCHITECT Series of Early American Architecture

MAIN ENTRANCE DETAIL

JAMES J. HILL REFERENCE LIBRARY, ST. PAUL, MINN.

(Reproduced from the original sketch by Louis Kurtz)

ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

DETAIL IN THE COURT

PUBLIC LIBRARY, ST. PAUL, MINN.

ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

1884

DOORWAY LEADING FROM READING ROOM

JAMES J. HILL REFERENCE LIBRARY, ST. PAUL, MINN.

ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

1285

JAMES J. HILL REFERENCE LIBRARY, ST. PAUL, MINN.
ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

1886

JAMES J. HILL REFERENCE LIBRARY, ST. PAUL, MINN.
ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

187

POLYCHROME TERRA COTTA DOORWAY

LIGGETT & MEYERS BUILDING, NEW YORK CITY, N. Y.

ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

188
8

DOORWAY IN HOUSE OF SHERMAN L. DEPEW, BLOOMFIELD HILLS, DETROIT, MICH.
ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

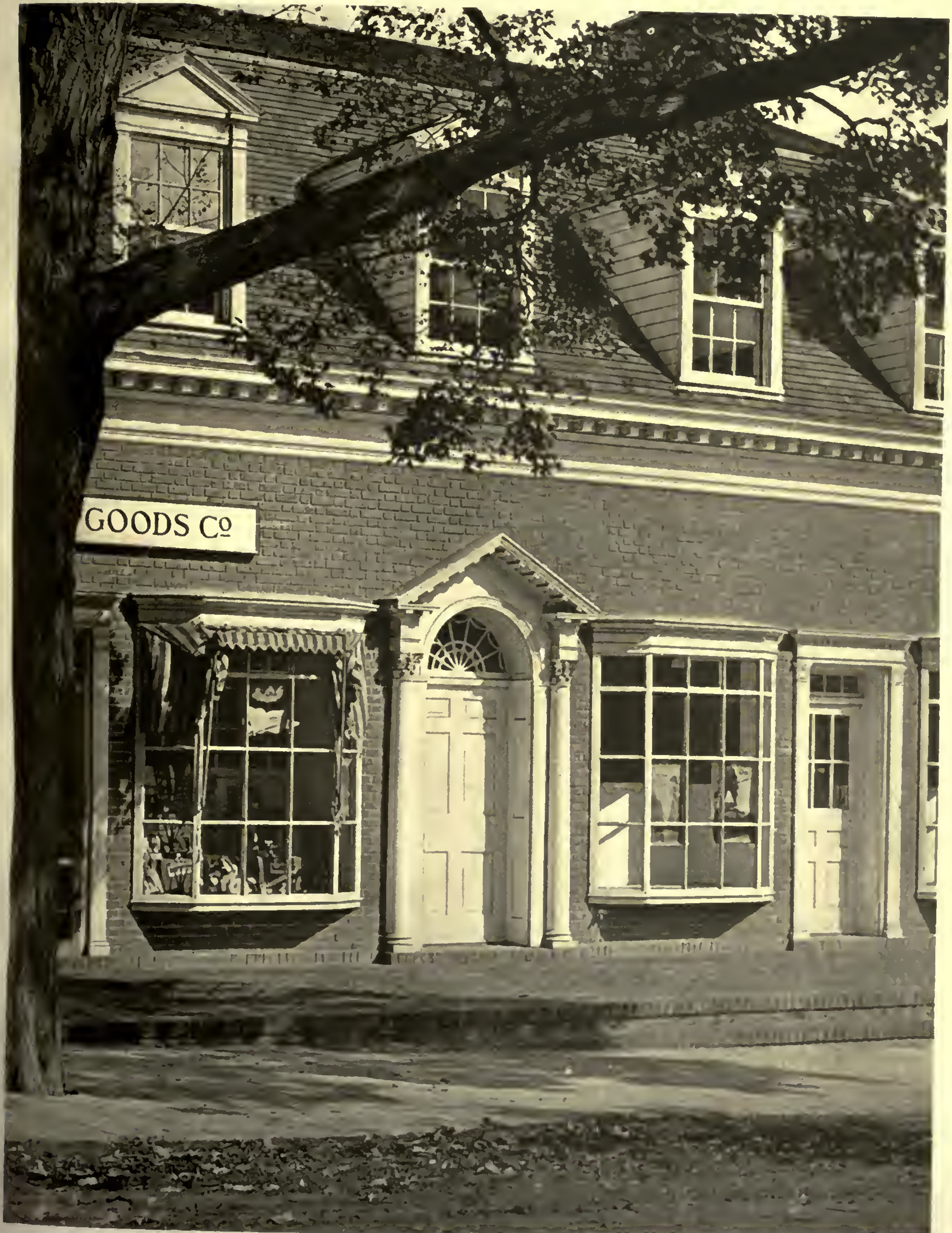
188 9

COMMUNITY BUILDING, WATERTOWN, CONN.
ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

188[10]

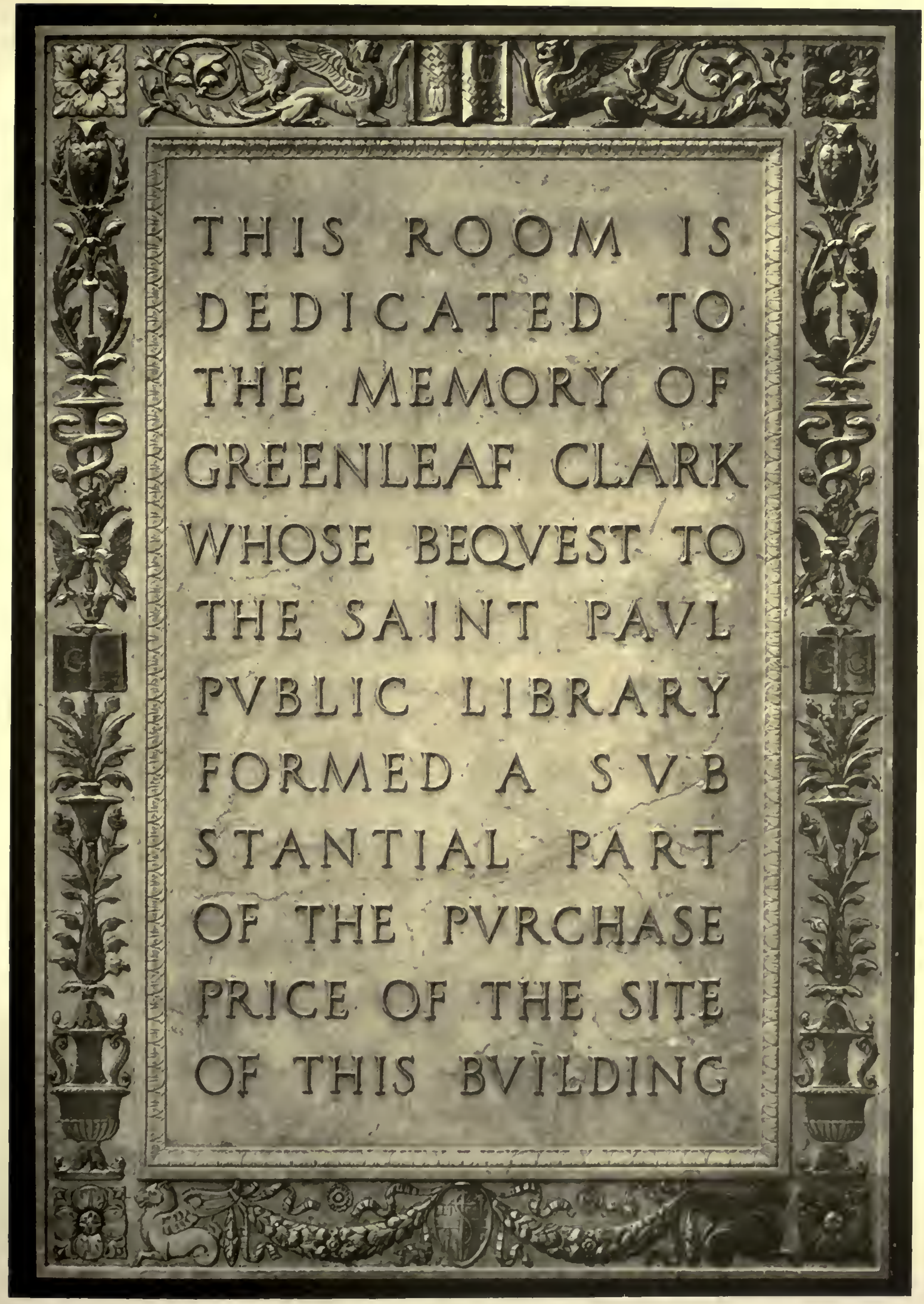
DETAIL, COMMUNITY BUILDING, WATERTOWN, CONN.
ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

18 8"



COMMUNITY BUILDING, WATERTOWN, CONN.
ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

1881²



MARBLE AND BRONZE TABLET, GREENLEAF CLARK ROOM
ST. PAUL, MINN., PUBLIC LIBRARY
ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

·EDITORIAL·COMMENT·

Architectural Education.

THE matter of architectural education is probably one on which the profession of architecture will soon have to act. Much discussion has been held, and very voluminous reports have been presented to conventions of the Institute and to meetings of State Societies. In all of these reports it is agreed that educational methods need revision. Some of them offer constructive suggestions. Men who have given this very important subject close study are agreed that present methods do not graduate students with the qualifications needed to enable them successfully to practice architecture as it is, or should be practiced today.

Since the World War started in 1917, things have moved with great rapidity. Methods then approved and put into practice are today obsolete. The profession has, or should have learned the lesson that the practice of architecture is what it always has been, an art, but that it has also become a very complex business. Architectural educational methods have not sufficiently changed to meet these altered conditions. While it is not necessary to say that the art of architecture is not merely design, it is necessary to warn against those who seem to think that it mainly is.

Possibly those who are averse to any radical changes in present methods are influenced by the fact that they have not sufficiently kept abreast with the times to enable them competently to appreciate these new conditions.

Discussing Architecture after the War, and with particular reference to Architectural education, C. H. Blackall, in a series of articles which appeared in *The American Architect,* stated:—

"We cannot postpone decisions as to what we shall do with ourselves and our profession. The decision must be made now and it must be made as far as possible so as to endure for the new era which is coming in. We may continue to theorize as to what it may be, but we are in the midst of an actual condition and we must trim our sails and plan our course accordingly."

Two years have elapsed since the above was written, and we are yet snugly berthed in indifference. We have neither trimmed our sails nor planned a course that leads to any definite end of our voyage.

If the methods of architectural education are to be revised and made modern—not left as now, archaic,—such revision should be made by architects themselves. While there is no intention to minimize the valuable work that has been carried forward by those in charge of our architectural schools, it is certainly true that the men who are actually engaged in practice and who receive into their offices the graduated students, best know those students' deficiencies and just what revision there should be in their training to make them better fitted to begin their life work as architects,—not designers, but master builders.

An opportunity for State Societies is now presented. The Institute, working through its chapters and covering the entire United States, has a bulky machine and a widely scattered territory. State Societies would be able to confine the revision of methods of architectural education to their own States and could get quickly and efficiently the results desired.

We should then have concrete examples to guide us in our selection of a method that would in the end be the best.

The laws governing the registration of architects and professional practice are largely the result of State Society efforts. Things have been done, ends have been attained. We shall undoubtedly soon have the profession safeguarded from within and without. The need is urgent. Why postpone action.

New York City's Works of Art

THOSE who dwell in New York should know what their Art Commission is accomplishing. A reliable way to secure this information is to obtain a copy of the recently issued Catalog of Works of Art Belonging to the City, prepared by the Art Commission.

The term "works of art," as belonging to a municipality was long so erroneously applied as to cause a smile of derision by those who know. Since New York created its Art Commission, municipal art in New York has meant art in its truest terms. We may not take pride in our forms of City government, we may feel shame when we regard the records of certain of our high office holders, but we shall find compensations in the efficiency of the work of our Art Commission. Ever since this valuable body was created, it has stood between the citizen and those who would foist on the City any form of art that was not good. Unfortunately there are bad examples of art owned by the City. These were acquired before the Art Commission came into existence. Their removal is prevented for many reasons, principally because it would create ill feeling on the part of a large number of people, some of them of foreign birth, who contributed to their cost. But, the later acquisitions, many of which are illustrated in this report, are absolutely worthy to be placed where they are and even the ultra-critical may not justly censure them.

We may take a very great pride in our Art Commission and it may stand in the future, as it has in the past, a fine example that every city in this country may with profit follow.

A Ministry of Art

THE American Magazine of Art, in an editorial discussing A Ministry of Art, reviews the work accomplished during the past twelve years by the National Commission of Fine-Arts, and arrives at the conclusion that it might be wise "to develop step by step along lines already advanced, rather than to start at the top and re-organize." This contention shares the same fate as any other with a faulty premise.

As it is understood, the proposition is to create a Ministry of Art, and not a Ministry of the Fine-Arts. There is a very wide difference between the two. An appreciation of the fine arts is in a sense a higher education of art. An appreciation of art, is to know, appreciate and encourage the development of the higher branches of craftsmanship.

To start with education in the fine-arts is exactly what the American Magazine warns against, a revision or reform, beginning at the top.

The work of the National Commission has been almost exclusively confined to an oversight and encouragement of the fine-arts. Architecture is the oldest and most important of these. And architecture depends more on the development of the art of the craftsman than does any of its sister arts. It will be futile for our great designers to evolve their masterpieces if they cannot find the craftsmen to execute them. Let us have a Ministry of Art, and let his appointment and the reasons for the creation of this department be so clearly stated that the vast number of people who ignorantly class art as architecture, painting, sculpture and music, learn that it also comprises the artistic quality of even the most commonplace things of every day use.

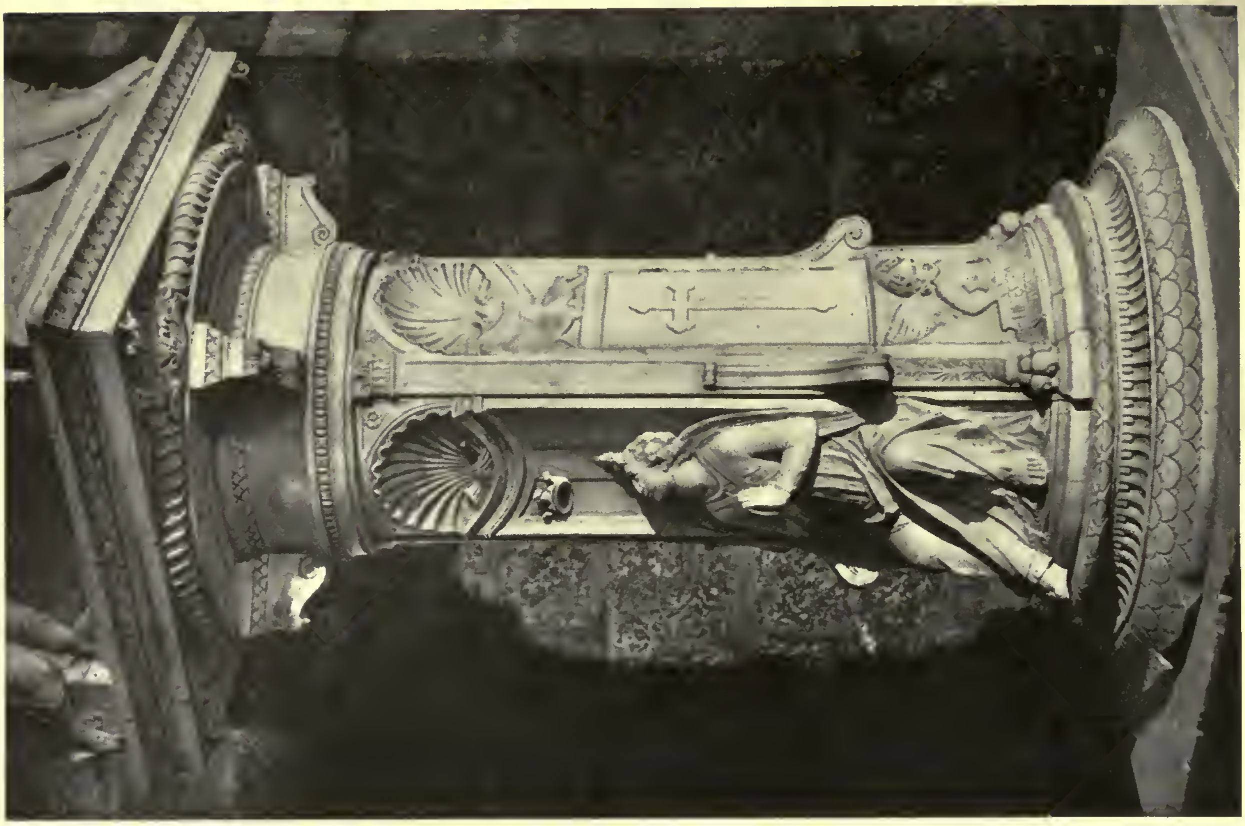
When those who indifferently regard the creation of a porte-folio of Art in the Cabinet of our President, understand the practical elements of such an office, they will be more likely to favor its creation. Those who rave about art, are those who retard its advancement. When sober-minded practical people—the architects' clients, for example—learn that art is not a luxury, but a necessity that has a large commercial value, they will be among the first to favor a Ministry of Art.

The hard-headed client doesn't enthuse much over the frenzies of art with which architects often seek to impress him, but if he can be shown that the addition of good art to his building will bring him an increased rental, the percentage of which he can figure with a stump of a pencil on the back of an envelope, he'll be keen for it.

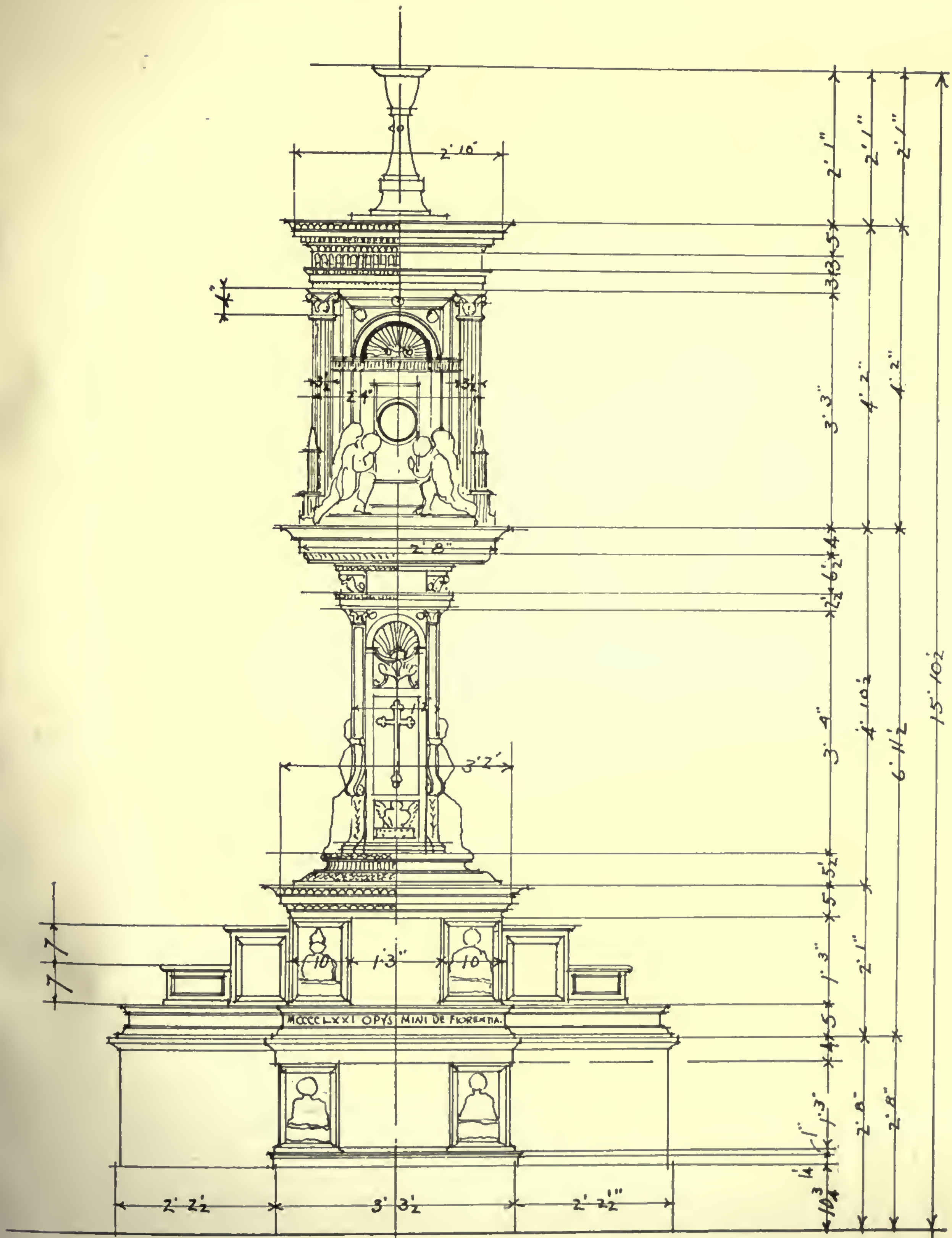
If we are to develop an appreciation for art through the institution of a Ministry of Art, it will need to be along lines sound and practical, and not through hysteria and the "patter" indulged in by those who think they do, but really know nothing of the real elements of the things they rave about.

CIBORIUM IN BAPTISTRY, VOLTERRA, ITALY

THE AMERICAN ARCHITECT, SERIES II.
FRENCH AND ITALIAN DETAILS



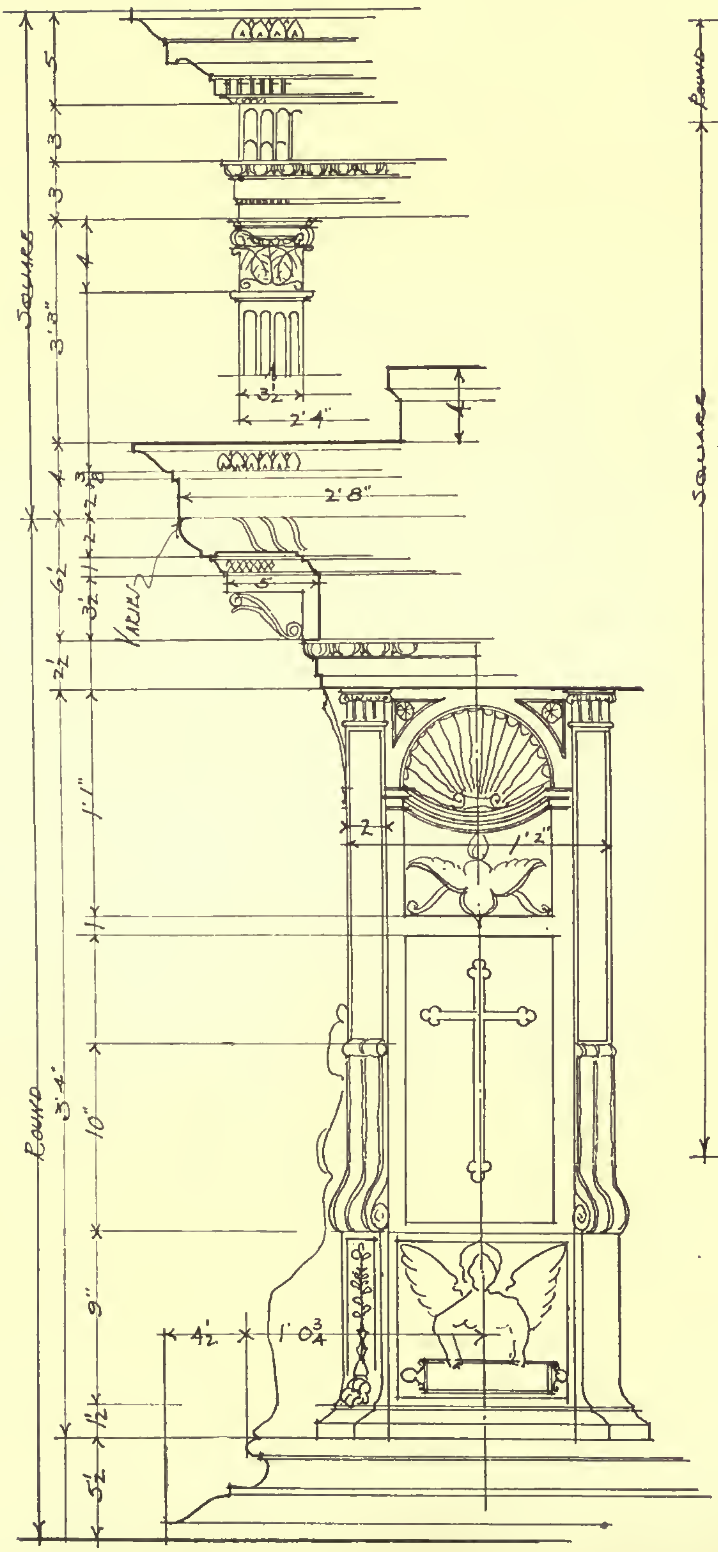
DETAILS OF CIBORIUM IN BAPTISTRY, VOLTERRA, ITALY

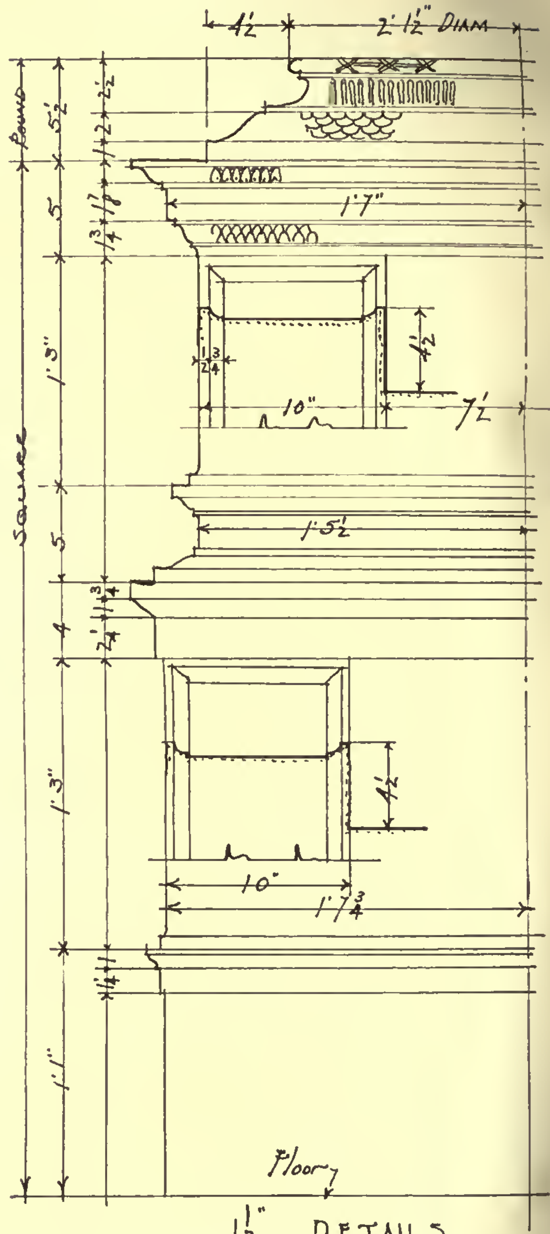


½" ELEVATION

CIBORIUM IN BAPTISTRY, VOLTERRA, ITALY

MEASURED AND DRAWN BY ROBERT M. BLACKALL, 35TH HOLDER OF ROTCH TRAVELING SCHOLARSHIP





1½" DETAILS

CIBORIUM IN BAPTISTRY, VOLTERRA, ITALY

MEASURED AND DRAWN BY
ROBERT M. BLACKALL
35TH HOLDER ROTCH TRAVELING SCHOLARSHIP

NOTES on the ILLUSTRATIONS

ART GALLERY, OLD LYME
Charles A. Platt, Architect

A FEATURE of this gallery, shown in this issue, is its admirably arranged top lighting. In most of our modern galleries there is a place, called by artists "the morgue" where owing to poor lighting, the wall space becomes the least desirable place to hang pictures. As this space may not be left unfilled, artists await the opening reception with trepidation, fearing their canvases may have been hung in that undesirable place. There is no "morgue" in the Lyme Gallery. Every foot of wall space is equally well lighted. This is a source of satisfaction to every artist who sent pictures to the recent exhibition. The method employed to secure this desirable effect is shown in the detail drawing accompanying the article on this art gallery. The architectural excellence of this small art gallery is so apparent that further description is superfluous.

RECENT WORK FROM THE OFFICE OF ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS

SELECTIONS from the work of the office of Electus D. Litchfield & Rogers, illustrated in this issue, will not require further description to enable the reader to appreciate its excellence.

From time to time *The American Architect* and *The Architectural Review* will seek to present details of work in place of the stereotyped method of perhaps over-illustration of one example. It is believed the suggestive opportunities are much greater and the value more largely enhanced by presentation of a collection of good details. While, of course, it is the duty of an architectural magazine to present to its readers a review of recent commendable buildings, the practical value will be better maintained by omitting much that is believed to be extraneous and not pertinent to the complete exposition of good architecture and commendable design.

CIBORIUM IN BAPTISTRY
Volterra, Italy

AS soon as the Renaissance had taken root in Florence and had been accepted by the people with great acclaim, the details of this new style were developed quite as rapidly in the purely decorative works as in the monumental buildings. Altars, mural monuments, tabernacles, puppets and ciboria offered scope for the genius of the most distinguished artists. Lucca della Robbia (1442-1482), Mino da Fiesole (1431-1484) and Benedetto da Majano (1442-1497) excelled in this type of work. It was in work of this character that the Renaissance oftenest made its first appearance in a new center. This Ciborium from Volterra designed and carved by Mino da Fiesole in 1471 when he was forty years old is considered one of his finest works. Done in his prime of life and in good preservation at present, we can enjoy this little monument as one of the best of its kind in existence.

THE SOCIETY OF LITTLE GARDENS

Program of a Competition for the Design of a Garden Treatment for the Typical Suburban Backyard

THE Society of Little Gardens, of Philadelphia announces a competition in the design of a garden treatment for the typical suburban "backyard."

The purpose of the competition is to procure one or more designs which may be presented to the public to stimulate and guide the development of the out-of-doors space of the average American dwelling-house and to bring it clearly within the meaning of the word "home," now too generally limited to the space within four walls.

All students of the garden problem are invited to submit designs under the terms of this program, this invitation comprehending professional garden designers, draftsmen and students in schools of architecture and landscape design. Nor is the amateur garden lover excluded, provided only that his ideas are presented in the technical form prescribed.

Garden design has long stood as a recognized phase of the profession of architecture, but its benefits have been restricted, by the cost of professional services, to the owners of properties of the more costly type, and have extended to the general public only through their parks and playgrounds. It is here the purpose of the Society of Little Gardens to offer to the average small house owner, without cost, an aid in the form of suggestive sketches, to be obtained through this competition. In so doing, the Society recognizes that the competitors will have rendered to the public a service of substantial value, and it therefore proposes to compensate in part for this service by the payment of an honorarium to each of the authors of the three designs selected in the judgment and also to include in the publication of each the name of its author, with its place in the competitive award. The honorarium will be as follows: To the author of the design placed first, one hundred fifty dollars ($150.00); to the author of the design, placed second, one hundred dollars ($100.00); and to the author of the design placed third, seventy-five dollars ($75.00). Honorable mention, in the discretion of the jury, may also be awarded, but designs so rated will be published only with the written consent of their authors.

The designs will be judged by a jury to be composed of Wilson Eyre, Jr., Warren P. Laird, and Horace Wells Sellers, who have prepared the program and are acting as the professional advisors of the Society. Should a vacancy occur in the membership of the jury, it will be filled by an architect selected by the remaining members.

Copies of this program may be obtained upon application to Mrs. Charles Davis Clarke, president, 2215 Spruce Street, Philadelphia, Pa.

SOCIETY OF BEAUX-ARTS ARCHITECTS

OFFICIAL NOTIFICATION OF AWARDS—JUDGMENT OF AUGUST 16th, 1921

FINAL COMPETITION FOR THE 14th PARIS PRIZE

PROGRAM

The Annual Committee on the Paris Prize proposes as subject of this Competition:

"AN EXHIBITION CENTER"

A rich municipality in developing its city plan, proposes to give great importance to a center for exhibitions and assemblies. It is convinced that not merely national but international prominence will be given to the city which provides, in a magnificent manner not hitherto realized in America, facilities for great political, religious, or industrial conventions and assemblies and exhibitions of all kinds.

Therefore, at a point where important avenues and streets converge, a circle with a radius of 750 feet has been drawn and the ground within its circumference left free for the placing of the contemplated construction. It is proposed to erect here a building or a group of communicating buildings which may be used as a unit or separately.

The requirements are:

(1) A *Great Hall* to be used for industrial exhibitions, horse shows, athletic meets, horticultural exhibitions, etc. The clear floor area in this should be not less than 50,000 sq. ft., around which should be disposed exhibition galleries which may be converted into seating space when required.

(2) An *Art Gallery* adapted to annual exhibitions of national and international scope and loan exhibitions of different kinds, such as painting, sculpture, architecture, furniture. Certain of these galleries should be lighted from windows in the wall, others from overhead. The floor area of this should be in the neighborhood of 30,000 sq. ft., disposed on one or more floors.

(3) An *Auditorium* with a seating capacity of 10,000 for public meetings, concerts, etc.

(4) An *Enclosed Space* available in connection with these units where, in the open air, concerts could be held and sculptural and horticultural exhibits shown in connection with those held under cover.

(5) A *Restaurant*, installed somewhere in the group, to serve visitors during the time of exhibitions or assemblies.

The facilities for entrance, circulation, and exit should be carefully considered in connection with these buildings as they will necessarily vary according to the functions of the different elements included. At times the whole group will be used for a single purpose, at other times there will be separate or simultaneous use of the different units.

Jury of Award—J. W. Cross, R. M. Hood, P. Sawyer, J. G. Rogers, W. F. Lamb, C. Z. Klauder, E. Swartwout and H. O. Milliken, Chairman.

Number of Drawings Submitted—5.

AWARDS:

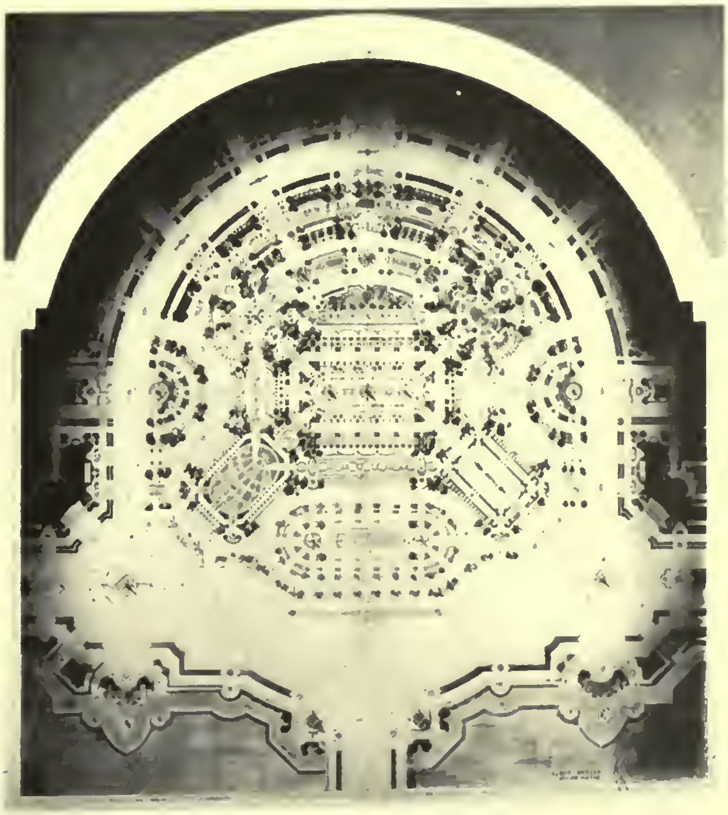
PARIS PRIZE WINNER (1st Medal)—Lloyd Morgan, Atelier Hirons, N. Y. C.

PLACED SECOND (1st Medal)—J. G. Schuhmann, Jr., Columbia University, N. Y. C.

PLACED THIRD (2nd Medal)—A. E. Westover, Jr., "T"-Square Club, Phila.

PLACED FOURTH (2nd Medal)—H. S. Atkinson, "T"-Square Club, Phila.

PLACED FIFTH (2nd Medal)—R. A. Fisher, "T"-Square Club, Phila.

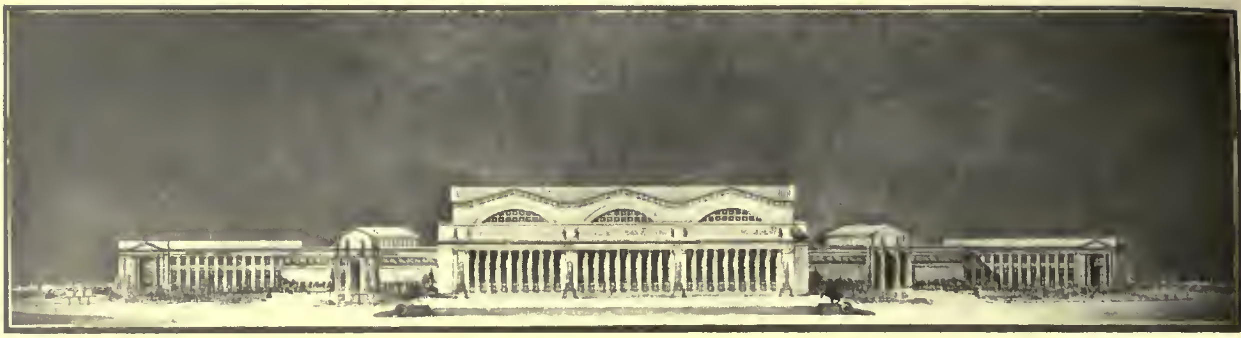


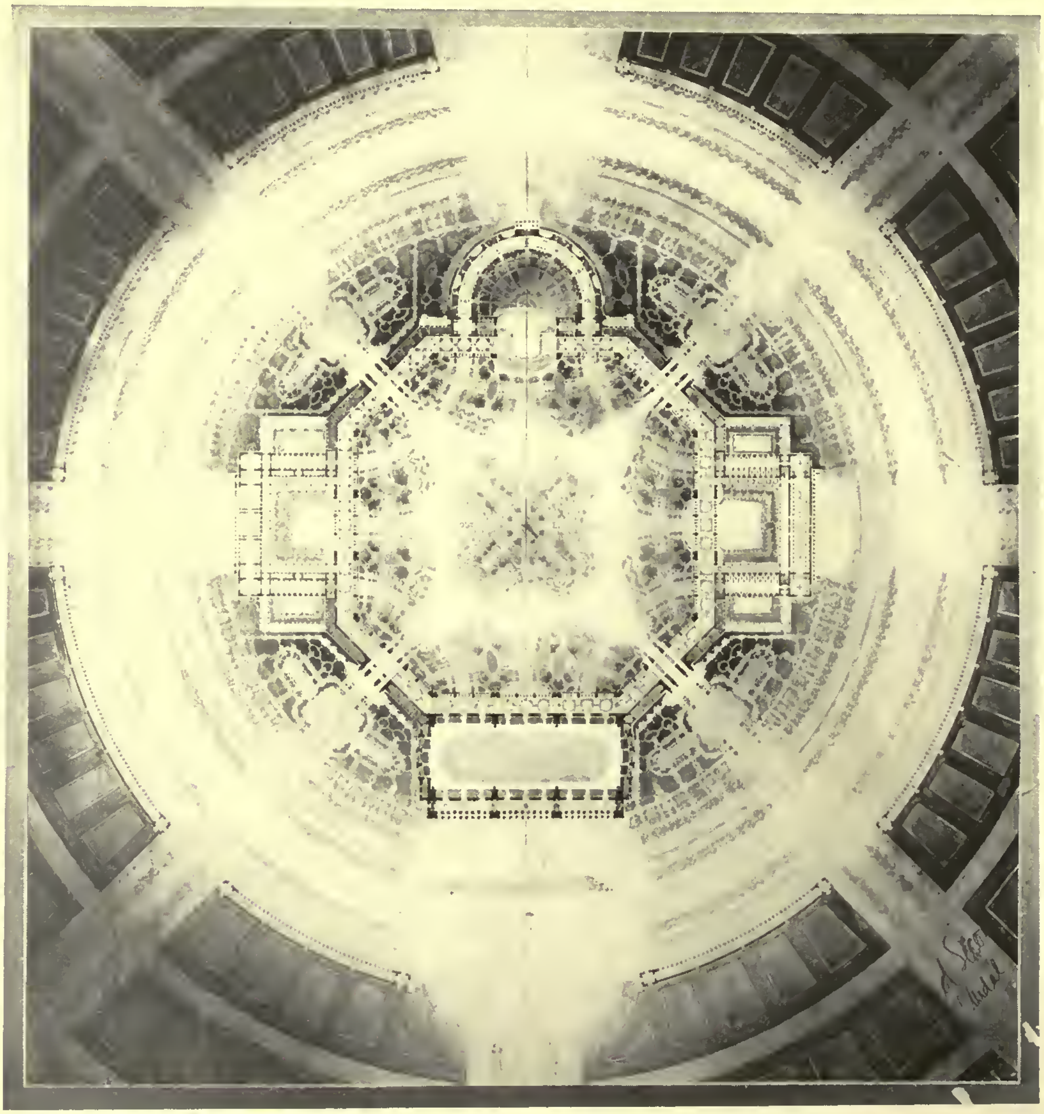
LLOYD MORGAN

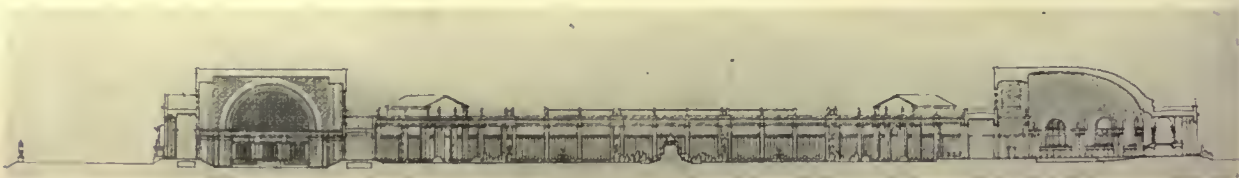
PRIZE WINNING DESIGN
(FIRST MEDAL)

ATELIER HIRONS

FINAL COMPETITION—14TH PARIS PRIZE—SOCIETY OF BEAUX-ARTS ARCHITECTS

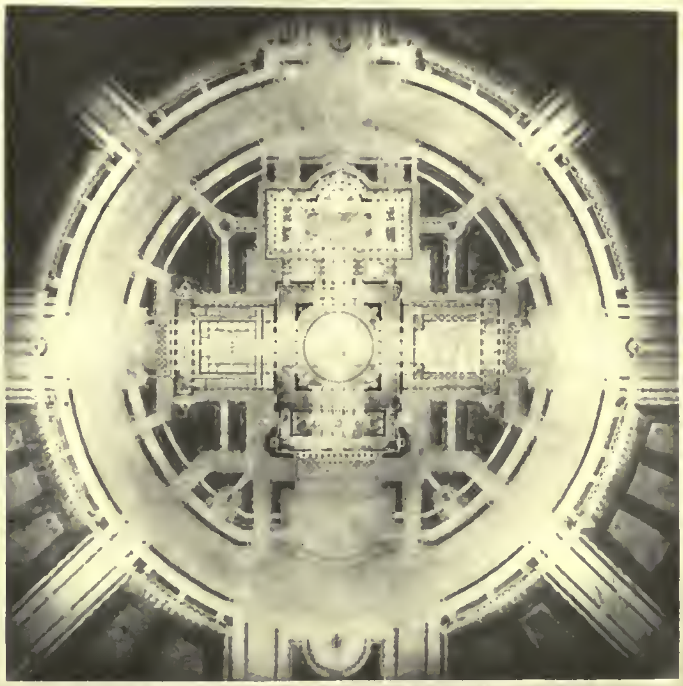


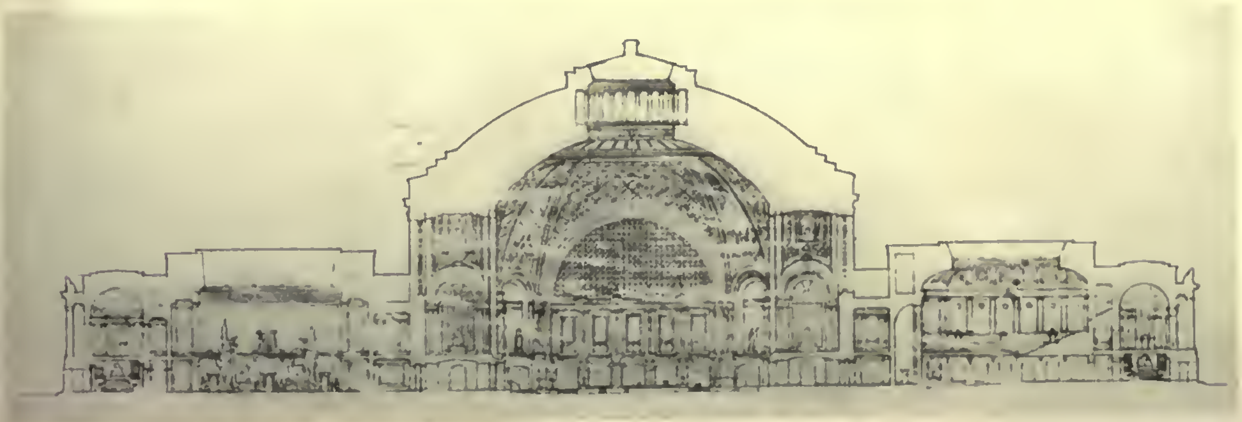




J. G. SCHUHMANN, JR. PLACED SECOND (FIRST MEDAL) COLUMBIA UNIVERSITY

FINAL COMPETITION—14TH PARIS PRIZE—SOCIETY OF BEAUX-ARTS ARCHITECTS.

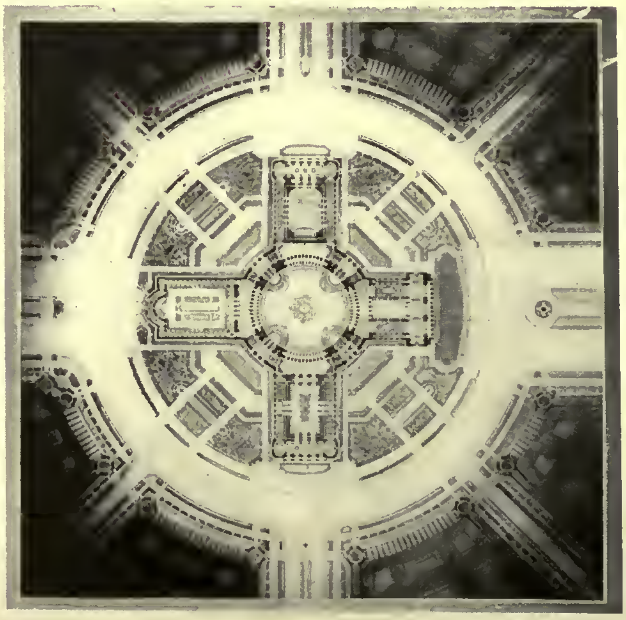
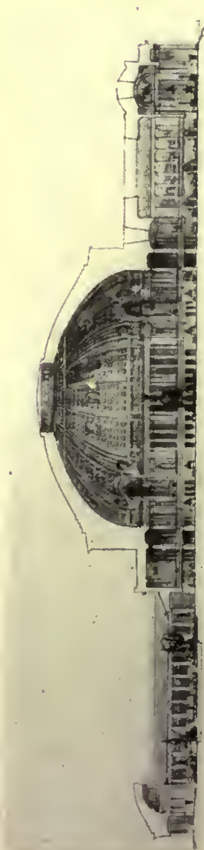




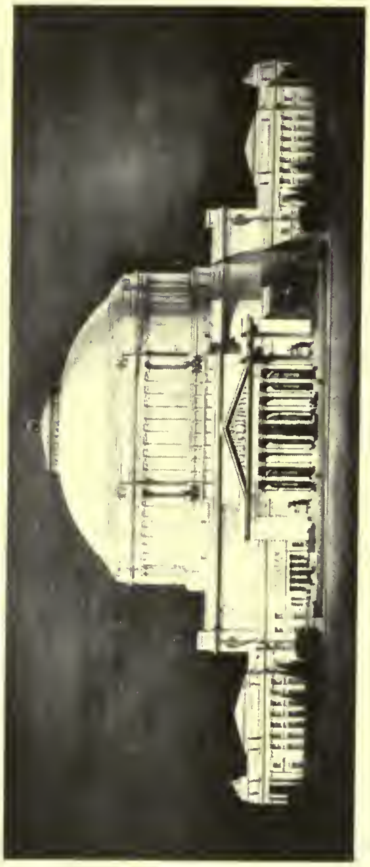
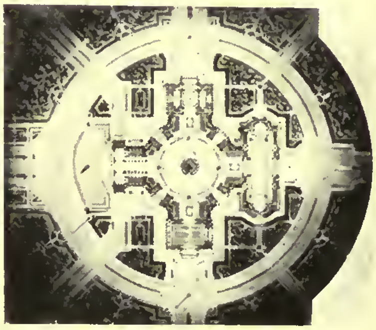
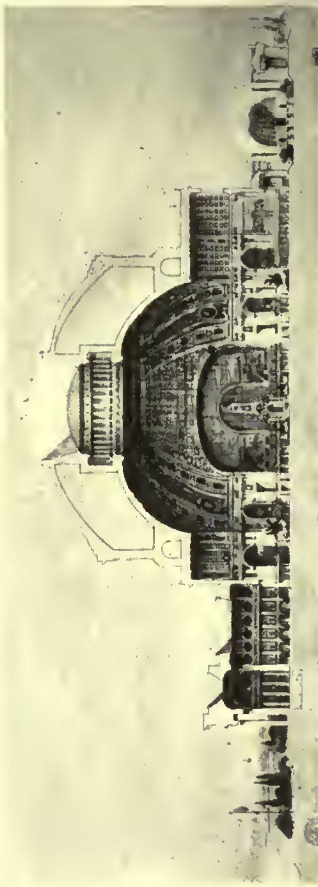
E. E. WESTON, JR. PLACED THIRD T. SQUARE CLUB

(SECOND MEDAL)

FINAL COMPETITION—14TH PARIS PRIZE—SOCIETY OF BEAUX-ARTS ARCHITECTS

H. S. ATKINSON — T. SQUARE CLUB
PLACED FOURTH
(SECOND MEDAL)

R. A. FISHER — T. SQUARE CLUB
PLACED FIFTH
(SECOND MEDAL)

FINAL COMPETITION—14TH PARIS PRIZE—SOCIETY OF BEAUX-ARTS ARCHITECTS

DEPARTMENT of SPECIFICATIONS

An understanding of certain fundamentals of contract law will be of great advantage to specification writers as they will find that such a knowledge will act as a counter-balance to what may be innocent recklessness in the preparation of specifications.

It is admittedly not within the province of this department to expound principles of law as they apply to building construction. In recent issues of *The American Architect* there have been discussed by Mr. Clinton H. Blake, Jr., certain phases of law as applied to work in which the interest of the specification writer centers. Other works of a comprehensive character, covering the multitudinous aspects of what is termed "Architectural and Engineering Jurisprudence" may be found in the technical or legal branches of public libraries or may be purchased from publishing houses that make a specialty of technical and scientific books.

It is advisable that the specification writer study several of these works, almost every one of which carries messages of value to the reader, as such study will reveal the particular pit-falls that one will do well to avoid.

One well established rule of legal procedure is that an appellant must come into court with clean hands. In other words he must have done all he could do in a legal way to forestall litigation and the submission of his difficulties to the courts must not force him to reveal illegal acts that he has done in order to substantiate his side of the controversy.

It is to be understood that the cautious specification writer will so prepare his documents as to avoid any implications of dishonesty, yet unfamiliarity with certain rules of equity may cause the doing of wrongful things in a wholly innocent manner.

If one expects the contractor to perform his obligations to the last dotting of his "i's" and crossing of his "t's" he must, himself, be every whit as meticulous in the formulation of his specifications. It is not equitable to require contractors to do certain things or to furnish certain materials without having set up a standard of perfection that is easily attainable by one who has ordinary skill or who exercises ordinary care in supervising the work of his employes. If the highest grade of work is expected the specification writer must emphasize very strongly his intention to demand the most unusual skill in the execution of the work. It is needless to say that even though such requirements are written into the documents it is not to be expected that they may be obtained.

In the making of two castings of the best grade of what is termed "jewelry bronze work" it is futile to anticipate that one will be a "precise" (exact) replica of the other or that one will be "identical" with the other. No two things can be identical in the strict interpretation of the word and if that is granted as a truism then why use such words when other words, such as "similar," may be used and their strict interpretation demanded when necessary? If the specification writer has had training in the field he will know to what point accuracy is carried in the ordinary or even extraordinary methods commonly used and he should anticipate these conditions and strive to specify the best grade of the quality of work he wishes.

At the same time there must be a recognition of the fact that some construction work will demand, say, the first, or best, grade of workmanship commonly available in the locality while other operations will be entirely satisfactory if the second, or average good, grade of workmanship is provided. A study of local usages, the class of labor available and the necessity of using the one or the other quality of workmanship will determine the standard which it will be most desirable to specify.

If it seems necessary that there be furnished the best grade of workmanship, either in shop fabrication or in field construction, that it is humanly possible to obtain, then a survey of the local contractors who ordinarily would be called on to perform similar work of a lower standard should be made to determine the possibilities of accomplishing the desired result with the facilities available. Oftentimes it will be found that the specifications must create a standard lower than desired (perhaps because of financial limitations or because of medium grade resources at hand) or else to maintain the high standard and then permit only those to submit estimates who are known to have the ability to execute the work.

It is well at this point to bring up once more the matter of control over the securing of bids that the specification writer should have. Where the work of an organization is of a diversified nature the specification writer should advise as to the contractors who are to be invited to submit bids to a far greater extent than in that organization which is fortunate enough to be able to specialize on one, or possibly two, classes of buildings, in each case the ruling thought being to secure the best possible execution of the work. It is not entirely fair to invite a contractor of questionable ability or who is known to use questionable practices in his work to submit a bid based on specifications that one can be reasonably sure will not be met by that person. It is unfair to the contractor, the owner and the architect and is one of the reasons why a desire for low bids (too low to accomplish the desired standards) oftentimes leads to such great grief for all concerned in producing a happy result. The specification writer should, at all times, if he himself is not in charge of the solicitation of bids, see that the one having jurisdiction of such matters understands thoroughly what requirements have been laid down in the specifications.

In his "Notes on the Law of Contracts" in the book, *"Specifications and Contracts,"* written by J. A. L. Waddell and John C. Wait, Mr. Wait says:

"All Parts Will Be Reconciled If Possible.—If the court can find a construction or interpretation that will harmonize with both or all of the several parts of the contract, viz., the plans, specifications and covenants, it will adopt that meaning. The meaning which is consistent with all parts.—So, when specifications required walls to be plastered with K. & Co's Cement under the direction of the Superintendent of K. & Co. and the specifications also required that cement and sand should be mixed in equal parts, it was held that effect should be given to each requirement by holding that the Superintendent's powers extended to the laying of the cement plaster and that the contractor was bound by the proportions named in the specifications and that the contractor could not change the proportions even though the Superintendent did consent to it."

"Construction Against Party Using Language.—Another point of law to be considered in the interpretation of clauses which are in conflict, is that the courts will usually construe the terms most strongly against the party who first used them or who prepared the contract. This rule of construction is generally applied, *except* where the government or the public are parties, in which case it is usually held that the meaning will be adopted which is most favorable to the government or public, the courts holding that the interests of the public should be protected, because there is, presumably, nobody who has the interest in public welfare that he has in his own."

It is plain, common, good business judgment always to lay down rules of procedure that will permit of harmonious relations between all those involved in the execution of the work. It is not within the province of good specifications that they exhibit the profound knowledge of their author when it is known from the beginning that the results they are to accomplish cannot be accomplished, regardless of the nature of the structures. Mere words will not obtain good workmanship or good materials. The drawings, details, specifications and agreement of contract, all must be prepared with fair-mindedness and with self-evident intentions that the contractual interests of the contractor will be guarded just as jealously as those of the owner or the third-party interests of the architect.

A great deal has been said with respect to ethics and there has been much discussion as to how much control over business affairs the fundamentals of ethics should have.

Ethics naturally presupposes that there will be a sense of man's moral obligations to his fellow men in all the affairs of business life and that if he demands certain obligations he will submit himself to similar or correlative obligations. Too often building contracts have carried stipulations that the contractor must do everything and subject himself to the whims of the architect or his superintendent and, at the same time, say to him that, even though he is held by the throat, he must not protest but should at all times bear a happy mien. Such conditions, it is gratifying to note, are being remedied by a more universal use of the contract documents prepared under the auspices of the American Institute of Architects and it will be a happy day when every one uses them. It is not to be understood that they are perfect but they are so much better than other forms that they may be used with assurance that the conduct of the work under their guidance will be of credit to all.

However, it is not to be supposed that the use of these contract documents will remedy inaccuracies in the body of the specifications, nor will they be of assistance in clearing up ambiguity, forgetfulness or attempts to force the contractor to do things directly opposite to incorrect indications on the drawings. The specification writer must not think that if disputes arise they can be settled amicably under the provisions for arbitration. One of the parties to the contract can refuse to submit to arbitration without damaging his future case in the courts and in such an event of what use will this clause be? At least one authority on contract law has advocated the abandonment of the arbitration clauses because they cannot be enforced.

These conditions should act as a guide to the specification writer and cause him to be extremely cautious in the preparation of the specifications so that he will feel that ethically he is right and that legally or equitably he has done the best he could to make all conditions fair and possible of accomplishment without disputes or financial losses. He should understand that in an attempt to render judgment the court will be guided almost entirely by the contract documents as they lie before him and that his judgment can not be influenced by what was meant or what was in the mind of the author unless the documents substantiate these intensions. If there has been expressed in the contract and in the drawings and specifications an honest attempt to treat the parties to the contract with all fairness and if they are supplementary, one to the other, to such a degree that their purpose can not be hidden then the judgment of the court will not fail to conform to the facts in the case. Personal experience has shown that judges invariably follow the rule of law as expressed above by Mr. Wait and the lessons learned substantiate the conviction that if you would expect fair dealing from the contractor you must deal fairly with him in all things. Firmness of purpose can be reflected in the proper preparation of specifications but it is ridiculous to be harsh in one clause, lenient in another and what may be termed lackadaisical in a third. A straight course of fair dealing must be followed from the beginning to the end of the specifications and if this is done it will result in a smooth and pleasant progress of the work from its inception to its completion.

This matter of a thorough understanding of the fundamentals of contract law as applied to building construction should not be treated lightly and, on the other hand, it should not be taken so seriously that the specification writer feels he has a thorough understanding of the principles in detail and can rely on his own judgment as to what to do and what not to do in particular cases. An axiom that should be well known is that "A slight understanding of law is more dangerous than ignorance." This is perfectly true but the point that is brought out is that if the specification writer has a fairly accurate understanding of what *not* to do he will be so guided that the specifications he prepares will be above the current average documents. When intricate legal problems may be involved the services of counsel trained in building law must be availed of, otherwise a good ending will be fortuitous rather than intentional.

If suggestions that have been made in this and in previous articles in this department are followed the specification writer can not fail to do his work in an excellent manner and will find that he will not be bothered by legal disputes and controversies that are inimical to the welfare of his organization. His work will be accomplished so carefully that he will not have to look to the right and to the left at every step but will be able to drive straight ahead to the goal without being distracted by doubts and misgivings.

In all circumstances the specification writer must exercise his ingenuity, he must always be on the alert to avoid doing those things that lead only to disaster and should endeavor to know what he should not do as well or perhaps better than what he should do. If "don'ts" are thoroughly understood and their teachings religiously followed then the specification writer should have no great difficulty in procuring workmanship and material in conformity with the requirements of the drawings and specifications.

Many specification writers are finding that these principles, when faithfully followed, bring to the construction work the cordial relationships that are so essential and it behooves all those who must prepare specifications to devote sufficient time to an analytical study of their problems so they may be prepared to turn out their work in the days of extremely busy times that will come in the not far distant future.

THE ANCIENT CLIFF DWELLERS IN UTAH

A CORRESPONDENT to the *Times* of New York describing the work of an expedition sent out by the Museum of Natural History to Grand Gulch, Utah, says in part:

N. C. Nelson, American curator of the museum, conducted the expedition and brought back, besides extra specimens and determinate data, some new light on the relative ages and time of settlement of the cliff dwellers of the Southwest. These Indians, who built many-roomed apartment houses in caves and at inaccessible points on the sides of overhanging cliffs, constitute an archaeological phenomenon whose importance is not appreciated in this country.

Pueblo culture is 4,000 years old and manifested itself in 2000 B. C., as now, in communal villages, each being one large house of many rooms, like a hotel. The building was of stone inlaid with clay; or if stone and clay could not be obtained, mud and sun-dried brick were utilized. The earliest building was done with liquid clay, which was poured in construction as we pour concrete, and left to harden. Women helped in the building, for the fingerprints of women have been found on building remains in the Gulch. The age of the marks is estimated at 3,000 years.

Some form of decoration was given to each room of the cave dwellers' hotel. The Indians either carved or painted pictures of birds, animals or human beings on the walls. These, with the pottery and basketry for which the cliff dwellers have long been famed, undoubtedly comprised their sole furnishing and interior decorating. Near the entrance to a room there is often the imprint of a human hand on the wall. The Indian who lived there put his hand in red paint and then pressed it, palmward, against the wall. Whether this, too, was decoration or a symbol for identification, the owner's "mark" is speculation for archaeologists.

LEGITIMATE PRODUCTION HARMED BY MISAPPLIED SKILL

A WELL known man, writes *Good Furniture* in a recent issue, who had a taste for art, started collecting quite late in life. Speaking one day to an expert, he said he had decided to spend twenty thousand a year on his hobby, and was determined to buy only the best. Shortly afterward, he died, and his head clerk wrote to the expert, asking him to make a valuation, adding that he could not understand why so many dealers had expressed a wish to do this, some of them almost insisting, in fact. On examination the expert discovered that these men had supplied the collector with a number of spurious objects, and, as he had kept all their letters describing them, they wanted to make the valuation to save their reputations.

The effect of collecting as shown is not confined to furniture and paintings, but every kind of art object is subjected to forgery. In china and glass it is carried on very effectively from the forger's point of view. In cases where the pottery has ceased to exist, and there are no living representatives of the original manufacturers, such as the Chelsea pottery, we find so-called Chelsea prices being produced with the old trademark of a crown and anchor forged on each piece.

With forgeries being manufactured daily, it follows that a considerable proportion of our craftsmen are very skilful in their own particular craft. Would it not be much better if they were endeavoring to use their skill on the production of articles that would bear their personal expression? Certainly our age is not lacking in men capable of artistic production. The trouble is that these abilities, all too frequently, are being shunted off in illegitimate directions, instead of being allowed to find expression wholesomely, and for the benefit of, instead of the detriment of, current design in the home furnishing trades.

STATE BUILDINGS IN WASHINGTON

THE movement to erect in Washington, D. C., a group of buildings representing every state in the Union, is meeting with necessary favor. These buildings, it is intended, shall house permanent exhibitions by the various states represented. While it would be many years before such a project could be completed, the completed work would be of inestimable value to the individual states and to the nation as a whole. The United States government would undoubtedly provide the sites for the buildings and would leave the choice of the kind of building and its erection to the states.

Every state in the Union produces within itself sufficient characteristic building material to permit it to erect its building of its own products.

In addition to the exhibitions which would be in the buildings the edifices themselves would be a lasting monument to the progress and commercial activity of each state.

CRESSON TRAVELING SCHOLARSHIP AT UNIVERSITY OF PENNSYLVANIA

BECAUSE of the increase in the expense of living and travel in Europe, the Cresson Traveling Scholarships of the Pennsylvania Academy of the Fine Arts have been increased $200, or from $500 to $700. The scholarships, endowed by the late Emlen Cresson and his wife, Priscilla, are awarded by the directors upon the recommendation of the faculty and the committee on instruction.

DEPARTMENT OF ARCHITECTURAL ENGINEERING

POSTS AND LINTELS

Some suggestions on proportions for architectural designers

IN the State of Illinois the Architects' License Law defines buildings as "structures having walls and roof, with, or without, other parts," the other structural parts being posts, lintels and arches. Posts in modern language are piers if of masonry in which bending stresses do not occur and are posts when of any other material in short lengths, usually one story heights. When relatively long and slender and designed to resist bending they become columns.

Architects are frequently called upon to lay out buildings and prepare estimates of cost without sufficient time to make a structural design. Sometimes the project is tentative and the expense of making a structural design is not justified. The sketches and estimates satisfy the client and the structural designer is put to work. It happens occasionally that the architectural planner fails to allow sufficient space for columns, beams and girders, the result being unsatisfactory to the client. To avoid such mortifying incidents all architectural planners should memorize a few safe dimensions for ordinary building materials.

The architectural possibilities of reinforced concrete. Cantilevered columns to carry travelling cranes and working platforms in a high narrow room spanned by deep beams suggest medieval halls.

The design begins with the floor. For floors carried on joists, the tongue and groove flooring should be not less than ⅞-in. thick if single. Thinner flooring should be used only when laid over sub-flooring of surfaced boards. The maximum span for loads in dwelling houses may be 24-in. while for office floors it should not exceed 16-in. Laminated floors in ordinary office buildings may have a thickness in inches equal to one-fourth the span in feet if some slight deflection is allowable. To keep the deflection within limits which will not crack plaster on the underside, the thickness in inches should be not less than one-third the span in feet. For floors of light manufacturing buildings the thickness in inches should be not less than one-third the span in feet and if deflection is to be limited the thickness in inches should be not less than one-half the span in feet.

Floor joists should have a depth in inches of not less than two-thirds the span in feet. This is a safe rule to follow. Beams carrying laminated floors or joisted floors should have a depth in inches not less than one-half the span in feet for ordinary loads. For the loads required in light manufacturing buildings, as well as for buildings where deflection is to be limited beams should have a depth in inches not less than two-thirds the span in feet. This applies as well to girders, but it is better slightly to increase the proportion of depth for girders better to obtain stiffness and resist shear. For girders it is well to allow a depth equal to one-tenth the span and increase this to one-eighth the span for very short girders carrying loads concentrated at mid-span. The difference between beams and girders is that beams carry uniformly distributed loads and are themselves supported by girders, excepting of course such intermediate beams as may run into columns. Girders carry concentrated loads, represented by the end beam reactions, and shear is a force to be reckoned with for this reason.

The foregoing rules for allowances for beams and girders of wood apply as well to steel and reinforced concrete. In the latter two materials some saving in depth may be effected but it is well to leave such niceties to the structural designer. For heavy concentrated loads such as tanks and machines provide space for a beam having a depth in inches equal to the span in feet. Occasionally a series of spans, some short and some long may be required to carry machinery. The depth allowed for beam or girder for each span should be in

Timber. Mill construction with long span laminated floors. Two piece girders resting on metal post caps.

inches equal to the longer span in feet. Within this space the structural designer will be able to fit his supports without trouble. The space allowed for widths of all beams and girders should be not less than two-thirds the depth.

A deep narrow beam, or girder is the most economic. The stiffness obtained by increasing the depth is an additional advantage. Whenever an architectural design permits the use of beams and girders with depth equal to, or greater than, one-tenth the span the structural designer will find his problems simplified.

Timber. Semi-mill construction with beams carried on stirrups instead of resting on girders. This effects saving in brick but reduces fire resistance.

Size of Bays

In business establishments floors are divided into bays, the general design being affected by many factors peculiar to the business but most strongly by considerations of commercial sizes of material, story heights, etc. Usually the greatest economy is obtained by using the smallest practicable bays for the industry which will occupy the building. Changing character of occupancy must also be considered so the building may readily rent in the event that the tenant for whom the building is erected removes in the future to another location.

For a general purpose building a span of less than 12 feet will reduce renting value and 18 feet may be considered as close to the maximum pos-

Reinforced concrete. Top floor of an administration building. Long span slabs on beams carried by columns. No intermediate girders. Square columns are inferior to round columns in case of fire.

sible for heavy timber construction. When a building is to be of heavy timber construction spans of 14 feet to 16 feet are commonly used unless the owner is willing to wait a long time in order to secure large timbers from the mill. All wood should be well seasoned before going into a structure so it is wise to obtain from local dealers information on sizes of the largest timbers they carry in stock.

Reinforced concrete. Depth of beams and girders practically equal. Wires go through lower half of beams.

With steel and reinforced concrete the greatest limitation on span length is fixed by the ratio of depth to span. The head-room being fixed it is measured to the bottom of the deepest girder or beam. All space above this necessary head-room is waste. It can seldom be well ventilated and the cost of heating it, together with the interference with proper lighting caused by deep beams are factors deserving of consideration. Another objection to deep beams lies in the increased amount

Reinforced concrete. Deep, narrow beams and girders. Heavy cantilevered columns for traveling crane. Wires go through lower half of beams.

of wall, which, in a number of stories may amount to that necessary for an additional story. Economic design calls for the least possible depth of floor and the longest spans consistent with this depth.

The economic span of 18 feet for wood is fixed by the difficulty in obtaining timbers of suitable size in lengths greater than 18 feet. This diffi-

Reinforced concrete. Special design with deep, narrow girders carrying wide, shallow beams. Round columns.

culty does not exist with steel but the objections to deep beams place a practical limit of about 22 to 24 feet on steel construction. Even then girders will show below the general ceiling level which is obtained by plastering on lath attached to the underside of beams. The additional floor thickness called for in longer spans adds to the number of bricks in outside walls.

Reinforced concrete made possible the "girderless slab" or "flat slab" as it is usually styled. This is what the name implies, a flat slab resting on columns without girders or beams. For a superimposed load of 100 lb. per sq. ft. the total thickness of the slab will be 6¾-in. for a panel 16 ft. square and 11¼-in. for a panel 26 ft. square. For a superimposed load of 300 lb. per sq. ft. the total thickness of the slab will be 10¼-in. for a panel 16 ft. square and 18 in. thick for a panel 26 ft. square. The figures given apply to slabs resting

Reinforced concrete. Girderless floor carried on large column capitals without drop heads.

on enlarged column heads. When a square "drop head" is cast on the column head for the slab to rest on the slab thickness may be reduced one or two inches depending on the span. The drop head, however, will have a thickness of not less than half the slab thickness and is not ornamental.

The flat-slab was a development from the use of shallow beams of reinforced concrete having

Reinforced concrete. Girderless floor carried on drop-heads. Columns and capitals are round in order to offer maximum resistance to fire.

depths equal to one-twentieth to one-twenty-fourth the span and widths equal to one-half the span. Reinforced concrete deflects a very small amount under load compared to wood and steel. The flat-slab is heavy and contains a great deal of material. It is economical principally because the form work is not complicated.

Piers, Posts and Columns

An architect will seldom take advantage of the possible slenderness of vertical supports as he wishes to obtain artistic proportions. Vertical supports are therefore generally built out with lath and plaster, which incidentally adds to fire resistance.

Reinforced concrete. Girderless floor on drop-heads. Corrugated iron used in forms to give ornamental ceiling.

To obtain sizes of posts it is necessary that some estimates be made of weights and the sizes of posts should be taken from hand books. Roughly speaking, the structural designer will not be hampered if the architectural planner assumes the diameter or smaller side of all posts in inches as equal to the clear height in feet.

Reinforced concrete. Girderless floor carried on drop-heads supported by large column capitals. The columns are octagon in shape to harmonize with the square capitals and at same time resist fire practically as well as round columns.

Brick or stone piers should have the least thickness equal to one eighth the height for such preliminary sketches as are considered in this article.

ECONOMY IN STEEL DESIGN*

ONE secret of reducing cost of fabrication and cost of construction, according to Mr. Fleming, is standardization. Following the standardization of timber sizes and steel sizes came the long desired standardization of brick size in 1920.

According to Mr. Fleming, in 1916, on an average job, a division of the money spent in producing the structure would indicate that labor cost about 30 per cent. and material purchased about 70 per cent. of the total. Today the division would be approximately 40 per cent. for labor and 60 per cent. for materials, and it is predicted that in the near future, owing to the rising price of labor, this division will be more nearly 50-50. As the labor cost increases it becomes self-evident that more and more material can be used, if thereby labor can be reduced.

Blue-prints for a building recently submitted showed a total of 54 footings. These footings were in the form of truncated pyramids with a square or rectangular base. Slight variations in the size and shape of the base and of the top on which the column rested resulted in nineteen separate types of footings. Of this number, fourteen occurred once, two occurred twice, one three times, one occurred five times, one twelve and one sixteen times. The footings as detailed doubtless save some concrete over that required by simple steps, but the saving was made at the cost of some very fussy and expensive form work. The simplicity of forms for stepped footings goes far to offset the cost of the small additional amount of concrete involved.

Erection

Mr. Fleming believes that a great opportunity for the draftsman exists to make erection as easy as possible. Close fits and entering connections should be avoided. The caution regarding unnecessary shop rivets applies with added force to field rivets. There are many devices for attaching the work of other contractors that will eliminate drilling holes.

The first installment of this article appeared in the issue of August 31.

Practical construction superintendents say that if it is necessary to have rivets at isolated points it is cheaper to drive two rivets than one.

Seats for beams and girders are often worth their weight in gold.

Close co-ordination with the erection department from start of design to finish of fabrication always lessens cost of erection.

In through plate girders be sure that floor beams can be erected without spreading the girders. It should not be necessary to tip columns to put in place beams or girders.

Avoid too many changes in rivet sizes. Sometimes it is cheaper to increase sizes of some connecting members than change rivet sizes for a small number of connections.

Purlins should be placed in the upper or peak side of clips. They are thus prevented from sliding down the roof before being bolted.

A decided reduction in the cost of erection can often be brought about by the use of bolts instead of rivets for field connections. The specification for a twelve-story apartment house in New York City has the clause: "All connections within 3 ft. of the column centers must be riveted. All tank and sheave beam supports must be riveted. Other connections may be bolted." In this particular building the beams upon which some columns depend for lateral stiffness do not connect directly to the columns, but frame a foot or two away into other connecting beams. Mr. Fleming asks: "Is not this a commendable cause for similar cases?"

He believes that bolted connections are permissible for the following:

Buildings of one story, not of great height and acting mainly as shelters. Such buildings carry no shafting or electric traveling cranes and unless exposed to unusual winds there is little reason why field connections may not be bolted throughout.

Buildings for temporary use.

Subordinate framing such as that required for stairs, doors, windows, partitions, ceilings, moniters, pent houses, curbs and railing. It is often desirable, if not necessary, to have framing around windows, doors, skylights and similar work bolted in order to secure proper adjustment for the work of other contractors.

Purlins and girts, except where they form an integral part of a system of bracing. There is little reason why the clips to which purlins and girts are attached should not be shop-bolted, instead of shop riveted, to main members. The same is true of many connections for subordinate framing.

Platform and floor plates. If there are trucks moving on the floor, or there is shoveling of coal or material, countersunk-head bolts should be used. An indentation in the head is convenient to hold a bolt while the nut is being turned. In other cases bolts with button heads not over 1/4 or 5/16-in. high may be used.

Connections of beams to beams and beams to girders in floors that do not support machinery, shafting or rolling loads. This is an important item in a many storied office building or hotel. If the connections of floor members to columns are riveted the structure is stiff transversely and longitudinally. Little is gained in stiffness and much is added to expense by riveting connections of filling-in members. Moreover, in fireproof construction the bolts are embedded in concrete, a fact which should assure any doubter that there is no chance of nuts becoming loose.

Bracing connections not subject to direct stress. This refers particularly to the intersection of bracing angles midway between trusses and columns. An overzealous inspector will sometimes insist upon specifications being carried out to the letter and that rivets be used. This necessitates riveting from a special rigging at a cost of a dollar or two per rivet. The cost would not be a valid objection provided anything were gained by it.

Connections are subject to shearing stress at points where members rest upon other members.

The foregoing list is a conservative minimum. Mr. Fleming believes that in many cases it may be extended, in which opinion he is by no means alone.

The Time Element

Mr. Fleming concluded his valuable paper as follows:

"An element entering into the cost of steel structures that should not be overlooked is time. A structure wanted in an abnormally short time can usually be obtained only at an abnormal price. On the other hand, delays preventing normal procedure are always expensive. A delay may occur in furnishing complete information to the drafting room. Probably there is nothing that increases the cost of drawings so much as incomplete or incorrect information at the start.

"A change in a single figure is often far-reaching and the liability of error is great. Besides the morale of a drafting force is liable to be broken if called upon to discard work upon which much time thought has been spent. When it comes to fabrication some sizes may not have been received from the rolling mill which necessitates putting aside the members affected. The erector may be held up because of the non-arrival of pieces when needed.

"Delays all mean increased cost, for work in no department can be laid aside and taken up later without incurring expense. In addition there is the loss to the purchaser of the interest on capital during the time it lies idle and the loss due to the interruption of business. Indeed, the fourth dimension of the cost of structures, the mysterious path by which costs take wings and mount upward is *time.*

"The claim that all advantages derived from lessening the cost of a steel structure accrue to the fabricating firm is true only for isolated cases. If methods tending to reduce cost are persistently followed a large part of the saving will in the end revert to the purchaser."

WARM AIR FURNACE HEATING

THE question of proper design and proportion of the house heating equipment is of vital importance to those who dwell in regions periodically visited by winter.

Since October, 1918, an investigation of warm-air furnaces and heating systems has been carried on by the Engineering Experiment Station of the University of Illinois, Urbana, Ill., in co-operation with the National Warm-Air Heating and Ventilating Association. The principal objects of the investigation are, briefly, to determine methods of increasing the efficiency and capacity of warm-air furnace heating systems, and also to establish satisfactory and simple codes for testing and rating furnaces, so that the heating equipment may be properly proportioned for the work it has to do.

Bulletin 112 issued in 1919 contained a report of the progress on the work. Bulletin 120, just issued, continues the report of progress to date, in addition to which it describes special apparatus and methods of testing. It is the latest and most reliable information with respect to warm air heating systems.

THE PRESERVATION OF TIMBER

THE American Wood Preservers' Association has recently established a Service Bureau with offices in the Otis Building, Chicago, Ill. The policy of the Service Bureau is to disseminate information on the preservative treatment of woods and aid architects, engineers and contractors in wood preservative problems.

NOTES ON SELECTING LUMBER

SPECIFICATIONS often call for "virgin growth" or "second growth" timber, yet the terms are without fixed significance, and the material when delivered cannot be positively identified as belonging to one class or the other, says a writer in *Technical Notes, No. 153,* published by the Forest Products Laboratory, U. S. Forest Service, Madison, Wis.

"Virgin growth," also called "first growth" or "old growth," means timber which grew up in a standing forest under conditions of active competition for sunlight and moisture.

"Second growth," when applied to a forest stand, usually means timber whose main growing period occurred under conditions of lessened competition, after all or a portion of the original stand had been removed by cutting, fire, wind, or other means. In connection with individual trees, the term is used to mean any whose growing conditions approximated those which would produce a "second growth" stand. To the wood user, "second growth" means material cut from either of these sources. In general, the term is associated with the idea of a second crop of timber, though specific applications may vary.

Virgin growth is generally thought of as slow growing timber, while second growth, due to more favorable conditions, is relatively rapid. A faster rate of growth is evidenced by wider annual rings. These are popularly supposed to indicate stronger and tougher wood in the hardwoods, such as ash, hickory, elm, and oak; and weaker and brashy wood in the conifers, such as pine and fir. Hence, for uses in which strength and toughness are essential, second growth is sought among the hardwoods, whereas in conifers virgin growth is desired.

As a second growth forest attains maturity, the rate of growth slows up, and the annual rings may be no wider than in virgin growth timber of the same size. On the other hand, when a slow-growing suppressed forest tree is freed by removing the neighboring trees, it may grow rapidly for a long period. Therefore it is possible to have some wood with the characteristics of virgin growth and some with those of second growth in the same tree. Furthermore, individual trees in a virgin growth forest may have the characteristics of second growth throughout and vice versa.

Instead of broadly specifying "second growth" or "virgin growth" or depending upon requirements on the width of annual rings to secure good material, the Forest Products Laboratory considers it advisable to disregard rate of growth and rely upon density as a guide to quality.

BUILDING STATISTICS FOR 1920

THE following data were furnished by the Civic Development Department of the Chamber of Commerce of the United States.

A blank soliciting the required building information was sent out to the 288 cities in the country having a population of 25,000 or over. Their total population was nearly 38 million. Of these, 131 cities, with a population of 81.5 per cent. of the total, reported.

"It is interesting to note," says the report, "that of the estimated one billion, forty three million dollars spent on buildings in 1920 in the cities reporting, more than 36 per cent. ($382,307,000) were devoted to dwellings. Factories and work shops came second with 16.8 per cent.; stores and mercantile buildings third, with 13.3 per cent.; while office buildings and garages tied for fourth place with 8.2 per cent. each. Schools, hospitals and charitable buildings together called for 5.4 per cent. or $77,388,000. Amusement places cost more than churches, hospitals or public buildings, the sum being $38,637,000.

"If the rate of building in the non-reporting cities was the same as in those which reported, the total number of building in all the cities of 25,000 or more population may be estimated at 195,000, at an estimated cost of $1,280,000,000."

BUILDING TRADES WAGES IN SCOTLAND

THE following figures were given in the July 29 issue of *The Architect*, London, England, and were supplied to that paper by the Scottish National Building Trades Federation. The figures as printed were in English monetary units and are here reduced to United States units on the basis of one penny being equal to two cents. This makes possible a comparison of wages in 1914 before the great fluctuations commenced in international exchange.

Rates per hour in 1914

	Edinburgh	Glasgow
Bricklayers	$0.20	$0.22
Glaziers	.19	.19
Joiners	.21	.21
Masons	.19	.21
Painters	.19	.20
Plasterers	.19	.21
Plumbers	.20	.21
Slaters	.19	.20
General Laborers	.12	.14

In November 1920 the wage for all the building trades was fixed at 56 cents per hour for Class "A" districts, 54 cents per hour for Class "B" districts and 50 cents per hour for Class "C" districts. The pay for all building laborers was fixed at 46 1-2 cents per hour, irrespective of districts. Effective March 16, 1921 all wages were reduced by four cents per hour and a sliding scale was adopted which is based on the cost of living.

Between 1914 and 1920 the cost of living in Great Britain increased nearly four times. It may therefore be seen that in the skilled trades wages did not advance proportionately, therefore such men had to adopt a lower standard of living. The increase in pay of ordinary laborers kept pace with the cost of living, so their standard of living was undisturbed. These phenomena resemble those in all countries affected by the war, the upper and lower classes of society experiencing little disturbance while the middle class has experienced a violent re-orientation.

The figures presented make possible an interesting study. They show that wages in Great Britain are on the average about one-half as high as wages in the United States, so that when the world settles down a bit more the competition is going to be severe. The present exchange rate makes British wages really about one-fourth smaller than here shown. The superior efficiency and greater output of the American easily wipes out the exchange handicap, but the normally lower wages in Great Britain and lower standard of living of British workmen indicate that we are facing a long hard fight in the world's markets. The table of wages here presented is interesting when compared with the table presented on page 131, issue of Aug. 17, of The American Architect.

EMERGENCY HEAT FOR SPRING AND AUTUMN

THE central heating plant, whether it be hot air, hot water or steam, lacks flexibility, an advantage possessed by the old time heating stove and the open fireplace. With these heating units the chill of Autumn and the dampness of early Spring were robbed of their discomforting effects by small fires which were burned for the few needed hours. Maximum comfort was thus secured, for the rooms heated quickly and were quickly cooled by simply letting the fires burn out. The expense was also small.

The central heating plant is so ordinary today that many dwellings, small homes as well as the largest apartment houses, have but one chimney with no provisions for putting stoves in any of the rooms. It is rare that practical fireplaces are built in modern houses, the result being great discomfort during the months when the furnace gives out too much heat when the sun is shining. Men who own their homes wastefully burn much fuel to obtain necessary warmth in early morning and late evening hours, keeping dampers closed and doors and windows open nearly all day. From time to time the fire is permitted to go out, with all the attendant discomfort. Tenants of apartment houses lack even this amount of control, being subject to the vagaries of janitors who often live in stove heated basements, and the owner who counts the burning of coal as a wasteful increase in overhead.

Architects should persuade their clients to provide properly constructed chimneys for stoves, or fireplaces, in order to save heating expense and provide increased comfort during cool days in the Spring and Autumn. The expense, for a house of medium size, will be balanced by the coal saved in six years, for the writer kept cost figures on two identical houses for a period of nine years, one being supplied with one chimney for furnace only and the other with an additional chimney for a fireplace on the ground floor and a stove on the second floor. The difference in comfort cannot be expressed in dollars, especially when the auxiliary heating is available in case of illness and is enjoyed by elderly members of a family on days when the rest of the family is perfectly comfortable without it.

HAZARDOUS HOME CLEANING FLUIDS.

UNDER the above heading The National Board of Fire Underwriters asks that information about dangerous cleaning fluids be widely disseminated. In drafting offices many tracings are cleaned with these fluids and the warning is as necessary for draftsmen as it is for their wives who clean small articles of dress at home.

Cleaning preparations consisting wholly of carbon tetrachloride are safe from a fire standpoint; in fact this liquid is valuable as an extinguisher of small fires in confined places.

Carbon bi-sulphide is said to be sold by some druggists as a safe preparation, when it is, in fact, classified as the most hazardous of inflammable liquids. It is more explosive than gasoline because of its greater volatility. Its vapors will ignite at comparatively low temperatures without either spark or flame being present. The heat of a steampipe, for example, is sufficient.

Not only do some men sell carbon bi-sulphide as a safe cleaning fluid, but some sell a mixture of carbon bi-sulphide and ether, which makes the matter still worse. The efficiency of gasoline as a solvent has made its use in cleaning an every day occurrence, with many accidents. A half-cupful of gasoline poured into a kitchen sink flashed vapor to a gas stove several feet away and caused the death of a woman who had started to clean her gloves in the gasoline.

Gasoline vapor has been known to flash a distance of over 100 feet. The vapor from one gallon of gasoline, when properly mixed with air has an explosive power equivalent to that of eighty-three pounds of dynamite.

When there is any doubt about the safety of cleaning fluids now on the market, inquiry should be made of the fire chief or a local fire insurance agent as to whether it has been examined by the Underwriters' Laboratories. The fire hazards of cleaning fluids differ considerably. Certain of those upon the market have been approved by the Underwriters' Laboratories as being non-combustible and non-inflammable. Others are classed as being burnable but not giving off dangerous, highly inflammable vapors. Good fire protection is almost entirely a matter of education and architects are happily placed to impart proper knowledge on the subject.

FIRE RISK IN SCHOOL HOUSES

A RECENT publication of the National Fire Protection Association shows that of all the school buildings in the country only 5 per cent. are of Type A, constructed entirely of fire-resistive materials. Thirteen per cent. are Type B, with fire-resistive construction as to walls, floors, stairways and ceilings, but with wood, or composition floor surfaces, and wood roof construction over fire-resistive ceiling. Seventeen per cent. are of Type C, with masonry walls and fire-resistive corridors and stairways, but with combustible floors, partitions, roofs and finish. Forty-four per cent of the school buildings are of Type D, with masonry walls, but otherwise with ordinary joist construction and wood finish. Twenty-one per cent. of the schools, including the old-time country schools, are of Type E, with wood construction. This shows that 80 per cent. of the schools are firetraps, in spite of the numerous warnings which have been given on the dangers of such construction by serious losses of life. Little children are entitled to every possible protection, and fireproof construction should be required by law for every school building more than one story high.

One prominent insurance company reports that for the past five years its loss ratio on brick buildings has been 65 per cent. in protected towns and 115 per cent. in unprotected towns. On frame buildings the loss ratio was 138 per cent. in unprotected towns. On contents the loss ratios were 64 per cent. for brick protected, 76 per cent. for brick unprotected and 116 per cent. for frame protected. Many other companies have an equally bad schoolhouse record.

Ohio requires that all school buildings more than one story high must be of fireproof construction, and the fire prevention regulations are strictly enforced by the state fire marshal, who also makes specially careful inspections of schoolhouse risks. These laws were passed after the burning of the Collingwood School in which fire 150 children lost their lives.

THE AMERICAN SPECIFICATION INSTITUTE

127 No. Dearborn St., Chicago

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THE American Specification Institute has been founded on the theory that the interchange of knowledge concerning specifications that it is possible to obtain in an organization whose members have made or are making a study of the art of specification writing will result in their improvement, to the benefit of all those concerned in their use. The Specification Institute is national in scope and it solicits the support of all specification writers, architects and engineers who design or supervise the construction of buildings, engineering structures, mechanical equipments for buildings and structures of all kinds and all work whatsoever in which materials of construction or building equipment are used.

The program of organization of The American Specification Institute contemplates a detailed study of the materials and methods used in construction work, the economics of building construction so far as specification work is properly dependent on the principles of construction economics and the means of accomplishing specification documents that are clear, concise, coherent and that can be understood by the courts.

The need of such an organization, i.e. one that will devote its energies exclusively to all phases of specifications, their preparation and use and that will make these studies under the guidance of men trained in the work, has long been recognized. The following letter, recently received from one of our members, expresses, in a very clear manner, the benefits that the average specification writer will derive from the Specification Institute.

"It is with a great deal of pleasure that I send you my application for membership in The American Specification Institute. The explanatory matter which you have sent me has been read with a great deal of interest and with profit.

"For a number of years I have been trying to produce specifications that will come through to the completion of the work without having serious errors brought to my attention. Of course minor errors that, from the sense of the clause or paragraph, are apparent are to be expected to some extent but errors that are ridiculous or that result in embarrassment or financial loss are to be guarded against with the greatest of zeal.

"Do not misunderstand me in this. I do not anticipate that the Institute can, for me and in my behalf, eliminate such errors but it does seem to me that a body of men who are experts in specification work could devise some means of checking the manuscript or of checking the drawings so that one could be reasonably sure of having included all necessary matter and at the same time be sure that all ambiguity or careless wording has been kept out.

"It is my view that what the specification writer needs, more than standard specifications (to some the word 'standard' is detestable) is an orderly collection of data pertaining to the work, which I understand you propose to compile and authoritative instructions respecting the fundamentals of specifications. It then would be the duty of the specification writer to perfect himself by study and observation and the assistance of the Institute.

"I shall be happy to be of whatever assistance I can in the carrying forward of the good work you have commenced."

The above letter is typical of others that have been received and of conversations the Acting Executive Secretary has had during a recent trip through the eastern territory.

The Annual Fall Conference

The Board of Governors has received a suggestion that there be held in Chicago in the early fall a Conference of those members and others interested in the work of the Specification Institute in order that an intimate discussion of the problems confronting specification writers may be had.

The Board of Governors is now formulating a program for such a conference and it is expected that the date may be fixed during the coming month.

The success of such a conference will depend, in a great measure, on the attendance of members and it is believed that much of value will result from it. Members who may wish to visit Chicago during the fall are earnestly requested to make their arrangements fit in with the conference if at all possible.

Papers discussing various phases of specifications will be read and it is expected that discussions with respect to co-operation with other national or local organizations having committees at work on the study of matters which are intimately related to specifications will lead to immediate steps toward a more universal use of the facilities offered by The American Specification Institute.

Prospective members and others interested in the activities of the Institute are requested to communicate with the Executive Secretary's office. In the interim, if copies of *The American Architect* are available to the reader he may read with profit the issues of February 16, 1921 and of June 22, 1921 and subsequent issues.

PERSONALS

THUMB TACK CLUB OF DETROIT TO HOLD EXHIBITION

AN Architectural Exhibition is to be held, under the auspices of the Thumb Tack Club of Detroit, in the galleries of The Detroit Institute of Arts, October Seventeenth to Thirtieth, inclusive.

Inquiries regarding Exhibits and Year Book may be addressed to Mr. Wm. E. Kapp, 710 Washington Arcade, Detroit.

Oscar H. Drouin has opened an office for the practice of architecture at 73 Main Street, Woonsocket, R. I.

D. S. Pentecost, architect, who was previously located at 330 Adams Street, Gary, Ind., is now practicing at 705 Connecticut Street, that city.

Announcement is made that Joe H. Wildermuth & Co., architects, have opened architectural offices at 690 Broadway, Gary, Ind.

The architectural offices of H. C. Deckbar, architect, have been moved to 1006-7 Wright & Callender Building, Los Angeles, Cal.

Frank G. Krucker, architect, wishes to announce that he will retain offices for the practice of architecture at 520 Ferguson Bldg., Los Angeles, Cal.

C. M. Hutchinson, formerly associated with the architectural firm of Walker & Eisen, has engaged in private architectural practice at 427 Security Building, Los Angeles, Cal.

It is announced that H. L. Staves, landscape architect, has opened an office for the practice of architecture at 1216 Grand Avenue, Des Moines, Iowa.

George Feltham, architect, of St. Petersburg, Florida, has opened a branch office in Clearwater, Florida, and requests samples, catalogues, etc., for his files.

It is announced that Charles Fallen, architect, is now practicing architecture at 206 Touraine Building, Fort Worth, Tex. He is desirous of receiving manufacturers' catalogues and samples.

Harold E. Hall, registered architect, formerly of Westwood, N. J., is now associated with Hester, Interior Decorators, 425 Seventh Avenue, New York City.

George F. Kessler recently resigned from his position as landscape architect for the Cincinnati Park Commission, having served in this capacity since 1907.

Simpson & Githens, architects and engineers, have dissolved partnership and the business will continue at the same location, 869 Reibold Building, Dayton, Ohio, under the name of E. F. Simpson.

An architectural partnership under the firm name of Kuehn & Walsh has been formed by Earl Walsh and F. C. W. Kuehn, both of Huron, S. D. Their offices are in the City National Bank Building, Huron.

Calrow, Wrenn & Tazewell, architects, New Monroe Building, Norfolk, Va., have changed the firm name to Calrow & Wrenn, with offices at the same location, Mr. Tazewell no longer being associated with the firm.

George B. Ford, architect and city planner, 132 Nassau Street, New York City, recently received word that he has been awarded a gold medal by the International Planning Exhibition at Ghent, Belgium, for his plans for the reconstruction of Rheims, France. The reconstruction is already under way.

According to recent press announcements, Lloyd Morgan, a New York architect, has been awarded the annual Paris prize of the Society of Beaux-Arts Architects, providing $3,000 for two and one-half years' study at the Ecole des Beaux-Arts in Paris. Mr. Morgan won the award by offering the best plan for "an exhibition center."

Announcement is made of the formation of the firm of Batchelder & Scales for the purpose of conducting a general architectural and structural engineering business, their offices being located at 35 West 27th Street, Indianapolis, Ind. They are desirous of receiving manufacturers' catalogs and samples. Mr. Batchelder is a graduate of the Massachusetts Institute of Technology, and a Rotch Traveling Scholarship and American Academy of Rome man. He was formerly designer for Allen & Collens of Boston, and a partner of the firm of W. E. Russ & Co., Indianapolis. Mr. Scales is a graduate of the University of Illinois, and was formerly chief designer for the Lackawanna Bridge Co. of Buffalo. He was also a partner of the firm of W. E. Russ & Co., Indianapolis.

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CHURCH OF S. VITALE, RAVENNA, ITALY

THE AMERICAN ARCHITECT
The ARCHITECTURAL REVIEW

VOL. CXX | WEDNESDAY, SEPTEMBER 28, 1921 | NUMBER 2377

ARCHITECTURAL ACOUSTICS

The Transmission of Sound through Flexible Materials—Part I

Being part of an investigation of an inclusive research program upon the general problem of the transmission of sound in buildings

BY PAUL E. SABINE

AT present the most common practice in attempts to prevent the passage of sound from room to room through partition walls is by the use of so-called "sound deadening materials." In general, such materials are soft, flexible, and porous, and are supposed to be effective in damping the vibrations of sound by virtue of these properties. Very few, if any, quantitative facts are available either on the question of the absolute efficiency of such materials in reducing the fraction of sound transmitted or upon the relative merits of different materials of this character as means of securing the desired results. The well-known fact that materials of this sort absorb a comparatively large fraction of the sound incident upon them, and reflect only a small proportion has led to a widespread belief in their efficacy as sound "insulators." The following is a report of a series of experiments conducted in the Wallace Clement Sabine Laboratory, at Riverbank, Geneva, Illinois, during the last nine months, with a view to supplying quantitative data on the question of the relative merits of materials of this character, as well as to determine their absolute efficiency in reducing the intensity of sound transmitted by them. This investigation is part of a more inclusive research program upon the general problem of the transmission of sound in buildings. The results are presented at this time partly because of the light which they throw upon the practical question of securing "sound insulation" by the use of so-called "sound deadeners," and partly with a hope of eliciting the opinion and the results of experience of engineers and architects who have had to deal directly with this problem.

At the outset, it should be stated very clearly that the data here presented apply only to the transmission of aerial sound waves and not to vibrations set up by vibrating or rotating bodies in direct contact with the structure itself, or by impacts applied directly to floors or walls. In an article published in 1915, Professor Wallace C. Sabine has given some very interesting examples of the undesirable facility with which vibrations of this latter character are transmitted by modern building construction. Numerous trying experiences in this laboratory in attempts to secure experimental conditions of absolute freedom from extraneous sound, as well as a number of practical problems submitted from time to time by others serve to emphasize the importance of an independent investigation of means of reducing such vibrations. This latter investigation has begun, but has not been carried to completion at this time. It may, however, be stated that materials which are comparatively ineffective in reducing the intensity of sound transmitted through partition walls, may have considerable merit in reducing the noise of impacts and vibrations applied to walls and floors.

The Mechanics of the Transmission and Absorption of Sound

The reader interested only in results may omit the perusal of this section. Apparently contradictory results have imposed upon the writer the necessity of modifying his own earlier conception as to the nature of the process by which sound energy is transmitted through intervening partitions. With the thought of establishing a common point of view between reader and writer, the following considerations are presented, with all due apologies for their somewhat didactic character.

Let us suppose that the rooms A and B are separated by the partition P, and that the construction is such that the energy of sound vibrations can be transmitted from A to B by the medium of this partition and by no other means. Under the action of the sound waves, assumed to have their origin in A, P is subjected to a periodically varying pressure. In the compression phase of the sound wave, the pressure upon P in A will be greater than that in B, while in the rarefaction phase the opposite will be true. If P be assumed to be of non-porous material, it will clearly be subject to a force periodically alternating in direction. Under the action of such a force, a vibration of the partition will result, which will be in turn communicated to the air in B. Sound is thus induced in B.

Now the amplitude of the vibrational motion of the partition under the action of any particular tone will depend upon a number of factors involving the three physical properties of mass, elasticity, and internal friction or damping and also the dimensions of the wall, that is its length and height as well as its thickness. The factors mass, elasticity, and dimensions determine what have been called the "natural frequencies of vibration" of the partition. If by any means, the partition be distorted instantaneously, it will in coming to rest vibrate with various definite frequencies which are determined by these factors. Without going into the details too deeply, it can be said that the amplitude of vibration of the partition under the action of sound waves and, as a consequence, the intensity of the sound in B will depend, other things being equal, on the proximity in pitch of the incident sound to any one of these natural frequencies. An interesting illustration will make this clearer. Upon a table in the laboratory, a steel billet weighing approximately 160 pounds was supported at two points near the ends so that it was free to vibrate in one of its natural modes. It was found that the billet could be put into vibration vigorous enough to produce an easily audible sound by means of a small tuning fork tuned accurately to the natural tone of the billet and held against a door eight feet away. In a material like steel, the damping factor or internal friction is small as evidenced by the length of time a tuning fork of this material will remain in vibration, so that the effect of a large number of extremely small impulses, properly timed is cumulative, and the vibrational energy acquired by the bar becomes appreciably great. In a similar manner, the transmission of sound energy of any particular pitch from A to B by the medium of the partition may vary from tone to tone in a manner not easily predictable. Moreover, the effect upon transmission of varying either the mass or the elasticity factor cannot easily be foretold in advance of actual experiment. Thus, in certain cases, experiment has shown that doubling the thickness of a partition has actually resulted in increased transmission of sound of some one pitch, an effect not readily explicable upon the basis of our ordinary notions, but one easily explained upon the assumption that the pitch of that particular tone more nearly coincides with a natural frequency of the double thickness wall, than with a similar frequency of the single thickness.

In general it may be stated that the effect of increasing the stiffness of a partition wall, other factors remaining constant, will raise the frequency of any one of its natural modes of vibration. Increasing the mass, other factors being kept constant, lowers the natural frequency. The increase or decrease in the transmission of sound of any given pitch by either of these changes, will depend in part at least upon whether the change brings a natural frequency of the partition more nearly into unison with the tone in question or the reverse.

The third physical property which affects the vibration of the partition, and hence the intensity of sound in B is that of internal friction or damping. This is the force, frictional in its nature, called into play by the motion of adjacent particles upon each other as the partition vibrates under the action of the sound. Unlike the other two factors an increase in the damping acts always to *decrease* the vibrational motion. Moreover, increased damping is effective in reducing the transmission for all frequencies. In soft felt-like materials this factor is assumed to be great and it is upon this assumption, no doubt, that the general belief in the efficacy of these materials as "sound deadeners" is based. The absorption of sound energy can take place only through the action of forces which are frictional in their nature. Energy expended as work against such forces is dissipated as heat. It is to these properties of inelastic flexibility, compressibility and porosity that fabrics owe their high absorptive power. It should be said in passing, however, that the reduction of intensity of sound within a room whose walls are lined with absorbent materials results from a large number of reflections from those absorbent surfaces, whereas the absorption occurring in the transmission of sound through a partition must occur in a single passage. To what extent this large damping of such materials is effective in compensating for the lack of mass and stiffness is a question to be answered only by experiment, and it is to this end that this investigation has been carried on.

In the foregoing a non-porous partition has been assumed. In the case of the materials with which this paper deals, there has been also a greater or less degree of porosity, so that the pressure changes due to the sound in A have been communicated in part directly to the air in B. Due to the dissipation of energy by friction of the vibratory air particles in intimate contact with the walls of the pores of the material the amplitude of the transmitted vibration is diminished.

Finally it is to be said that the varying pressure on the partition due to the sound will set up compressional waves in the material of the partition which in turn will give rise to sound waves on the other side.

Briefly, then, sound may result in B from a source located in A in three distinctly different ways.

In the first, the partition acts as a diaphragm or plate possessing the properties of mass, elasticity, or stiffness, and damping, hence having natural frequencies of its own which are important in determining both the absorption and transmission of sound of any given pitch. In general the effect of increased mass and stiffness is to reduce the transmission of sound in this way, although for particular cases this rule may not hold, as has been noted. Increased damping reduces the transmission of all tones, but is more effective for high pitched than for low pitched sounds.

In the second, the varying pressure which constitutes the sound wave is transmitted directly through the pores of the material, the magnitude of these pressure changes being decreased by dissipative forces in this transmission. Here again the reduction of sound intensity is greater for high pitched sounds.

In the third, sound may be transmitted by compressional waves in the material itself.

The Method of the Experiments

The method used in determining the relative intensities of sound on opposite sides of partitions made of the various materials studied is essentially that described in *The American Architect* of July 28, 1920, and is originally due to Professor Wallace C. Sabine. For the details of the experimental arrangements by which the passage of sound between the two rooms was limited to the partition under test, the reader is referred to a still earlier article in this same journal (July 30, 1919.) The materials tested were in panels 36″ x 84″. These were mounted in suitable frames and set in a doorway between the room in which the sound was produced, which shall be called the Sound Chamber and the room in which it was received, the Test Chamber. The sources of sound of various pitches were the carefully calibrated set of organ pipes already described. For reasons which will be stated later, partitions consisted successively of one, two, three, and four layers of each of the materials tested, and the measurements were made at intervals of one octave from C_2, (128 vibrations per sec.) one octave below middle C, to C_7 (4096 vibrations per sec.) four octaves above middle C. All precautions were taken to prevent the passage of sound through cracks. The results indicate that accidental transmission by some other means than by the partition being studied was too small to vitiate the results generally, although in cases where the transmission through the partition proved extremely small, this source of error was sufficient to make it unsafe to draw conclusions from the observations.

Transmission of Sound by Hair Felt

The first material studied was the hair felt, one inch thick, now so widely used in correcting acoustical defects due to excessive reverberation in rooms. For the purpose of study this material has the advantage of being homogeneous, and highly porous, leading one to expect that the results may be more easy of interpretation than would be the case with a less simple material. The relative intensities of sound upon opposite sides of one, two, three and four inches of felt were determined for each of the six tones. As illustrative of the method employed throughout, the actual observations and the necessary computations are given for a single tone C_5 (1024 vibrations per second).

The organ pipe is sounded, and the duration of audible sound in the Sound Chamber after the pipe has ceased is measured. Call this time t_1. Under identical conditions the duration of the sound in the Test Chamber, heard through the felt is also measured. Let this time be t_2. If I_1 and I_2 be the intensities of the sound in the two rooms,

$$\text{then } \log_e \frac{I_1}{I_2} = A\,(t_1 - t_2) \quad \text{Equation 1}$$

A is the absolute rate of decay of sound in the Sound Chamber and is computed from the time t_1 and the dimensions and absorbing power of the Sound Chamber. By supplying the suitable constants the above equation can be put into the form

$$\log_{10} \frac{I_1}{I_2} = .126\, a\,(t_1 - t_2) \quad \text{Equation 2}$$

The determination of the value of a, the total absorbing power of the Sound Chamber for any value of t_1 is the result of some six months of experimental study of the Sound Chamber initially. The data for the single tone are given in Table 1.

Table 1.

Thick in inches	t_1 (secs)	t_2 (secs)	$t_1 - t_2$	a	$\log_{10} \frac{I_1}{I_2}$
1	10.09	9.17	.92	6.28	.72
2	10.29	8.86	1.43	6.20	1.13
3	10.23	8.34	1.89	6.22	1.49
4	10.19	7.89	2.30	6.23	1.81

The times t_1 and t_2 are each the mean of one hundred determinations.

In Figure 1, the value of the logarithms of the ratios of the intensities are plotted as ordinates against the pitch of the tones as abscissae for one, two, three, and four inches respectively. In Figure 2, the same facts are presented in a more significant manner. As in Figure 1, the ordinates are the logarithms of the ratios of intensities on the two sides of the felt, the abscissae, however, repre-

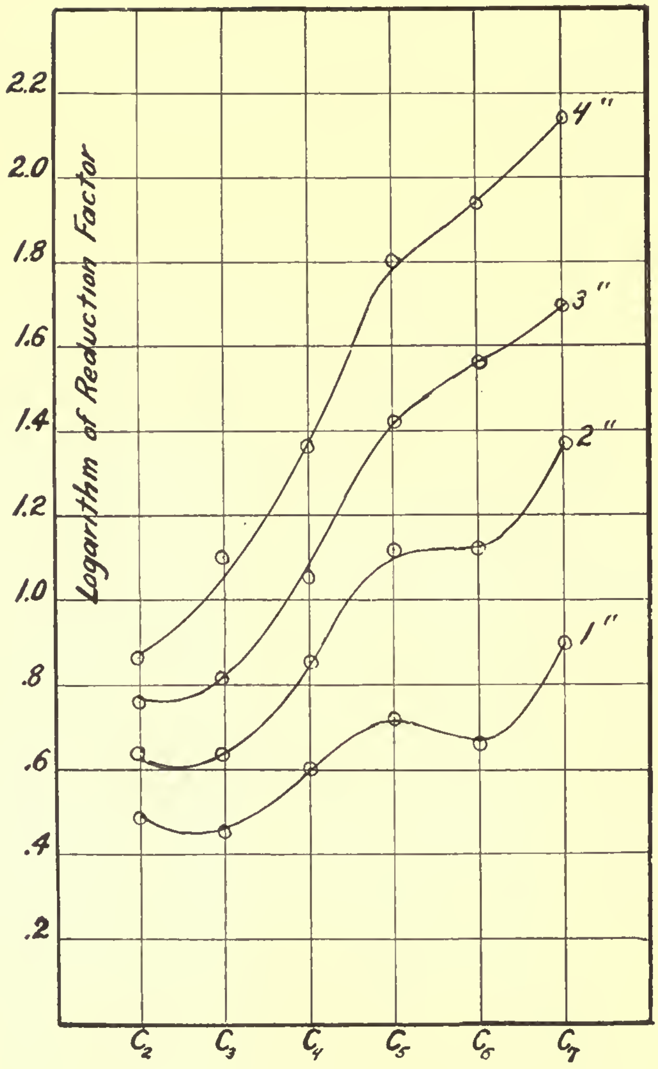


Figure 1. Reduction of Intensity of Sound transmitted by Hair Felt of varying thickness, plotted as a function of the pitch.

sent the thickness in inches. The ratio of the intensities has been called the Reduction Factor. We shall denote it by the letter k. It may be taken as a measure of the efficiency as a "Sound Insulator" of the partition in question. It will be noted that the points representing experimental values of the logarithms of k for any one tone fall upon a straight line. This relation between the reduction of sound by a felt-like material, and the thickness of the material was found to hold for a single tone by Professor Sabine in 1915. The present extension to the entire range of musical tones is of importance, since it demonstrates that the process of transmission of sound by such a material is identical for all tones, independently of their pitch. It means of course, that increase in the logarithm of the reduction factor for a material like felt is proportional to the increase in thickness. Since each additional inch produces the same increment in the logarithm of the reduction factor it follows that each additional inch of felt after the first reduces the intensity of the transmitted sound by a constant fraction. Referring to the example, the average increase in any number in the last column over the preceding number is .36. The number whose logarithm is .36 is approximately 2.3. Each additional layer of felt then reduces the intensity of the transmitted sound in the ratio of 2.3 to 1.

If the straight lines of Figure 2 be extended, toward the vertical axis it will be seen that they cut this axis at points above the origin. At first glance this would seem to indicate that a reduction in the intensity of the sound is produced by felt of zero thickness, an apparent paradox. What is really signified, however, is the fact that there is a reduction in the intensity of the sound at the interface between the two media (i. e. felt and air) a fact quite explicable on theoretical grounds. We can represent all the observed facts for a single tone by a single equation,

$$\log k = \log \frac{I_1}{I_2} = r + q\,x \qquad \text{Equation 3}$$

Here, r is the logarithm of the reduction at the surface of the felt, and q the logarithm of the reduction per unit thickness of the material; x is the thickness.

(To Be Continued.)

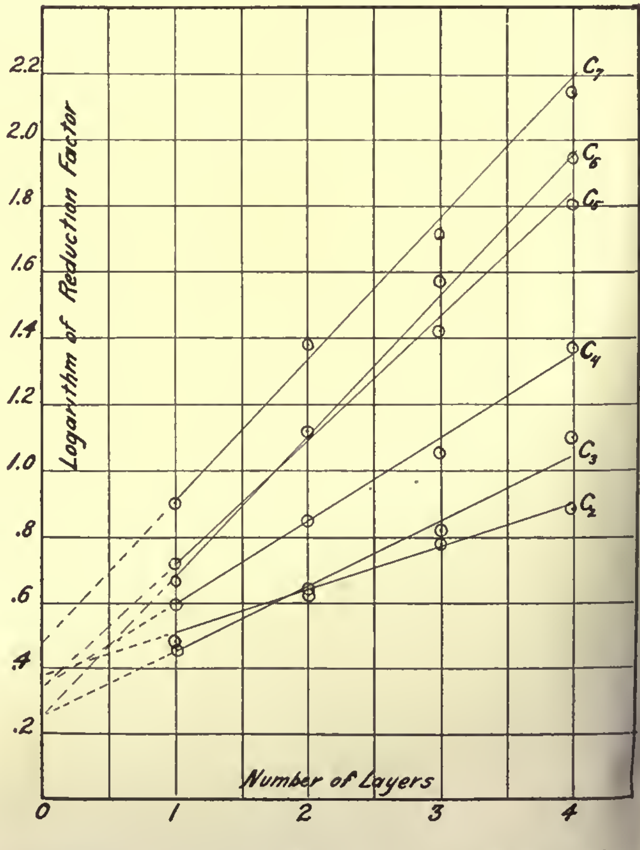


Figure 2. Reduction of Intensity of Sound of different pitches transmitted by Hair Felt, plotted as a function of the thickness.

THE PHOTOPLAY ARCHITECT

What he does and how he works—Illustrated by examples from the photoplay of Victorien Sardou's "Theodora"

BY JEROME LACHENBRUCH

ALL art forms develop from the simple to the complex. Where the earliest forms reveal merely a method of communication, the later and more mature convey subtle suggestions that the individual may appreciate in the measure of his own emotional reactions. As the effect achieved becomes ever more subtle, it is obvious that the method by which it is attained has become more differentiated and the tools employed more numerous. In fact, the first sculptors not only shaped their own tools, but performed every operation that created the earliest iconograms. There were no marble blocks to be quarried, no clay models to be shaped, no variety of instruments to be fashioned. Our forerunners' caves furnished the material for their labors, their arrow-shaped weapons became their chisels, and their creative urge led them to tell simple stories of elementary existence in crude pictorial form.

But with the complexification of civilization, artistic methods underwent a process of specialization, until today the sculptor's hand and brain are occupied only with objectifying a concept in marble. The energy once spent in performing a number of simple preparatory operations is now lavished in more difficult and more delicate ones.

The modern architect differs from his predecessors in that he has delegated the physical creation of his ideas to allied artificers. We recognize in him a man who plays with sketches and blueprints; he is never the man who lays stone upon stone. But a new type of architect has developed within the last ten years who not only follows the fundamental procedure pursued by his colleagues, but also takes active, directorial command in seeing that his plans are carried out according to his conceptions. In short, the motion picture architect has found it necessary to revert to the methods of mediaeval architects and to watch each step in the construction of a motion picture set.

It is well known that he deals with genuine architectural problems, but these are all subordinated to the primary purpose of creating a perfect illusion on the motion picture screen. Consequently, his labor is complicated by such pictorial considerations as light effects, composition, and photographic "angles." A structure, imposing in itself, must be so built that it lends itself readily to the presence of people. That is to say, its beauty must not only not be disturbed, but even increased by their actions. A sightseer leaning against the statue of a lion in a garden does not enhance the pictorial beauty of that garden as a composition. But a mob in the Byzantine Hippodrome as shown in the accompanying photograph, belongs there. This fitness between the architectural environment surrounding and gracing human figures is one of the subtlest problems that the screen architect has to consider.

The mosaics in this scene are painted on plaster in a variety of colors chosen especially for their photographic value

It is not a matter of chance that these tremendous sets are close reproductions of original structures. Modifications may have to be made for the reason just mentioned, but the structures themselves are the result of a long and painstaking process of research, planning, sketching, blueprinting and building.

The research department of a large film company is given many details to look up in such matters as period decoration, minor designs and materials. But there is always a directing mind who knows what should be done. In the case of the architect who planned the mammoth sets for the

Italian picture, "Theodora," which was brought to America by Samuel Goldwyn, much of the research work was a matter of history to its creator, for the sets in "Theodora" are the work of the architect at the Vatican. As the story deals with the period of Justinian, during whose reign as emperor Byzantine art reached its finest flower in the structure of St. Sophia, the photoplay architect fused the Oriental, Roman, Grecian and Christian elements that make the present Mosque one of the noblest examples of architecture the world has ever known.

When one reflects upon the number of sketches and blueprints that must be made for a commonplace photoplay exterior, one is appalled at the industry and sincerity that screen architects bring to the creation of a spectacle.

There are five separate steps in the screen architect's labors before he sees his conceptions as physical structures. First, after reading the story and deciding upon the type of sets to be made, he draws a number of sketches. These are carefully gone over with the members of the directorial staff, who study the effectiveness of the architectural composition in connection with the dramatic action to be filmed. Many sketches may be beautiful in themselves, but may be impractical as motion picture sets, for one of several reasons. Perhaps some scenes that should be photographed beneath a window cannot be taken because the actors might be overcrowded in a set constructed according to the sketch. Or the grouping or movement of the characters might be clumsy and out of keeping with the spirit that informed the architect's rough drawing. These details must be unconsciously in his mind when he is transferring his conception to a charcoal or a pencil and water color drawing.

A scene in the Hippodrome

When the sketches have been accepted, the more mechanical elements of the architect's undertaking begin. From the rough design, finished, detailed drawings are made of the various sets viewed from different angles. Dissimilar elevations, acting platforms for balconies, height of arches and other details are all indicated here for the army of blueprint draughtsmen, who are the next group to add their labor and knowledge to the work in hand. Literally scores of blueprints are drawn for a mammoth spectacle like "Theodora," the shell-like settings of which took six months to erect.

But in the case of this picture, a procedure that is sometimes employed in American productions was followed. It consisted in erecting miniatures of every set that was to be constructed. For this alone, separate sets of blueprints had to be made. In a spectacle conceived on so magnificent a scale, the models were essential for the directorial staff to work out the pictorial grouping of thousands of players to define the various angles from which scenes were to be made, to test in miniature the effect of light at disparate heights, and finally to decide upon and to record for future reference the exact action of the various players in the different scenes and sets.

In this scene the action of the play has been greatly enhanced by the well expressed scale of the architectural setting

One may readily imagine that a scene enlisting the services of thousands of actors cannot even be rehearsed unless the director has a very clear idea of what the action is to be. This is the important use to which miniature models are put. There is another, too, but that is mainly for atmospheric effect. When this is wanted, a miniature of a castle or some other structure that may not be used in the picture as a background for actors, is photographed and inserted in the photoplay to add to the mood or to the continuity of the tale. For example, it may be thought valuable to show a flash of the gorgeous home to which the hero has brought his bride, yet so far as the story is concerned, the action may transpire in a remote corner of the garden. In photoplays of spectacular dimensions,

The Hippodrome

these atmospheric flashes, which occupy only a few feet of film on the screen, are important for their descriptive value as well as to avoid unnecessary titling. Yet, after all, they are but a side issue with the screen architect, his main interest lying in the erection of the life-sized sets.

With the blueprints finished, some of the architect's most arduous work begins. The construction department is prayerfully entrusted with the physical erection of the sets, but that doesn't eliminate the architect. He is not only in constant consultation with the builder in charge of construction; he is also out on the "lot," climbing scaffolds, often directing an apparently unimportant detail, or devising some means for one of the construction groups to circumvent an unforeseen, and often believed an unsurmountable, difficulty.

Moreover, the photoplay architect encroaches on the builder's preserves in still another respect. He must know materials, the color in which substances are reflected when subjected to the powerful bank and spot lights of the electricians; for the screen does not give back hard black and white, as many laymen suppose. Shades and tints of many colors may be suggested through the use of the ordinary film camera. But in order to obtain the exact effect desired, the requisite materials must be employed in the construction work. Although the building branch of the motion picture studio knows these things, it is the artists who devise the color schemes of the various sets. Their information must often come from the architect who, as in the case of a huge set that follows an architectural period, is supposed to be more familiar than they with the color work used in the ornamentation of different architectural styles.

A problem for the photoplay architect

In "Theodora," perhaps the most elaborate spectacle, architecturally, that has ever been made, the marvelous mosaic work that was one of the impressive features of Byzantine art, though original in that period only in its application, reappears on the screen with the authentic colors truly suggested. Though they are, of course, not actually presented as in life, they are so remarkably contrasted with the other color effects that they give the visual impression of reality.

Not only are the original color contrasts maintained in this Goldwyn spectacle, but most of the features of Byzantine architecture at its apex have been reproduced. The brick walls of houses, richly inlaid with mosaic portraits of saints, shown full-face as they were in the sixth century, reveal both Greek and Oriental designs. Moreover, the joint use of Roman arch and Grecian lintel, each modified by the other, the huge dome and semi-domes, with the lives of the saints storied there in bright mosaic of marble or of colored glass, all these combine to make the sets a close reproduction of the architecture of Justinian's Constantinople. The distinct contribution of the Justinian period, the pushing out of semi-domes from a central dome, the former supported on minor arches, has been adapted directly from St. Sophia. With this, and the use of galleries at different elevations, the sense of spaciousness so manifest in the best examples of six century architecture, has been achieved. The huge circus, or Hippodrome, large as it is in itself, appears gigantic because of its architectural treatment.

Here, too, the Vatican architect has taken a step closer to maintaining the verities between original and reproduction than many Americans have. In most of our work, we have tried to avoid showing height in our photoplay spectacles. In "Theodora," height copied from original sources, found its way to the motion picture sets. Roofs were not eliminated, for the reason, perhaps, that production costs have a different connotation in Italy than in California. While we have been able to present the *illusion* of height in many ways, "Theodora" actually shows it. One method is as good as another; in some instances, the suggested way may be the more effective. Who that has seen "The Cabinet of Dr. Caligari" can forget the sloping walls in some of the scenes that seemed to be cut off close to their base by the upper line of the screen frame. Here, the exaggerated perspective gave the suggestion of that immense height which in the Italian spectacle is presented objectively. These are a few of the screen architect's many difficult problems.

Through his truly creative work, the photoplay architect has become one of the most important members of the producing staff. In creating the elaborate architectural type of motion picture, his work takes on an added value, for without his knowledge and his adaptive ability the spectacle cannot be created.

Christ Church
Alexandria, Va.

(See reproduction of original drawing by O. R. Eggers on opposite page)

CHRIST CHURCH in Alexandria, Va., was, before the addition of its present tower, typical of a class of church buildings erected during our Colonial period. It was a plain, foursquare building, with a hip roof, and its main architectural features were the cornice and the finish of doors and windows. These received the considerable attention that was characteristic of the work of the skilled Colonial builder.

George Washington was one of the first vestrymen of this church, and the pew he occupied remains today as it was in Washington's time.

General Robert E. Lee, who commanded the Confederate forces during the Civil War, was also a member of this church, coming from his stately home in Arlington, a sketch of which house has been made by Mr. Eggers for this series.

A PROVIDENCE DOOR-YARD
MERICAN ARCHITECT Series of Early American Architecture

224a

Owing to an accident, the print described on the opposite page is necessarily omitted from this issue and this substituted in its place.

224a

·EDITORIAL·COMMENT·

THE CHICAGO ARBITRATION

THE important items in the recent decision of Judge Landis as arbiter between organizations of employers and employes in Chicago have not been given deserved importance by the press which has stressed the wage scale. Judge Landis very truly said that "Reliable testimony showed a 20 per cent. reduction in wages, other conditions remaining the same, would produce but a 6 or 7 per cent. reduction in building cost."

"The real malady lurked in a maze of conditions artificially created to give the parties a monopoly and in rules designed to produce waste for the mere sake of waste, all combining to bring about an insufferable situation, not the least burdensome element of which was the jurisdictional dispute between trades members of the same organization."

Judge Landis believes that the numerous corrective provisions that have been included in the more than forty trade agreements, if carried out in good faith will produce savings and economies to the public far greater than would have resulted from a 20 per cent. wage reduction, other factors and conditions remaining the same.

It is upon other things than mere wage reductions that public attention should be centered. Wages follow the law of supply and demand during a period of stationary or falling prices. The world is facing such a period now and wage reductions are inevitable in the building industry. The mutual agreement to be governed by rules of fair play and drop all rules restricting number of apprentices, restriction of output, restriction of outside competition, and a number of similar trades rules, will restore the building industry in public confidence.

A few centuries ago in England skilled laborers who sought good pay far from home were sought like runaway slaves and when caught were branded on the forehead with the first letter in the name of their home town. Thereafter they remained at home or if they went elsewhere, they went to a town with the same alphabetical designation. The remedy was the organization of labor and as late as 1840 men were deported in convict ships for joining labor unions. Today the labor unions are so strong that employers' unions treat with them. Between the two a situation developed which led Judge Landis to say:

"It is the violation of no confidence to say that building construction had gotten into bad repute in this community. There was a general disposition to keep away from it as a thing diseased. Capital avoided it. The wise dollar preferred most any other form of activity, or no activity.

"And this applied to the whole range of building construction from the cottage to the skyscraper. This attitude of the public added to the profound commercial and industrial depression generally existent, resulted in a virtual famine in housing accommodations and brought about the idleness of many thousands of men willing to work.

"It was in view of these conditions that the umpire conceived it to be his duty to aid those parties to rehabilitate the industry in the esteem of the public, the great unrepresented party to this arbitration, but nevertheless the one upon whom the consequences of the award would fall."

Faced with a period of lowering costs the two huge giants, organized employers and organized employes, were forced as a measure of self-protection to get together. Precedents had been created and decisions and rules based on them had to be swept away so the building industry could go through a period of readjustment such as other industries are going through. By their own rules employes had branded themselves and freedom of movement was impossible. Employers had followed suit and both employes and employers prohibited outsiders from coming in. The United States was becoming a republic of independent cities like ancient Greece and with promise of history repeating itself. The decision of Judge Landis has done what the leaders hoped in their hearts would be done. A fresh start is now possible and the future for the building industry is bright.

REGIONAL TYPES OF ARCHITECTURE

THE impressions and criticisms of architectural development in the United States by men of prominence in literary fields abroad, have been referred to in recent issues of both *Architecture* and *The Western Architect*. It is, of course, satisfactory to learn that we are approved of and that the architecture we are developing in this country is typical of our steady advance as a nation.

The "skyscraper" or tall building is in every case the main topic.

The Western Architect, commenting on these things, in an article largely made up of excerpts from the writings of foreign critics of American architecture, refers with much repetition to an "American Architecture," meaning, it is inferred, a national type, and to the "Chicago School," meaning, it is also inferred, the Middle Western type.

Accurately speaking, an "American" type of architecture would have reference to all of the Americas, North, South and Central. We shall never achieve an American type, and probably never successfully arrive at a national type. But we will evolve, and we are, steadily evolving regional types, and this result will be the most satisfactory.

The "Chicago School," to which our esteemed contemporary so pridefully refers, is simply a good example of the development of a regional type. We shall not seek to dispute the claim of *The Western Architect* that a group of well trained, far-seeing men in the middle West have traveled further towards the development of a regional type than those in any other section.

This Middle Western type will, in course of time, become a unit among the series of types that regionally represent our architectural development and become part of a composite type which will make our national architectural style. The fact that the foreign critic, visiting this country and not able by actual observation to comprehend the wide areas which comprise these United States or the varied climates that here exist, speaks of the development of a national type, need not also lead the native observer into the same error. We must develop our great sub-divisions to meet conditions of climate and we can never successfully attain a national characteristic in architecture until we have fully realized this necessity.

The very complete architectural exhibition, gathered by the Institute and exhibited in the Smithsonian Institution during the recent convention in Washington, afforded an excellent opportunity to see what has and will always happen in this country when there is standardization in types of buildings and the materials used in their construction. It was never possible to place regionally any buildings, such as apartment houses, hotels, business structures, by elements of design that would declare a regional location.

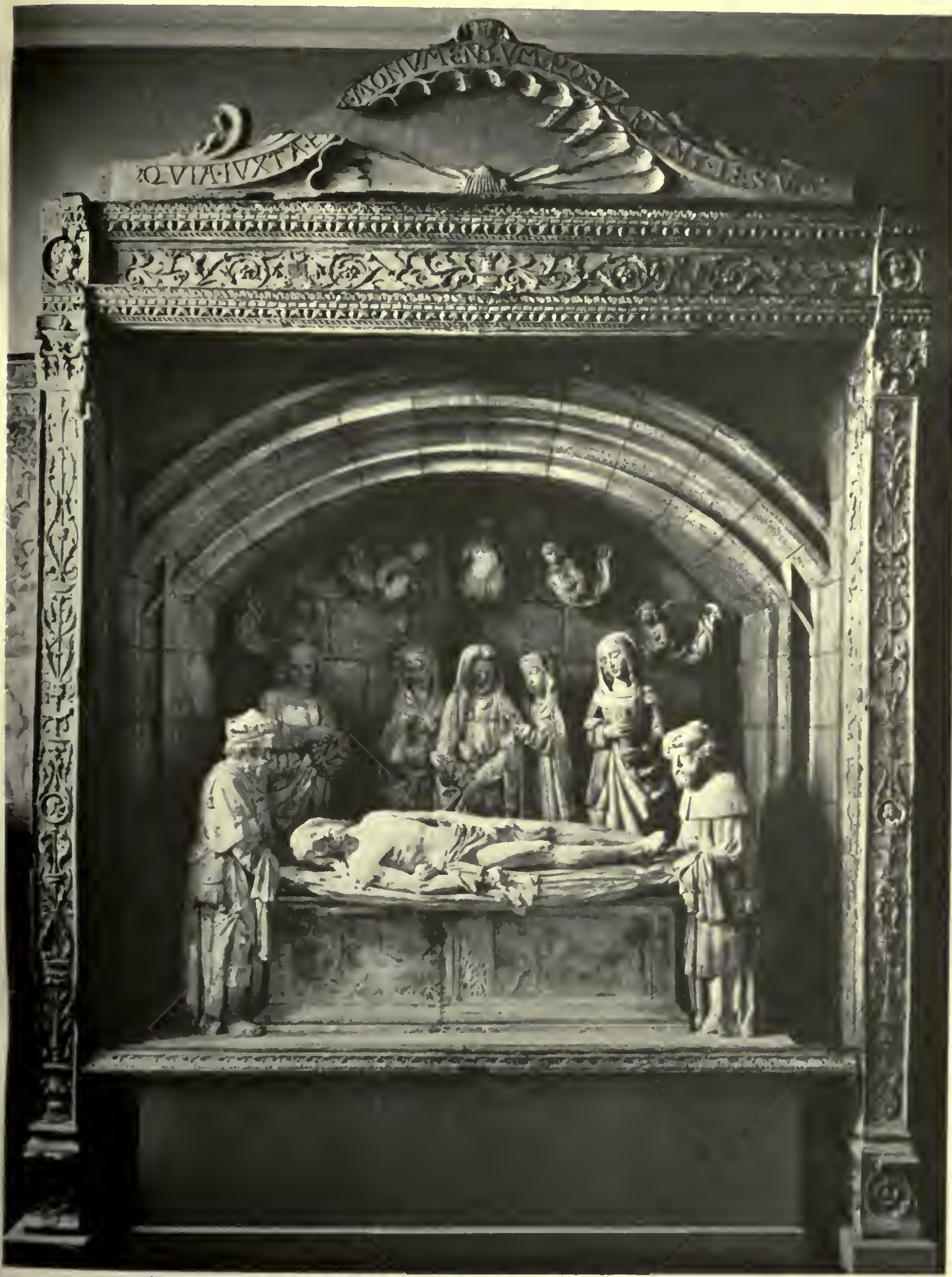
In its newer architecture one city looks exactly like another. It is only in rare cases that motives of design are based on the adaptation of regional tradition, or suggested by the flora or the dominating industry of the locality.

The Institute's exhibition of architecture, as represented by Chapters all over the United States, with the possible exception of those in the Middle West, showed the tendency towards standardization in design, which may be taken as a development towards a national type, and little, if any, movement in the direction of regional types. The former, we feel, will be a retardance of the logical movement of our architectural development. The latter, the development of regional types, a consummation devoutly to be wished.

ITALIAN RENAISSANCE CHOIR STALLS

From the Hoentschel Collection, Metropolitan Museum of Art

(Reproduced by courtesy of the Museum)



THE ENTOMBMENT

FROM THE CHÂTEAU DE BIRON, FRENCH, EARLY XVI CENTURY MUSEUM

(Reproduced by Courtesy of the Metropolitan Museum of Art, New York.)

NOTES ON THE ILLUSTRATIONS

THE DETROIT PUBLIC LIBRARY

CASS GILBERT, ARCHITECT

THE building throughout is of the highest type of fireproof construction with structural parts of reinforced concrete and protected steel. All floors are of reinforced concrete with surfaces of plain cement finish, mastic, tile, mosaic and marble, each chosen with a view to its suitability in a particular location. All partitions are of terra cotta.

All wood trim is of oak. The walls, piers and columns of the entrance hall and stair halls are of Tennessee marble, with stairs and floors a combination of Travertine and Tennessee marble. The walls of the delivery room are of Bedford stone. The exterior is of light Vermont marble with roof of slate and clay tile.

All elevators are electrically operated. The lighting system is electric with fixtures generally of the semi-indirect type. Direct low pressure steam heat is used and the building is ventilated by a tempered blower system.

THE verdict as to a library, when judged by its practical elements, may safely be left to the experienced librarian and his assistants. These men, trained by long experience, know what a library should be in its planning. It is reasonable that architects who study the problems of a public library would be more or less influenced by the verdict of the men who will administer it as a building for the storage of the books and their circulation. The Librarian of the Detroit Public Library on all occasions expresses his unqualified approval of the building. His assistants, each in their special departments, are equally praiseful.

While much and labored writing might express in many detailed references the excellence of this structure in design and plan, it will not, in view of the very complete illustration, be necessary. The trained observer will be able to study thoroughly what Mr. Gilbert has so very splendidly accomplished.

NEIGHBORHOOD HOUSE, MARINA MISSION, MAYAGUEZ, PORTO RICO

D. EVERETT WAID, ARCHITECT

THE school building at Mayaguez, Porto Rico, illustrated in this issue, is part of the improvement of a block on the river front. In the project for the future development there is some model housing designed to give a better mode of living to the humblest native Porto Rican.

It may be of interest to state that the policy of Presbyterians in Porto Rico, in Arizona, and other home mission fields, is to establish schools where common public schools are needed, but still wanting. When the community is strong enough in sentiment and taxpayers to take over the school, the mission teacher is withdrawn and incidental religious instruction is left to the mission church.

The present building is being constructed with walls and floors of reinforced concrete, designed to withstand at least moderate earthquake shocks.

The roof construction is of wood covered with a slate surfaced composition roofing and protected beneath by means of metal lath and plastering.

The lower part of the building is planned for school rooms for young children. It includes moving picture facilities for the benefit of the neighborhood. The second story is designed as living quarters for the teacher in charge and the assistant teachers.

CHOIR STALLS

Church of St. Pietro, Perugia, Italy

MEASURED AND DRAWN BY ROBERT M. BLACKALL

DURING the period of the "High Renaissance" in Italy churches of larger size and increasing decorative treatment were built. The decoration especially, was quite often concentrated in choir stalls and ceilings, and many craftsmen were employed to beautify the interiors of these churches. The accompanying choir stalls, which are among the finest in Italy are of walnut and admirably carved and inlaid (Tarsia) by Stefano da Bergamo (1535-1616). The exquisiteness of the carving and the choiceness of the decoration make these stalls worthy of careful study.

MAIN ENTRANCE, CEMETERY OF THE GATE OF HEAVEN

CHARLES WELLFORD LEAVITT, LANDSCAPE ENGINEER

THIS gate is of Kingwood stone and wrought iron. When completed, the main entrance feature will consist of a group of buildings, comprising, besides the gate, a Community Mausoleum and other improvements. The complete length of the gate, as shown in the illustration, is approximately 60 feet, and the height of the piers, 16 feet. The pictures depicted in carving on the stone and wrought iron are all symbolic. The symbols are painted in high color, and as the gates open towards the North, their warmth with that of the rich carving on the piers makes a decidedly artistic effect. The architectural work is that of Bloodgood Tuttle.

PUBLIC LIBRARY, DETROIT, MICH.
CASS GILBERT, ARCHITECT

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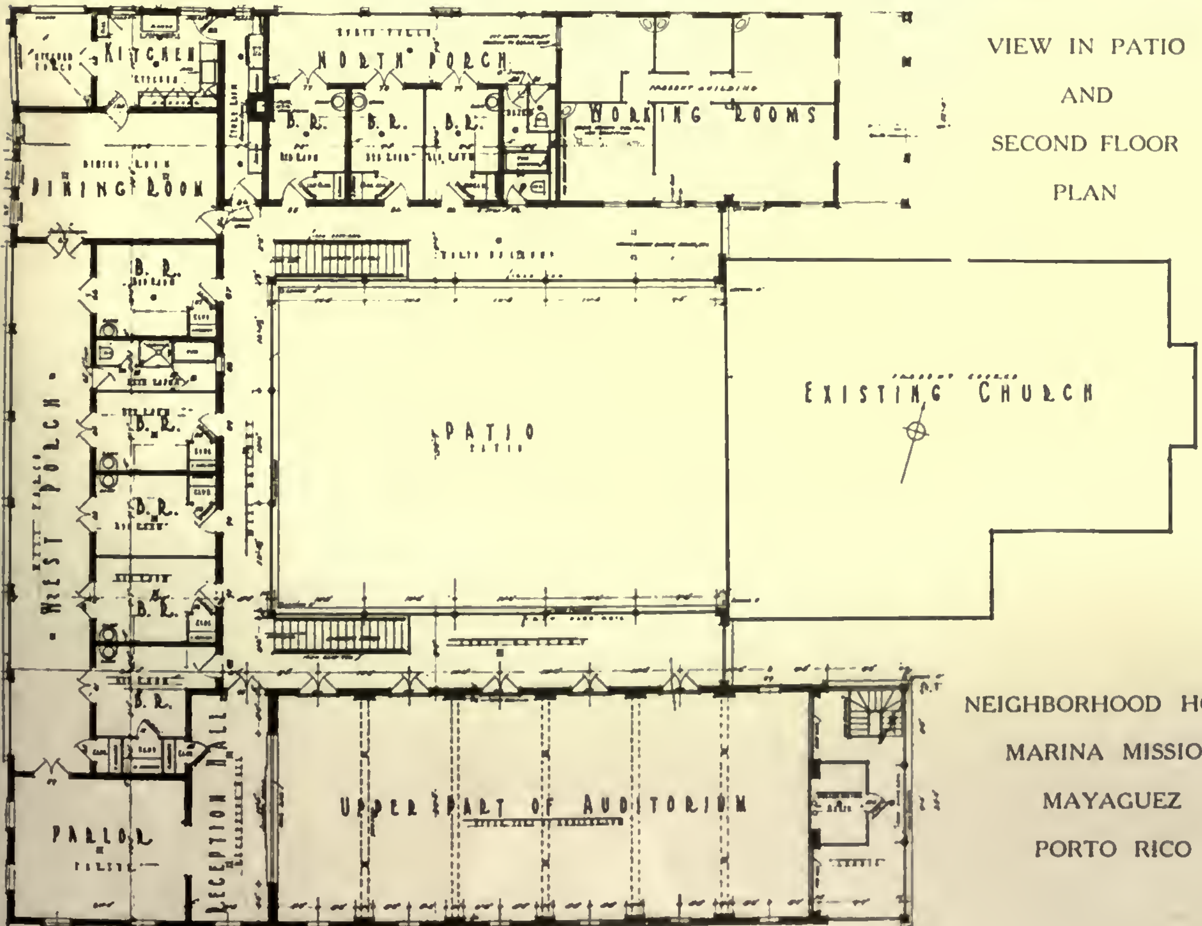
DELIVERY ROOM, PUBLIC LIBRARY, DETROIT, MICH.

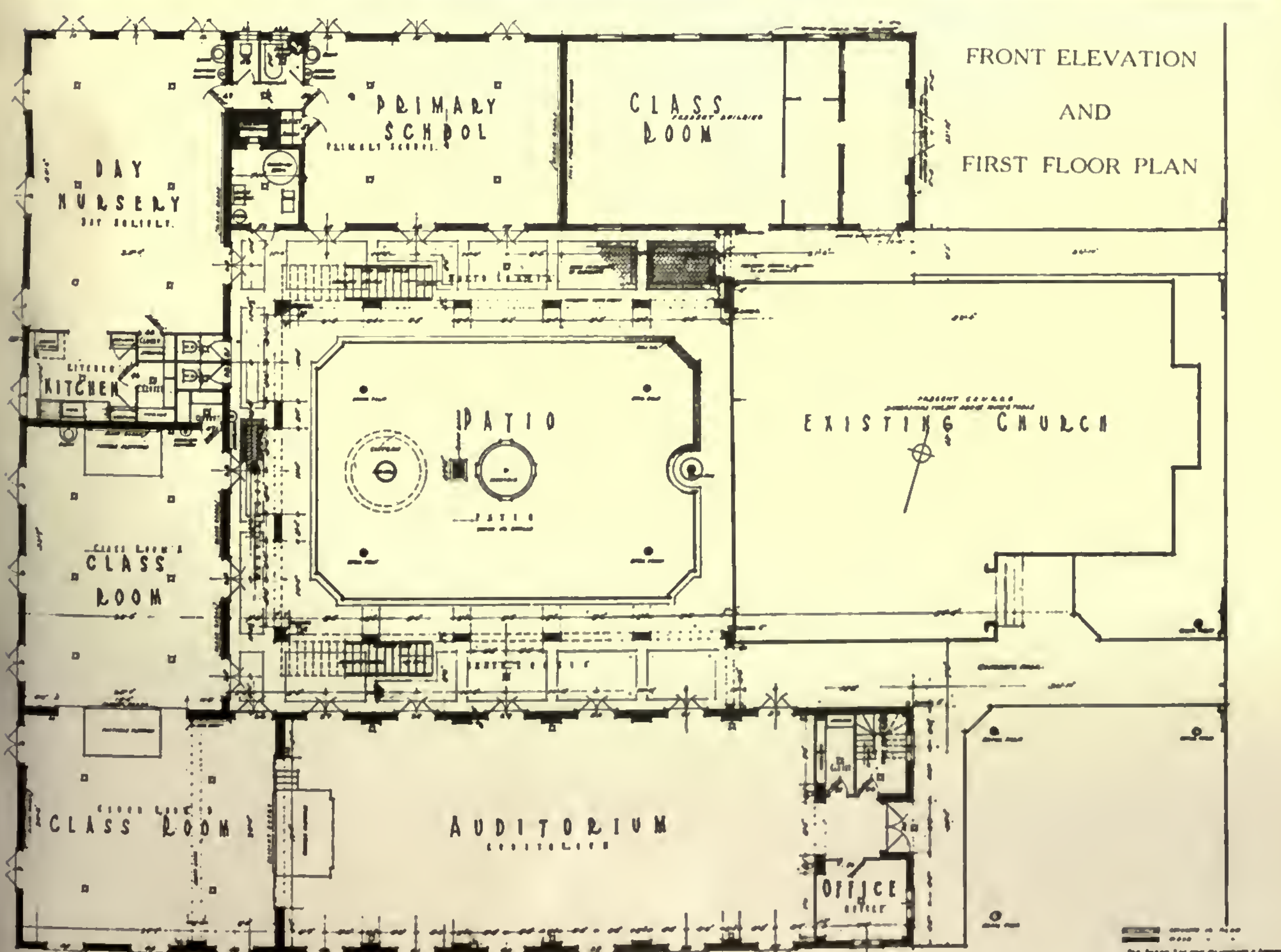
CASS GILBERT, ARCHITECT



VIEW IN PATIO AND SECOND FLOOR PLAN

NEIGHBORHOOD HOUSE
MARINA MISSION
MAYAGUEZ
PORTO RICO

D. EVERETT WAID, ARCHITECT



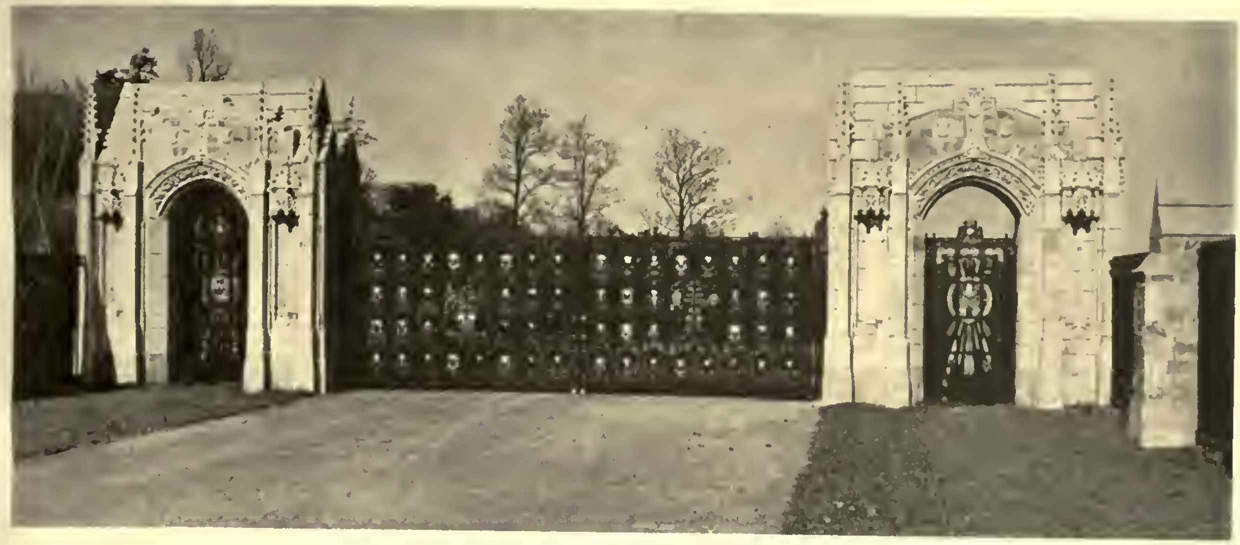
FRONT ELEVATION AND FIRST FLOOR PLAN

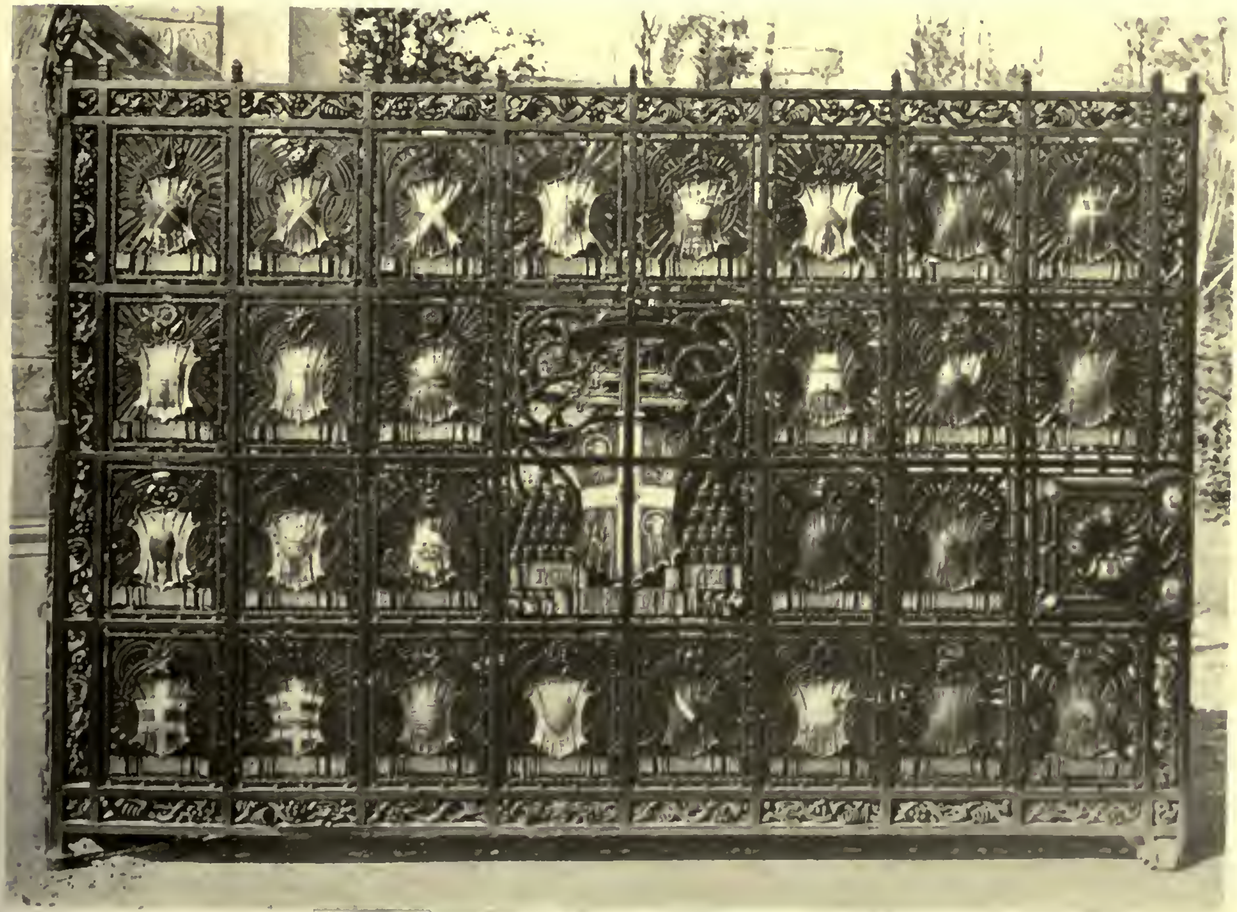
NEIGHBORHOOD HOUSE, MARINA MISSION, MAYAGUEZ, PORTO RICO

D. EVERETT WAID, ARCHITECT

THE HENRY ROGERS MALLORY MEMORIAL, GREENWICH, CONN.
JAMES GAMBLE ROGERS, ARCHITECT

228 "





MAIN ENTRANCE TO THE CEMETERY OF THE GATE OF HEAVEN

DESIGNED BY CHARLES WELLFORD LEAVITT, LANDSCAPE ENGINEER

DETAIL, MAIN ENTRANCE TO THE CEMETERY OF THE GATE OF HEAVEN
DESIGNED BY CHARLES WELLFORD LEAVITT, LANDSCAPE ENGINEER

GATEWAY-VILLA MEDICEA, CARREGGI, FLORENCE

ACADEMY OF THE FINE-ARTS, RAVENNA

VILLA MALCONTENTA, ON THE BRENTA

SOME ITALIAN SNAP-SHOTS

BY ROBERT M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

MURANO

VENICE MONUMENT, PADUA

PALAZZO LOREDAN, VENICE

SOME ITALIAN SNAP-SHOTS

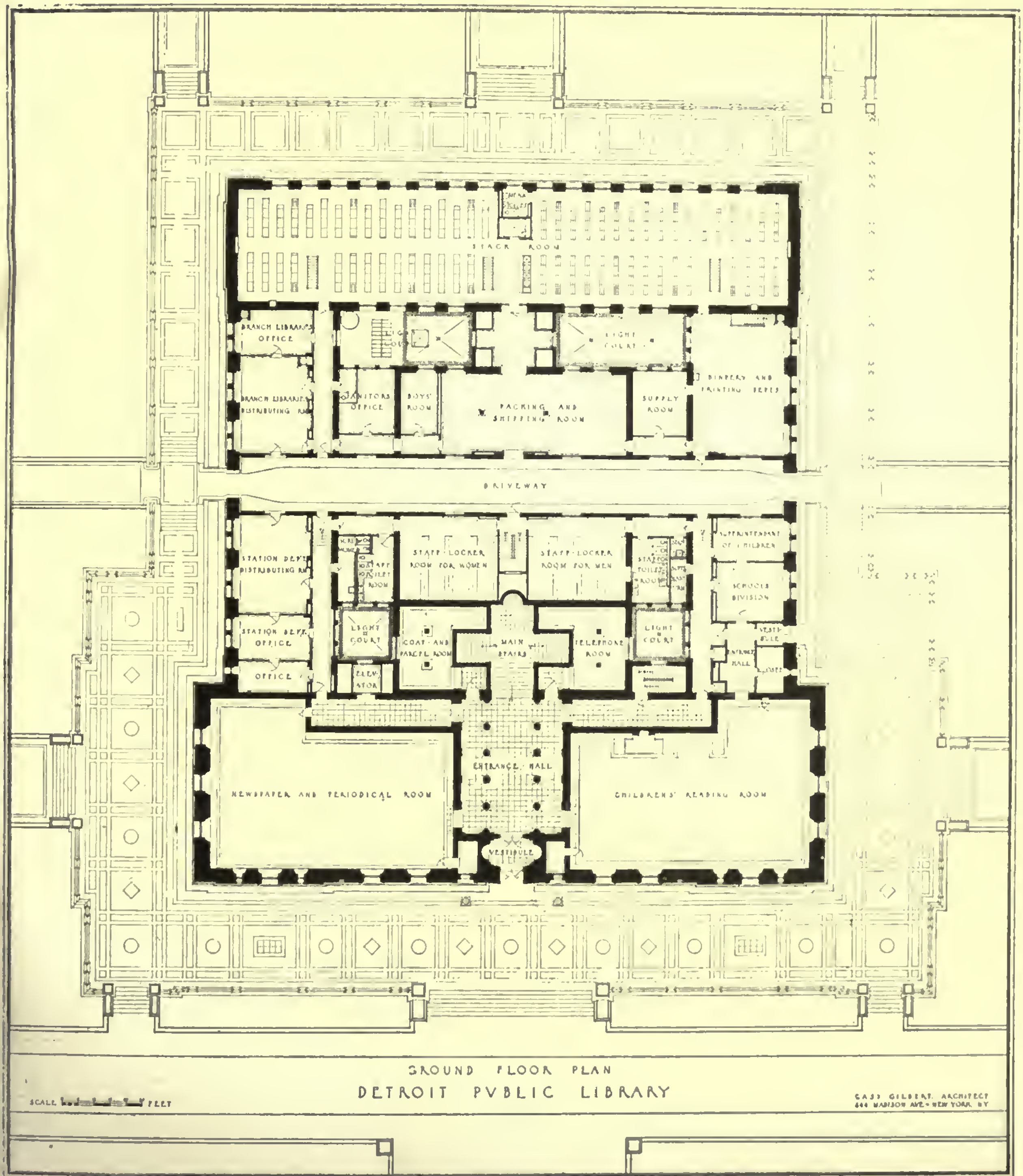
BY ROBERT M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

ELECTROLIERS IN PALAZZO PUBLICO, SIENA

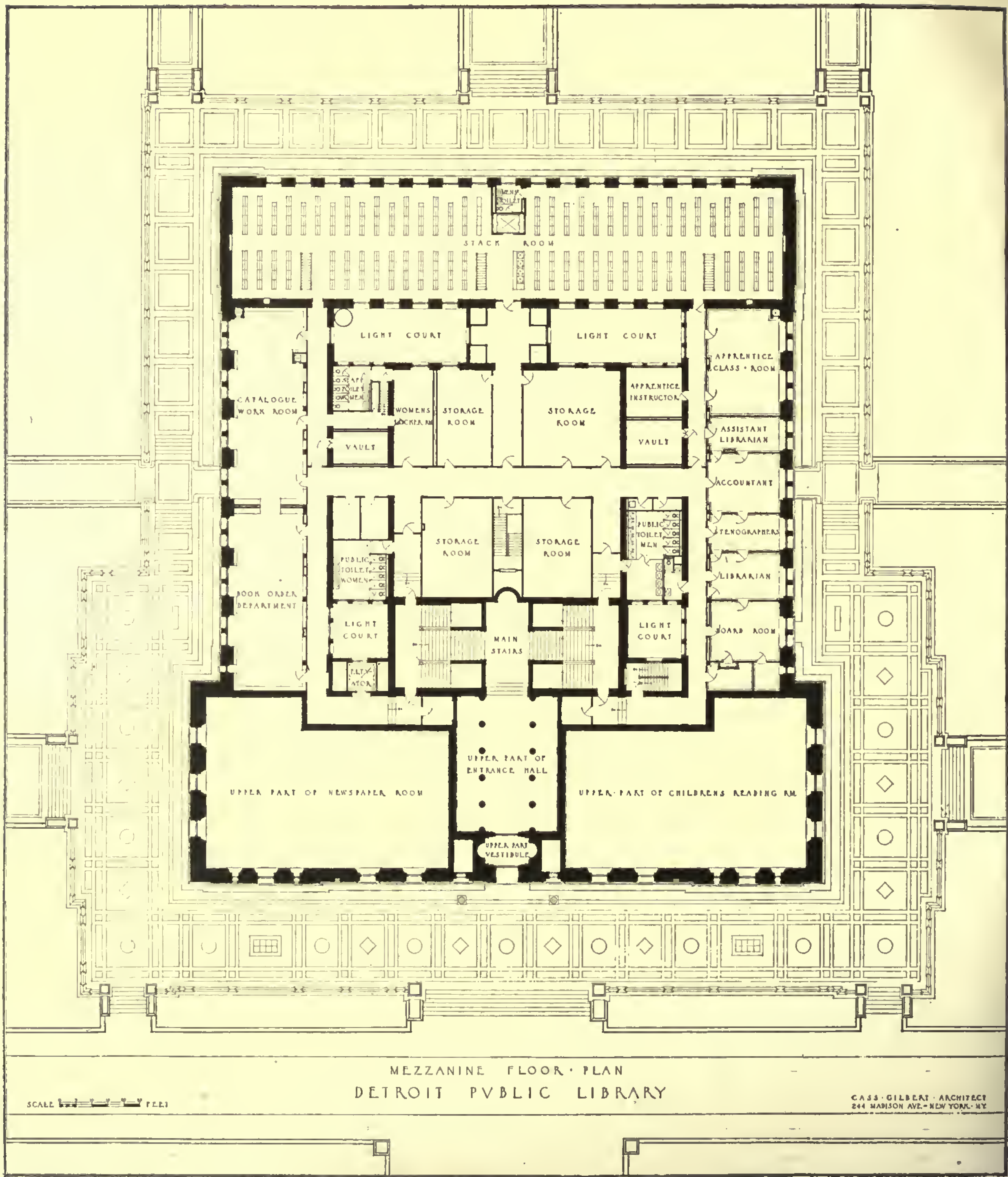
SOME ITALIAN SNAP-SHOTS

BY ROBERT M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

228 16.



CASS GILBERT, ARCHITECT



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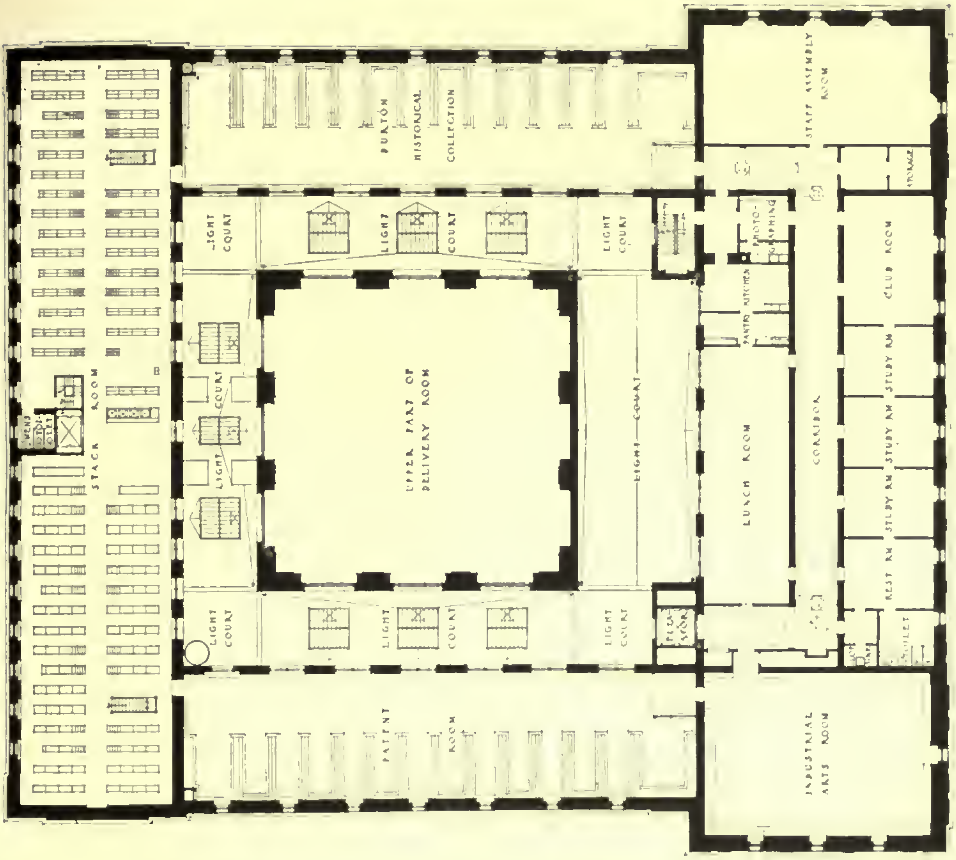
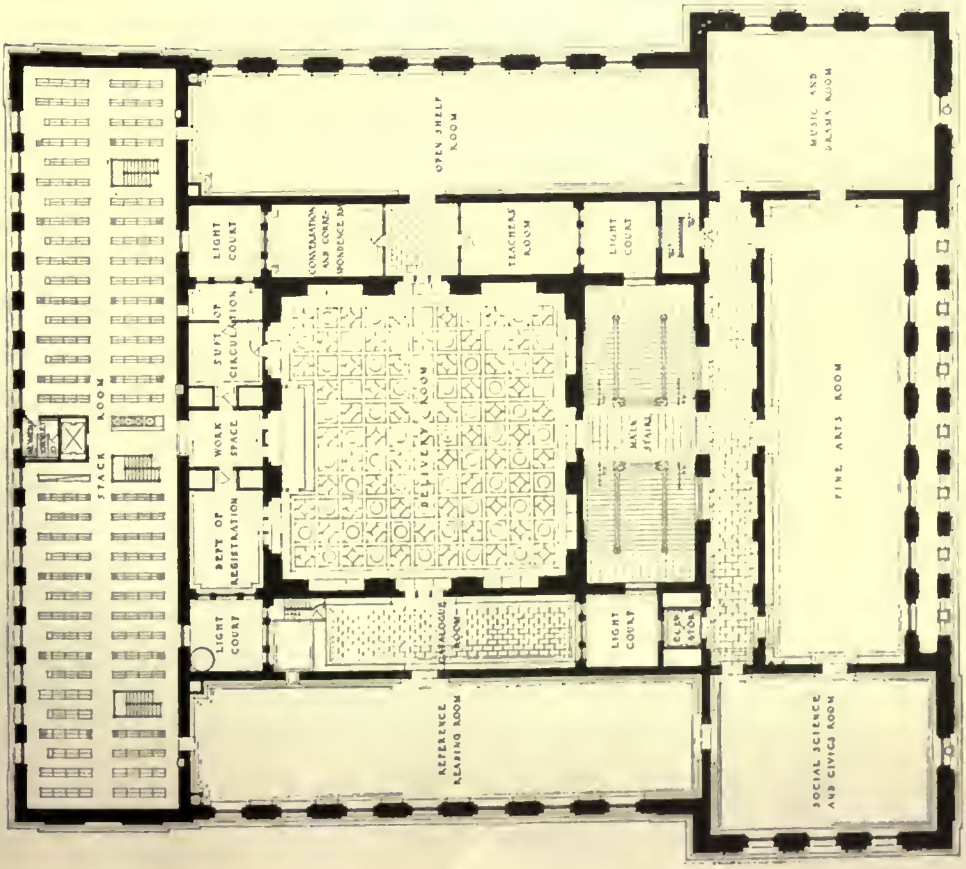


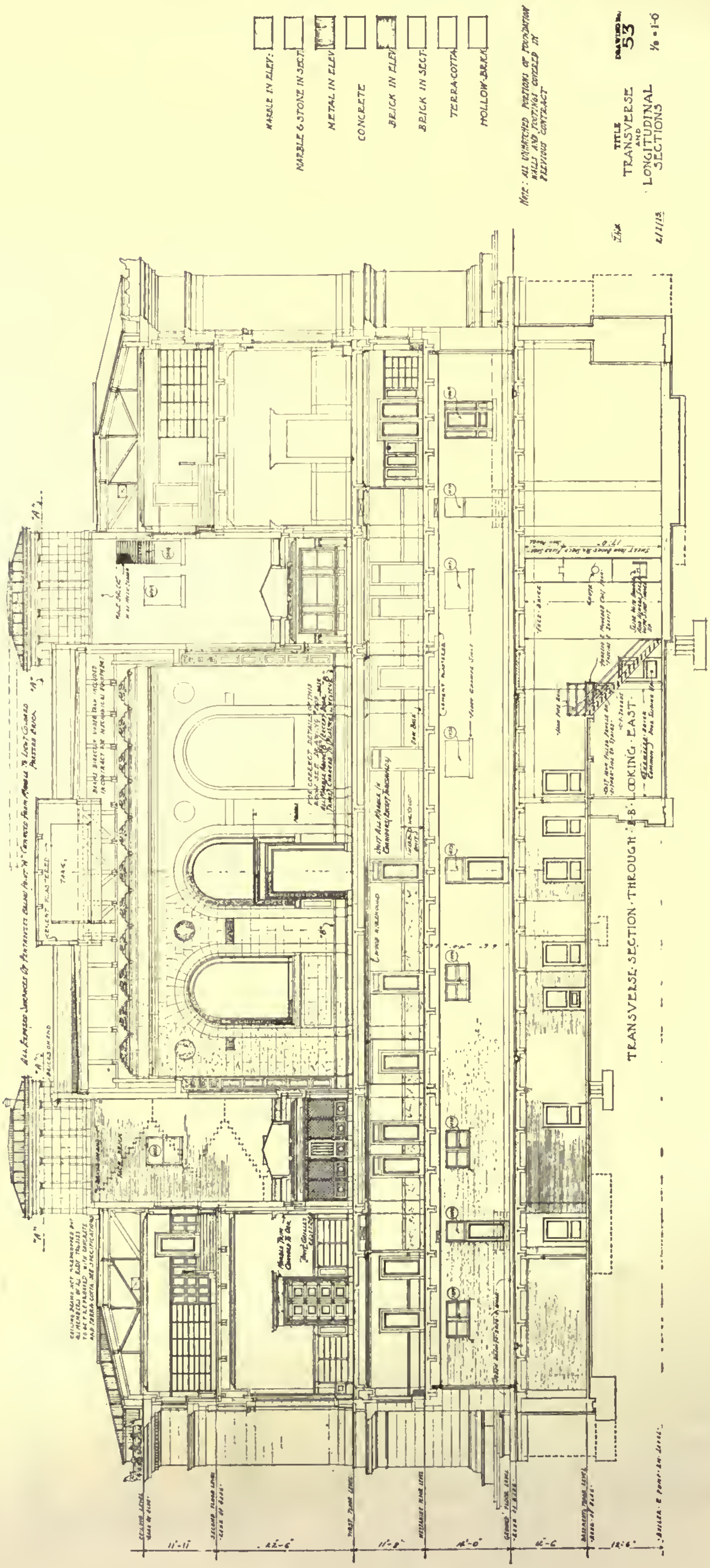
SECOND FLOOR PLAN



FIRST FLOOR PLAN

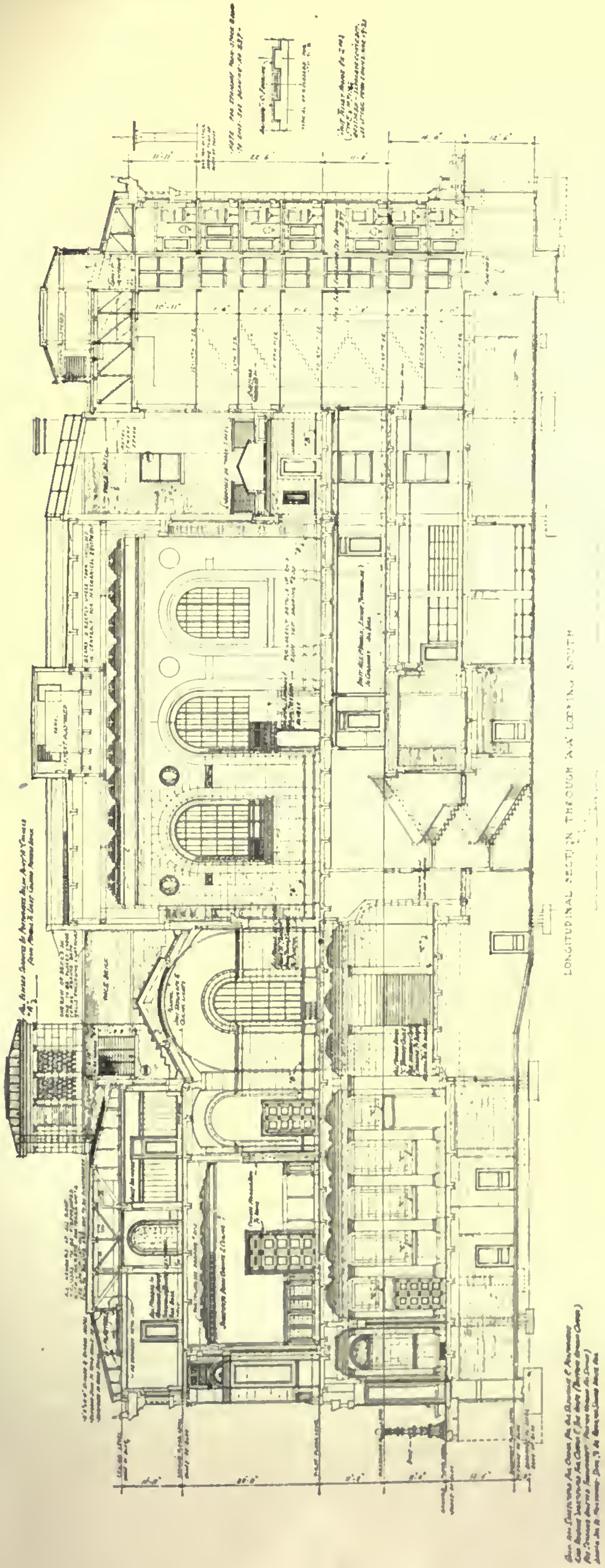
PUBLIC LIBRARY, DETROIT, MICH.

CASS GILBERT, ARCHITECT

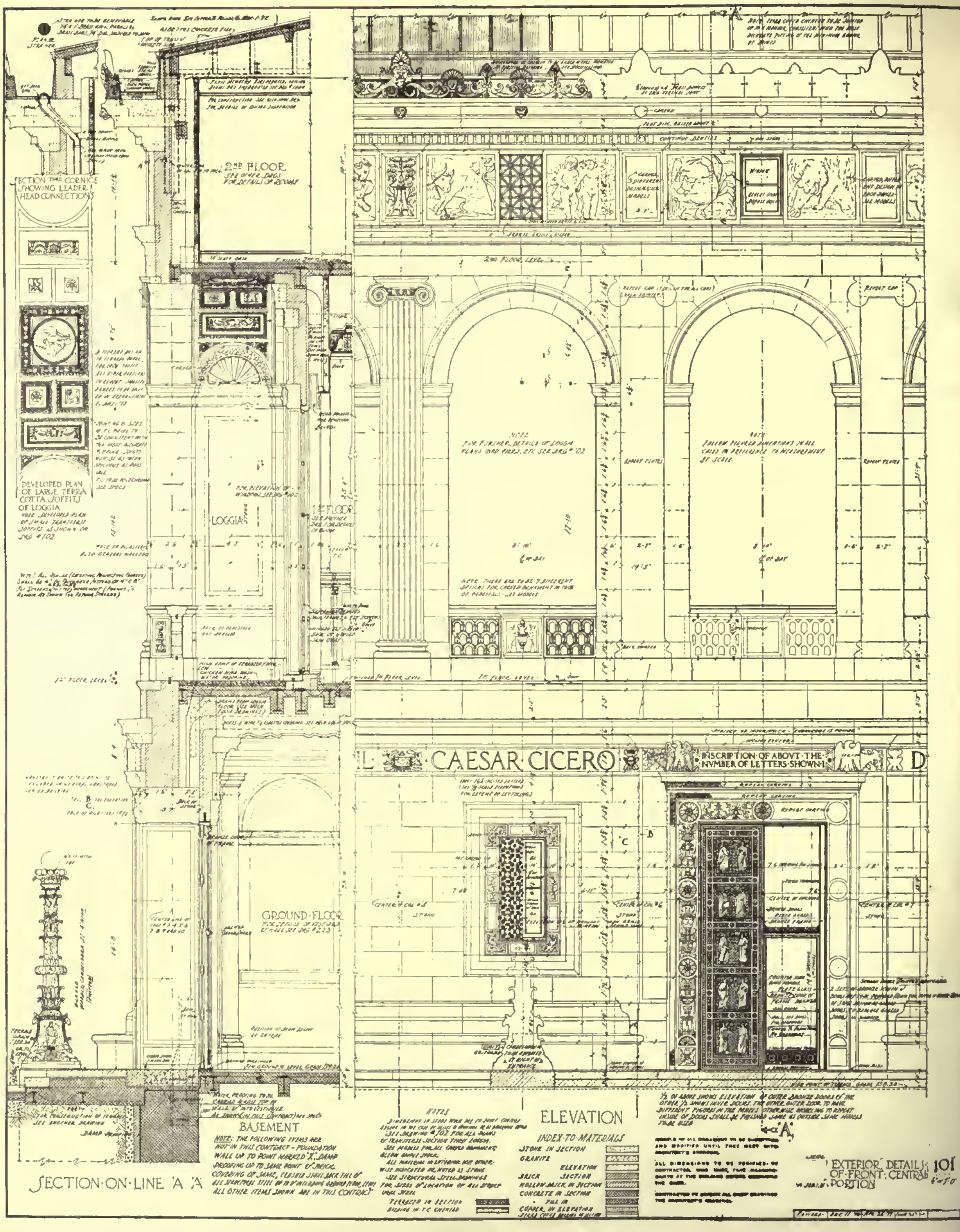


TRANSVERSE SECTION, PUBLIC LIBRARY, DETROIT, MICH.

CASS GILBERT, ARCHITECT

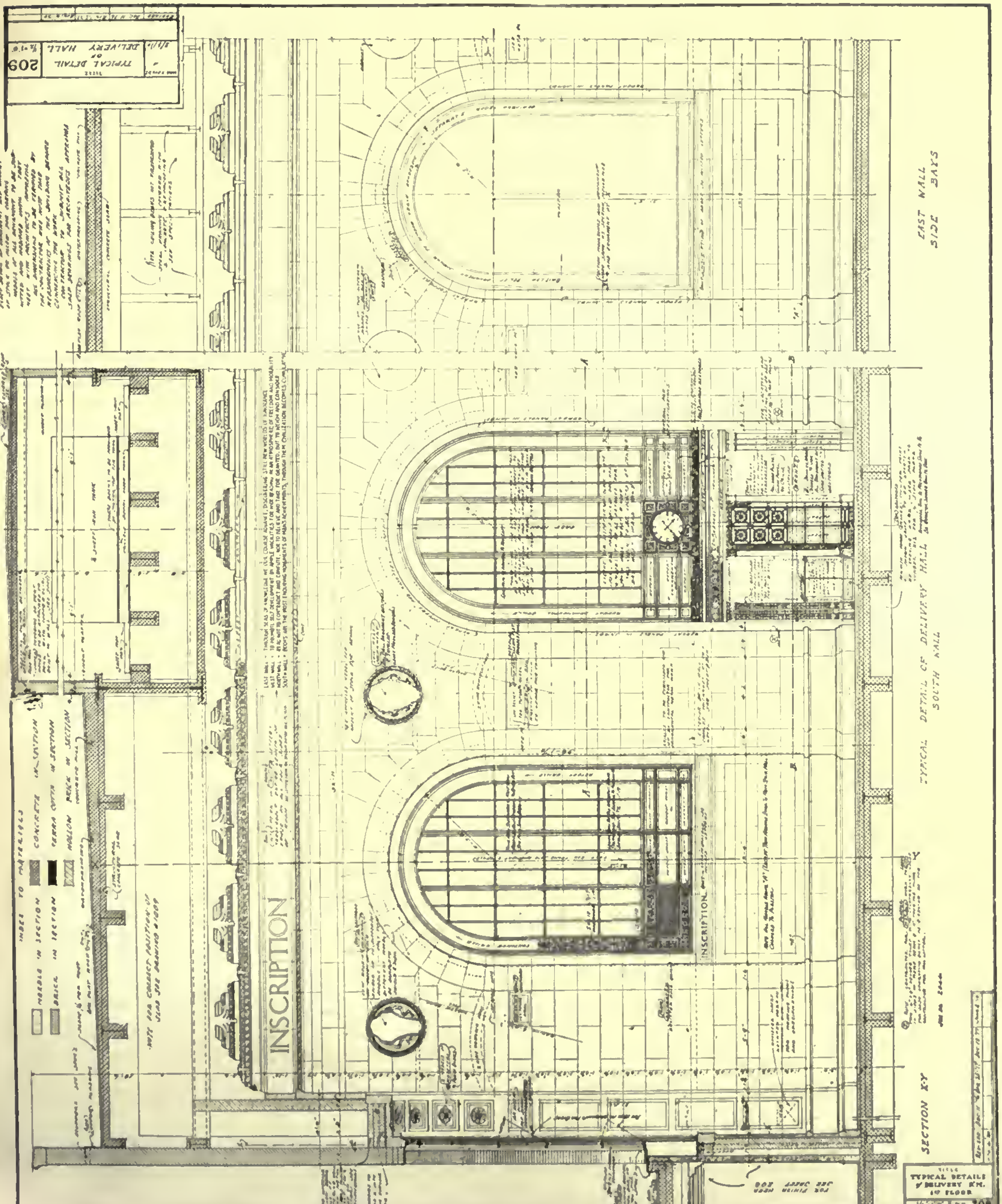


LONGITUDINAL SECTION, PUBLIC LIBRARY, DETROIT, MICH.
CASS GILBERT, ARCHITECT



DETAIL, FRONT CENTRAL PORTION, PUBLIC LIBRARY, DETROIT, MICH.

CASS GILBERT, ARCHITECT



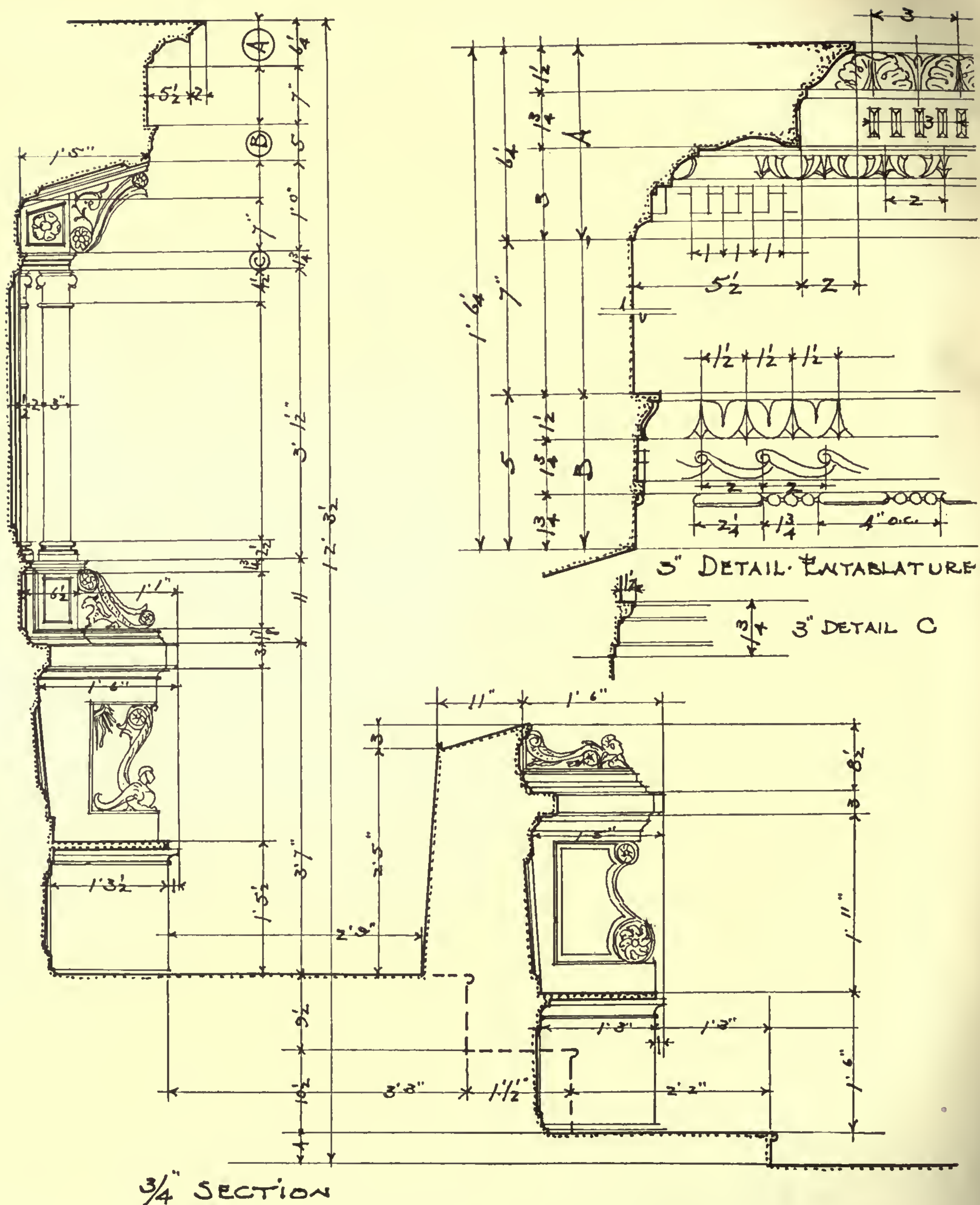
DETAIL, DELIVERY HALL, PUBLIC LIBRARY, DETROIT, MICH.
CASS GILBERT, ARCHITECT

CHOIR STALLS IN CHURCH OF ST. PIETRO, PERUGIA, ITALY

THE AMERICAN ARCHITECT, SERIES II
FRENCH AND ITALIAN DETAILS

DETAILS OF CHOIR STALLS
CHURCH OF ST. PIETRO, PERUGIA, ITALY

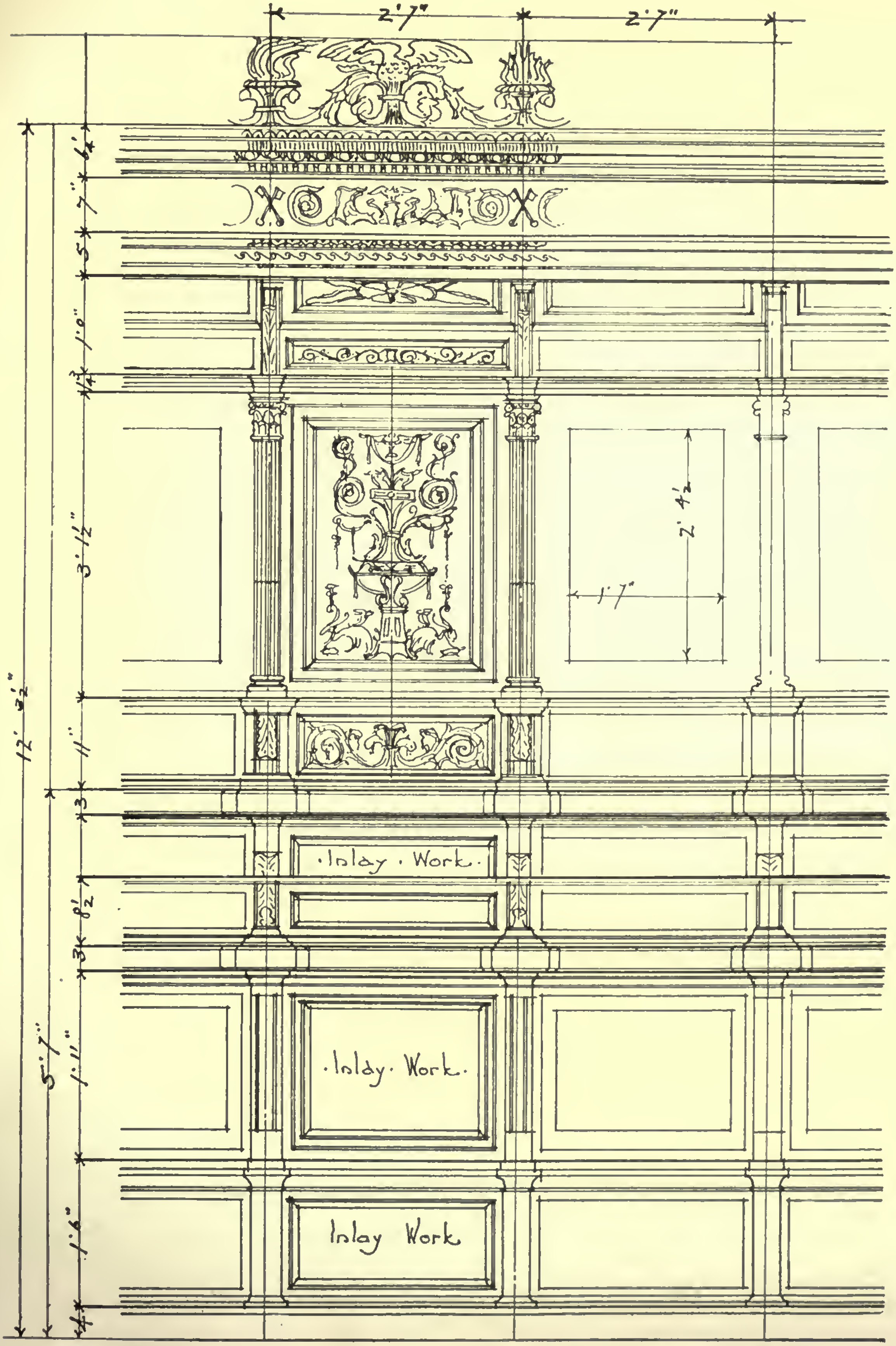
THE AMERICAN ARCHITECT, SERIES II
FRENCH AND ITALIAN DETAILS



CHOIR STALLS, CHURCH OF ST. PIETRO, PERUGIA, ITALY

MEASURED AND DRAWN BY ROBERT M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

THE AMERICAN ARCHITECT, SERIES II
FRENCH AND ITALIAN DETAILS



ELEVATION OF CHOIR STALLS, CHURCH OF ST. PIETRO, PERUGIA, ITALY
MEASURED AND DRAWN BY ROBERT M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

THE AMERICAN ARCHITECT, SERIES II
FRENCH AND ITALIAN DETAILS

DEPARTMENT OF SPECIFICATIONS

THE methods of control of the fundamental principles of specification writing as heretofore expounded in this department can be applied with equal facility to the small office as well as that office which enjoys a large practice and maintains a specification department that devotes its time, exclusively, to the study and preparation of these essential documents.

In many respects it is perhaps of greater importance to the office of less pretentious practice to devote more care to preparation of specifications than it is to the organizations of greater scope. That is to say, if the small office exercises extreme care in specifying what is to be accomplished and, as a necessary corollary, makes certain that the interdependence of the drawings and specifications is perfect, then there should be no reason for the architect to be disappointed in his hopes for ever-increasing business.

Quite often specifications are not given their proper attention until after some difficulty has arisen on the work under construction, at which time the architect fervently—and with honest intentions—swears that never again will such a thing occur. Very probably that phrase or clause, or whatever it might be that has caused the difficulty, has been revised so as not to cause further annoyance, while at the same time, other parts have been neglected. So it runs—if the preparation of specifications has not been given the proper systemizing—first one part and then another part will be found to be in error and this see-sawing will continue until the specification writer, in desperation, submits to the utter necessity of approaching his problems from an entirely different view-point.

Mistakes can be made by anyone regardless of the public or professional esteem in which his organization is held and it requires constant endeavor in correct analysis of the problems at hand to arrive at logical conclusions, regardless of the "size" of the office. It is true that those having more extended practices are passing through more varied experiences and have an accumulation of past work on which their judgment can be based. On the other hand, such large offices, merely because of their size, have a great many more problems with which they must contend and their departmentalization results from the necessity of putting in the hands of one person all matters having to do with one or a restricted number of the processes involved in the production of drawings or specification. Nevertheless, for each operation, the specification writer does not find it much easier to prepare his specifications than would the architect of smaller practice who does his own work, except as his ingenuity has produced such labor-saving devices that system requires for convenient operation. Thus it can be seen that if it were not for some attempt having been made so to organize the work that it can be produced expeditiously and at the same time with some degree of accuracy the specification writer who must devote all of his time to this special branch of the work would be so overloaded his department would break down under stress of operations that must be published for estimates simultaneously.

The architect of smaller practice, who writes his own specifications, occupies a position somewhat analagous to that described above. His many professional duties make such inroads on his available time that, unless his specification work is happily organized, he cannot hope to accomplish creditable work unless he too has brought system into play and is prepared to do his work with the rapidity the press of time requires. This is the critical point. There is such a great temptation to postpone study of the specifications for each operation until the last minute when some old specification will be revamped in some hap-hazard fashion or else the work is turned over to one of the draftsmen to be checked (perhaps) by the architect, when they are completed. The confusion that inevitably results reflects the conditions attendant during the preparation of the specifications and, of course, is the precursor of like confusion in the field.

If the architect of medium practice finds it impossible to delegate the writing of specifications to one of his assistants and if he wishes to assure himself of freedom of difficulties arising from inaccurate specifications he cannot do otherwise than devote as much time as is necessary to organize this part of his work immediately. It may seem an onerous task but he will find that once it has been done he will be able to give it a minimum amount of attention that will prevent it from becoming useless. As a matter of fact, no systemization of specification writing ever can become useless if it has been given sufficient study so that the needs of the work will be met.

THERE seems to be an erroneous belief among some architects that the specifications for a many storied office building must be larger than for a similar building having but one or two office floors. If one thinks for a moment he will discover that the work in one story is merely repeated in the remaining stories, whether they are two or twenty and if one paragraph is sufficient to specify adequately the marble thresholds (or saddles) in one corridor it will cover the thresholds in all other stories, no matter how many there may be. So it is with the greater part of all other items entering into any one type of building. Therefore no architect who writes his specifications himself should feel that it is beyond his powers to organize his work on a scale similar to that of offices having quite an extended practice. This has been proved by the fact that some of the best specifications that have been written have been prepared, seemingly with the most meticulous care, by architects who are not what some persons foolishly term "big" architects. And, it is well to say here that some of the best examples of how *not* to write specifications bear the name of these "big" offices.

No one architect or class of architects has an exclusive God-given right to say that specifications produced in their offices are the best that can be written. Fortunately the ability to accomplish this most desirable result is inherent in the average architect if he wants to do the right thing in the most correct manner. At the present time many architects undoubtedly have idle time during which they can, with profit, put their "specification house" in order. Everyone has in his office practically all the material required to make a start on the work and there undoubtedly is sufficient system in the present arrangement of those matters having to do with specifications to warrant the assertion that the average architect will find the task less onerous than he may believe.

The various schemes that have been outlined in these columns may be put in operation with not a great deal of labor and it is quite probable that as the work progresses the interest aroused may lighten the seemingly hard labor. It is certain that something of the sort must be done if the architect wishes to increase his business through the means of enthusiastic clients who can say that "their" architect succeeded in eliminating most of the vexatious troubles commonly associated with building construction.

In resume, the various steps that should be taken, particularly by the architect who writes all specifications for his work, will be explained in somewhat different detail than given heretofore, in the hope that a more serious consideration of the importance of organization of the processes essential to correct specification writing will be engendered. In the first instance it will be assumed that the architect has a collection of catalogs and similar informative data.

A start should be made by analyzing the nature of the work that has been done in the past and the probabilities of the future. That is, if the work has, in the main, consisted of residences, small business buildings and apartments, with a sprinkling of industrial buildings of diverse character, all these classes should be listed. There should be made an outline of all branches of the work treated separately in the specifications for each class, such as masonry, carpentry, sheet metal, plumbing, etc. When it is certain that these outlines are fairly representative they should be merged into one complete outline. To this final outline there should be added items that may be unusual in the ordinary run of the work but which, nevertheless, may be expected at some future time. For example, in residence construction not a great deal of attention has been given to the correction of accoustical defects yet it is quite possible that in some future residence it will be decided to treat the library or the billiard room so that noise will not disturb occupants of the room in the one case or those in remote parts of the house in the other case. A study of these possibilities will indicate a number of additional items that should appear in the general outline.

THE arrangement of the catalog file should then be undertaken using either method that already has been suggested. As the catalogs are filed the parts of the work they cover should be checked off and, at the same time, a cross-index should be prepared, if it seems advisable to have one. Upon completion of this work it will probably be found that many desirable catalogs are missing and they should be sent for at once, rather than to wait until they are needed and be disappointed because they are not in the file. If space is a desideratum many of the catalogs may be reduced in thickness by removing pages that have no vital use in the preparation of specifications such as whole sheets of pictures of buildings in which some detail of interior equipment may have been used. The file will be of much greater value if all such extraneous matter is removed and it will be surprising how much space can be saved.

At the time the catalog file is being arranged a list of its contents should be made and the date of publication of each catalog indicated. If catalogs are dated three or more years previous the manufacturer should be notified to send a copy of the current catalog if the one filed has been superseded by subsequent issues. In the interest of accuracy it would be well to make such an inquiry respecting every catalog but as this might, in some cases, entail a great deal of work at the outset the first suggestion should be followed rather than the second one.

While the catalogs are being arranged the specification data file should be kept in mind and matter that properly belongs therein rather than in the catalog file should be separated. There is some possible chance of confusion with respect to the line of demarkation between what should go in the catalog file and what should go in the specification data file. It is suggested that the specification data file contain only that matter of an informative nature that relates to the production, fabrication or finish of material, standard specifications and historical data that may assist in a more intelligent use of the various items. The catalog file, then, would receive all matter exhibiting shape, contour, size, recommended methods of installation and similar information or customary usages. The specification data file also should contain all previous specifications and specifications prepared by other architects. The method of arrangement of matter in this file is perhaps more difficult of solution than for the catalog file as the multiplicity of sub-divisions, if carried to too fine detail may be harmful to easy use. The probable arrangement, however, should at least be based on the major sub-divisions of the specifications. Then one part of the file would be devoted to, say, "Concrete Masonry," in which all matter relating to this part of the work would be placed. As the matter to be filed is gathered together or increases in amount subsequent to the establishment of the file, logical sub-divisions will become apparent, at which time the file can be re-arranged as convenience of accessibility dictates.

The preparation of a master specification, careful compilation of which has been advised in a previous article, may be held in abeyance until after the catalog and specification data files have been brought to a state of usability and their organization seems to be sufficient for present needs. However, the ultimate use of a master specification is deemed advisable, for its formation will, of itself assist in the proper preparation of a specification. When it is to be compiled the matter that is to be put into it should be very carefully studied to make sure that its general style is of the same standard throughout. That is to say, if the architect has a tendency to be extremely brief in some parts of his specification and, while brief, is able to include all essentials, he should endeavor to have all other parts somewhat similar. A specification that is extremely brief in spots and quite loquacious or verbose in other spots is not well balanced and gives the impression that brevity is the result of ignorance while loquacity indicates a desire to parade one's knowledge before the reader.

If, during the compilation of the master specification, it appears that several paragraphs may be written treating the same subject in different ways such paragraphs should be prepared so that all such variations, so far as possible will be fixed at the inception of the work. Repetition of subject matter in the master specification should not be avoided but rather it should be cultivated if it tends to present valuable data in usable form. Repetition, however, should not be carried to an extreme, such as an attempt to see in how many ways the anticipated accomplishment of the desired object may be had with the use of the same materials or methods in all cases.

THE use of card indexes has been advocated by some specification writers and some such devices have in times past, been placed on the market. The users of card indexes have been able to organize their specification work so well that much time and labor are saved in the compilation of new specifications. For all practical purposes the master specification which has been discussed here is the same as a card system except that for the former standard loose leaf sheets are used whereas for the latter cards of either the regular 4"x6" size or 5"x8" size are used. For either form of specification the matter may be typed directly on the units or it may be typed on sheets of paper which are pasted to the sheets or cards.

It is not possible to judge as to whether the one or the other system is the best to be used. The American Specification Institute undoubtedly will meet this problem at some early date and it is to be hoped that the membership of this organization will find it possible to make some determination relative to the merits or demerits of the respective methods of master specification compilation. The architect or specification writer (and this does not mean that specification writers are not architects or should not be considered as such) must remember that the writing of specifications is just as intimate an expression of his individuality as the delineation of the drawings. It is perfectly proper that certain standards should be set up which can be followed in the writing of specifications and it is the purpose of this department to suggest such methods or usages that might become a standard of some fashion. But standardization can not eliminate the intimate personal element without discarding individuality and that condition is not desired by anyone interested in the more accurate, concise and coherent writing of specifications for building construction and equipment.

LEGAL DEPARTMENT

Conducted by

CLINTON H. BLAKE, Jr., of the New York Bar

THE architect of today is necessarily interested in the increasing tendency to arrange for the adjustment of disputes by arbitration. He is interested in this, not only because of the fact that it affects his differences with his client and offers a particular method of disposing of them, but also because it is especially important in the relations of his client with the contractor and in its bearing on the status and disposition of controversies arising between them.

There is nothing novel, of course, in the simple idea of adjustment of differences by arbitrators. It is a method which has been adopted to a greater or less extent in disputes between men for centuries. The modern development of the idea, however, is quite different.

The courts have always been jealous of their prerogatives, and have refused repeatedly to allow people, by private agreement as to the method in which disputes can be settled, to oust the court of its jurisdiction. This theory has been perfectly logical, and has been based on the thought that the people, in setting up a judicial system with the courts to administer the law, have provided the courts as the means by which private disputes and controversies are to be decided.

The logical final step, in order to give arbitration a proper and definite status in our legal system, has been the providing, by statutory enactment, that the parties to a dispute may arbitrate and that an agreement, to submit a dispute to arbitration, is valid and enforcible.

The legislature of the State of New York, in the laws of 1920, declared in effect a new public policy, abrogating the ancient rule as the court construing the statute said, and provided among other things that "A provision in a written contract to settle by arbitration a controversy hereafter arising between the parties to the contract, or a submission hereafter entered into of an existing controversy to arbitration pursuant to title eight of chapter seventeen of the code of civil procedure, shall be valid, enforcible and irrevocable, save upon such grounds as exist at law or in equity for the revocation of any contract." Other sections of the New York Arbitration Law provide for the enforcing of the arbitration contract, the naming of the arbitrator, and a stay of proceedings, in the event that any suit or proceeding is brought when the arbitration is ordered.

It was not long after the adoption of this law, before its validity was challenged. It was claimed that it was in violation of the provisions of the state constitution securing the right of trial by jury. It was claimed that it was unconstitutional as curtailing the general jurisdiction of the New York Supreme Court, which the constitution of that state continues unimpaired. It was contended that it violated the federal constitution, in that it might impair the obligation of a contract.

The Court of Appeals has recently disposed of all these claims in an opinion rendered by Judge Cardoza. It is held that the arbitration law is applicable to pre-existing contracts, but not to pending actions. If the contract was made before the statute was enacted, but the parties to the contract had not elected what remedies they would pursue, at the time the statute went into effect, (for instance, if no suit had yet been commenced) they might have their choice of any legal remedies available at the time when the choice is actually made. If however, an action had been commenced before the enactment of the statute, the commencement of the action would be construed to be an election to sue in the ordinary way, and that particular controversy could not be settled under the arbitration law. The Court held that the statute was not unconstitutional in that it abrogated the trial by jury, because a jury trial is a right which may be waived, and by the consent to arbitrate, the parties to the arbitration agreement did waive it.

The Court further held that the statute was not unconstitutional as depriving the Supreme Court of its jurisdiction; that the people had, in fact, established the Supreme Court to administer the law; that the arbitration suit, being part of the law, it was proper that it should be administered by the court, that this would not oust the court of jurisdiction, but would merely introduce a new issue into the cause.

The operation of the arbitration law is quite simple. Where contending parties agree that their controversy may be decided by the Board of Arbitrators, the court, under the Arbitration Law, must decide in the first place, whether such an agreement has been made. If it has been made and is of a character which is valid under the law, the court will not proceed in the usual way until the facts have been established by the arbitration. When this has been done, the court is still available "for whatever measure of relief the situation may exact. * * * The award will be enforced if valid and for cause, will be annulled." Finally the court held that the law did not impair the obligations of a contract, but that, on the contrary, it strengthened them.

It is reasonable to expect that the precedent set by the New York law will be followed in other states and that the common sense view of the Arbitration Law adopted by the New York Court will be concurred in by the courts in other jurisdictions when similar questions are presented to them for determination.

RECENT LEGAL DECISIONS

AN owner and a builder entered into a construction contract which did not contain any clause to the effect that the builder should not be liable for damages arising from strikes and similar causes. There was a delay of seven and one-half months in the completion of the work. An action was brought for an accounting in equity by one of the parties and the other countered with a claim for damages. The work was being conducted during the continuance of the World War. The court found that each side had been chargeable to some extent with negligence and that each had contributed somewhat to the delay. It was held that neither party could, under these conditions, recover from the other. The court decided that it would take judicial notice of the conditions attending the prosecution of the war and of the effect of the war and of these conditions on the country at large and on building and construction activities generally.

Home Builders v. Busk (*Nebraska*-1921) 182 *N. W.* 589.

A contract, made in writing, covering the reconstruction of the roof of a building, provided that the contractors should not be responsible for damages due to strikes, fire, accident or other causes beyond their control. While the work was under way and before the roofing operation had been completed, a rain storm broke and caused damage. The evidence showed that the approaching storm was visible two or three hours before it finally broke. In an action by the owner to recover for the damage done by the rain the contractors claimed that the clause in the contract, referred to, exempted them from liability. The court held that the defense was not tenable, and that under the conditions the failure of the contractors to cover an opening in the roof, in time to prevent the damage, was negligence for which they should be held liable.

Orshel Co. v. Fischer (*Iowa*-1921) 181 *N. W.* 775.

IT is the ordinary rule that a lien cannot be charged against real property for improvements unless the work is done with the consent of the owner. The legislature may, however, if it deem it proper to do so, provide, by statute, that an owner who knows that the improvements are being made and keeps silent, shall be considered to have authorized them. The interest of a part owner also may be subjected to a lien for the entire cost of improvements made at his instance or with his consent, and where only one of several part owners knew of an improvement and failed to disclaim responsibility for it, his interest in the land may be charged with a lien for the cost of the entire improvement.

Bergland & Peterson v. Wright (*Minnesota*-1921) 182 *N. W.* 624.

A written contract will not be set aside unless fraud or misrepresentation be shown. Moreover, the misrepresentation must be as to a material matter. Misrepresentation on a point which is of no importance and materiality will not be enough. The existence of fraud will not be presumed and the party who charges it, must prove and establish it.

Smith v. Waterloo, etc. Ry. Co. (*Iowa*-1921) 182 *N. W.* 890.

ONE who furnishes materials for a building at the instance of a subcontractor in the second degree is entitled to a lien, under lien law of Iowa. But one who contracts to furnish steel work and who is required to "fabricate" a substantial part of it, according to the requirements of the plans and specifications, is a contractor as distinguished from a materialman.

Illinois Steel Warehouse Co. v. Hennepin Lumber Co. (*Minnesota*-1921) 182 *N. W.* 994.

UNDER the Mechanics' Lien Law of Connecticut (General Statutes of Connecticut 1918, Section 5217), the lien right of a subcontractor depends on the existence of the right to a lien in the original contractor, irrespective of whether the original contractor ever proceeded to perfect the right or not. Where a donor conveyed land to a charitable organization as a gift and later, and following the conveyance and as an additional gift, contracted for the erection of a building on the land, it was held that the donor could not be considered the equitable owner of the land so as to subject the latter to a Mechanics' lien in favor of an unpaid subcontractor, on the theory that the contract between the general contractor and the donor was a contract between the contractor and the owner; the mere fact that the owner under such circumstances knew that the work was going on is not equivalent to his consent within the statutory provision, which provides that a lien may attach where materials are furnished with the consent of the owner.

Avery v. Smith (*Supreme Court of Connecticut*) 113 *Atlantic Reporter* 313.

DEPARTMENT OF ARCHITECTURAL ENGINEERING

LIGHT WEIGHT STRUCTURAL STEEL

Suggestions on fire-safe construction for average buildings

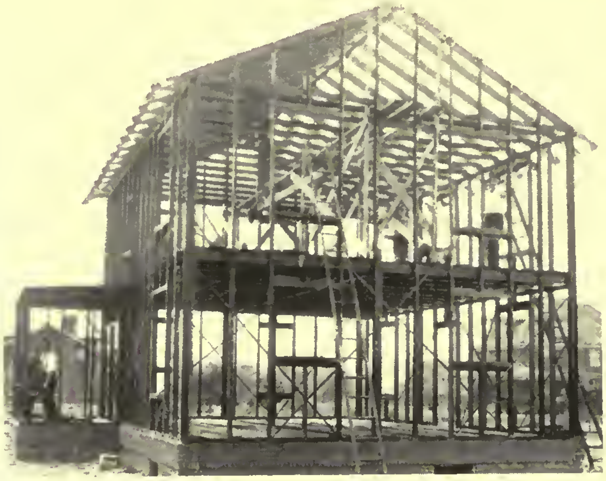
ARCHITECTS, contractors and engineers have been reading advertisements of metal lumber for a long time and circulars and descriptive matter are to be found in every up to date data file. To these men who have been keeping track of the material it will be somewhat of a shock to learn that the first two story metal lumber building was erected a few months ago in Canton, Ohio. It is shown completed, ready for tenants, on this page and the two views following show details of construction. In a case of this kind where the manufacturers undoubtedly waived considerable profit in order to demonstrate the practicability of their material, the question of cost as compared with wood framed houses cannot be said to be settled. However, the sale price of the building is given as $10,500, this covering the walks, drive, shrubbery, flowers and completed lawn. It is stated that the house is on a desirable lot located on a paved street in the best residential section of the city, all of which sounds much like an advertisement.

The Completed House

The main point of interest is that at last a two story house of metal lumber has been erected. During the war a number of small single floor houses were built of metal lumber but nothing ambitious was attempted. It is now stated that stock plans for low cost houses, such as architects cannot afford to bother with except in quantity, as for a land development enterprise, are available. Metal lumber was hailed many years ago as a material which would replace wood for dwelling houses but the early promoters found promotion costs very high and the difficulties encountered in framing joists to studs and in framing over openings in bearing walls led many of them to abandon the idea of houses built with this material instead of wood. The light weight joists were very popular and were exploited in connection with bearing walls of brick, concrete or stone, with interior non-bearing partitions of metal lumber studs. In the many buildings in which this material was used a small number had a few load-carrying interior partitions. The building of a steel frame house following the plans of a wood framed house is an achievement.

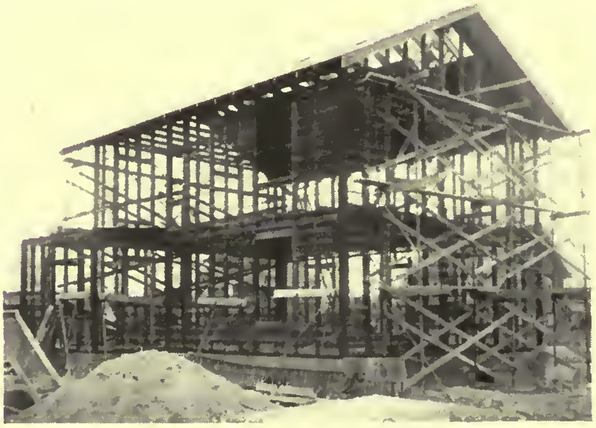
The studs and joists have prongs at regular intervals by means of which metal lath is attached. The interior is plastered with ordinary plaster and the outside is plastered with durable stucco. Some of the cracking in stucco is due to shrinkage of wood and this source of cracks is done away with by using metal lumber, leaving then as the only possible causes for cracking, inferior materials or workmanship in the stucco, carelessness in framing and failure of foundations, all avoidable with proper inspection.

Spikes and nails used in wood frame buildings are replaced by 3/8-in. and 7/16-in. bolts in the assembly of metal lumber. The framing and connections follow approved practice in rolled structural steel, the details being modified for the very light loads to be carried on the floors of dwelling houses. Framing over openings in bearing walls follows wood framing very closely. Bridging between joists is replaced by tension straps. Ceilings on the underside of joists are plastered on metal lath attached by the prongs and the floor over the joists is of reinforced concrete, the reinforcing consisting of ribbed metal lath. Wood floors are often placed over the concrete on wooden furring strips attached to the upper edge of the floor hoist. A fire which may attack the floor can be easily controlled for it is confined to the upper surface and will merely char the wood.



Frame work of metal lumber house ready for lath. Rear view

It is stated on good authority that about 74 per cent. of all fires originate on the inside and the



Lath on metal lumber house ready for plasterer. Cornice going on

manufacturers of metal joists have done a real service in introducing this light and inexpensive non-burnable material. Many fires originate in basements and the use of metal floor joists with plastered basement ceilings and first floor of reinforced concrete will reduce the cost of insurance and have considerable effect on statistics of fire losses. With each additional steel joist floor the fire-safeness is increased and the use of partitions of metal studs plastered on both sides gives additional security. The illustrations of floors and partitions made in this manner can be studied to advantage.

The floor loads in dwelling houses are very light and wood has no competitor in standard weight rolled steel sections, which make the dead load disproportionately large. Metal lumber, or pressed steel joists give sufficient strength and stiffness with the minimum of dead load. For floors carrying ordinary loads the pressed steel joists are strong competitors of wood and in many cities are replacing wood in dwellings, hotels, clubs, etc. Being light they reduce the weight to be carried on partition and bearing walls as compared with standard rolled steel sections and ordinary reinforced concrete floors, with or without tile between ribs. The weight is comparable to wood with the added advantage that there is no shrinkage and settlement and no danger of dry rot. Moisture alone affects steel and when it is protected against moisture by paint or other protective coating it may be said to be everlasting. It affords no harboring places for vermin and it cannot burn.

Apartment houses in Brookline, Mass., in which all floors are carried on light steel joists. Partitions are of plaster on metal lath carried on metal studding

Metal lumber is made of very thin steel strips pressed into the shape of channels. Two of these channels placed back to back make an I beam. The beams were formerly made by rivetting the channels together but it is less expensive to join them by spot welding and rivetted sections are rare today. Pressing was also found to be expensive so that metal lumber today is formed by a rolling process in a forming mill. This operation is performed by a series of rolls similar to the rolls in a steel mill, the strips of light steel being gradually

Apartment houses, Brookline, Mass., showing steel stud construction in all partitions, and steel joist floors

Teleph one Exchange, Akron, Ohio. Brick bearing walls. Interior was of ordinary wood joist floor construction, wood studding and wood lath. Gutted by fire the interior was reconstructed with structural steel and steel lumber joists

Niagara Hotel, Toledo, Ohio. Thos. F. Heber, Architect. Pressed steel floor and bearing partitions

formed into shape. Every step in the formation of this lumber is a rolling process and the channel sections come from the rolls in varying lengths up to a maximum of 130 feet. The first rolls run in oil for the purpose of coating the steel strip and

Underside of pressed steel floor

E. J. Woodison Factory, Detroit, Mich. Geo. W. Graves, Architect. Live load 200 lb. per sq. ft. Joists 20 in. on centers. Supported on structural steel

facilitate production. This oil also prevents rusting in the seam between two channel sections when welded back to back to form an I section.

The steel channel sections are sorted according to length after the rolling is completed and are placed back to back in pairs. Each pair is passed through a spot welding machine which spot welds the webs together. The spot welds are 3/8 in. in diameter and so strong that tests of beams to destruction have resulted in the tearing out of small disks of metal from the webs.

Steel joists are now made with depths as great as 18 inches. The web is a sheet having a width equal to the full depth of the joist, the flanges consisting of narrow channels attached at their edges to the web plate. A joist built up in this manner is in reality a plate girder. It is used as the web of a combination steel and concrete T beam. The upper flange is embedded in the concrete floor slab, which is thus called upon to carry all compression, the lower flange of the light steel girder carrying all the tension.

The limitations of the material confine it to spans not exceeding 24 feet and floor loads not exceeding 125 pounds per square foot. This makes it the lightest known floor and claims are made that in competition with ordinary types of reinforced concrete floors savings in cost of from 10 to 25 per cent. have been made. There were also proportionate savings in other structural parts as reduction in floor dead load affects girders, columns, walls and foundations.

Arctic Ice Cream Co., Detroit, Mich. Steel joist floors framing into reinforced concrete girder of T section

The annual per capita fire loss in the United States is approximately ten times that in European countries. Fire-safe building will go far to reduce this tremendous disparity and light structural steel sections will aid in the solution of the vexing question of how to build fire-safe at a minimum cost.

PRELIMINARY REPORT OF EXPOSURE TESTS ON COLORLESS WATERPROOFING MATERIALS

THE Bureau of Standards, S. W. Stratton, Director, issued in August a bulletin containing a preliminary report of exposure tests on colorless waterproofing materials. The following extracts contain the data which is of most interest to architects.

Purpose of Tests

The purpose of this study is: (1) to compare the effectiveness of numerous waterproofing materials found on the market, (2) to determine the durability of the treatments when exposed to the weather, (3) to determine the effect of the treatments on the appearance of light colored stones.

Description of Materials and Methods of Application

All waterproofing materials except two were submitted by the manufacturers. Treatment T described below is non-proprietary. The relation between the reference letters and the trade names is withheld from publication.

Material A.—A thin liquid of clear yellow color consisting mainly of china wood oil dissolved in a petroleum distillate. The non-volatile is approximately 27 per cent. Two or three applications were specified for porous stones and one for dense stones like marble. Where more than one is applied the first is allowed to dry thoroughly before applying the second. The limestone specimens treated for the tests reported herein were given three liberal coats 24 hours apart.

Material B.—A very thin liquid of clear yellow color containing approximately 67 per cent. of volatile matter. The non-volatile consists of equal parts of paraffin and a fatty oil. Two coats were specified for rough surfaces and one for cut stone. The specimens were given two coats at an interval of 24 hours.

Material C.—A thin liquid slightly brown in color, containing about 96 per cent. of volatile matter. The non-volatile consists of an aluminum soap and the solvent is mineral spirits. One application was recommended in which the surface should be brushed over until thoroughly saturated. The test specimens were treated in accordance with this recommendation.

Material D.—A thin liquid, light yellow in color, having a china wood oil odor. The volatile matter amounts to about 90 per cent., which is mineral spirits. The non-volatile is a fatty oil. The recommendations for application were at least two coats applied with a bristle brush 24 hours apart. The specimens treated were given three coats, since the stone did not appear to be saturated by the second.

Material E.—A 15 per cent. aqueous solution of magnesium fluid silicate. This material was applied to the specimens in three coats of the following solutions:

1, 1 part solution to 2 parts water.
2, 1 part solution to 1 part water.
3, 2 parts solution to 1 part water.

Material F.—A thin liquid of milky color, and odor of ammonia. The volatile amounts to about 97 per cent., which is water, and the solid matter is sodium-ammonium soap. The recommendation for application was two coats for ordinary materials, and three for unusually porous materials, applied with a brush or spray. The specimens were given three coats 24 hours apart.

Material G.—A very thin liquid, having a nitrobenzol odor. The volatile amounts to about 88 per cent., which is a petroleum distillate. The non-volatile appears to be a heavy petroleum distillate. The recommendations for application require two or more coats at intervals of 24 hours. The specimens were given three coats.

Material H.—A milky liquid consisting mainly of a 6 per cent. aqueous solution of casein glue. The manufacturers recommend not less than two coats, the second to be applied immediately after the first is absorbed. Two coats were applied to the specimens under test.

Material I.—A thin liquid of light amber color. The volatile amounts to about 62 per cent. which is petroleum distillate. The non-volatile is a mixture of fatty oil and paraffin. The manufacturers recommend that the material be applied until the stone is saturated, which will usually require not more than two coats. The specimens were given three coats.

Material J.—A clear, slightly yellowish liquid of the consistency of syrup, and the odor of fusel oil. The volatile amounts to about 92 per cent., which is ethyl acetate, acetone, etc. The non-volatile is mainly cellulose nitrate. The producers recommend this material for urban districts where there is considerable smoke. They recommend that it be thinned for use on Indiana limestone with 5 per cent. of amyl acetate. The specimens treated for testing were given one liberal coat, in accordance with these recommendations.

Material K.—A thin liquid of yellowish brown color and coal tar naphtha odor. The volatile amounts to about 62 per cent., which is solvent naphtha, and the solid matter is coal tar resin. The producers recommend this for alkaline conditions such as found along the sea shore. The specimens were given two coats at an interval of 24 hours.

Material M.—A thin clear liquid with an odor of mineral spirits. The volatile amounts to about 86 per cent.. which is a petroleum distillate. The solid matter is paraffin. The producers recommend one coat applied with a brush or by dipping. The specimens were given one liberal coat with a brush.

Material O.—A thin liquid of amber color and odor of varnish. The volatile amounts to about 60 per cent., which is mainly mineral spirits. The solids are oils and resins. The producers recommend two coats. The specimens were given two coats at an interval of 24 hours.

Material P.—A thin liquid of amber color and varnish odor. The volatile amounts to about 62 per cent. which is mainly mineral spirits. The non-volatile consists of oils and resins. The producers recommend two coats. The specimens were given two coats at an interval of 24 hours.

Material Q.—A thin liquid of amber color and varnish odor. The volatile amounts to about 68 per cent., which is mainly mineral spirits. The non-volatile consists of oils and resins. This material and the two preceeding are thin varnishes. The specimens were treated with two coats.

Material R.—This treatment consists of a liberal application of molten paraffin which is afterwards heated with a flame to drive the wax into the pores of the stone. The specimens were first heated in the drying oven to 110 deg. C. and heated again with the flame of the Bunsen burner after the application.

Material S.—A thin cloudy liquid having an odor of mineral spirits. The volatile amounts to about 93 per cent., which is mainly mineral spirits. The solid matter is paraffin. The producers specify two applications with a brush, for stones of ordinary porosity, or three for very porous materials. The limestone specimens were given two coats.

Material T.—This is a non-proprietary treatment known as "Sylvester's Process." It consists of ¾ lb. of soft soap dissolved in 1 gal. of water and ½ lb. of alum dissolved in 4 gal. of water. The soap solution is applied and shortly afterwards the alum solution is applied. The action that takes place results in the deposition of an aluminum soap which is insoluble. The specimens treated by this process were given three applications as described above.

Description of Stone Specimens

Two types of stone were used for testing the waterproofing materials, viz., Indiana limestone and a light colored, fine grained sandstone from New Mexico. Specimens were prepared from four samples of the limestone representing the products of four different localities. The specimens were cut from the different stones with a core drill, and were 2 inches in diameter and 2½ inches high. These cylinders were ground on the ends to give smooth well finished surfaces.

The different stones are described in the following table:

Mark	Type of Stone	Color	Texture	Water absorption in 30 min. per cent.	7 days per cent.
No. 1	Ind. Limestone	Buff	Fine gr.	4.49	5.52
No. 2	Ind. Limestone	Buff	Fine gr.	3.16	5.18
No. 3	Ind. Limestone	Buff	Medium	5.44	5.87
No. 4	Ind. Limestone	Buff	Coarse	5.59	6.43
No. 5	N.M. Sandstone	Gray	Fine gr.	1.94	3.24

were taken into the laboratory, weighed, immersed in water for thirty minutes and weighed again after drying the surface with a towel. The results of the weight determinations are shown in the report by curves.

In a few cases the weight curves indicate that a considerable amount of water was retained in the stone since all the subsequent weighings were higher than the first. It was noted that for most cases there was a gradual loss in weight with the length of exposure. This may be due partly to the gradual disappearance of the waterproofing material and partly to the solution of the stone.

In the case of Stone No. 1 treated with Material C, the weight at the end of 7 months was less than the weight of the dry stone before it was treated. In this case the loss cannot be accounted for by the disappearance of the treatment, and must be partly accounted for by the solution of the stone. The same thing occurred in the case of Stone No. 4 treated with material T.

It was noted that a rain shortly before the time

Appearance of treated stone in waterproofing tests. Some are changed less by the treatment than by a year of exposure to soot and smoke.

Description of Tests

The finished specimens were dried in the electric oven at 110 deg. C before the treatments were applied. All proprietary treatments were applied in accordance with the recommendations of the producers. Special care was taken to obtain a thorough penetration and it is believed that better results were obtained on the specimens than could be obtained on a structure. The uniformity of results obtained from the different specimens treated with the same waterproofing material indicated that the treatments were properly applied.

After the treatments appeared to be dry, the weights of the treated specimens were determined. The specimens were then put on the roof of a building where they were freely exposed to the rain and sunshine. Each month the specimens

of weighing caused a considerable increase in the weights of the specimens, but when a few dry days preceded the weighing, the weights were usually found to be near the original. A few of the materials allowed a considerable absorption of water which was retained in the specimens. Such materials would probably be more harmful than beneficial where exposed to frost action.

Results for the following specimens have not been included in this report, due to the fact that they have not been under test long enough to justify it; H, J, L, S and O.

The accompanying illustration shows the appearance of the materials on slabs of Indiana limestone. The half of each slab to the right is treated. The waterproofing materials corresponding to the slab numbers are as follows:

1	C	5	I	9	M	13	P	17	A
2	O	6	H	10	B	14	J	18	T
3	K	7	F	11	L	15	S	19	S
4	D	8	C	12	Q	16	G	20	R

All these treatments alter the original appearance of tho stone. Many mar the appearance so much as to be objectionable on the exposed walls of buildings. Those that alter the appearance of Indiana limestone least are G, T, L and C. Those that mar the appearance of the stone are O, K, I, Q, P, and R. The others which may be called the intermediate group would probably be considered objectionable in accordance with the prominence of the building. While they change the appearance of the stone considerably, the effect is probably not as pronounced as that due to a year's exposure to the soot and smoke of manufacturing districts.

In the following list the materials have been placed according to their value in reducing the water absorption. The numbers opposite the materials were obtained by dividing the maximum percentage of absorption of the treated specimens during the tests, by the percentage absorbed by untreated specimens of the same stone during 7 days' immersion.

For Materials on Indiana Limestone

Material I	.01	Material T	.43
Material B	.03	Material F	.69
Material C	.05	Material D	.72
Material M	.13	Material Q	.75
Material A	.21	Material P	.76
Material G	.33	Material K	.81
Material E	.99		

For Materials on New Mexico Sandstone

Material C	.47
Material R	.60
Material T	.66

THE IMPORTANCE OF INSPECTION

THE recent failure of the brick and reinforced concrete building of the Imperial Tobacco Company of Norfolk, Va., by fire has again raised tho question as to the value of concrete as a fire resisting material.

Prof. Ira H. Woolson, consulting engineer for the National Board of Fire Underwriters, has issued a special report on the fire. His findings were that unprotected stairways and open elevators throughout the building violated the principles of fire protection, while the fire hazard was greatly increased by the erection of a wooden construction story, inclosed with sub-standard brick walls, over the roof of the original building. The contents were of a character which developed intense heat in burning.

In design and construction the building appears to have violated all the fundamental requirements for a first-class structure of its type. The quality of the concrete was poor, the mixing was carelessly done, the placing of reinforcement was faulty and its protection was inefficient. The building was six stories high, the floors, columns and girders being of reinforced concrete with brick outer walls. The complete destruction by fire of a building regarded as of high class construction and a comparatively safe fire risk, shows the necessity for continuous competent supervision of reinforced concrete buildings during erection. Careful inspection, however, should not be limited to reinforced concrete buildings if architects and builders value reputation.

THE VALUE OF FIRE WALLS

THE tractor plant of the Moline Plow Company at Rock Island, Ill., as originally planned was one great open area, the building being 1,200 feet long. Viewed as a machine in a production plant it was ideal, for every process was in plain view and all materials could be routed with a minimum of interference. The building was constructed as planned and proved to be as ideal as the planners had predicted.

The insurance agent, however, was nervous. The building violated the cardinal principles of fire protection, as large open area is one of the principal factors in the spread of fire, and the insurance rate was materially higher for that reason. As a result of the persistency of the insurance agent two fire walls were erected, cutting the plant into three sections, the walls being equipped with large automatic fire doors through which the material could pass. It was estimated that the reduction in insurance costs would pay for the walls within two years.

The total insurance carried on the building and contents was $4,134,722. A fire occurred and the contents of one of the sections, 464 feet long, were completely destroyed. The insurance loss paid on the burned section was $966,955.47, an amount which shows plainly how difficult it is to control a fire in such a plant. Tho two fire walls held perfectly and although the fire in tho burning section could not be extinguished and burned as long as it found combustible material on which to feed, it was confined to the area in which it originated. The fire walls thus saved over three millions of dollars and made possible an early resumption of production. Such incidents help prove that non-bearing walls are not always an expense to be avoided.

BUILDING WAGES

An investigation was recently made on the comparative rates of wages in the United States and foreign countries for the Committee on Ways and Means of the House of Representatives. The results are given in the following table in dollars per day figured at the rate of exchange prevailing for the year shown.

	United States	Germany	Japan	England	France	Spain	Austria
Bricklayers:							
1913.....	$5.49	.....	$0.62	$1.80	$1.51	.....	.....
1914.....	5.59	$0.99	.55	1.72	.....	.....	.....
1919.....	7.02	.13	1.40	.....	.....	$1.51	.....
1920.....	9.60	.82	1.75	3.29	1.41	.....	$0.55
Laborers:							
1913.....	2.47	.....	.29	.....	.....	.....	.....
1914.....	2.50	.81	.28	1.09	.....	.....	.....
1919.....	3.86	.41	1.00	.....	.....	.....	.....
1920.....	5.58	.....	1.25	2.83	1.06	.....	...53
Carpenters:							
1913.....	4.24	.....	.45	1.80	.....	.....	.....
1914.....	4.33	.99	.43	1.58	.....	.....	.....
1919.....	6.19	.42	1.10	.....	.....	1.35	.....
1920.....	8.27	.....	1.40	3.23	1.54	2.05	.55
Painters:							
1913.....	4.04	.....	.60	1.70	1.43	.....	.....
1914.....	4.16	.92	.....	1.47	.....	.....	.....
1919.....	6.10	.42	1.25	.....	.....	1.54	.....
1920.....	8.33	.71	1.65	3.19	1.54	1.23	.45
Plasterers:							
1913.....	5.39	.....	.48	1.70	.....	.....	.....
1914.....	5.44	.....	.....	1.62	.....	.....	.....
1919.....	7.06	.....	1.25	.....	.....	1.74	.....
1920.....	9.22	.....	1.75	3.29	1.54	.....	.61

The sources of information were the most reliable data in each of the countries mentioned, and the table has considerable value. "The rate of wages influences but slightly the amount of wages on any enterprise," was the dictum of economists a generation ago and it was true during a period of falling prices when considerable numbers of workers were unemployed and there were great movements of surplus population from congested countries. Today the general use of labor saving devices calls for a revision of the broad statement.

In *The American Architect* of August 17th, a table was given of a rational Wage Differential for Building Trades Mechanics and in the issue of Sept. 28th data were presented on wages of building mechanics in Scotland. From the August, 1921 Monthly Bulletin of the Illinois Society of Architects the following table was taken and it is interesting for comparison with the discussion above mentioned on wage differentials.

Average Wage Scales of Building Trades in 46 Cities as of June 30, 1921.

Rate Per Hour

Carpenters	82.77	Masons	106.69
Cement Finishers	87.07	Ornamental Iron	94.57
Electricians	93.80	Pipe Coverers	96.69
Hod Carriers	61.55	Plumbers	101.54
Laborers	42.61	Roofers	80.62
Lathers	93.00	Sheet Metal	88.34
Painters	84.02	Steam Fitters	101.20
Plasterers	105.90	Steam Fitters' Helpers	61.28
Plasterers' Tenders	64.24	Stone Cutters	100.78
Bricklayers	109.06	Structural Iron	97.50
Elevator Constructors	99.11	Tile Setters	98.88
Gas Fitters	96.02		
Hoisting Engineers	92.80	Average or basic wage	89.93
Marble Cutters	97.59		
Marble Setters	100.50		

The awards made by Judge Landis on Sept. 7th, 1921, were as follows, the rates being per hour:

Boiler Makers	$1.00	Marble Rubbers	.75
Brick Layers	1.10	Scagliola Rubbers	.75
Fire Proofers	1.125	Mosaic and Tile Workers	1.025
Cement Finishers	.85	Mosaic and Tile Helpers	.70
Comp. Floor Finishers	.975	Pipe Coverers	.95
Cement Workers	.725	Plumbers	.95
Derrick Men	.90	Comp. Roofers	.925
Drain Layers	.825	Slate Roofers	1.00
Electricians	1.10	Stone Cutters	1.025
Gas Fitters	.95	Stone Carvers	1.25
Hoisting Engineers	1.10	Stone Planers	.825
Other Steam Engineers	.85	Steam Fitters	.95
Orn. Iron Workers	.95	Tuck Pointers	1.00
Struct. Iron Workers	1.05	Terrazzo Workers	.95
Common Labor	.725	Terrazzo Helpers	.75
Caisson Men (Winders, etc.)	.85	Excavating Laborers	
		Wall Men	.55
Caisson Men (Diggers, etc.)	.975	Others	.475
		Comp. Floor Laborers	.725
Hod Carriers	.7875	Lathers	1.00
Machinery Movers	.85	Sprinkler Fitters	.925
Marble Setters	.875	Roofing Teamsters	$30 per wk.
Marble Helpers	.70		

The following rates were fixed as fair for the trades who were in the arbitration, but who for one cause or another had not submitted agreements acceptable to the arbitrator:

Elevator Constructors	.95	Glaziers	.95
Fixture Hangers	1.00	Sheet Metal Workers	.95

And for the three trades not in the arbitration, equally fair working agreements and rules would justify the following maximum wage rates:

Carpenters	1.00	Plasterers	1.10
Painters	.95		

Under the stipulation making Judge Landis the Arbiter between the contractors' associations and the Chicago Building Trades Council the above will be the wages paid the various building trades, parties to the arbitration, until the first day of June, 1922. Under the arbitration agreement the Arbiter, on or before the first day of February, 1922, must make another wage award for all these crafts for the year ending May 31, 1923.

AMERICAN PIG IRON PRODUCTION

Annual statistics of the American Iron and Steel Institute, announcing the production of pig iron in the United States during the past calendar year (1920), show a total for all kinds of pig iron of 36,925,897 gross tons, as compared with 31,015,364 gross tons produced in 1919, and with 39,434,797 gross tons in 1916, which was the record year for the industry. Pennsylvania surpassed all other states as a producer of pig iron in 1920, its output being 13,983,134 tons, and Ohio was second with 8,533,470 tons. Illinois was third with 3,280,875 tons, and Alabama fourth with 2,392,962 tons. Of the total production, 16,737,722 tons were basic, and 12,062,084 tons Bessemer.

A REVIEW of RECENT ARCHITECTURAL MAGAZINES

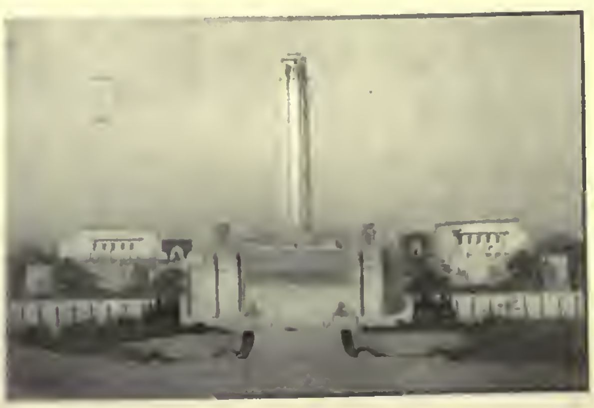
BY C. HOWARD WALKER

IN the *The Journal of the American Institute of Architects,* September, 1921, Mr. G. D. H. Cole writes on an important development of Policy of the British Building Guild and the New Contract; notice, please, a contract which now guarantees something, because as Mr. Cole says, the first thing a purchaser wants to know is *m a x i m u m liability. Mirabile dictu!* By what devious and tortuous paths we have reached this marvelous wisdom. "Under the cost price form of contract, the Guild could not tell him this." We have suggested this fact before. "They have not been in a position to give the purchaser a firm guarantee on this point, and there were two possible ways out of the dilemma." First the principles of the Guild could be abandoned and a lump sum (of course, ultimately competitive) could be stated. That would never do, and so the Guild takes an "alternative course which is essentially simple" and will agree on a maximum price in which is included an insurance fund to take care of any possible deficit. This has a resemblance to the method of the private builder. But the principles of no profit (beyond the legitimate day's wage) is maintained by the purchaser being called upon only to pay cost price if it should prove to be less than the maximum price agreed upon. Good, we have known this to occur outside the Guild. Now to get down to basic facts, what is cost price? At present the Guild can underestimate the private builder, probably because of

From "The Architectural Record"

Merchandise Building—Eastern Store of Sears, Roebuck & Co., Philadelphia. George C. Nimmons & Co., Architects

From "The Journal of the A. I. A."



Kansas City Memorial Competition
H. Van Buren Magonigle, Architect

From "The Journal of the R. I. B. A."

Two Views in the Whiteley Village

the size of its organization. It is, in fact, a Department Store. How long this will continue, we have no prophetic knowledge, but, how near the Guild is approaching the private builder, we leave our readers to judge. *Sic transit.*

M. Vaillat's analysis of the Exhibit of American Architects at the Salon of French artists is appreciating and complimentary. He regrets the absence of plans. Probably American plans would require elucidation to the countries of Europe.

Georgiana Goddard King writes interestingly upon Castles in Spain. Turegano, Penafiel, Coca and S. Servando, Toledo, huge, grin and ominous.

Mr. Whittaker in Shadows and Straws deplores the collapse of the housing program. Let us get another slant upon this fact. The taxes in England at present are such that the professional man is taxed 50 per cent. of his income, and the owner of large estates pays 80 per cent. of his income. Estates are auctioned for taxes and bought in by the farmers when it is possible. Despite this confiscatory taxation the Government lacks funds, as a very considerable proportion is devoted to supporting non-employed men, who are not particularly anxious to be employed. You "cannot have your cake and eat it too." Let Labor clean its own stables. Mr. Whittaker is a single taxer. It is an interesting, plausible solution, capable of admirable success in small communities, exactly as a model of a device seems perfect when the use of the device shows faults. But his prophecy that this century will be characterized as the Culmination of the Acquisition Age, ignores the fundamental axiom that accrued savings make possible enlarged undertakings. It is the abuse of accumulated wealth which requires attention, not the existence of that wealth.

From "The Architectural Review," London

Marine Hotel, Amsterdam—General View
Von Der Mey, Architect

The Journal of the American Institute of Architects, August, 1921. Shadows and Straws comments upon Mr. Magonigle's Kansas City memorial. Mr. Whittaker speaks of genius as "a wayward child," and cites both this memorial and Mr. Goodhue's Nebraska State Capitol as examples of this type of genius. Here we differ. Mr. Goodhue's design is based upon commonsense, and has no mark of the wayward child. Mr. Magonigle's design belongs to the wayward cult. Also the comment that "discussions of competitions ignore architecture and lay emphasis on the architect and client" must come from misinformation. The public at large discuss neither architect nor client, but do discuss visual effect and utility. This review for some years has discussed architecture whether or not of competitions, with absolute disregard for either the personality of the architect or of the client, and it is not unique in that respect. Mr. Magonigle's plan seems admirable. His prospectus is equally so. But the relation of solids and wall surfaces to each other leaves much to be desired. The base to the tower is much too large for the cross section of the tower, and the star plan of the tower is entirely out of character with the great rectangles of its base. The *poché* indicates that fact, and the elevation and perspective reiterate it. The tower is not ennobled by its varying surfaces, but becomes striated, and suggestive of drawn out metal, in fact a gigantic candlestick upon a Brobdignagian base. Perhaps this is intentional, but it is not monumental in effect. Nor are the bowl-like terminations of the tower and of the corners of the base happy as they suggest clay and not stone. And huge carved stone rings are a banality. The angles on sticks may be effective; they are deliberately bizarre.

Here is a conception which was devoid of marked utilitarian demands, which was to be an expression of an ideal, i. e. "the flame of inspiration guarded by the Spirits of Courage, Honor, Patriotism and Sacrifice upon an altar high erected in the skies." It is a noble conception; it sounds fine, and can be fine, but we contend that it is not fine. It will require a chart to be comprehended. There is no realization of the nobility of the conception in its working out. We are reminded of Garrick's remark about Goldsmith. This tower is a flare, appealing not to dignity nor to refinement but to sensationalism. Nor has it anything to do with the design for the Nebraska Capitol. That was a logical carrying-out of an unusually excellent plan, hastily detailed in its non-essentials. This is an ideal conception, requiring great care in proportions and detail, both of which Mr. Magonigle will undoubtedly contribute later.

From "The Architectural Record"

Fountain in Wall of Lemon House—Cigliano, San Casciano, Val Di Pesa, Italy

There is one trite remark we beg to make. A tower is not of value merely because it is a simple vertical. If that were the case, every factory chimney would be a work of art. Nor is architecture necessarily impressive because it is big, or because a simple factor emulates the ambition of the frog to become an ox. If that were really the case, how very little we should value the Erechtheum or the temple of Nike Apteros.

Mr. Robert Kohn's paper on Cost-Plus Professional Charges is logical, as far as it goes, and it seems to be complete. We note the architect's personal time is charged on a salary basis, and an

From "The Architectural Review," London

Thatched Cottage at Ampthill

From "The Architectural Record"

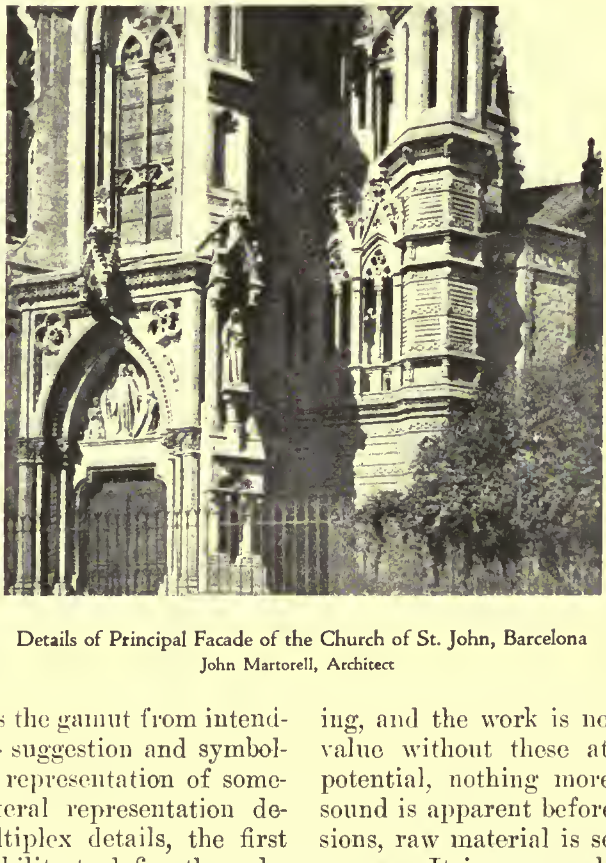
Flintridge Country Club, Near Pasadena, Cal.

agreement is made that total charges shall not exceed a basic rate of a given per cent. It sounds like a good business proposition on both sides. Is there a fly in the ointment? Is competitive bidding, which some of our profession have decried, lurking anywhere, and if it is, is it reprehensible? Like Rosa Dante, we only "want to know."

Mr. William Adams Delano contributes to this issue, his address upon Artist and Artisan, made at the Yale School of Fine Arts. It is admirable in every respect.

The Architectural Record, August, 1921. Opening article by Mr. Alfred C. Bossom on the Art of Nicholas Roerich whom he considers a "great artist" of today who has of all the most significant message to American architecture. Mr. Bossom states "America has outgrown 'white architecture' and has reached a period wherein color is a vital element in every complete architectural scheme. The effect of color on the mind is receiving much attention." Mr. Roerich's "desire is to interpret man's religion to the universe," and much more of this character. Is it possible to get down to facts? As we see certain facts they are these:—Visual art runs the gamut from intended literal representation to suggestion and symbolism, through some sort of representation of something. As absolutely literal representation demands delineation of multiplex details, the first result is either through inability to define those details, or a recognition that they are impertinent, to minimize them, to eliminate them. This is assumed to broaden the artist's records. It may, and it also may not show his initial incapacity to study, to develop, or adequately to express. The work of undeveloped peoples, of children and of the mentally deficient falls at once into this latter class. These are facts, not theories, and it would be well that the admirers of such work should appreciate these facts. What is it in such work that justifies admiration and eulogy? Absolutely nothing. It may excite interest, create discussion as to its intention, stimulate the curiosity as does a puzzle, but under no circumstances, is it to be considered as an accomplishment, but only as an effort. When done unconsciously, the artist struggling to an attainment, it deserves the reserve of suspended judgment and nothing more. Sincerity always deserves that, even if ridiculous. Charitable words are applied in that case, interesting, naive, suggestive. But when this work is exploited as masterly in anything but the minor arts (it being of a similar adolescence—lack of importance to much in those arts) there exists either charlatanry or the union of uneducated minds. That this is a fact is likely to be challenged. What is training, specialism, or generalization from exhaustive knowledge? The admirers of such as that of Mr. Roerich are specialists, as are nearly all people with cults. Certain other facts exist, have existed, and will always exist, despite mouthings. There are qualities which are in nature and in man's work, which are defined by adjectives which are decorations of honor. They are Refinement, Delicacy, Subtlety, Order. These have nothing to do with mental suggestions or interpretations of intentions. Nothing can be read into them. They are facts and recognized as being of value, and when they do not exist, something of importance is lacking, and the work is not masterly. Can it be of value without these attributes? Yes, as being potential, nothing more. In forensic eloquence sound is apparent before sense. In visual impressions, raw material is seen before the forms it assumes. It is a very old threadbare means of obtaining attention to play to the gallery, or as at present, to the pit. The spectator who is enthusiastic over obvious, too obvious, smashes of tone or of color, of monstrosities of shape need take no credit that he sees them. They have been intended to penetrate a torpid intelligence. There are terms which have been considered derogatory, such as raw, crude, undeveloped, chaotic. We recommend the study of these adjectives so that their pertinence may be recognized; also the definition of the word "vigor" which is not dependent upon any of these qualities. As to symbolism, to inspirational suggestion, these modern lucubrations have no monopoly of either, but are in many cases so vague that their interpretations differ. Of what

From "Vel-i-nou"



Details of Principal Facade of the Church of St. John, Barcelona
John Martorell, Architect

value are they? The only virtue they possess is that they are not anemic, but a liking for blood-puddings is a taste induced by poverty,—in this case, poverty of knowledge. Mr. Roerich (we have met him) is sincere and earnest. He is not a charlatan. Every Russian church is decorated all over its apse, and often elsewhere, with paintings of Scriptural stories in imitation of Byzantine mosaic. Because of that and to make them perceptible to the worshippers, they are broadly outlined, and colors are of high intensity and of considerable areas of unbroken values. This work is of various degrees of proficiency, never of superlative skill. It has a certain splendor in its place. Its painters, excepting perhaps some few who worked upon Russia's most important churches, were artisans, often pitiably unskilled. Prof. Roerich was brought up amidst this work, and he has bettered it, but it has no peculiar message. It is a translation of a translation. The message is that of the Byzantine mosaic. In reference to Prof. Roerich's stage-settings, the elimination of detail and areas of even tone and color of modern spectacles is well fitted for his work. We look forward with confidence to the future. "When the half gods go, the Gods arrive."

As to color in architecture upon the exterior of buildings, it is no new thing, but merely a reversion to Egypt and Archaic Greece. It is significant that as Greece reached her apogee, color was minimized. But Egypt and Greece had a homogenous architecture, which dominated the polychromy. We have the most hetereogenous architecture the world has ever seen. Let us beware of lifting the lid of Pandora's box once again. Color is the embellishment of form, and if form is isolated, can greatly enhance it, but form is the background and should dominate, and enhance the beauty of color and act as a neutral foil. But a harlequinade is mere confusion, a babel of impressions. We have not yet mastered form; let us be wary of color.

Mr. Myron Hunt's Country Club at Flintridge, near Pasadena, Cal., is a series of simple one-storied buildings with good interiors.

Mr. Frank Chouteau Brown contributes the third of his excellent papers upon Apartment Houses.

Mr. George C. Nimmons has an illustrated article upon the group of buildings called the Eastern Store of Sears, Roebuck & Company, at Philadelphia, for which he received the Institute Gold Medal for Industrial Design, deservedly.

Mr. Eberlein illustrates the delightful small Villa of Cigliano, San Casciano, Val di Pesa.

Notes and Comments contains good material well written upon the new obligations of architecture, by John Taylor Boyd, Jr.

The above illustration of the house of Mr. Henry A. Gardner, Chevy Chase, Md., shows, even in the black and white reproduction, the accent that may be secured when the colors of the paints used are selected with correct artistic knowledge. The house is painted a light cream with white trim. The blinds are "Colonial blue." The pickets of the fence are white with "Colonial blue" top. The effect is decidedly good.

THE AMERICAN SPECIFICATION INSTITUTE

BOARD OF GOVERNORS

THE American Specification Institute has been organized to clarify the atmosphere surrounding the processes involved in the writing of specifications for building and engineering construction and equipment and all correlative work that must be considered by the architect or engineer in the successful accomplishment of his professional activities.

Modern complexity of building construction and equipment necessitates to a far greater extent than ever before the close study of those matters and things that must be specified, and in addition a study of all the phases of the work that will be affected by the selection of any one material or method of construction. As the scope of work ordinarily assumed by the architect or engineer has increased it has become necessary to establish research laboratories and found new chairs of instruction in universities and in every way endeavor to increase the technical knowledge that must be brought into play in the professional work of the architect. Specification work, alone, has been badly neglected.

Practically all other branches of technical endeavor have very complete methods of attacking the problems presented them and the text books covering all phases of such work are available to all. In the haste to improve and perfect building construction there has been no concerted attempt to study the writing of specifications as they should be written in order to produce documents that will assist in the successful conclusion of each operation. Heretofore specifications have simply grown without a great amount of leading except in instances here and there where men of foresight have recognized that the organization of their specification work must be given attention in order that it might be expeditiously handled.

Specifications have been in the past, to a very great extent, the result of individual effort and as such have varied in many features that can be conventionalized so as to be common to all if a national effort is made toward that end. As the membership of The American Specification Institute will be composed exclusively of architects and engineers who are interested in the writing of specifications or in the making of original researches or the determining of new processes, it is confidently believed by the Board of Governors that the efforts of the members, if directed along lines that will lead to a more easy and happier accomplishment of their work through mutual study, will produce a very great deal of good. There is at present a great duplication of study, research and labor on the part of specification writers for the reason that there has been no systematized means for collecting and distributing information of interest to them. This condition has tended to make the work seem more arduous than it should be, while if specification writers were given the same amount of assistance by means of text books and concerted deliberations on the part of men highly trained in the technical features of their work as has been extended the designers of the structural framework of buildings or the designers of mechanical equipment, the present task which seems unending and which is abhorred and approached with dread will become one of the most pleasant tasks in the office. Throughout the country there may be found specification writers who have had sufficient vision of the possibilities of reducing the work of specification to a minimum that they have analyzed the problems that must be met and have attempted to bring order and method into their work. They have found that the time so spent has been well spent as it has come near to lifting their routine duties out of the slough of tedium.

The American Specification Institute has been organized to improve all those conditions surrounding the writing of specifications and to bring to specification writers the benefits that are to be obtained from the organized efforts of men accustomed to study and write these essential documents. The scope of the Specification Institute already has assumed a national character and the co-operation through membership, of all specification writers, is cordially invited.

ITEMS OF INTEREST

THE two following letters have been received from members and they are deemed of such great interest that they will be made the subject of a bulletin:

"I have been using a card system of my own for writing specifications for over ten years and after several revisions, bringing it to date, find that it will build at least 95 per cent. of a specification for most any building, besides serving efficiently as a 'tickler.' The cards are based on the best standard practice and conform to most of the modern codes and recommendations. The specifications produced in our office from these cards, have been so clear and complete that we have not had an average of two inquiries per building for interpretation as to intent, and we consider them as equitable from a legal viewpoint."

"It may be of some interest to you to know that the writer uses a card system in preparing all but brief memorandum specifications. Standard clauses are typed on 4"x6" cards, special blue cards being inserted to cover special conditions applicable to the particular job. There are roughly 1,500 standard cards to a set, including general, heating and plumbing. The specification is typed directly from the cards, then the standard cards are returned to their place in the set and the specials filled.

"In the general specification for * * * 520 standard cards and 91 special cards were used, or about 85 per cent. standard, which is considerably below the usual average.

"The system as it has been developed here would seem to attain about the maximum of flexibility, speed and accuracy, for example, the cost of preparing the * * * general, not including checking and typing, was less than $25.00. It has, however, the objection of undue length, for there is an almost irresistible temptation to use material, which while perfectly applicable, is of relatively minor importance. This is in course of correction through a drastic revision of the standard cards."

ANNUAL FALL CONFERENCE

THE work in connection with the organization of a Conference during the early fall months, which will be made an annual occurrence, is progressing in a very gratifying manner and it is hoped that members will lend their best efforts toward a successful meeting. The program will be announced in the next issue of *The American Architect* and it is believed that the date will have been determined by then. The Conference will be held in Chicago.

FOREIGN INTEREST

THE attention of members has already been called to the world-wide interest that is being aroused in the work of the Specification Institute. An application for membership has been received from a specification writer in Christchurch, New Zealand. This is simply another indication that the Specification Institute has a serious work to perform and that those who desire to accomplish their work expeditiously and in a satisfactory manner are much interested in all efforts that will assist them in removing the onerous burdens of professional activities.

INDIANAPOLIS ASSOCIATION OF ARCHITECTS

THE Acting Executive Secretary was a guest of the Indianapolis Association of Architects at their monthly meeting September 14th. He explained to the Association the organization of the Institute and was greatly pleased at the interest shown by those present.

PERSONALS

A CORRECTION

IN an interview with Electus D. Litchfield, published in our issue of September 14, Mr. Litchfield was quoted as including in the work of Electus D. Litchfield & Rogers the Denver, Colorado, Post Office. While it is, of course, generally known in the profession that this competition was won and executed by Tracy, Swartwout and Litchfield, the wording of the interview might lead the uninformed reader to assume it was by Electus D. Litchfield & Rogers.

This statement is made at the joint request of both firms that the record of so important an architectural undertaking may be kept straight and any error of statement corrected.

John Sloan, architect, formerly practicing at 570 Fifth Avenue, is now located at 565 Fifth Avenue, New York City.

M. C. Nathan, architect, wishes to announce that he has opened an office for the practice of his profession at 70 West Monroe Street, Chicago, Ill.

A. Proskauer announces that he has moved his architectural offices from 201 East Ontario Street to 631 North Michigan Avenue, Chicago, Ill.

Horace G. Cook, Jr., recently opened an office for the practice of architecture in the Miners' Bank Building, Wilkes-Barre, Pa.

William N. Toy, Jr., recently opened an office for the practice of architecture at 421 Lackawanna Avenue, Scranton, Pa.

Announcement is made that Mac Turner, architect, formerly located in the Citizens' National Bank Building, is now in a suite with Addison C. Berry & Co., architects, Hammond, Ind.

Frederick Winter, architect, has enlarged his architectural offices and moved them from the Lambden Building to the Little Print Building, Huguenot Street, New Rochelle, N. Y.

J. C. Halstead, architect, 324-325 Chamber of Commerce Building, Birmingham, Ala., has expressed his desire to receive manufacturers' catalogs.

It is announced that Russoniello & Price, architects, have opened an office in the Scranton Life Building, Scranton, Pa., and are desirous of securing manufacturers' samples and catalogs of building materials.

It is announced that the firm of Rugh & Zalesky, architects, Security Building, Cedar Rapids, Iowa, has been dissolved, and the business will henceforth be carried on by Bert Rugh, at the old address.

James R. White, architect, Niagara Falls, N. Y., has formed a partnership with W. W. LaChance, architect, formerly of Saskatoon, Saskatchewan, with offices at 243 First Street, Niagara Falls, N. Y., and at 98 St. Paul Street, St. Catherines, Ontario, Canada.

Word has recently been received of the death of Adrian C. Finlayson, for many years an architect in Syracuse, N. Y. Mr. Finlayson has been superintendent of building for the insular government of Porto Rico, and formerly a student of Syracuse University.

Edward R. Bitting has moved his architectural offices from the E. B. Wilbur Trust Building, Bethlehem, Pa., to the recently completed I. O. O. F. Building, Broad and New Streets, that city. Manufacturers' samples and catalogs of building materials are desired.

Announcement is made that Henri E. M. Guindon, architect, Apartado Num. 1263, Tampico, Tam., Mex., has recently re-opened his office at the address given above, and desires to receive catalogs, circulars, etc., on building materials and fixtures.

G. F. Ashley, architect, who was formerly with Messrs. Palmer & Hornbostel, of New York City, announces that he has opened offices in the First National Bank Building, Oakland, Cal. Since 1915 Mr. Ashley has been practicing architecture in Shanghai, China.

Announcement is made of the death of Charles F. Weeks, for many years an architect in West Medford, Mass. He was born in Lincoln, England, seventy-four years ago, and came to the United States in 1886. Mr. Weeks became a skilled architect and designer and, as such, had drawn for the United States Government special designs of small houses for workingmen, and made card models of these little houses, which were sent by the Government to remote places where there were no architects, but only carpenters, who were enabled by the use of these models to build the houses. Mr. Weeks is survived by a daughter and a son.

FIFTH CENTURY SARCOPHAGUS, RAVENNA, ITALY

THE AMERICAN ARCHITECT
The ARCHITECTURAL REVIEW

VOL. CXX WEDNESDAY, OCTOBER 12, 1921 NUMBER 2378

THE HAMBIDGE THEORY OF SYMMETRY AND PROPORTION IN GREEK ARCHITECTURE AS RELATING TO ARCHITECTURAL DESIGN

BY JAMES A. KANE

DURING the past centuries the underlying principles of Greek design, especially those of symmetry and proportion, have been little understood. The excellence of this design has been freely conceded, competent opinion being practically unanimous in this regard. However, just the opposite situation exists as to the underlying cause of this remarkable excellence—an excellence which in certain examples approaches perfection. Gaudet, for example, says in his Eléments et Théorie de l' Architecture: "le Parthénon . . ., c'est, vous le savez, la perfection meme". . . .

The one underlying principle based upon undisputed fact that has been pointed out in this connection, is that of construction. Aside from this one law, these remarkable accomplishments in design have been explained as the result of a superior architectural instinct possessed by the Greek architect of that period.

However, with the information recently placed at our disposal, can we let this explanation stand as a satisfactory one? Was this work due simply to a combination of the knowledge of the just employment of constructive principles coupled with a very keen architectural perception? Or, had the architects of this age enlarged their understanding by the acquisition and employment of some principle of design comparatively unknown and unused by us? Should the latter be the case, we would have a reasonable explanation of their unexcelled efforts—efforts that are almost without parallel in the annals of human endeavor. There are indeed few examples of such efforts made by men over 2,000 years ago which have stood without peer throughout the succeeding ages; yet few will admit that in intelligence, earnestness of purpose and artistic perception, the most distinguished members of our profession are inferior to men living centuries ago.

Men have enormously enlarged their understanding since the days of Pericles, Phidias and Ictinus. The accumulated knowledge of centuries has been systematized, and disseminated by our great educational institutions. No longer do the collateral branches of our profession offer unknown difficulties. Planning, composition and graphic expression have been developed to a degree probably undreamed of by the Greek. A broad comprehensive knowledge has taken the place of a restricted one. Yet, we cannot say with any degree of assurance, that we have excelled or even equalled the work of our Greek predecessors.

Since we cannot admit that intellectually we are inferior to the men whose work we so frankly admire, their understanding of the problem of design and proportion must have been in some way superior to ours. It is reasonable to suppose, as has been previously suggested, that this superiority was due in large measure to the knowledge and application of some principle neglected by us. Two pertinent questions now naturally arise: First, what could this idea or principle be? Second, what is the probability of the Greek having knowledge of it, and employing it? The only way, in all probability, of either of these questions being answered lies in a careful study and examination of the work of classic Greece in a broad and open-minded manner.

It has long been recognized by many that the monumental structures of Greece have differed in some important manner from those of Rome and subsequent structures. Attempts to explain the proportion of the work of classic Greece, especially that of the Parthenon, based upon the employment of the linear module, or by certain linear proportions, have been unsuccessful. The most scientific explanations are those by Penrose and Lloyd—but all such explanations lack conviction and are unsatisfactory, especially as the results are almost always more or less rough approximations.

Now, as is well known, the Roman and much subsequent work is largely commensurable in any two dimensions; or, architecturally speaking, is co-ordinated to a great extent by the use of the module, but in the best examples of the Periclean Age of Greece, this more or less simple device of co-ordination does not exist. Yet there must exist in this work a co-ordinating principle, otherwise "perfection" never could have resulted.

This brings us to the point where light has been thrown upon this situation in a most important manner, by the result of the remarkable observations made by Mr. Hambidge. For the first time in centuries we have our attention called to an entirely new idea or mental standpoint—to a conception which will give us, it seems certain, the necessary additional mental tools to approach our problems armed with the Greek principle of design.

This idea in its simplest form is the idea of measuring or obtaining proportion by areas rather than by linear units. Our facilities of measurement are so well developed and understood that it is difficult to conceive of any other manner of measurement than our own being a practical and natural one, but when it is realized that these facilities were not possessed by the Greek, it is seen that he was forced to employ other means than ours. His surveying instruments were primitive. For this purpose he was compelled to rely upon the "measuring cord" or rope. Furthermore, the science of arithmetic, as we now understand it, was then unknown. This is an important fact. Consequently, the mental attitude of the Greek toward the problem of mensuration and proportion would be governed largely by these circumstances. An idea of just what this mental attitude was may be obtained from a consideration of the origin and development of the science of surveying employed by the Greek and his predecessor, the Egyptian.

The method of surveying or "cording of temples" by means of a rope dates from earliest antiquity. In the hands of the Egyptian, "cording" became a highly developed science. There exist many references to this process in Egyptian inscriptions. The surveyors who "corded" the Egyptian temples were known by the Greeks as the Harpedonaptae or rope-stretchers, and were regarded by the Greeks as expert geometers. The knowledge of this science was obtained by the Greeks from the Egyptians as early as the sixth century B. C. and was at an early period applied by them to the needs of architecture—as shown by the history of the famous "Duplication of the cube" problem. In the hands of the Greek this science was rapidly developed and perfected, and formed, it seems certain from Mr. Hambidge's researches, the basis of the correlating principle of proportion in their architectural compositions. How this actually could have been so may be understood further by a consideration of the result obtained from surveying by means of the rope, and the lack of knowledge of arithmetic.

Now suppose it is desired to know the size of a rectangular plan of this type:

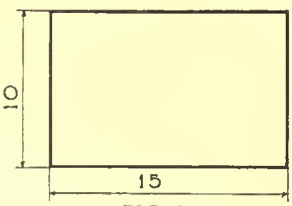


FIG. 1

Today its size or area might be found by multiplication as follows: 10′ x 15′=150 sq. ft. Without the knowledge of arithmetic its size could not be determined in this manner. However, a method open to the Greek was this: To refer the size of the rectangle to that of a square in one end of the rectangle thus:

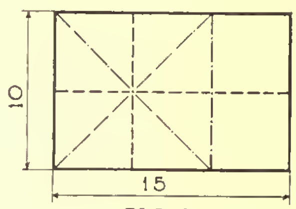


FIG. 2

This plan then could be described as a square and ½ rectangle (the size of the square being 10′) or for example as a rectangular plan 2 squares (of 5 ft.) wide and three squares (of 5 ft.) long, which was doubtless the Greek method. There would be of course an endless number of plans of this type.

Another type of plan easily surveyed by this method in which are inherent important proportional properties is a rectangular plan of this type:

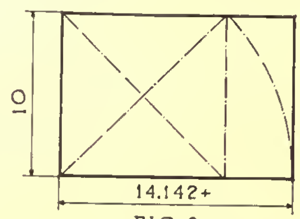


FIG. 3

Again, its size or area could be determined by arithmetic as follows: 10′ x 14.142 = 141.42 sq. ft. Here the decimal fraction occurs as an apparent obstacle to the Greek (it was not until as late as the 16th century that the use of the decimal was advocaetd). After constructing the square in the end of the rectangle, the length will be found to be the diagonal of this square. The Greek could then describe this plan by saying that it was a rectangle whose length was the diagonal of the square on its end—(the side of the square being 10′). Other rectangles of this type are rectangles such as: the rectangle whose end is as above but one whose side is the diagonal of the latter rectangle; one whose side is twice the end; or one whose side is the diagonal of two squares on its end, etc. It will be observed that there have been indicated two methods of determining and describing areas—first, the usual one of today by linear measurement and arithmetic; second, that doubtless employed by the Greeks, i. e., by referring the size of the rectangle to the size of a square constructed on the end of it, a method of mensuration entirely by area, a method which is in its character geometric and not arithmetric.

It will also be seen that while both types of rectangles were measured by areas, these types differ radically from each other. In the first type the areas are divided by ordinals and consist of squares, their widths and lengths being commensurable; in the second type the ends and sides are incommensurable but have a definite relation to each other. In the first of these rectangles for example, if 10 is squared the result is 100 while 14.142 + ² equals 200. That is, the square on the end and that on the side are as 1:2, therefore the ends and sides are commensurable in squares. The ends and sides of the other rectangles of this type mentioned above are commensurable in squares in the following proportions 1:3, 1:4, 1:5, etc. The fact that the ends and sides of these rectangles are commensurable in squares has an important bearing on their relation to Greek design.

The Greek architects, as their work in the light of Mr. Hambidge's investigation shows, entirely abandoned the use of all other rectangles than those of the latter type. To the logical mind of the Greek these rectangles made an appeal, doubtless on account of their properties mentioned above and through the opportunities they offered for the study of proportion. As it is difficult to realize how a knowledge of proportion could have been obtained at that time other than by geometric means, these rectangles and the right-angled triangle offered almost unlimited opportunities for investigation. That proportional relations were thoroughly understood is amply attested by existing records. We must therefore expect to find that in all Greek work of the classic period the proportional relations are geometric in character.

The relation these rectangles bear to each other and the simplicity of surveying them may be shown by means of a rope and the knowledge that a triangle whose sides are 3, 4, and 5 units is a right triangle, a fact which apparently was known at a very early period. For this purpose it is supposed that the rope is covered with some material and carefully calibrated and that rings are inserted at fixed intervals through which pegs may be driven.

A square plan may be laid out with a rope, as follows: First drive a stake through the ring at A. At B, 4 units from A, with the rope taut, drive another stake through the ring at this point. Then with a portion of rope nine units in length from B, drive a stake through the ring at the end of the ninth unit and third one from B to A, at D. There is now an unstretched loop of nine units from B to D. Through the fourth one from B, i. e., the fifth from D, with both sections taut, drive a stake through the ring at C. We would then have a right angle at B and three corners of a square at B, A and C.

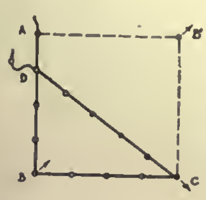


FIG 4

To locate the fourth corner, release the rope at B and at D, with the ends A and C fixed. Draw the ring B diagonally in the direction of B¹ a stake driven through the ring B when the segments become taut will locate the fourth corner of the square. This is an operation much simpler to perform than to describe.

Having constructed the square suppose it is desired to construct a rectangle whose length equals the diagonal of the square. The point C is fixed. There is a free end at D. Draw the rope taut to B. With the distance BC as a radius and C as a center, swing it down in the position CE. A similar operation with B as center will give the remaining corner F. We now have a rectangle whose end and side are as the side of a square to the square's diagonal.

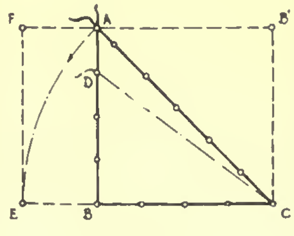


FIG. 5

Again, suppose we have constructed the rectangle just described but desire a somewhat longer one. This could be accomplished by stretching the rope from C to F and revolving it, and by repeating the operation with B as the center.

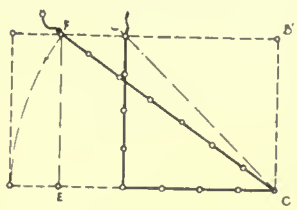


FIG. 6

A larger rectangle of two squares can be obtained by revolving the diagonal of the rectangle just described or by a similar operation to that in constructing one square, which an inspection of the diagram will show.

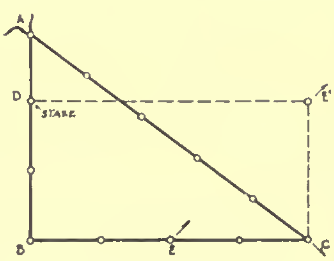


FIG. 7

A still larger rectangle can be obtained by revolving the free end with C as a center and CD as the radius and repeating the operation with B as center, or by constructing one square and with the center of the side of this square as a center

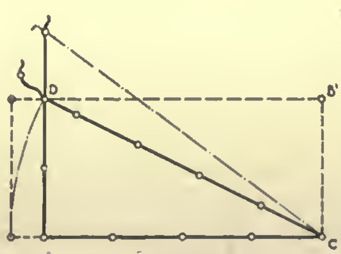


FIG. 8

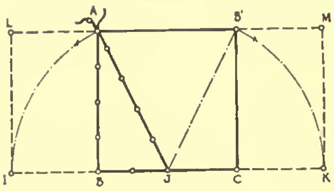
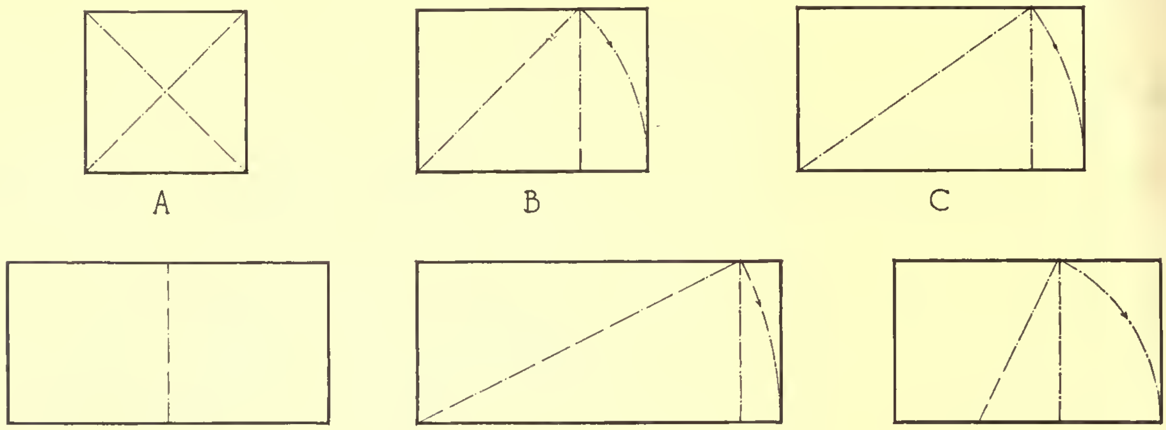


FIG. 9

and the distance JA or JB as a radius, revolving the rope to JK or JI. By the latter operation, we have also constructed the rectangle ABKM.

The following rectangles have been very simply and naturally laid out:



A B C D E F

FIG. 10

in the determination of the size of any rectangle was the process of referring it to a square. This is a simple example of the Greek conception of what is called "the application of areas." The method was further employed by applying other areas than squares in any given area, in order that the latter area might be understood, and its proportional parts used as elements of design. (It was not considered necessary that the applied areas be smaller. They could be equal, smaller or larger).

Considering the width as the side of a square in each case, the lengths of the rectangles are: A, the width of a square, i. e. a square; B, the diagonal of a square; C, the diagonal of B; D, the width of two squares, i. e. two squares; E, the diagonal of two squares; F, one-half the side of a square, plus the diagonal of a half a square.

Having laid out these rectangles the Hambidge theory of Greek design may be more readily understood. This theory may be stated as follows:

That the design of classic Greece was correlated by means of applied Geometry—only certain areas, however, being employed whose properties were thoroughly understood: the areas, or rectangles forming the basis of the design, being the rectangles just laid out, i. e. the rectangles A, B, C, D, E and F.

The latter two rectangles furnish the correlating proportions of their great masterpieces such as the temple at Bassae, the Erectheum and the Parthenon. There can be little doubt that this could have been the natural result of the employment of the means at their disposal, while from a careful investigation of Mr. Hambidge's work it seems almost beyond doubt that this result has been obtained by the Greeks.

It has been seen that the fundamental operations

er). How different then is the Greek conception of size or relative proportion from ours! And how natural that he should have had this viewpoint. It may now be observed first that the Greek method of mensuration was in fact applied practical geometry, and so considered by the Greek; second that the problem of proportion was studied and understood through geometric means. It then follows that the plans, at least, of their temples would be laid out by a geometric process—the stretched rope taking the place of our lines. To the logical Greek mind it would be natural and consistent to apply the same process to the elevations and details of his structure. That this actually was the case is clearly indicated by Mr. Hambidge's observations. These observations disclose the fact that when certain ratios are found to exist in the plan these same ratios are found throughout the entire structure, plan, elevation and details. For example, in the Parthenon the proportional ratios throughout are those inherent in the rectangle whose length is the diagonal of two squares on its end and the square, a component part of this rectangle.

To produce these ratios it seems that the Greek architect proceeded either of these ways:—First, to select some rectangle to form the basis of the design such as the rectangle that forms the basis of the Parthenon design, i. e., one composed of a square and the rectangle whose length was the diagonal of two squares on its end placed as shown in Fig. 11 and then to build up the entire composition by using only the logical component parts of this rectangle, or, second,—to determine first his desired fundamental dimension. This dimension might have been the length of the architrave, i. e., the typical column center dimension, or his total length or width. Probably for structural reasons the column center would be selected, the approximate length

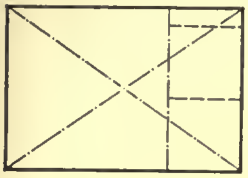
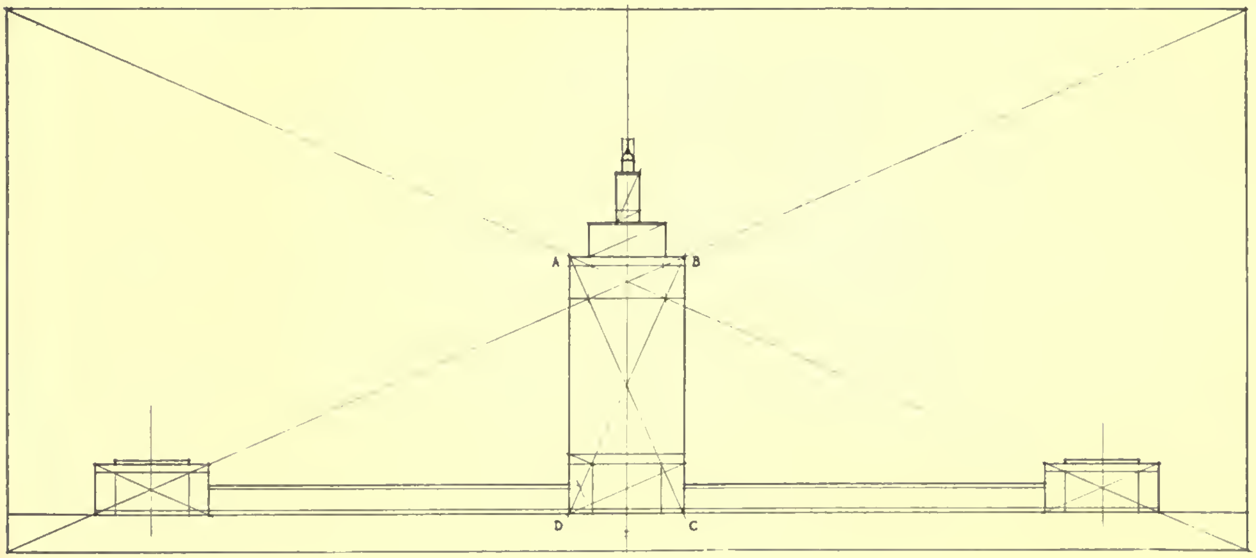


FIG. 11



and width would then be determined, for example, by the number of columns desired. In any case the next step would be to establish a rectangle to form the basis for the design, such as that occupied by the small projection below the first step, i. e. the leveling course. This rectangle having been established, every part of the plan and elevation as well as of the details was made some logical geometric subdivision of this rectangle.

The underlying idea then of Greek design was the conception that the component parts of a design should bear a geometric relationship to each other and to the whole composition in terms of a fixed area.

The accompanying diagrammatic sketch may serve in an elementary way to explain this idea and to suggest some of its possibilities. As a basis for this illustration, the rectangle whose length is the diagonal of two squares on its end has been selected. Here the rectangle ABCD was first laid out. The other parts were obtained by the elementary process of using forms whose diagonals are parallel to or perpendicular to that of the original rectangle, or those whose ends or sides are determined by the intersection of these diagonals.

ARCHITECTURAL ACOUSTICS

The Transmission of Sound through Flexible Materials—Part II

Being part of an investigation of an inclusive research program upon the general problem of the transmission of sound in buildings

BY PAUL E. SABINE

IT appears then that we may express the "sound insulating" values of a material of this character by giving the values of two coefficients which are experimentally determinable for any pitch, and that the relative merits of two different materials may be compared quantitatively by a comparison of these coefficients.

It was next of interest to know whether the comparatively simple law of transmission exhibited by this loosely felted material applies to somewhat more complex materials of the same general nature. Accordingly measurements were made upon a considerable number of materials that have been more or less widely used commercially as "sound deadeners." The tests were made upon samples of uniform size, mounted in the same manner in the doorway between the Sound Chamber and the Test Chamber. Successive layers were in contact, being held at the edges between felted wooden frames bolted together. All possible precautions were taken to prevent the passage of sound through cracks at the edges of these frames.

Of the various materials tested the results for six are presented as typical. These panels differed rather widely in their physical properties, so that a study of the results with these differences in mind may have considerable bearing upon the general problem of sound insulation.

TABLE 2

Sample	Thickness per layer	Material: Filler	Material: Covering
1	1″	Hair felt, wt. 9 lbs. per cu. ft.	None
2	½″	Sea weed, wt. 6.8 lbs per cu. ft.	Light paper, .015 lbs. per sq. ft. stitched at 3″ intervals.
3	½″	Coarse, woody, vegetable fibre, pressed into flexible board, wt. 15 lbs. per cu. ft.	None
4	½″	Light, fine, soft, vegetable fibre, wt. 9 lbs. per cu. ft.	Heavy paper, .092 lbs. per sq. ft. stitched at 6″ intervals.
5	½″	Mixed hair and fibrous asbestos, wt. 25 lbs. per cu. ft.	Heavy paper, .092 lbs. per sq. ft. stitched at 16″ intervals.
6	½″	Mixed hair and fibrous asbestos, wt. 31 lbs. per cu. ft.	One side, heavy paper .092 lbs. per sq. ft. Other side—Burlap.

These materials are described in Table 2. With the exception of Numbers 1, and 3 they were made of fibrous materials held together by being stitched between sheets of heavy paper. The results show how important a part is played by this paper covering, so that its mass is given. The results of the transmission tests are represented in Figure (3).

TABLE 3

Sample	Mass per sq. ft. 1″ thick	C_2 r	C_2 q	C_3 r	C_3 q	C_4 r	C_4 q	C_5 r	C_5 q	C_6 r	C_6 q	C_7 r	C_7 q
1	.74	.38	.10	.25	.20	.35	.28	.35	.37	.26	.43	.48	.43
2	.60	.85	.36	.67	.36	.58	.56	.33	.86	.35	.90	.30	.94
3	1.28	.77	.64	.77	.52	.68	.74	1.00	1.04	.10	1.78	.22	2.02
4	.8	.75	.42	.60	.34	.50	.44	.45	1.42	.50	2.74	1.00	3.12
5	2.1	1.22	.56	1.30	.60	1.22	1.08	1.05	1.64	.85	2.90		
6	2.6	.60	.90	.96	.86	.87	1.60	.60	2.44	.50	4.00		

For the sake of ready comparison with other materials, the results for the felt are presented again as Sample-Number 1. The coordinates in Figure 3 are the same as in Figure 2.

The graphs drawn are the best representation of the experimental results. To avoid confusing the figures, the experimental points actually obtained are not inserted. It should be stated, however, that these points fall no further from the values indicated by the graphs than was the case with hair felt. Most of the values represent the average of the results of observations taken by two different observers. The agreement between the values obtained by the two observers was close so that there is ample grounds for confidence in the essential correctness of these values. The departure from the straight line noted in the curves for the two highest tones with Samples 4 and 5 is explicable on the assumption of a possible by-path for sound other than through the sample. Efforts to eliminate this possibility by greater care in preventing the passage through cracks around the edges of the frames proved ineffective in changing the results. The difficulty of securing an ideal mounting for materials of this character is very great, however, and in the absence of any good theoretical reason for supposing a different law of transmission in the cases referred to from all the other cases in which the simple logarithmic law seems to hold, it has been assumed that the departures from this law are to be explained in this way. The point will bear further study, however.

We may accordingly, extend the law expressed by Equation 3 to all materials of what may be described as a "quilt-like" character, i. e. materials in which the elastic forces are small as compared with damping forces. The constants r and q of Equation 3 may be taken from the graphs in the manner illustrated by the felt after which we may compute the sound insulating efficiency of any number of units of the material in question. In

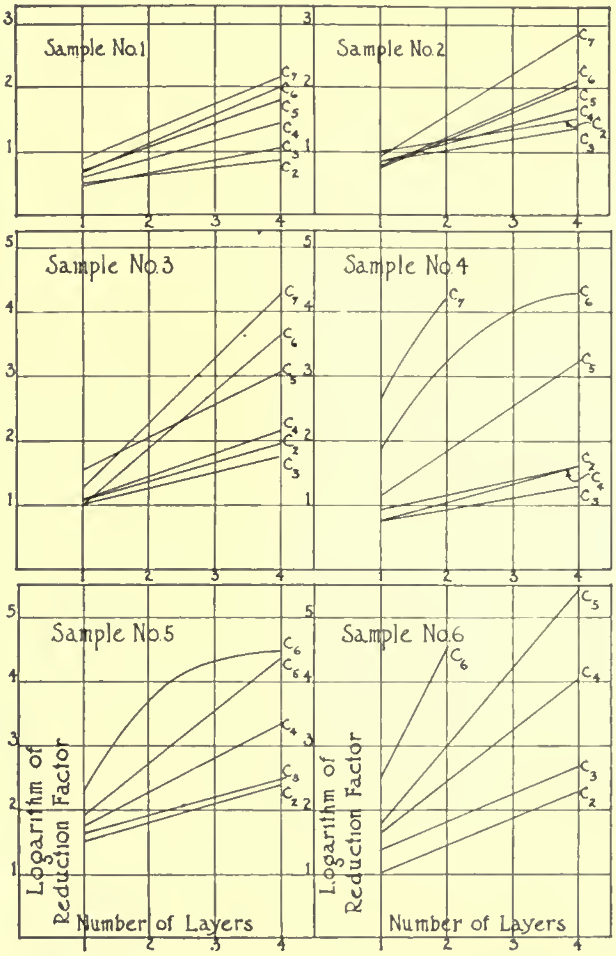


Figure 3. Reduction of Intensity of Sound transmitted by six different materials. For description of materials, see Table 2 on the preceding page

Table 3, the values of r and q are given for each of the tones for these six materials. The value of q, in each instance is that for a number of units of the sample that would have the thickness of one inch. A study of Table 3 shows that with few exceptions this value of q, which may be called the thickness coefficient, for the various samples is in the order of their relative densities. The value of k for any thickness, and any tone may be computed by Equation 3, so that we have a means of comparing directly the sound insulating values of these materials.

Efficiency of Paper Covering

The markedly lower efficiency of the felt as compared with materials of a not widely dissimilar character but contained between heavy paper covers leads to an inquiry as to the effectiveness of the paper itself in reducing the intensity of the transmitted sound. A special experiment was carried out to test this point. Heavy building paper weighing .095 pounds per square foot was tacked on one side of a felted frame, and set in the doorway between the Sound Chamber and the Test Chamber. The reduction in the intensity of sound through one, two, three and four thicknesses of paper with intervening air spaces of 1-¼", was measured.

The spaces between the successive layers of paper were then filled with felt, and the transmission of the combination was measured. This arrangement, in which the felt was only in loose contact with the paper, is not exactly equivalent to the other samples in which the filler was stitched to the paper covering. The results indicate that the combination of paper and felt is much more effective in reducing the transmission of sound than is either alone. In Figure 4 logarithm of the reduction is plotted against the number of elements, each element consisting of a doublet of felt and paper. As may be seen by comparison with the graphs of Figure 3 the combination of the highly absorbing and porous felt with the somewhat impervious paper is as effective in reducing the

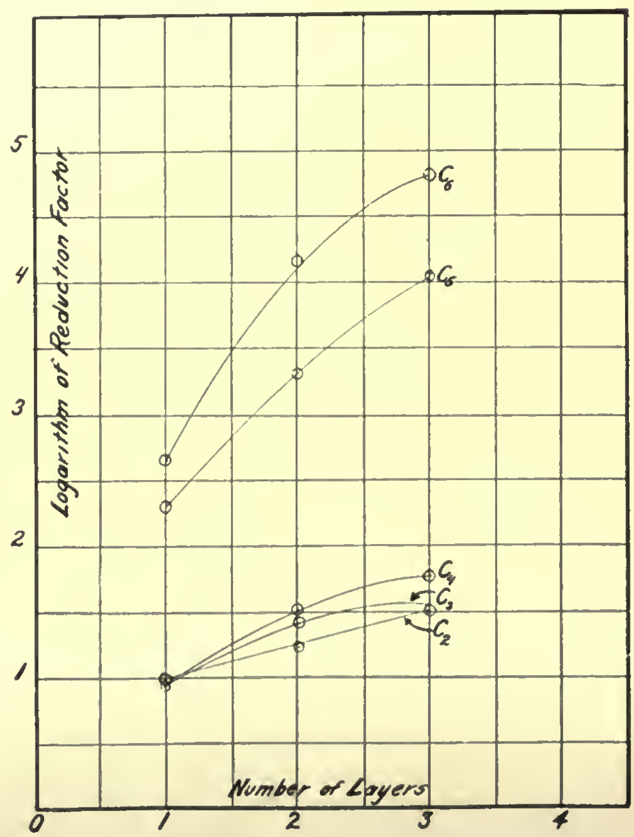


Figure 4. Reduction of Intensity of Sound by one, two and three doublets of Hair Felt and Heavy Paper

transmission of sound of the higher pitches as are the asbestos and paper combinations of half the thickness but greater mass. In Figure 5 the upper curve represents the actual logarithmic reduction of intensity of a partition consisting of four thicknesses of paper and three intervening layers of felt. The lower curve represents the values computed upon the assumption that the separate elements of the combination act inde-

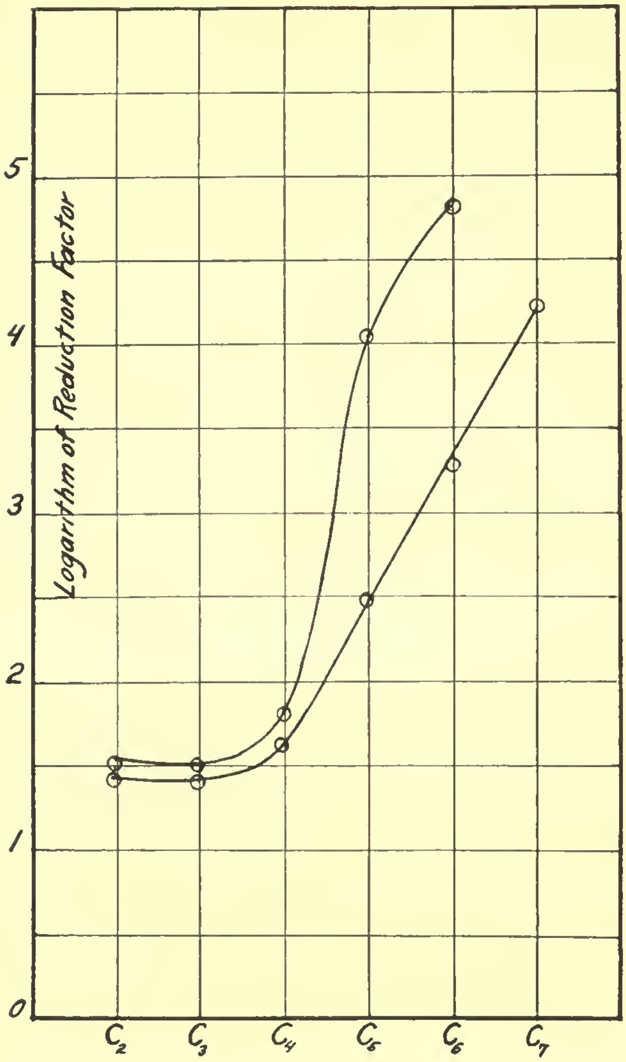


Figure 5. Reduction of Intensity of Sound transmitted by three doublets of Hair Felt and Paper. Upper curve represents the measured values; lower curve as computed

pendently of each other in reducing the transmission of sound. The fact that the actual reduction is markedly greater than that computed, especially for the higher tones, indicates that we are here dealing with a case that is essentially different from that in which the stitching together of cover and filler makes the two act as a single unit. The departure of all the curves of Figure 4 from straight lines bears out this hypothesis. This point was noted and an explanation given in the paper by Prof. Sabine already referred to, in which a construction consisting of alternate layers of thin sheet iron and felt with an intervening air space was studied.

TABLE 4

Source	Pitch Vibrations per sec.	Log Intensity	Inches of Sample 6 for complete extinction
Violoncello	256	5.	5
Violin played Fortissimo	512	7.	4
Loud speaking Voice (Male)	328-1050 *	7.	4
Loud speaking Voice (Female)	328-1050 *	5.	3
Open diapason Organ Pipe speaking under 4" pressure	512	8.	4-1/2

*Note. This is the approximate range of pitch given by Professor Dayton C. Miller in his "Science of Musical Sounds" of the upper partial tones of the human voice which determine the characteristics of vowel sounds, of what he calls the first class. It was upon the persistence of these upper partials, that the intensity was computed. The fundamental tones of the voice were much lower than the frequency range given in the table and of course, different for the male and female voices. The extinction of these upper partials renders speech unintelligible.

PRACTICAL CONSIDERATIONS

There are a number of points that might well be considered in the application of the foregoing to the practical problem of reducing the transmission of sound from room to room through partition walls. Only two will be discussed.

The first is as to the meaning of the numerical values given in terms of the loudness of ordinary sounds. Unfortunately there is no means of expressing quantitatively the loudness of any given sound. Moreover, the intensity of sound from any source within a room depends upon the absorbing power of the room as well as upon the acoustic power of the source itself. Recourse must be had to examples of the numerical values of sounds of ordinary intensities. Taking as our unit the minimum audible intensity for sound of any given pitch we may express the intensity of the sound from any source in a given room in terms of this unit. From time to time measurements of this sort have been made in this Laboratory. In Table 4, the intensities in the Sound Chamber from a number of common sources is given. The values in the last two columns are of course only rough approximations since the loudness of sound from the sources may vary widely. The Table gives a very good idea, however, of what constitutes complete insulation of sounds of these intensities.

The question as to how far the insulating efficiencies given above can be realized in actual construction is one that cannot be answered at the present stage of the investigation. In ordinary practice, the sound deadening material is installed between double partitions. Acoustically, the conditions in such use must be considerably different from those under which the present experiments were made. While the results of the investigation so far may be safely used in settling the question of the relative merits of materials of this sort, it is not possible to predict the actual effectiveness of any of them when used in a particular type of wall construction. The mode of supporting the sound deadening material, the separation of the double walls, details of construction, all enter into the problem, and must be made the subject of careful investigation before we can say with certainty that this means of increasing the sound insulating properties of partition walls is sufficiently effective to justify the increased cost entailed by the use of materials of this type. The results of the actual experience in attempts to reduce the transmission of sound in buildings are of great value in suggesting the most promising lines of investigation, and to this end, opinions and suggestion of those interested in the practical aspects of the problem will be welcomed.

Meanwhile a parallel investigation upon the transmission of sound by partition walls of standard types is being carried on. The ever increasing congestion of living and working conditions of modern life, the rapid multiplication of mechanical devices, with their inevitable noise and the consequent wear and tear upon nervous and mental power, make the problem one of vital importance and would seem fully to justify the time and labor necessary to secure the quantitative data required for its solution.

The End.

KNIGHTS OF COLVMBVS HOME SPRINGFIELD MASSACHVSETTS

JNO WM. DONOHVE, A.I.A. ARCHITECT

First Baptist Church Providence.

(See reproduction of original drawing by O. R. Eggers on opposite page)

PROVIDENCE, Rhode Island, may be said to be the first home of the Baptist Church in America. The congregation which now worships in the church so admirably shown in Mr. Eggers' sketch, comprises among its members many of the descendants of that first congregation which, in 1638, organized this church, under the ministry of Roger Williams.

The church illustrated on the opposite page is similar in design to many of the so-called two-story meeting houses that adorn New England villages and cities and which suggest, in every line, the devout spirit that has for so long a time maintained this church and zealously guarded its traditions.

FIRST BAPTIST MEETING HOUSE, PROVIDENCE, R. I.
THE AMERICAN ARCHITECT Series of Early American Architecture 270a

·EDITORIAL·COMMENT·

Unemployment And Wages

THE man out of a job shares today the front page with the latest news of municipal investigation and the most recent sensational "hold-up." He decorates the lawns of city parks, where with a newspaper for a mattress, he snatches some moments of sleep, and during waking hours, poses as "human documents" for political parties struggling for control. Professional reformers of various ranks and wide ranging abilities, are rushing into print. The "high-brow" analyst, from the seclusion of his study, has long since given to the world what he feels sure is the only true remedy for the evils of unemployment.

The Government, as represented by those connected with high offices, positively assert that they are ready to launch a remedy and confidently assure all the people that at least a million of the several million unemployed will at once be found jobs.

Organized labor is not loud voiced in the present discussion. From the standpoint of labor unions, it is unwise to discuss the wage question. The shrewd, far-seeing labor leaders undoubtedly know it is the very cure of the unemployment question. It is absolutely useless, as it is utterly misleading, to consider the question of the large numbers of unemployed without making wages the chief matter of investigation.

If labor showed the same unwillingness to discuss the problem of wages as affecting all the people and not specifically in its relation to organized labor, it would beget confidence, restore stability, and inaugurate an instant resumption of every stagnant industry.

The New York *Herald,* editorially commenting on the present situation as to unemployment, very wisely stated that if labor would seriously discuss ways and means of revitalizing business, it would be a "consistent building from the bottom up. All other methods of approach to the unemployment problem are but the footless efforts to build from the top down."

WE have made many economic blunders during these days of reconstruction, and we should profit by our errors. It would be nothing short of an economic fault to create unstable conditions and then call on the unemployed to go to work.

The many enterprises now standing still, and industries halted,—building, for example,—naturally throws vast numbers out of employment.

Any one of the many theories advanced, that does not take into first consideration the question of wages, is but a further example of economic blundering.

When the question of wages has been so definitely settled as to create a condition of reasonable stability, there will be a humming of the wheels of industry so loud and so steady as to drown out the theoretical arguments that are now complicating an already grave condition and getting us no further on the way to a solution of this vexing problem.

IN Great Britain men out of employment have been regarded as unfortunates whom it is the duty of the more fortunate to support until the return of better times. So generous has been the aid that competent observers say many thousands of men are receiving each week almost the wages of ordinary laborers. When offered work they refuse anything not directly connected with some trade in which they claim to be proficient and which happens always to be a seasonal trade, the season of course several months past, or to come. The result of unemployment doles led Mr. Bramwell Booth of the Salvation Army to write a letter to the London Times, in which he said among other things, "I do protest that paying for nothing is all wrong * * * * * * *. If we must pay, and it is evident we must, let us pay for work. One of the most serious dangers of the dole age in which we are living is the weakening of the self-respect and sturdiness of the working people. To be paid to do nothing is, economically and socially, bad enough, but to be willing to be paid to do nothing, that is far worse."

Bramwell Booth is one of the most practical and experienced sociologists in the world, the friend and counsellor of human flotsam and jetsam, the "down and outers," victims of intense commercialism. For such a man to protest that the way to aid men out of work is to give them work and not financial aid except as payment for work is significant. He is ably seconded by another man, Herbert Hoover. He said "The cure for unemployment is employment." It is quite possible Mr. Hoover paid small attention to human beings as individuals until his reputation for competent direction of large enterprises led to his selection seven years ago to head the Belgium relief work. He knows that self-help is the best help.

JUDGE Landis did a good work in Chicago in refusing to act as Arbiter between the associated employers and the associated laboring men until each side cleared its respective working agreements of clauses inimical to the public interest.

That a large number of the laboring men refused to abide by their promise to accept his rulings does not in the least impair the value of the work he performed. It is late in the season and during the winter arrangements will undoubtedly be made to start work in the spring along the lines indicated in Judge Landis' decision. The resumption of the building industry will do more than any single thing to reduce unemployment and start again the wheels of industry. Man's inhumanity to man is well exemplified in the present stand of organized labor on the question of wages. Prices are on the downward path in every line except house rentals and rents will come down when the supply of houses is adequate. Prices have fallen because of a "buyer's strike" caused by the inability of people to pay high prices as so many are out of employment and those fortunate enough to be employed are earning less than they were a year ago, that is, those who are not members of unions who are holding to war-time wages. Reliable reports indicate that the unions holding out most strongly for high wages number many unemployed and the refusal to abide by agreements entered into with arbitrators will cause many more to be laid off.

A willingness to accept the inevitable will cause a boom in building and in time will react favorably on every trade and calling. The money is in the banks waiting for some brave men to take a chance and ask for credit in order to resume business. It is fine to theorize but it is feared that this period of depression will end as have all others. They recur periodically about twice in a generation. The cry of the unemployed brings forth many suggestions, some of practical nature, but nothing is done until an actual shortage in certain goods leads a few adventurous manufacturers to try and capture the market. Their competitors follow and the money spent in wages by the employes gets into circulation. Prices rise and then fall as the market becomes saturated. There exist today underproduction of many things coupled with underconsumption of the things to be had in the market because those who might produce are idle and have not the money to buy the things of which there is a plenty. A survey of the country to determine wherein exists the greatest deficiency of goods shows that in the building industry exists the salvation of all business. The unions of building trades workmen hold the happiness of millions in their keeping. If they will agree to a reduction in pay to start things going there will be such a demand for their services in the near future that pay will again rise in response to the law of supply and demand.

PUBLISHER'S ANNOUNCEMENT

The Memorial Quadrangle at Yale University, New Haven, Conn.
James Gamble Rogers (Yale '89) Architect

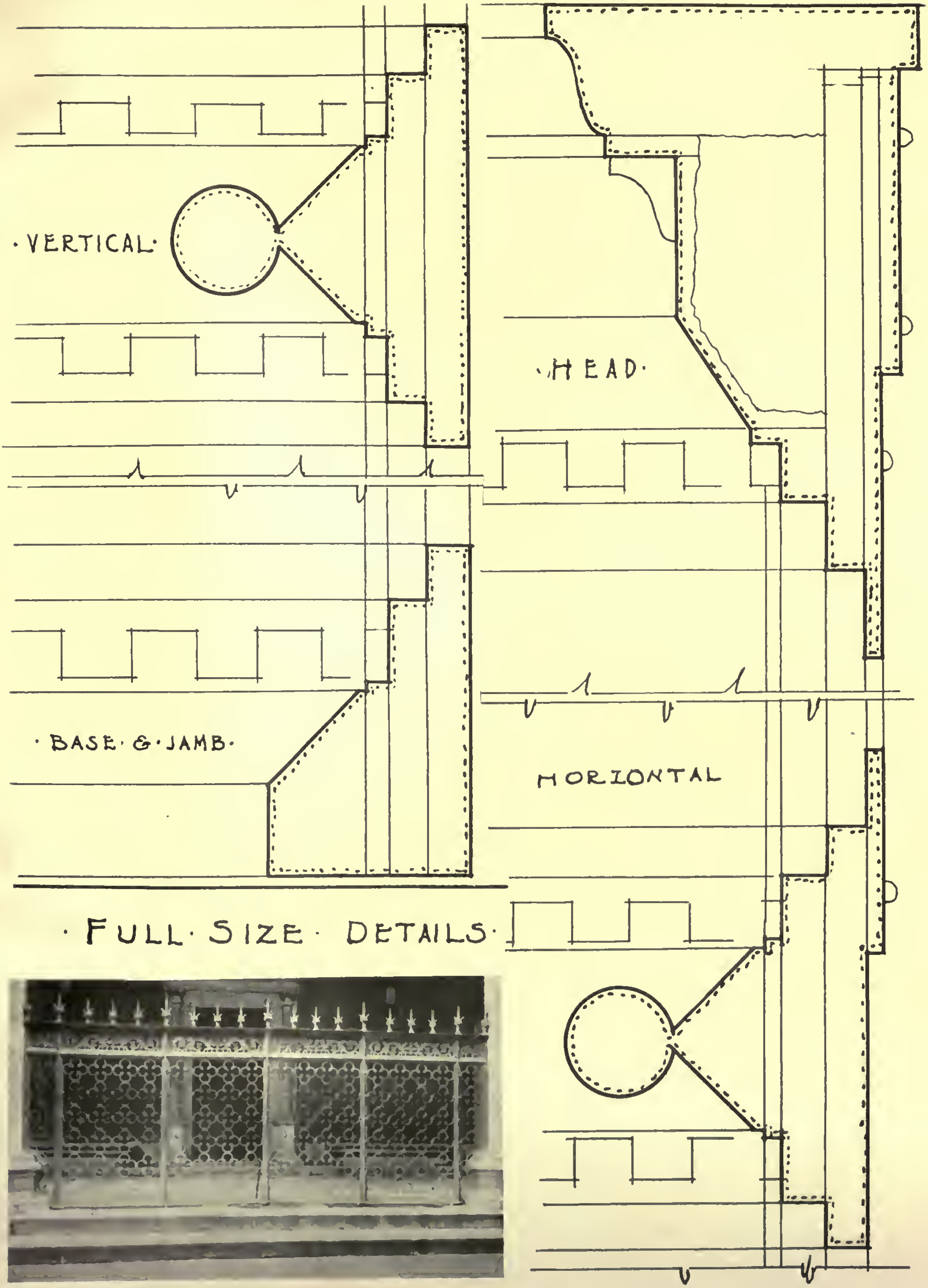
THE AMERICAN ARCHITECT and The Architectural Review will, in the issues of October 26 and November 9, illustrate the Memorial Quadrangle at Yale University, New Haven, Conn.

Believing that the architectural importance of this unusual group of collegiate buildings makes necessary the most authoritative and painstaking presentation, there has been no effort to secure priority of publication, but to present to readers of this journal the most complete illustration and description of these buildings that would be possible.

William H. Goodyear, M. A., Yale '67, Curator of Fine Arts, Brooklyn Museum Institute whose studies in Temperamental Architecture are familiar to the profession of architecture everywhere, will, in the issue of October 26, present an exhaustive analysis of the architectural features of the Quadrangle.

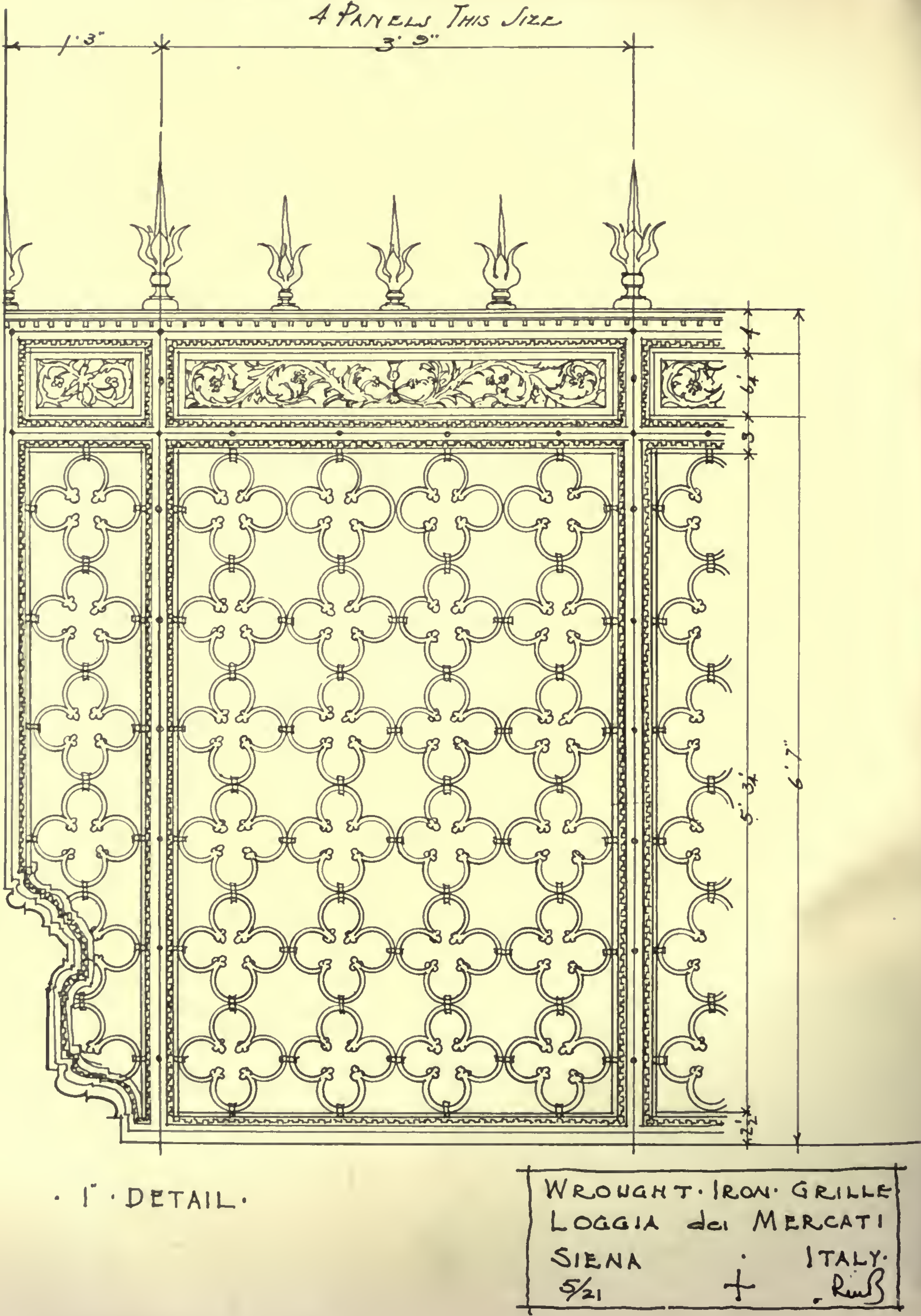
In the issue of November 9, James Gamble Rogers, the architect of the Quadrangle, will contribute an article.

Many of the illustrations have been made exclusively for these issues, to which have been added illustrations that have appeared at different times in the numerous publications of this collegiate group. In order to have a complete record of the buildings, it has been thought desirable to include a certain number of the better views heretofore shown.



WROUGHT IRON GRILLE, LOGGIA DEI MERCATI, SIENA, ITALY

MEASURED AND DRAWN BY ROBERT M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP



MEASURED AND DRAWN BY ROBERT M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

ENTRANCE FRONT

HOUSE OF WILLIAM LADD, CEDARHURST, L. I., NEW YORK

PEABODY, WILSON & BROWN, ARCHITECTS—CARROLL W. LADD, ASSOCIATE

274'

HOUSE OF WILLIAM LADD, CEDARHURST, L. I., NEW YORK
PEABODY, WILSON & BROWN, ARCHITECTS—CARROLL W. LADD, ASSOCIATE

HOUSE OF WILLIAM LADD, CEDARHURST, L. I., NEW YORK
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HOUSE OF H. W. BELL, ARDSLEY, NEW YORK
ARTHUR L. HARMON, ARCHITECT

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THE AMERICAN ARCHITECT—THE ARCHITECTURAL REVIEW
VOL. CXX, NO. 2378 OCTOBER 12, 1921

HOUSE OF H. W. BELL, ARDSLEY, NEW YORK
ARTHUR L. HARMON, ARCHITECT

HOUSE OF CHAPIN S. PRATT, LAWRENCE PARK WEST, N. Y.
BATES & HOW, ARCHITECTS

274 9

REAR VIEW

HOUSE OF CHAPIN S. PRATT, LAWRENCE PARK WEST, N. Y.

BATES & HOW, ARCHITECTS

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HOUSE OF CHAPIN S. PRATT, LAWRENCE PARK WEST, N. Y.
BATES & HOW, ARCHITECTS

DETAIL OF GARAGE AND SERVICE WING

HOUSE OF CHAPIN S. PRATT, LAWRENCE PARK WEST, N. Y.

BATES & HOW, ARCHITECTS

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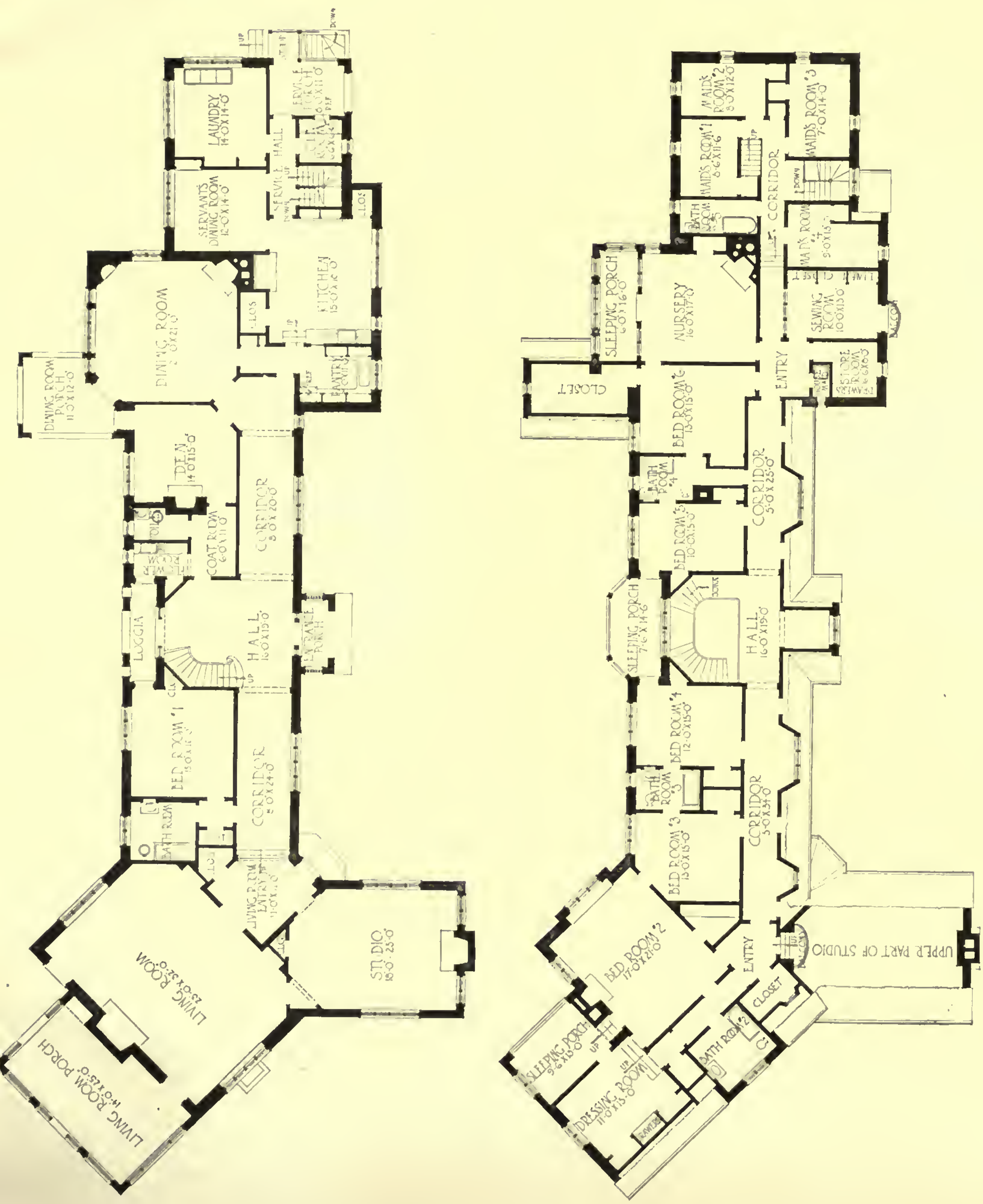

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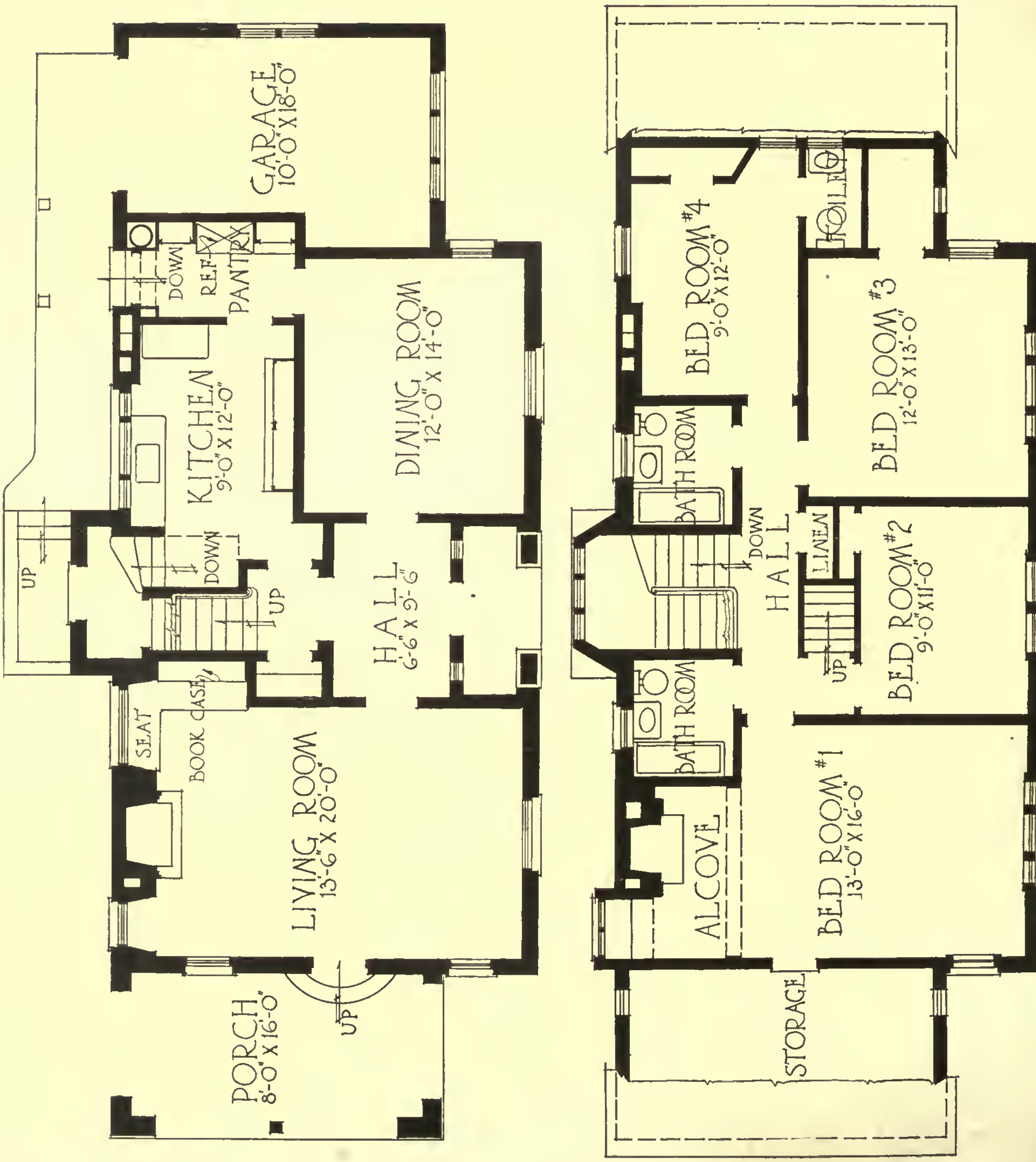
PEABODY, WILSON & BROWN, ARCHITECTS—CARROLL W. LADD, ASSOCIATE



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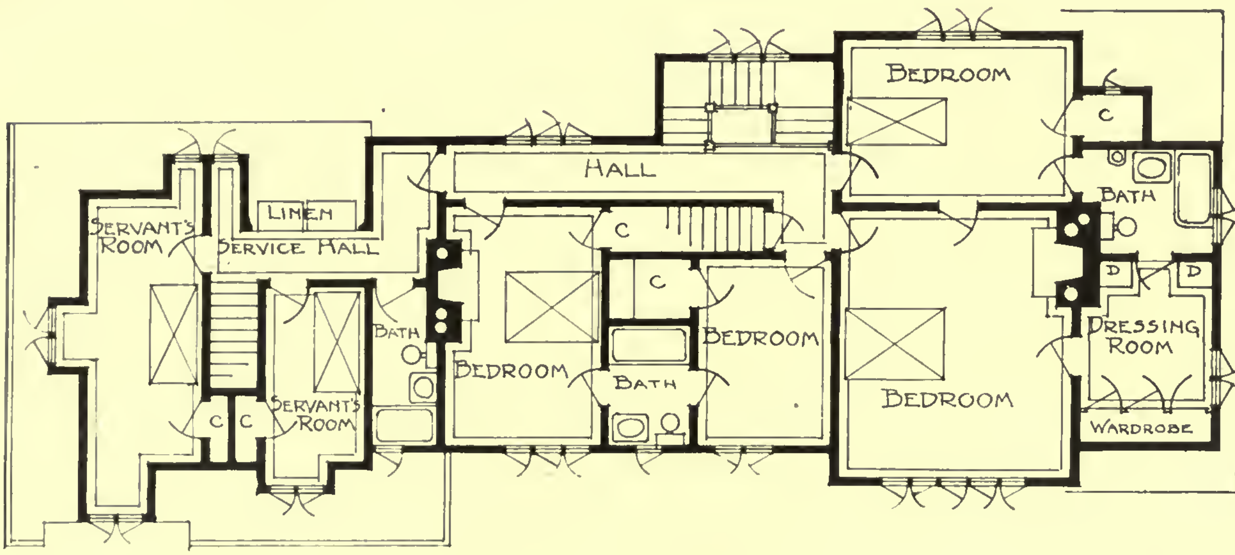
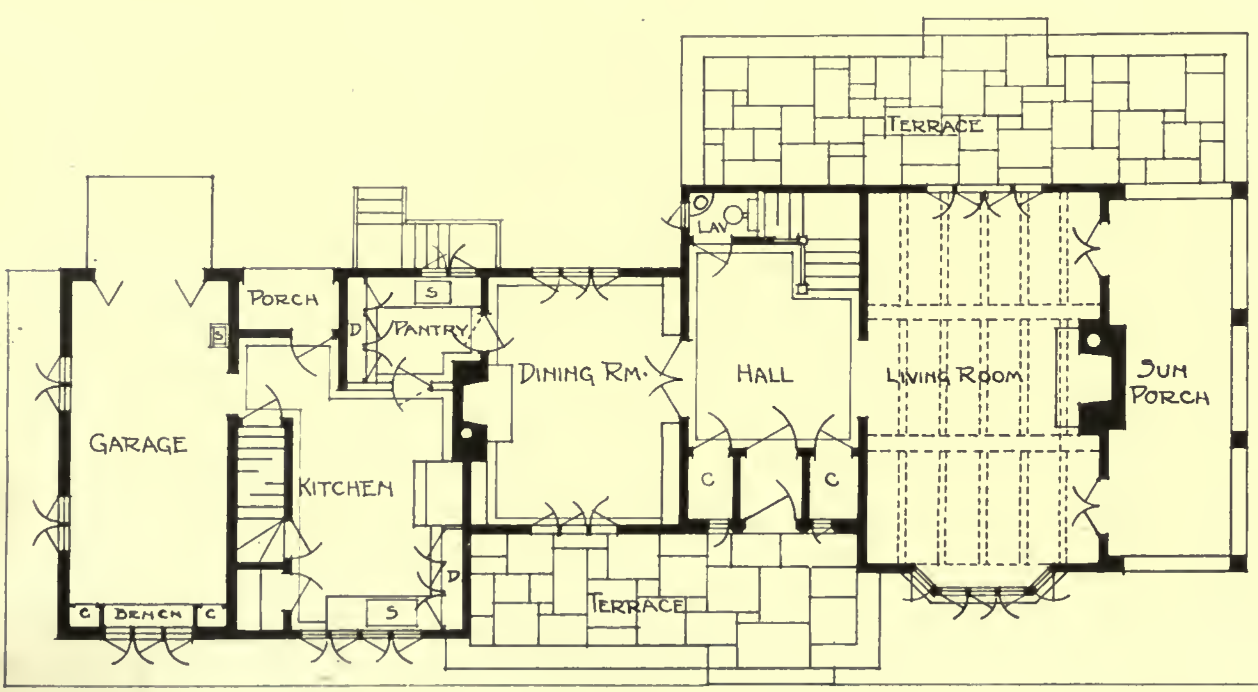


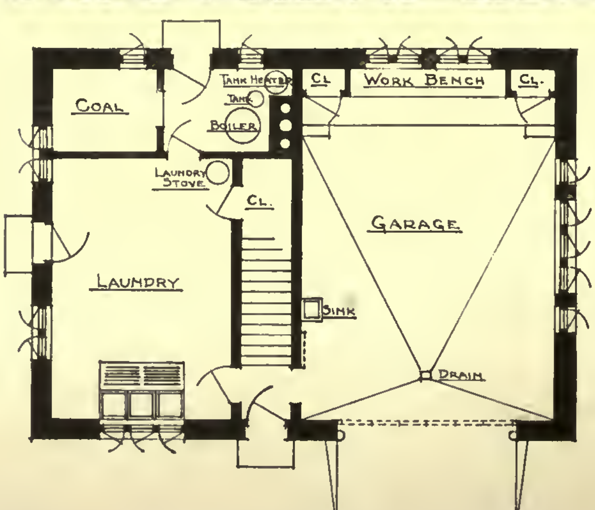
Second Floor Plan



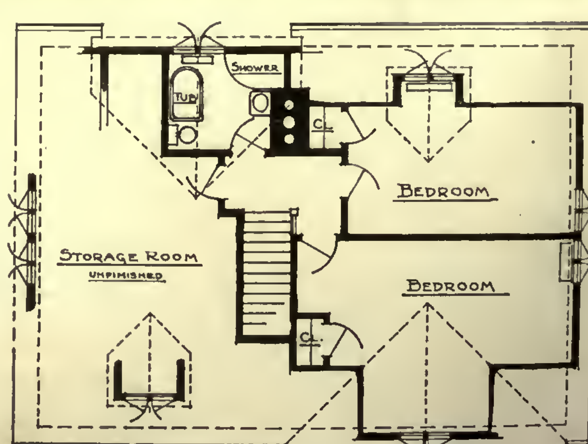
First Floor Plan

HOUSE OF CHAPIN S. PRATT, LAWRENCE PARK WEST N. Y.

BATES & HOW, ARCHITECTS



FIRST FLOOR PLAN



SECOND FLOOR PLAN

GARAGE OF W. A. BOSTWICK, LAWRENCE PARK WEST, N. Y.

BATES & HOW, ARCHITECTS

NO. 1. BROADWAY. OFFICES OF THE INTERNATIONAL MERCANTILE MARINE COMPANY.
WALTER B. CHAMBERS, F. A. I. A., ARCHITECT
GENERAL VIEW FROM BOWLING GREEN

NO. I. BROADWAY. OFFICES OF THE INTERNATIONAL MERCANTILE MARINE COMPANY.

WALTER B. CHAMBERS, F. A. I. A., ARCHITECT

SOUTH FRONT FACING BATTERY

NO. 1. BROADWAY. OFFICES OF THE INTERNATIONAL MERCANTILE MARINE COMPANY.

WALTER B. CHAMBERS, F. A. I. A., ARCHITECT

THE ROOF AND ITS SETTING AS AFFECTED BY THE ZONING LAW, REPRESENTED BY THE SURROUNDING BUILDINGS

NO. I. BROADWAY. OFFICES OF THE INTERNATIONAL MERCANTILE MARINE COMPANY.

WALTER B. CHAMBERS, F. A. I. A., ARCHITECT

BROADWAY ENTRANCE TO BOOKING OFFICE. THE EAGLE IN THE PEDIMENT WITH THE FIGURES OF NEPTUNE AND MERCURY IN THE SPANDRELS, TOGETHER WITH THE COATS OF ARMS OF PORTS OF CALL ARE

DEPARTMENT OF SPECIFICATIONS

IN previous issues of *The American Architect* this department has expounded certain principles governing the work of a specification writer and has suggested rules of procedure that have been found quite successful in actual practice.

These discussions have had particular reference to the qualifications of the specification writer, his office equipment, the construction or formulation of the specifications and their composition. We should now have well fixed in our minds the kinds and quality of attributes that seem fundamentally necessary in the successful accomplishment of the duties of a specification department.

With this groundwork thoroughly understood, it is logical to proceed with a study and determination of the succeeding processes of the work. In many of these suggestions (and also in some of the suggestions that have been put forth heretofore) there may be found a tinge of idealism that may seem almost impossible of attainment. However, in order that there may be standards of some sort, it is proper to make them ideal in many respects, with the hope that the goal may some day be won.

The specification writer, as has been suggested, should be active from the time the preparation of drawings is commenced, lending his advice and counsel in the general preparation to undertake the work in a systematic manner. The first step that should be taken is the direction of the survey of the ground. It is universally recognized that an accurate survey is quite essential, especially where a building is to be erected between two existing buildings or where the greater part of the work is the remodeling of an existing building. The matter of a survey for a new structure will be discussed first. It will be assumed the building is to be erected in a distant city.

The surveyor who is selected to do this work should be a man experienced in obtaining the information necessary for use in building construction. If such a surveyor is not known a request to the local city engineer or county surveyor will usually bring a recommendation which, in most cases, may be relied on. A list of instructions, embracing questions that must be answered for all work and questions that have particular application to the operation at hand, should be prepared and sent the surveyor. These instructions and questions will cover the following points:

1. An exact copy, without abbreviations, of the legal description of the property as given in the deed or deeds.
2. A plot plan of the property and of sufficient of the adjacent properties and streets, alleys, courts or other public places contiguous or in which there may be public utility systems that may serve the building.
3. Copies of all state or local law, ordinances, rules or regulations that have to do with building construction, sanitation, fire prevention, electrical equipment, occupancy (either temporary or permanent), of adjacent public highways and rules and regulations of all public utility companies.
4. Character and composition of sub-soil to a depth of at least fifteen feet below the bottom of the deepest footing. The best practice will be to have test borings made at each corner and at points on bounding lines midway between the corners. Samples of the borings should be taken for each foot in depth and these samples kept for future reference and not thrown away before the foundations are placed. Diagrams of each hole should be made, showing the soil conditions at various depths and their location noted on the plot plan. In addition, the engineer should report what soil loads were used for recently constructed buildings in the immediate vicinity, and give the name of the owner or architect or other responsible person with whom intelligent correspondence could be had respecting soil conditions. For buildings of one or two stories test holes probably will not be necessary, in which case the judgment of the engineer can be relied on for guidance. The engineer also should make note of any rubbish fills, sloughs, water courses, springs, tunnels, sewers, wells or deep holes in the sub-soil, with complete data as to all such conditions. Also the ground water level should be determined, particularly in clay or stone, and an indication of the chemical composition of the water.
5. Ascertain from authorities having proper jurisdiction if steps, belt courses, cornices, open areas, etc., are allowed to project beyond the property line. The discovery of such restrictions should be made separately from the study of the local building laws.
6. Report as to all available aggregates for concrete. Samples of the sand and stone or gravel should be sent in. If these materials must be shipped in from other places, give the names and addresses of at least two shippers of such material.

7. Give the size and color of common brick, state whether it is made of clay or shale, determine its absorption percentage and note whether of local manufacture or imported. If imported state from whom. Send in an average sample without attempting to secure the best brick in a pile.

8. State whether good steam boiler cinders are available locally and, if so, give their source of supply.

9. State whether there are two sewers, i. e., one for sanitary wastes and one for storm water. Will back water valves be required?

10. Give complete details as to water supplies, especially average pressure, meter requirements, possibility of use of water for hydraulically operated machinery.

11. Give complete details as to gas supply, especially whether natural or artificial or if both are available, average pressure and metering.

12. Give complete details as to electric light and power service, especially whether direct or alternating, system of wiring, voltage, phase, cycles, metering, minimum horse power for power use for which a power connection separate from lighting connection will be provided.

13. Give complete details as to telephone service, electric-clock service, watchman's service, telegraph call service and all conduits that must be provided to accommodate wires of these services.

14. If there is a district heating plant that may have service available for the building, give complete details of such service.

THESE questions should be written on standard letter size sheets, subdivided as may seem necessary and amplified as the judgment of the specification writer dictates. The surveyor should be instructed to answer each question in as great detail as possible, giving any supplementary information that may seem desirable or applicable to the work in hand. The answers should be made on the same size sheet and should be numbered corresponding to the numbers of the questions. In many cases it would facilitate matters if the surveyor is told what kind of a building is to be erected and is given a rough plot plan showing the approximate ground area. If it is possible to approximate the demand for water, gas, electricity, telephone and other public utility services the surveyor should be made acquainted with such probabilities in order that he can more intelligently confer with the various officials and provide all information that may be of use in studying the preliminary layouts.

The plot plan, or survey, of the property as prepared by the engineer should be made on tracing cloth with "north" at the top of the sheet and the orientation indicated by arrow marks. This seems elementary to many specification writers, yet this requirement should be emphasized as it is annoying to discover that the usual assumption as to orientation is erroneous with respect to a particular survey as there are some surveyors who disregard this primary rule. The dimensions should be given in terms of feet and inches, using the English rather than the decimal system although the lines may be laid out in accordance with the decimal system customarily used by surveyors.

The surveyor should determine a datum level for vertical measurements. If the city has no established datum level, then it will be convenient to locate this one hundred feet below the level of the sidewalk at the main axis of the building, unless the foundations are to extend down below the one hundred feet level, in which case a level two hundred feet down will suffice. In this connection a bench mark should be established on some permanent nearby landmark that will not be obstructed or harmed by the subsequent building operations. It preferably should be located on some building across the street and not on a trolley or wire pole, mail box, fire plug or lamp post that may be removed before the use of the bench mark becomes necessary.

The plot plan made by the surveyor should have indicated on it the following items:

15. The exact dimensions of the property. These dimensions should be checked from the direction opposite to which they are first determined to ascertain if the position of the lines is coincident, no matter from which direction the survey is made. This word of caution is interposed for the reason that in one survey the front width of a certain property, when chained from an intersecting street corner to the south, was one hundred feet while, when chained from the north intersecting street, it was one hundred feet and four inches. In this case it was necessary to make a re-survey of quite a large district to remedy the error that had been made by a surveyor about sixty years previous. The re-check always should be made when the deed reads somewhat as follows: "All of lot 'A' and the south twenty feet of lot 'B'," as there is expressed a width of lot that can only be determined by an exact survey.

16. Measurements of all angles of property lines.

17. The widths of all contiguous streets, alleys, courts, areas and walks.

18. Elevations of abutting walks or curbs at all corners of the property. Where alleys, courts or areas abut the property, the elevations at the property lines also should be given. These elevations should be checked by the proper city authorities and if the city desires the elevations of new work raised or lowered the official new elevations should be noted. Also show pitch of walks as required by city.
19. Locations of poles, hydrants, lamp posts, mail boxes, street drainage inlets, sewer or water manholes or other public utility equipment that presumably must remain.
20. Locations of car tracks in streets.
21. A cross-section of gutter flags and curbs and notes as to materials used.
22. Indications of marks for all property lines and the permanent bench mark.
23. A layout of basement and foundation walls of the existing buildings, with sidewalk areas or sub-sidewalk spaces carefully described and notations respecting materials that compose all of this old work. The extent of existing excavated spaces and the nature of masonry or other work that must be removed should be understood by the contractor excavating for the new structure.
24. Drawings showing the profile of all walls of adjoining buildings that are on the property lines or are fairly close to them. If party walls are in existence and they must be considered for the new structure, complete information as to their construction and the loads from the adjoining buildings that they support. If statutes or ordinances fix a level below which the constructor of the new building must shore, underpin or otherwise care for the adjoining walls, indicate this level on these profile drawings and make note of concentrated loads that must be given especial shoring attention.
25. In the case of party walls indicate their position exactly and note whether the front wall of new building is to overlap these walls. In any case make a drawing of adjacent parts of front walls of adjoining buildings, with heights of belt courses, cornices, parapets, etc., carefully shown.
26. Note positions, diameters, flow directions and depth of all sewers.
27. Note positions and sizes of all water mains.
28. Note positions and sizes of all gas mains.
29. Note positions and sizes of mains for district heating service.
30. Note positions and nearest manholes of any underground electric light and power, telephone, telegraph or similar electric services.
31. Note all existing sewer, water, gas and electric connections and give their sizes and state whether they could be used for new structure if desired.
32. Note points of entrance of all overhead or underground services such as water, gas, electricity, telephone, telegraph, messenger call, clock, etc. after consulting with officials of interested companies.

It is very possible that experience will supply additional points that should be taken up for consideration at the time the survey data is assembled. Each operation should be studied, especially where it is in a city at some distance from the office or if it is necessary to send to such a city a surveyor whose services are too expensive to warrant frequent trips for re-surveys or for amplification of the data originally obtained. At the time the survey is ordered the sketches should have been developed sufficiently to enable the architect to determine the main points that are to be considered and to prepare a schedule of the matters additional to those appearing above. It seems trite to say that no building operation of any consequence should be commenced without a very carefully drawn survey, especially when the building is to be built to the lot lines.

Particular attention always should be given that part of the work that relates to available local materials, their kind, quality and usability for the work contemplated. The disregard of available local materials that is evident in many specifications would be laughable were it not for the fact that the laugh is always on the architect, thus discrediting his professional acumen to a certain extent.

A series of photographs of the site and surrounding property should be made in large sizes and from points that will reveal all items of interest. Wherever it seems probable future needs will require more detailed information, photographs at close range should be made and their subject marked on one set of the general views.

For a survey that is to be made for remodeling purposes it is rather difficult to lay down any special rules of procedure except that all structural parts of the building should be dimensioned and fixed exactly on the various floor plans and sections. Except in extreme cases, where the known future loadings are very light, it may not be essential to uncover construction to discover these factors but a good rule is to obtain too much rather than too little information.

All measurements of existing work should be "running measurements" and not from corner to window reveal, width of reveal, width of pier, etc., as the latter method gives too many chances of errors. It is advisable to establish horizontal and vertical bench marks or station points to which all measurements for certain areas are referred.

Notes as to all public service supplies, interior mechanical and electrical equipment and, in fact, everything that can be considered parts of the building or equipment should be made in the fullest and most detailed manner.

Photographs of visible exterior walls of interiors should be made wherever possible, in order that the drafting room will have a more clear understanding of existing conditions.

All of these points have a great deal to do with the work of the specification writer and they should be given serious consideration by him or his colleagues on every operation.

Capital—Church of S. Vitale, Ravenna, Italy

DEPARTMENT OF ARCHITECTURAL ENGINEERING

NO. ONE BROADWAY

The New York Offices of the International Mercantile Marine Company

WALTER B. CHAMBERS, F. A. I. A., Architect

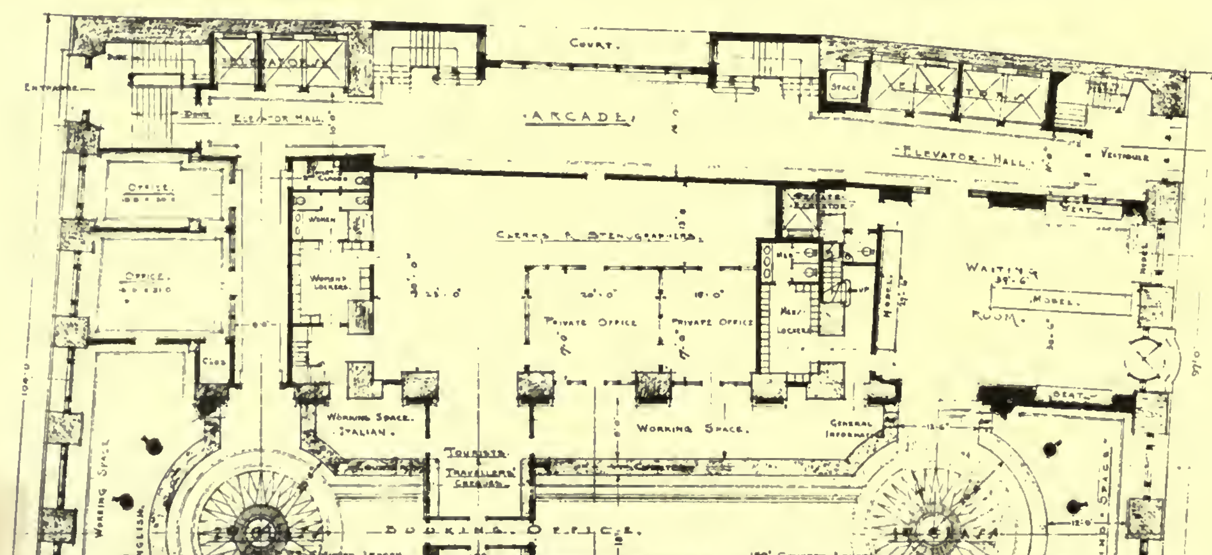
LOWER Manhattan Island, and more particularly that part near to Bowling Green, was during the Revolutionary War, the theatre of many stirring events.

When the Colonies had secured independence and the "Battery" became the social center of the city, many buildings were erected by heads of families socially and commercially prominent. From No. 1 Broadway, which forms part of the site on which the remodelled building of the International Mercantile Marine Company stands, stretching north to Trinity Church at Wall Street, every square foot of ground has its historical tradition.

Architects who plan or remodel structures in this historic locality have unconsciously assumed certain obligations and may be said to approach their work under the dominating influence of what, for the want of a better locution, might be called "historical perspective."

The site of No. 1 Broadway overlooks on the Broadway side the old market place and bowling green of the early settlers, and to the south the site of the first fort in New Amsterdam, and the Battery.

Peter Minuit, in 1626, bargained with the Indian owners of Manhattan in the clearing that is now Bowling Green, and bought the island for $24. The scene of this historic transaction lies under the windows of No. 1 Broadway. Pieter Kocks, a soldier in the Dutch garrison at Nieu Amsterdam built a tavern in 1647 facing the Bowling Green, on the corner now covered by No. 1 Broadway.



Ground Floor Plan

In 1664—when the British flag replaced the Dutch on the old fort across the way—a new tavern was erected on the site, by Thomas Broen. Archibald Kennedy, Captain in the Royal Navy, built a spacious mansion on the site of No. 1 Broadway in 1768.

Kennedy's mansion was occupied in 1776 by Gen. Israel Putnam, of the American army. Here for some weeks Gen. George Washington came frequently from his headquarters at Richmond Hill to confer with his officers. Later the house was occupied in turn by Sir William Howe, and Sir Henry Clinton, successively commanders of the British naval and military forces which occupied the city on the retirement of Gen. Washington's army. It was from this house that Major Andre wrote the letters to Benedict Arnold, which preceded the American officer's betrayal of his trust, and Andre's capture and execution.

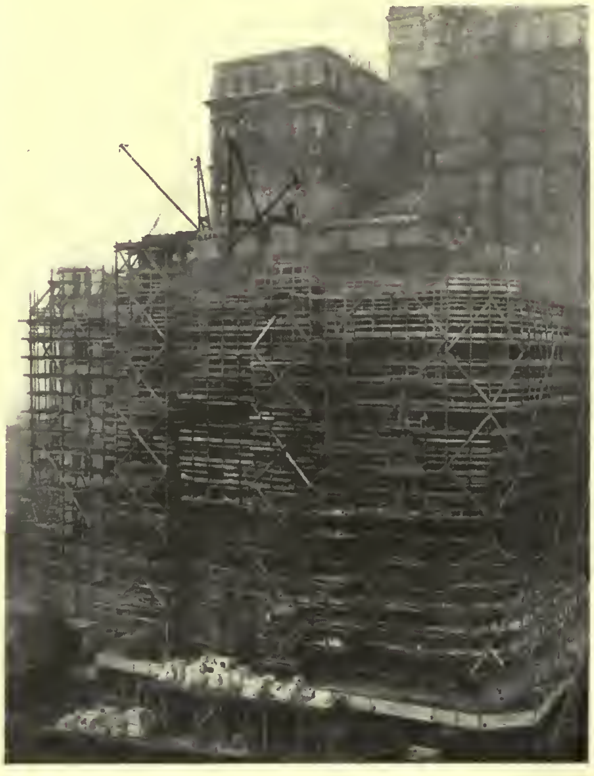
No. 1 Broadway. Washington Building erected 1882. Later known as The Coal Exchange

The Kennedy mansion was restored in 1783 to its owner, who sold it to Nathaniel Prime, one of New York's leading merchants and financiers, active in the financing of the New York Water Supply Company organized by Aaron Burr (Vice President of the United States 1801-5).

In 1794 the Prime home became a house of public entertainment known as the Washington Hotel. In this hotel Tallyrand, the exiled Minister of Napoleon, made his home for a time. With the passing of the years the hotel became gradually a combined hotel and office building until, in some year not recorded, it was converted into an office building.

Cyrus W. Field, of Atlantic Cable fame, bought No. 1 Broadway in 1882. Here he erected a 12 story office structure, then the tallest in lower New York, known as the Washington Building, and, later as the Coal Exchange.

In 1919 the property was purchased by the International Mercantile Marine Company and Mr. Walter B. Chambers, F. A. I. A. was intrusted as Architect with the alteration of the structure. Mr. Chambers had the triple task of converting a late-Victorian wall bearing office building into a modern fire-resistant structure; designing the fronts on three streets to typify the occupancy, that of a ship owning company, whose ships sail the seven seas; and having ever in mind the jealous regard of the public for historic localities. How well the task was performed is left to the judgment of those who study the views here presented.



Remodeling No. 1 Broadway 1919-21. Upper stories torn down. Staging in place for the setting of the new stone facing

The old building was first constructed to a height of ten stories, the two upper stories being added several years later. All exterior, and some interior walls were bearing walls having thicknesses proportioned to loads which were apparently figured liberally. The few interior columns were square, of cast iron and all beams and girders were of wrought iron. The outside walls were faced with red brick and all trim was of brownstone. There was but one stairway and six slow speed elevators in two banks.

The reconstructed building is 12 stories in height, with two mezzanines and two roof pent houses, one of which contains offices. There are two separate main stairways and eight high speed electric elevators, four at the Broadway side, three at the Greenwich side and one private. There are two entrances to offices, one from Broadway and one from Greenwich street. The elevator halls and arcade are connecting, the floors and walls being of marble. The iron grille elevator doors as well as all grille work throughout the building contain nautical and marine suggestions in keeping with the building. The doors opening into the arcade are of bronze,

Tenth floor level ready for new walls. Note bolts set in old walls to serve as ties. Walls above this level are of tile faced with stone

The new exterior has a granite base up to the first floor level and light buff Indiana limestone above. The panels are of Cipolin marble and the piers in the second story carry Venetian Mosaic shields with the coats of arms of the leading ports of call of the company's ships. These heraldic designs are beautifully worked in colors and indicate with good taste that the building is more than local in character. From the stone carvings around the shields project bronze sockets for flag staffs. The Stars and Stripes float over the main entrance, the house flags of the company's lines occupying minor flanking positions.

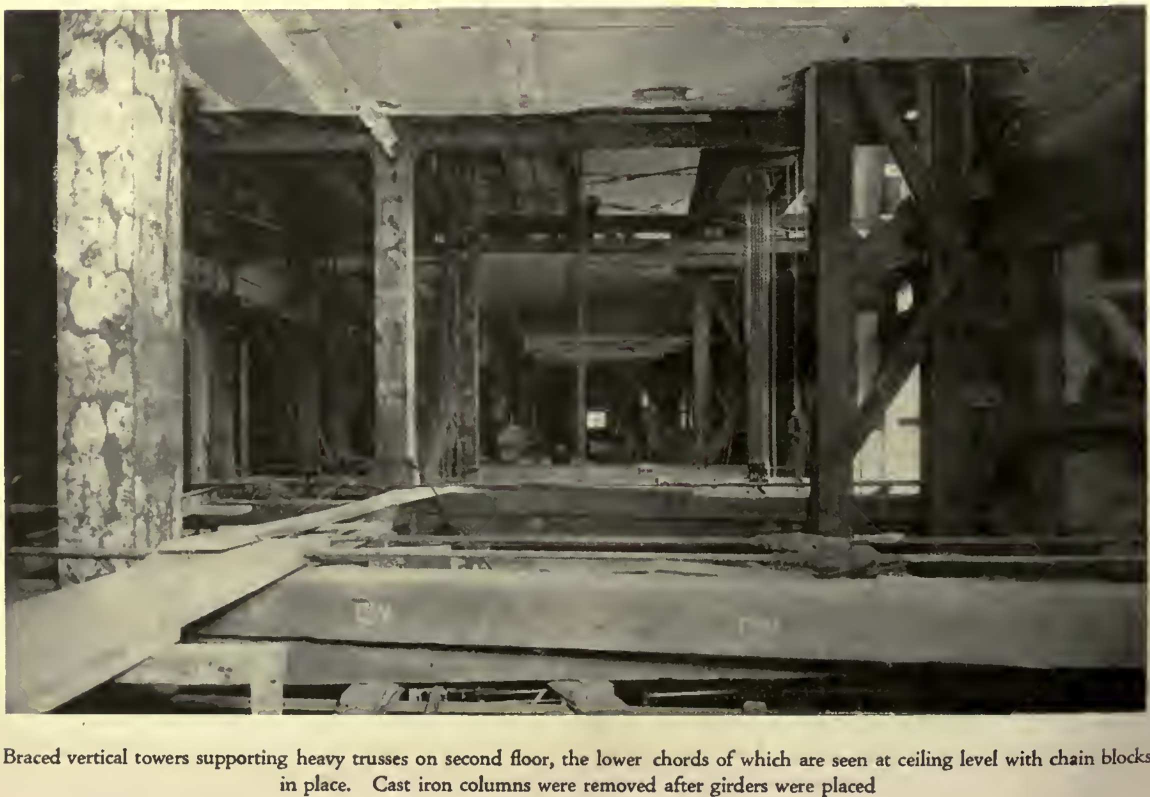
Over the arch of the main entrance are carved Neptune, god of the sea and Mercury, god of commerce and trade, with the American eagle above. The architectural and decorative mouldings and carvings contain representations of star fish, sea shells and sea plants.

Old brick walls prepared for the stone facing

The booking office extends the entire length of the Battery Park front of the building, from Broadway to Greenwich street with a length of 100 feet and a breadth of 40 feet. The ceiling height is 25 feet. The floor and counters are of marble and set in the floor at the east and west ends are large ships compasses in vari-colored marbles. The walls are panelled in soft buff Botticino marble with pillars of rich black marble irregularly lined with white. The designs of the

The framing for the new upper floors

Heavy Trusses used to carry the girders which were hoisted into place by means of chain blocks. The cast iron columns here shown remain in the remodeled structure resting on girders



Braced vertical towers supporting heavy trusses on second floor, the lower chords of which are seen at ceiling level with chain blocks in place. Cast iron columns were removed after girders were placed lighting fixtures are patterned some after old ships lanterns and some after terrestrial globes. On the main wall are two large frescos, one of the eastern and the other of the western hemisphere. There is a small moving picture hall in which films will be shown portraying life aboard the company's ships.

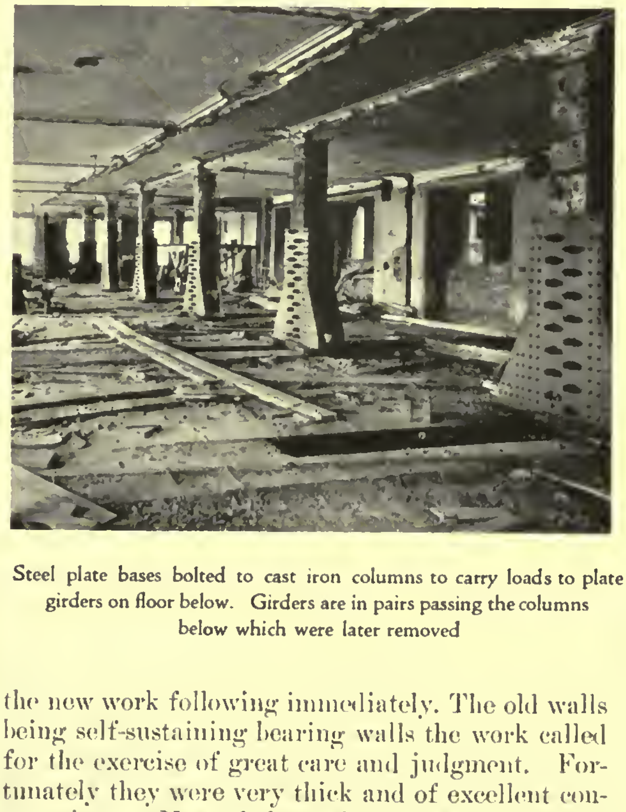
Needling and supports for walls

THE ENGINEERING FEATURES

Loss of income during the period of remodeling of an old building is an item of cost, the amount of which in this instance was kept as low as possible. All preparatory work in the basement was well under way before tenants on the first and second floors vacated their offices. The tenants on the third to the ninth floors inclusive were not disturbed. All tenants above the ninth floor were obliged to move. The presence of tenants on seven floors and the necessity for insuring to them uninterrupted service and convenience with absolute safety, required careful planning and an absolute adherence to predetermined methods and schedules.

Shoring supporting old pier cut out to receive new work

The old building was completely dismantled down to the tenth floor, temporary roofing was erected and new steel framing placed for the new upper floors and roof. The walls were built of tile and the stone facing placed independently of the work below. In fact the work proceeded as though an independent building was erected above the ceiling of the ninth floor. The original red brick and brown stone walls were cut back to receive the new stone facing, starting at the bottom, the new work following immediately. The old walls being self-sustaining bearing walls the work called for the exercise of great care and judgment. Fortunately they were very thick and of excellent construction. Nevertheless shoring and needling were used freely and more than ordinary care was exercised at all times.



Steel plate bases bolted to cast iron columns to carry loads to plate girders on floor below. Girders are in pairs passing the columns below which were later removed

The column and girder installation included the taking out of ten old cast iron columns from the foundation up to the second floor and the removal of one of the cross-bearing walls. Concrete piers against the exterior and court foundation walls were installed and connected across the building, underneath the basement floor, by reinforced concrete girders, designed to pass on each side of, and leave undisturbed, the interior column foundations, for which purpose two sides of the heavy granite base blocks of these latter were partly cut out.

Girders in place under second floor. The ends are supported on steel columns encased in brick piers. The cast-iron column at mid-span was removed after girders were seated and bases were bolted to columns in second story.

On these piers and girders steel columns were erected against the exterior and court walls, extending up to the ceiling of the new booking office, with steel bolsters at top for support of large plate girders to carry the centre line of the old cast iron columns from the second floor up. The columns were solidly encased in the new brick lining of the exterior and court walls.

At each end of the building under the second, former third, floor, is a plate girder 56-in. deep with 38 in. flanges, the weight of each girder being 32 tons. Six pairs of intermediate girders 56-in. deep with 21-in. flanges, each single girder weighing 17 tons, carry the interior columns from the second floor to the roof. Several smaller cross girders were also installed each one weighing about 12 tons. The intermediate girders in pairs were installed on each side of the old cast iron columns, against which were bolted at the second floor, large steel flange bases for the purpose of transmitting the column load, to the plate girders.

Steel wedges placed between the bases and top of the plate girders were carefully driven to gradually take up the load. When the entire load of the line of old columns had been transmitted to the girders, and these had assumed their permanent deflection, the old columns below the second floor were removed. Then, as an auxiliary, and as an additional safety precaution, a steel shoe or blocking was installed and wedged up between the pair of girders, below the cast iron column, giving a direct vertical support.

The hoisting of the plate girders, which was done by means of two 20 ton chain blocks hung on heavy timber movable trusses, resting on the old second story floor construction, was preceded by the construction of an elaborate system of vertical and horizontal shores, braces and tie rods to support the chain block trusses and old floor construction, and prevent lateral movement of walls, piers and old columns. At no time during the entire operation was a line of old columns left unbraced in any direction.

As each girder was hoisted it was followed by a heavy timber cribbing built up at each end in such a way that an unexpected drop of the girder would not have been greater than a few inches. This timbering is shown in the figure below.

Placing the heavy girders and following with cribbing to minimize damage in case of accidental drop

MAJORITY OF CITIES HAVE NO BUILDING CODE

By Richard G. Kimbell*

THE utter lack of ordinances regulating construction in the majority of the cities of this country is astonishing. Most communities, I suppose, have the feeling that it is folly to undertake work of this or any other kind without first knowing that they will be able to finish it—as half finished work generally proves to be labor lost. There cannot justly be any objection to having up-to-date, workable building codes any more than to other good things, provided they cost nothing. The principal objection apparently is their expense, and the objection to paying arises largely from the want of ability to pay.

A real or imagined lack of ability to pay for a code and the subsequent expense of its enforcement accounts chiefly for the situation disclosed by an investigation of conditions recently conducted by the National Lumber Manufacturers' Association.

This Association made a canvass both by letter and personal representation of all of the cities containing more than 5,000 population in the United States. According to the 1920 census there are 1478 such cities.

*Architectural & Building Code Bureau.
National Lumber Manufacturers' Association.

The results of the information secured by this canvass are set forth in tabular form as follows:

	Pop. over 25,000	Pop. 10 to 25,000	Pop. 5 to 10,000	Total
Number of Cities in U. S.	279	460	739	1478
Cities with Code & Inspector	210	90	46	346
Code but No Inspector	13	26	25	64
Total Number with Codes	223	116	71	410
% of No. of Cities with Codes	79.9	25.2	9.6	27.6
Number with Inspector & no code	22	73	31	126
No Code & No Inspector	20	136	172	328
No Information Secured	14	135	465	614
Drafting or Revising Code	89	33	8	130
% of Cities with Code Activity	31.5	7.0	1.0	8.7

As far as information was obtained, only 410 cities (27 per cent. of the entire number of cities) have a building law, and in all probability twenty or more of these are included as a part of the original city charter. Other cities claiming codes had what were merely a set of restrictions specifying the area known as the "Fire Limits." In the majority of cases where the restrictions as to fire limits only prevail, the ordinance merely specifies the area included within such limits and requires that the buildings erected therein shall have incombustible walls and roofs, without any restrictions as to the allowable height of buildings, the maximum area between fire walls, or the character of the interior construction. As long as the exterior walls are of masonry and the roof supposedly incombustible, any kind and variety of fire trap and hazard may be constructed within the building and cover any area. In all probability, those laws are the only ones in effect as relating to buildings in 65 per cent. of the cities of over 5,000 population in this country where the construction industry is one of the mainstays of our national welfare and progress.

There are 259 cities with a population of over 25,000 and only 223, or 80 per cent. of these gave evidence of having a building code. Thirteen of those cities having codes have no enforcing officer. Twenty-three cities having no code gave information to the effect that they do have a building inspector. His duties seem to be indefinite.

Of the 460 cities with a population of from 10,000 to 25,000 only 116, or 25 per cent. have a building law and 26 of these have no officer to enforce it. Seventy-three apparently had a building inspector but he is, presumably, the Fire Chief who acts in enforcing some of the fire prevention requirements.

Out of the total of 739 cities of from 5,000 to 10,000 population, the small number of 81, or 9 per cent. have building laws and 25 of these have no means of enforcement.

The table shows quite a large number of cities from which no information was forthcoming. The majority of them are from 5,000 to 10,000 population and it is safe to assume, by considering the situation in the balance of the cities of that population, that they have neither a building code nor an inspector. It was definitely determined that 42 of the cities of over 25,000 population have no building code whatever.

A number of cities which have such laws have no copies available for the use of the public, the builders and architects. Some of them are hidden away in the minutes of the council meetings. The man who erects a building or has the supervision of the construction of a building must, necessarily, delve through musty records to determine what regulations he must comply with when building.

One large city of over 135,000 population has gone so long without any constructive revision to its building code that a reprint has not been made since 1912 and the building department of that city has in its possession only one printed copy of the code. Another city has its building code included as a part of its general ordinances and a charge of five dollars per copy is made when those who wish to build desire to have the necessary information available in their offices.

The facts presented here warrant thought by our engineering, architectural and civic bodies and by all others who are in any way interested in the welfare, growth and development of our cities.

Improvement in Gypsum Plaster.

MANUFACTURERS of gypsum wall plaster announce that a new manufacturing process has been adopted. The statement is made that this is the first radical change in 4,000 years. The new product is known as syanized plaster. The process seals each minute particle of gypsum against atmosphere moisture. The plaster loses none of its sand-carrying capacity, even when stored for many months. It does not go "dead" while in storage, and, being always "fresh," assures full coverage. Other economies of this plaster are the rapidity with which it takes the water in mixing, and its unusual plasticity under the trowel.

THE best available data on the strength and related properties of metals and alloys have been collected and published by the U. S. Bureau of Standards in *Circular No.* 101. It includes the tensile strength, proportional limit, percentage of elongation in 2 in., percentage of reduction of area, Brinell and scleroscope hardness of such materials as iron, carbon steel, alloy steels, wire and wire rope, semi-steel, aluminum, copper, etc. In addition figures are given in some cases for the compressive and shearing strengths and moduli of rupture.

THE AMERICAN SPECIFICATION INSTITUTE

127 North Dearborn Street, Chicago.

THE American Specification Institute has been organized to improve all conditions surrounding the writing of specifications, to foster intelligence and accuracy in their preparation and to bring to its members the benefits that are to be obtained from the organized efforts of men who are accustomed to study and write these most essential documents.

The kinds of specifications that are to be studied are those written by the architect or engineer in the ordinary course of his professional practice, including all classes of buildings and engineering structures, their equipment and interior decoration and finish to make them ready for occupancy and efficient use and for the embellishment of grounds, estates and waterways.

The American Specification Institute does not feel it necessary to include within its province of detailed study and analysis, the preparation of specifications that are to guide manufacturers producing valves for high pressure steam lines, cement, electric switches or any of the countless manufactured articles that are used in building and engineering construction of all kinds. There are in operation at the present time thoroughly efficient research organizations who are making studies of such problems and the reports of their deliberations are accepted by all technical professions as authoritative.

However, in the use of cement for instance, the interest of the architect or engineer is very keen in the study of its practicable use. In the case of this product The American Society for Testing Materials has a standard specification governing its actions under tests and any cement that passes the tests of this Society is acceptable to the well-informed user, and any cement which fails to pass these tests is condemned. The interest of the architect or engineer, then, begins where the interest of The American Society for Testing Materials ends. At this point, also, the American Concrete Institute begins to exercise its interest in the use of the material. Therefore The American Specification Institute will see that all of its members have at hand a copy of the current standard specifications of The American Society for Testing Materials that have to do with the testing of cement or any of the other building materials. For the same reason the membership will be kept informed of the activities of the American Concrete Institute, The United States Bureau of Standards and all other research organizations that are studying the most efficient methods for the utilization of cement and its behavior under the various conditions to which it is subjected.

Many of the valuable reports respecting investigations that have been conducted by authoritative organizations and which are of the greatest interest to specification writers have not, in the past, been brought to their attention. There are many reasons for this seeming secretiveness, the most prominent one being the fact that there has been no organization whose duty it has been to bring to the attention of specification writers all these matters. They have been left to their own devices in most instances and although a few men have been willing to devote hours of research for information on some particular point, such painstaking efforts have not been universal. The American Specification Institute through its various activities in behalf of its members, will save countless hours of duplicate study and will, consequently, be of constant and ever-present assistance in the correct analysis and writing of specifications.

The American Specification Institute has divided its activities into two general classes, that is (a) study of materials used in building and engineering construction and equipment, embracing the production and physical properties of raw materials, methods of manufacturing, fabrication and finishing in order that the specification writer will be more familiar with his work and a study of relative values of materials as based on appearance, initial cost and maintenance, effect of combination with other materials and proper materials for various types of buildings of varying grades and (b) a study of the method of writing specifications. In this latter class there will be studied the means of accomplishing complete co-operation between the drawings and specifications and to determine what methods of construction and installation should be used under given average circumstances, what the drawings should show or indicate and what should not be shown or indicated on the drawings for inclusion in the specifications.

THE development of an outline or checking list will be given attention. This subject already has been made the subject of several bulletins and has proved to be of very great interest to the members. The arrangement of specifications so as to conform to the sequence of construction and installation work, the writing and composition of specifications that are clear, concise, coherent and that can be understood by law courts and the principles of contract law as it affects the writing of specifications, all will be subjects of bulletins.

All bulletins will be issued in loose-leaf form to be placed in the cover which is furnished by the Institute. This will permit the revision of obsolete bulletins and the insertion, in orderly sequence, of all subsequent sheets. These bulletins will be made in the standard letter size sheet as has been recommended by The American Institute of Architects and it is expected that eventually there will be available to members a most valuable and highly useful text book of data respecting the preparation of specifications.

New Members

The following men have been elected to membership, Active grade:

F. P. Platt & Bro. Architects, New York City.
Herman J. Bargehr, Architect, Lyons, Iowa.
Elwyn E. Seelye, Engineer, New York City.
James M. Macqueen, Architect, Sewickley, Pa.
Norton Kirkpatrick, Architect, Niagara Falls, N. Y.
John W. Vickery, Architect, Rochester, N. Y.
Norman Reid Lightbody, Architect, Christchurch, New Zealand.
Richard C. Worden, Engineer, Bakersfield, Calif.
Chester Eugene Dean, Architect, Kansas City, Mo.
Joseph Hudnut, Architect, New York City.

Bulletin No. 1.

A revision of Bulletin No. 1, in accordance with suggestions that have been made by many of the members, is now being prepared and will be issued shortly. This bulletin is as follows:

Building Construction and Equipment
General Specification Outline

1—Matters Preliminary to Contract
2—Agreement and Schedule of Conditions of Contract
3—Work Preliminary to Construction
4—Inspection of Materials
5—Wrecking and Clearing Site
6—Surveying and Grades
7—Excavations
8—Foundations
9—Waterproofing
10—Structural Steel
11—Concrete Masonry
12—Reinforcing Steel
13—Fireproofing (Terra Cotta)
14—Stone Masonry
15—Artificial Stone Masonry
16—Brick Masonry
17—Cohesive Tile Work
18—Architectural Terra Cotta
19—Rough Carpentry Work
20—Ornamental Bronze & Iron Work
21—Miscellaneous Steel & Iron Work
22—Solid Steel Windows
23—Fireproof Hollow Metal Windows
24—Sheet Metal
25—Slate Roofing
26—Tile Roofing
27—Composition Roofing
28—Furring and Lathing
29—Plain and Ornamental Plastering
30—Models for all Work
31—Hollow Metal Trim
32—Kalamein Trim
33—Wood Cabinet Work
34—Interior Structural Slate Work
35—Interior Marble Work
36—Scagliola
37—Mosaic and Faience Tile Work
38—Terrazzo Work
39—Cork Tile Floors
40—Composition Floors
41—Rubber Tile Floors
42—Glass and Glazing
43—Structural Glass
44—Painting
45—Decoration
46—Draperies
47—Acoustical Correction
48—Hardware
49—Weather Stripping
50—Window Screens
51—Window Shades
52—Elevators
53—Elevator Signals
54—Dumbwaiters
55—Escalators
56—Pneumatic Tubes
57—Conveyors
58—Mail Chute
59—Master and Secondary Clocks
60—Express Call System
61—Telegraph Call System
62—Electric Recording Systems
63—Inter-communicating Telephone Systems
64—Electric Call Systems
65—Electric Signal Systems
66—Electric Wiring
67—Electrical Machinery and Equipment
68—Lighting Fixtures
69—Sewerage and Drainage
70—Plumbing
71—Pumps and Ejectors
72—Gas Fitting
73—Water Purification
74—Water Softening
75—Drinking Water Systems

76—Fire Protection Equipment
77—Automatic Sprinkler Systems
78—Refrigeration Machinery and Piping
79—Cold Storage Insulation
80—Heating
81—Ventilation, Mechanical
82—Power Plant Work and Equipment
83—Smoke Stacks
84—Heat Insulation
85—Permanent Building Equipment
86—Furniture and Fixtures
87—Landscape Architecture
88—Garden Furniture
89—Sculpture
90—Walks
91—Roads and Streets
92—Bridges

Members are requested to give Bulletin No. 1 their careful study and to suggest whatever changes or corrections they believe would improve or add to the general utility of the outline, notifying the Executive Secretary's office of their suggestions. When a majority of the members have made their response, a revised bulletin will be distributed for further criticism or for general acceptance as a tentative standard document.

Subsequent bulletins will carry detailed outlines of the items in the General Outline. These bulletins will be issued on the first and fifteenth of each month.

The earnest co-operation of all members is requested by the Board of Governors.

House of Clarence F. Jameson, Lafayette, Ind.
Charles W. Nicol, Architect

PERSONALS

SOCIETY OF BEAUX-ARTS ARCHITECTS

In the report and illustrations of the Final Competition for the 14th Paris Prize of the Society of Beaux-Arts Architects, published in our issue of September 14, the author of the design placed third was given as E. E. Weston, Jr., whereas the name of the author is A. E. Westover, Jr.

William Schultz has moved his architectural office from 2009 West North Avenue, Chicago, Ill., to 4945 Milwaukee Avenue, that city.

Robert Leal Hyett, architect and designer, has just opened an office at 511 Maple Avenue, Wilmette, Ill.

F. Rosenheim, architect, announces the removal of his office to Suite 402 Pacific Mutual Building, Los Angeles, Cal.

J. H. Johnson, architect, has removed his architectural offices from Sumter, S. C., to Bradentown, Fla.

Manley Clark Marcellus has opened an office for the practice of architecture at 105 Torrey Building, Duluth, Minn.

Announcement is made that Fabian & Donovan, architects, are now located at 147 Bradley Street, New Haven, Conn.

Harry Price, architect, has moved his offices from 709 Mercantile Library Building, Cincinnati, Ohio, to 602 that building.

Clifton C. West, formerly of the firm of Beckenstin & West, is now practicing architecture at 54 Church Street, Hartford, Conn.

Della Penna & Erickson, architects, located at 289 East 149th Street, New York City, are desirous of receiving manufacturers' samples and catalogs.

W. Sanford Full has recently opened a studio for the practice of architecture at 376 Central Street, Saugus, Mass., and desires manufacturers' catalogs and samples for his files.

Moritz Sax, architect, has moved from 1011 Fourth National Bank Building, Cincinnati, Ohio, to larger offices at 611 Johnston Building, that city.

Davis & Wilson, architects, have succeeded Ellery Davis at Lincoln, Nebr. The offices will remain in the Security Mutual Life Building, that city.

Clyde W. Smith, architect, who was formerly practicing his profession in the Andrus Building, has moved his offices to 700 Oneida Building, Minneapolis, Minn.

Ralph T. Abell, recently in government employ in the South, has resumed his architectural practice, with offices in the Spurling Building, Elgin, Ill.

H. H. Beckenstin, architect, is now practicing his profession at 54 Church Street, Hartford, Conn. This firm was formerly known as Beckenstin & West.

Howard McClovey, architect, formerly of 506 Fourth National Bank Building, Cincinnati, Ohio, is now practicing in offices on the eighth floor of that building.

Arthur Foster, architect, announces that he is now practicing his profession at 56 East Randolph Street, Chicago, Ill. He was formerly located at 155 North Clark Street, that city.

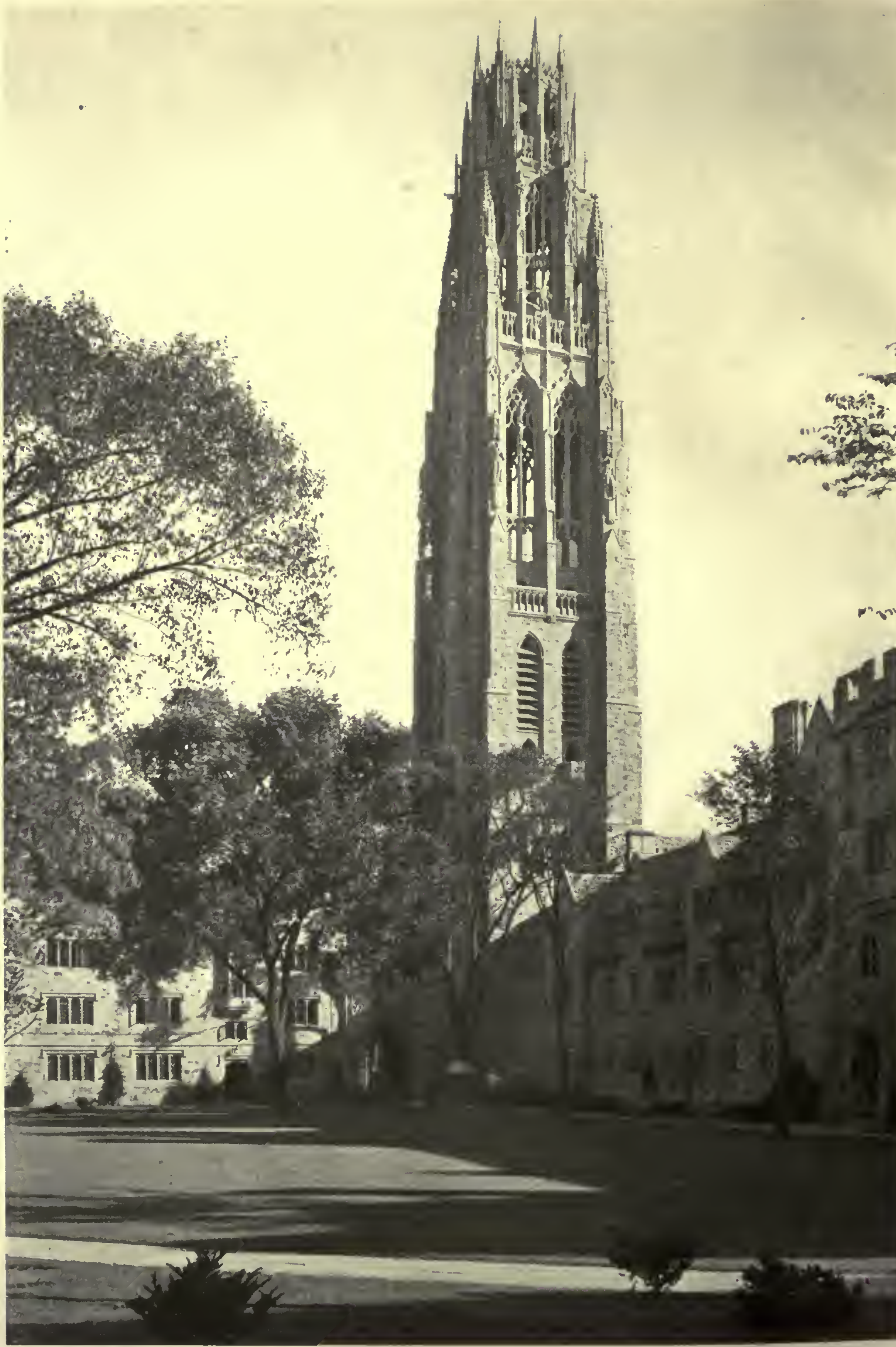
It is announced that T. M. Campbell, architect, is now practicing at 426 Atlantic Trust Company Building, Atlanta, Ga. His offices were formerly in the Johnson Building, Augusta, Ga.

Crowe and Schulte, architects, wish to announce that they have moved their architectural office from 1105 Second National Bank Building, Cincinnati, Ohio, to the Title Guaranty Building, that city.

Bart Tourison and Benjamin F. Betts, both graduates of Cornell University, wish to announce that they have opened an office for the practice of architecture at 1212 Land Title Building, Philadelphia, Pa.

H. Rafael Lake, architect, announces the opening of an office for the practice of architecture in the Balboa Building, San Francisco, Cal. Manufacturers' catalogs and samples are requested.

Henry John Burden and G. Roper Gouinlock announce the formation of a partnership for the practice of architecture under the firm name of Burden & Gouinlock, with offices at 101 King Street West, Toronto.



VIEW LOOKING ACROSS BRANFORD COURT

THE HARKNESS MEMORIAL TOWER, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

THE AMERICAN ARCHITECT
The ARCHITECTURAL REVIEW

VOL. CXX — WEDNESDAY, OCTOBER 26, 1921 — NUMBER 2379

THE MEMORIAL QUADRANGLE AND THE HARKNESS MEMORIAL TOWER AT YALE

JAMES GAMBLE ROGERS, Architect

By William H. Goodyear, Curator of Fine Arts in the Brooklyn Museum. Yale, B. A. 1867; Honorary Yale M. A. 1901; Honorary Member of the Royal Academies of Venice and Milan; of the Architectural Associations of Rome and Edinburgh; of the Royal Institute of Architects of Ireland and of the Society of Architects of London; Corresponding Member of the American Institute of Architects.

WHEN the writer was a student at Yale during the years 1863-67 inclusive, the accommodations of the College dormitories (then confined to the "old brick row") were only sufficient for the housing of the Senior and Junior classes. The exceptional cases in which Sophomores or Freshmen of the class of 1867 had rooms in these dormitories were almost wholly confined to students who worked their way through college by doing janitor's work and by acting as class division monitors. In such cases the Faculty was able to repay these services by giving such students dormitory room rent free, as well as by the remission of the usual fees. The writer well remembers his own sense of deprivation and that of his classmates during the two years of waiting for rooms on the College Campus; for the democratic social life of a college can only be properly enjoyed when living in college buildings. The loss of about one-half the possible income from the rent of rooms in the case of the given class, must also be figured as a serious loss to the University.

Elihu Yale
Statue on Tower

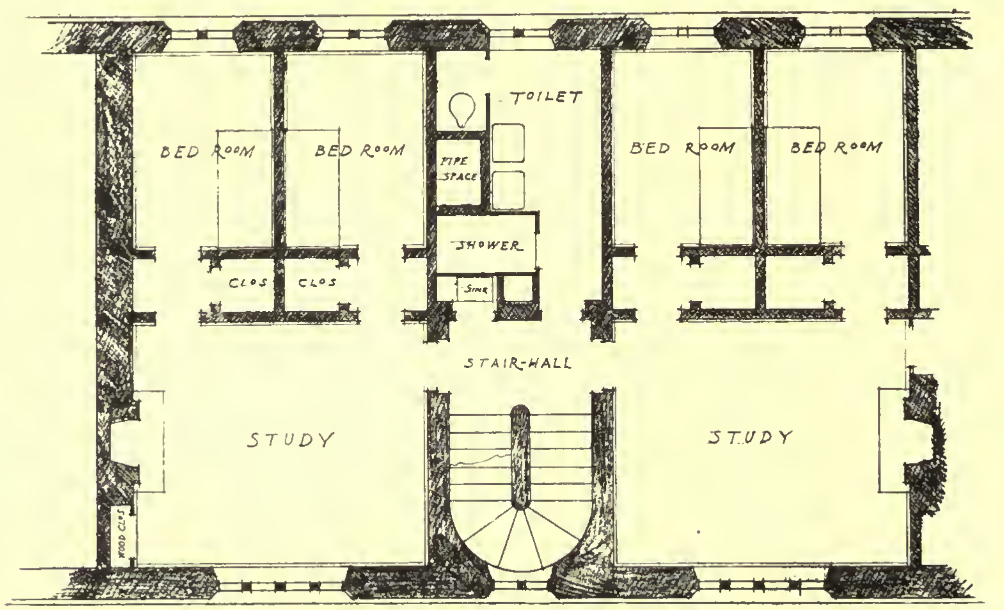
What the exact facts and figures may have been during the years preceding and following those of the class of 1867 need not be gone into here. It is enough to say that in spite of manifold gifts and bequests in this direction and the construction of a considerable number of dormitories, following the destruction of the old brick row, Yale College has always suffered great loss of income and serious detriment to its college life since the years best known to the writer, through the lack of dormitory buildings.

In the year 1916 the Yale Faculty made known to the world that it lacked 502 campus rooms for the housing of the academic department students and this number may have represented considerably more than one-third of the entire number of college students at that date. Yale *College* (Academic) must be distinguished as regards these figures, from Yale *University,* which includes the great number of students in the Scientific School, besides those of the Schools of Divinity, Law, Medicine, Art and other post-graduate students.

In the same year (1916) died George William Harkness of the class of '83, born in Ohio in 1860; a man of lovable, sympathetic, and charitable character, the business manager and head of a family of considerable income, and one who had shown much generosity during his lifetime to the University of which he was a graduate. His mother, Mrs. Stephen V. Harkness, resolved to found a memorial to her son which should meet the needs of Yale College as then recently made known in the matter of the large number of students who could not be accommodated in Yale dormitories.

Her undertaking was not specified in terms of money or even in terms of the number of students to be cared for. It was to the effect that she would provide means to house *all the students* of Yale College lacking college rooms; to include not only the expense of a new dormitory Quadrangle, but also the cost of removing and rebuilding certain University buildings then standing on the only plot of ground available for the Quadrangle (including the University heating and power plant; the Peabody Museum; Herrick Hall, formerly the Commons and Gymnasium; the offices of the Graduate School; Pierson Hall (a dormitory) and some other offices. There was also a row of shops on Elm Street and a row of residences on Library and York Streets).

The site thus made available was the entire block (in the rear of the college dormitories, facing the Green), bounded on the south and north by Library and Elm Streets and bounded on the east and west by High and York Streets. The exterior dimensions of the Memorial Quadrangle are 357 feet on the south (Library St.), 356 feet on the north (Elm St.), 413 feet on the east (High St.), and 416 feet on the west (York St.). The Quadrangle contains about 1,100 rooms and accommodates approximately 650 students. The corner stone was laid on October 8, 1917. By the date when this article appears the Quadrangle will be fully occupied; and the Senior and Junior classes (Classes of 1922 and 1923) will be settled in their rooms. This domicile is obligatory on these classes.



Scheme of study, bed rooms and toilet, Memorial Quadrangle, Yale University

"When Mr. James Gamble Rogers appeared before the Yale Corporation Committee to submit his designs for the Memorial Quadrangle, he laid before them the type plan of a study with two single bedrooms"

In spite of this very recent occupation, (the entire south side was occupied only a year ago) the lawns of the various courts are in perfect order; trees of considerable size (some dating before the present buildings) are found in the courts, bushes and greenery are seen in all directions and the exterior moat is covered with luxuriant vegetation. The landscape accessories and surroundings appear as though the buildings had been completed for many years. The setting of the gem is perfect.

II

WHEN Mr. James Gamble Rogers appeared before the Yale Corporation Committee on building plans to submit his design for the Memorial Quadrangle, his procedure was unique. What the Committee must have expected was a series of architectural elevations together with complete plans of the buildings proposed. What was laid before them was the type plan of a study with two single bedrooms: The logic of this proceding was perfect, although not exactly according to precedent. Given the need of a series of college residential buildings, what shall we consider as of greater importance, their façades or the comfort and daily life of the students who are to live in them, and how can plans be made for a series of residential college buildings unless the primary unit of a single suite of rooms be first considered and approved as to dimensions and arrangement?

Yale Men—1819-1890
Figures on the Harkness Memorial Tower

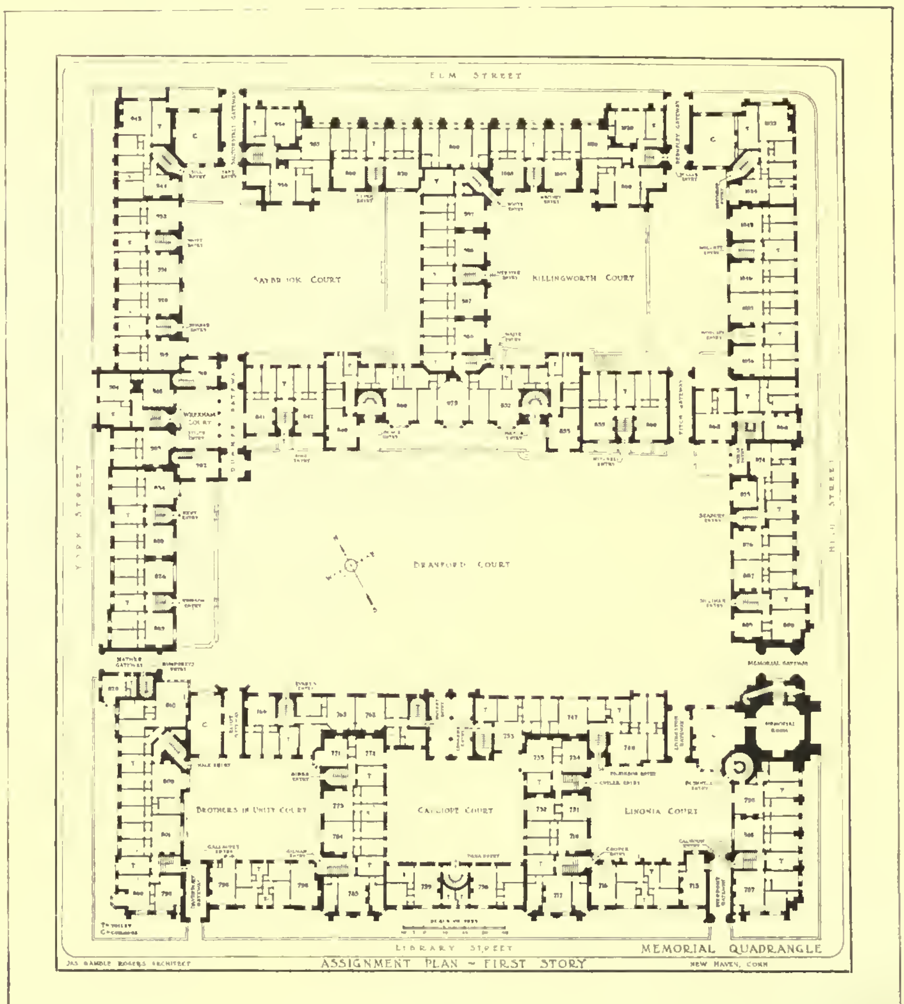
The excellent example of Mr. Rogers will be followed in arranging the matter of this paper and his typical unit suite of a study and two single bedrooms will be first described. The width of any building in the Quadrangle is, generally speaking, determined by the size of the type suite, with study windows on one side and bedroom windows on the other side; the combined width of two bedrooms being equal to the width of the study. The length of any building is generally conditioned by the space required for a pair of these suites, together with the stair-

Photograph of Plaster Model of Memorial Quadrangle

The variety of the various façades may be studied by reference to the above scale model. In the principal and largest court (Branford), the York Street and High Street sides are three stories high and the east to west sides are two stories high. The varying heights of the buildings in this Quadrangle give the greatest possible amount of sunlight in winter days.

ways and the landing between the suites; including the lavatory which opens on the landing and which is designed for the use of four students. The length of the buildings is thus determined by the number of double suites with their separate entries and stairways, which its plan contains. The type suite is, however, varied in a number of instances, as suggested by desirable or necessary variations in the typical plan, so that there are some suites consisting of a study and three bedrooms, others with only one bedroom and study and some single rooms which are bedroom and study combined.

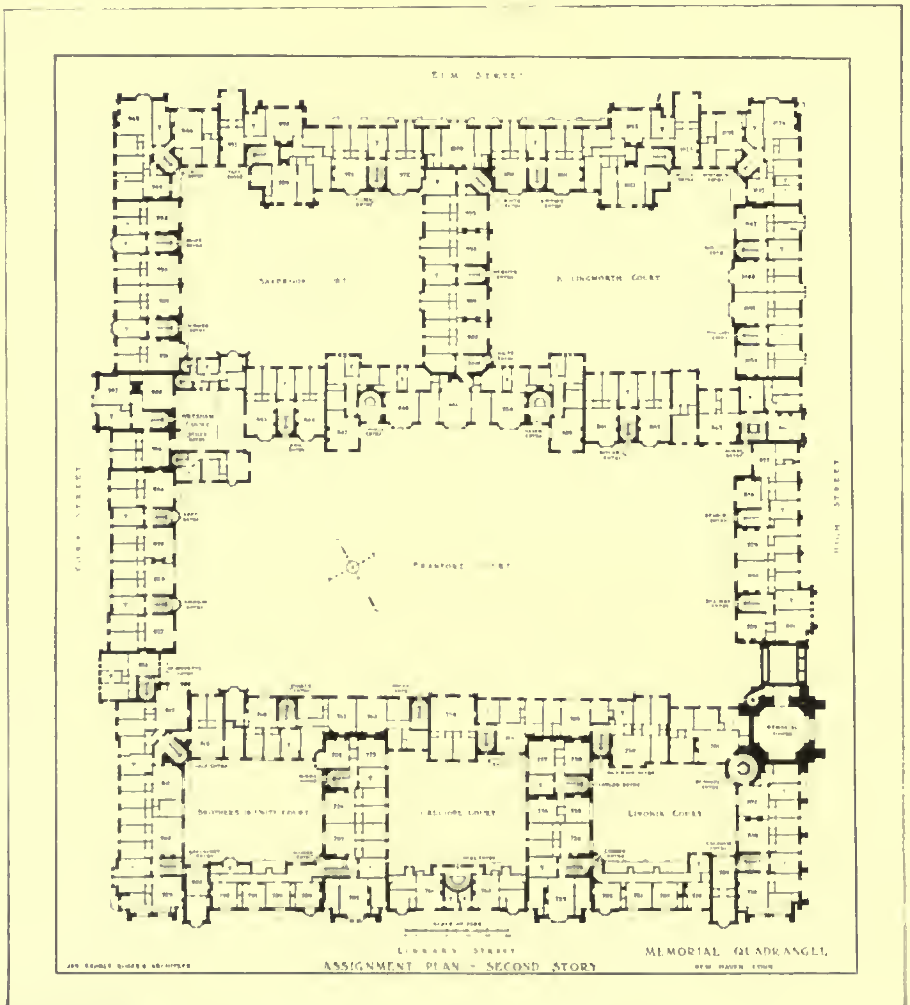
The floorings of these apartments are of oak The walls above the wainscot are of rough textured plaster of a neutral tint in grey or brown. (There is no smooth or white plastering except in closets). The ceiling, finished like the walls, is supported by massive oak beams in visible construction. Every study has an open fireplace for wood fires but heat is also supplied by radiators resting on slate bases, which are operated by a double system. Two radiators are concealed by the window seat in the study. One of these is operated by a system which is designed for moderately cold weather. The second radiator belongs to a system which also operates a



planks of varying widths, fastened down with exposed wrought iron nails and with a surface finish which shows the marks of the plane, although the surface is smooth and the joints practically invisible. The walls are finished below the wainscot with a slate base, sloping outward in the bedrooms for convenience in cleaning. The wainscot, doors and trim are of oak, showing the natural grain and surface, but stained to represent the natural effect of age and then finished with wax. radiator in each of the single bedrooms and is intended for severe weather. The bedrooms are provided with sash ventilators, so that the windows may be closed when desired in cold weather. The windows are vertically double and are framed in iron with small leaded panes. They open outward on hinges at the sides with sliding rods which may be fastened at any required amount of opening. The closets have cement floors with a slate base and are raised one step above the flooring of the rooms. The lighting system furnishes one electric light at the centre of the study ceiling with a variety of plugs for extensions to suit the convenience of the individual student. The appointments of the lavatories wholly discard bathtubs. They include a shower closet (with hot and cold water), two wash basins (for the typical pair of suites accommodating four students), and a toilet. Aside from the lavatory window, ventilation is provided through the shower closet into a shaft rising to the roof through the janitor's closet (which opens on the landing).

rounded corners at the angles and at the openings to the doors. Fire-escapes are provided in the interior construction by a system which carries each stairway to the attic, where it connects with the next adjacent stairway by a fire-proof passage. The interior construction of the buildings is of reinforced concrete.

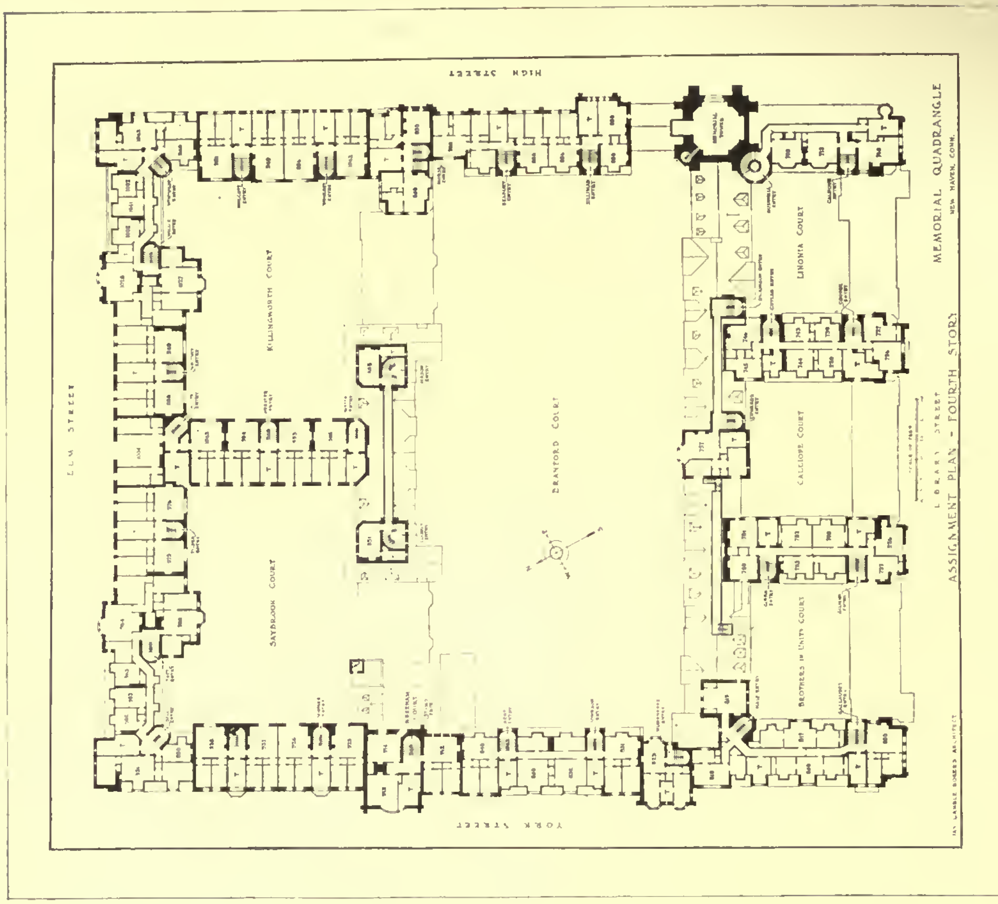
The argument of this article now proceeds to point out that the astonishing and unique beauty of the exterior architecture of the Quadrangle which will occupy our attention later on, is the expression and result of a controlling idea which

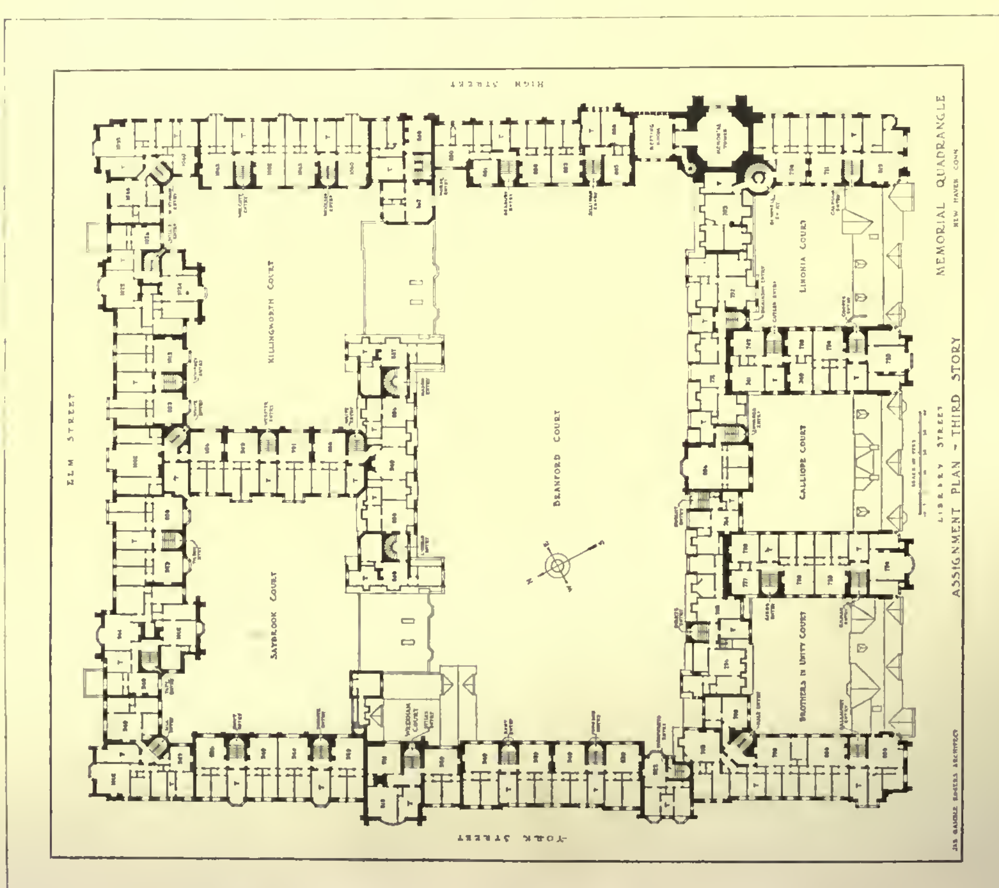


The stairways and landings are built of American travertine and these stone stairways show a really astonishing lightness of construction. At the line where the tread touches the rise of the next step, the thickness is only two inches. This lightness of construction is carried out in the balusters, which are slender rods of wrought iron with a twisted design which comes to the square at top and bottom. The hand rail is of unpolished India teak. The walls of the stairways and stairway platforms are of rough textured brick, with

is equally apparent in the interior apartments. This controlling thought, aside from the remarkable grasp of utilitarian and practical problems, is to break utterly, frankly and openly with the appalling monotony so far generally found in institutional interiors with a standardized system of repeated units having the same dimensions and purpose.

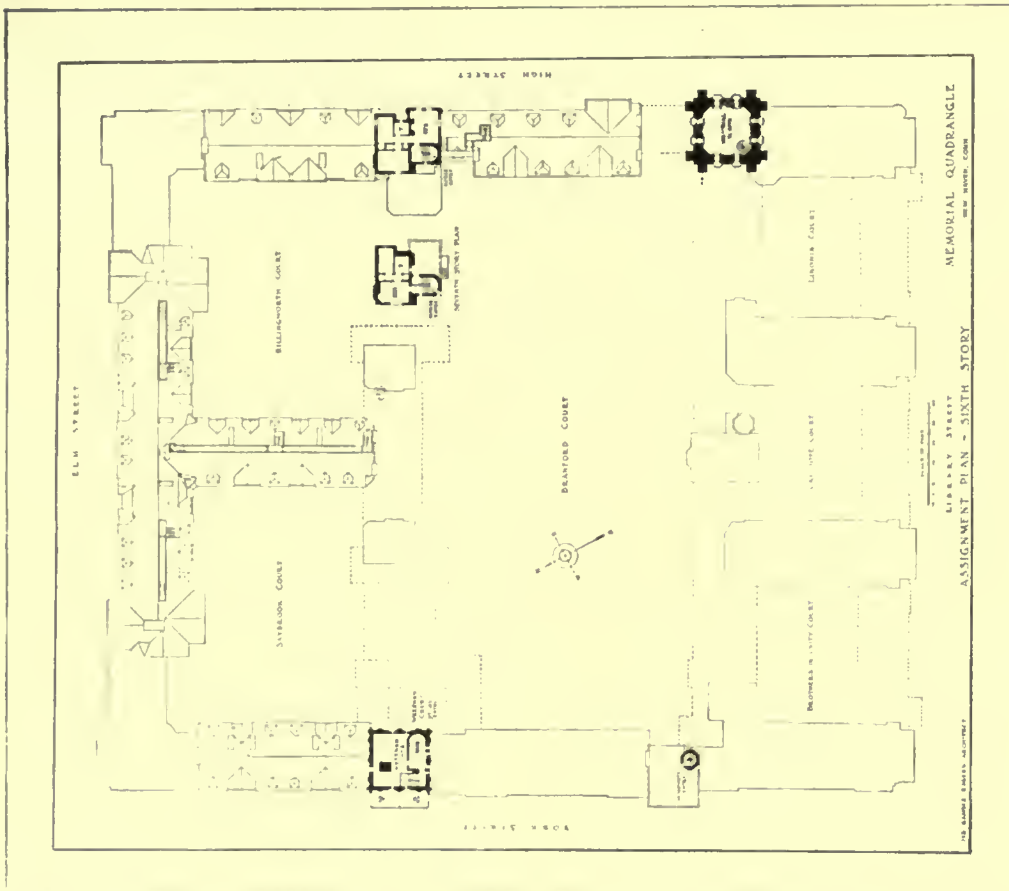
In order to describe the care and thought which have been given to the ideal of individualizing and varying the type unit of a college student's

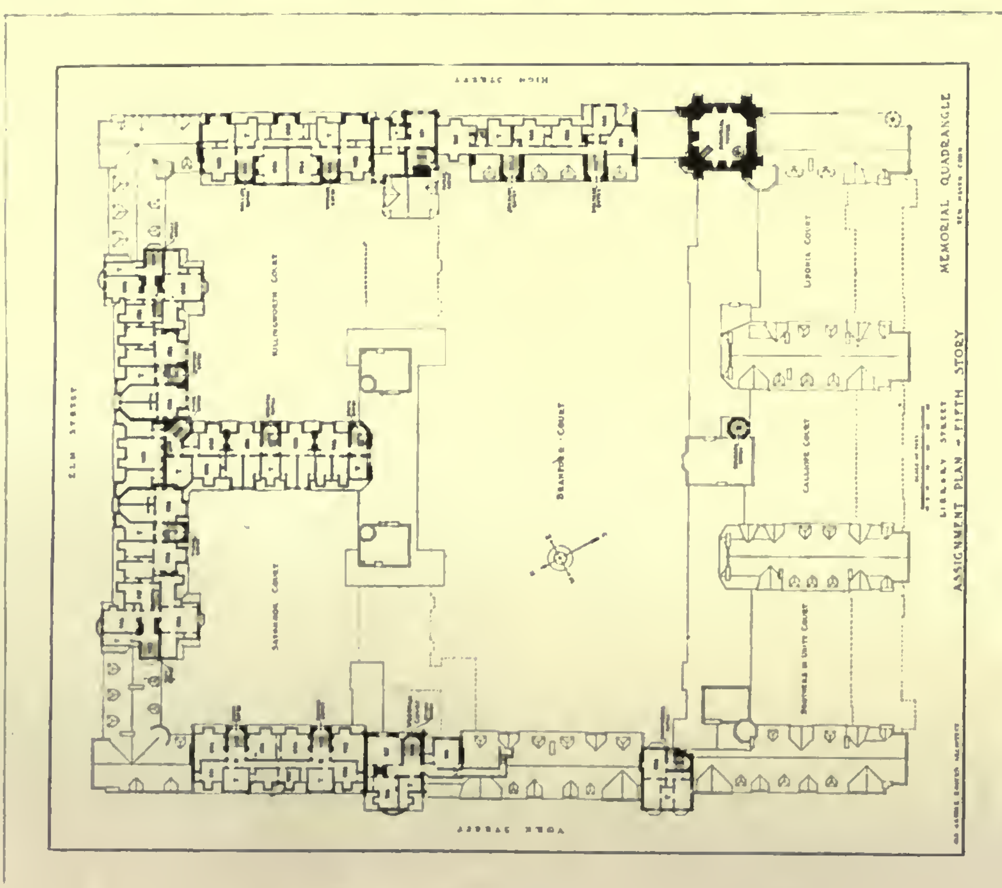




MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT





MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.
JAMES GAMBLE ROGERS, ARCHITECT

A cornice detail

apartment it has been first necessary to include a description of its practical and utilitarian features as well, and most especially so because many of these features combine utility with aesthetic quality and character; as found for instance in the rough finish of the walls, always more effective for color toning than a smooth plaster surface; as found in the visibility of the beams of the ceiling; as found in the visibility of the planing marks and exposed wrought iron nails, as a means to artistic finish in the oaken flooring; as found in concealing the radiators under the window seats; and as found in the rough textured brick walls of the stairway and landing which are far superior for color and texture to a plastered surface. The wrought iron balusters and unpolished teak rail of the stairway are another illustration. The use of a natural finish oak for the woodwork of the wainscots, doors, and trim; as distinct from the stain or color and smoother surface finish which is usually and necessarily found in woodwork of other material is also an aesthetic asset of supreme importance.

These features are of general importance but there are others which give a separate individuality to each apartment. It has been mentioned that every study has an open fireplace. In an apartment visited by the writer the fireplace was lined with American travertine but brick and iron are also used. Counting the oak mantel and oak trim there are five types of material used for the fireplace. By varying the combinations twenty-five different styles of fireplace are obtained, and these are used in adjacent and neighboring apartments. The practical result is a variety of appearance in contiguous apartments which appears to be universal for all. From the same point of view the plaster tint of the study walls shows five different tones of grey and brown for any five adjacent apartments, all of which are consequently dissimilar in this particular. An additional touch of individuality is obtained by the universal but modest and appropriate use of wood carving. The interior oaken spandrels of a study door noticed by the writer, contained reliefs, of excellent design and execution, representing on opposite sides, the Saviour and the Tempter, suggesting probably the choice between good and evil which lies open to the student. The corbels of the ceiling timbers terminated in grotesque human heads of an execution and conception equal to the best medieval work. A relief medallion portrait of some college worthy appeared on the oaken trim near the window. Finally every study window in the Quadrangle has one of its small panes decorated with a picture or device in color suggestive of college associations or college history, and this picture differs in every instance from its fellows.

Sketch of Library Street façade, showing the Moat

These various touches of individual decorative interest tend to humanize the student's life, to raise his plane of thought, and to stimulate his pride in his surroundings. Outsiders may not wholly realize the keen interest which the average college student takes in decorative accessories which illustrate, and relate to his college life. Far distant be the thought that too much has been done for him in the Quadrangle in the line of decorative art. Although much thought and much expense must have been devoted to these details, there is no taint of luxury and no visible suggestion of a lavish outlay of money in these directions. Good taste, common sense, simplicity and the economic use of constructive material and constructive necessity for decorative purposes characterize the interiors of the Quadrangle. From a practical point of view the writer cannot forbear the suggestion that philanthropists who are interested in apartment houses designed with a limited number of rooms for people of moderate means ought to visit these buildings. Without knowing what Mr. Rogers has hitherto done in this direction it may be hoped that his talents will be widely employed for this purpose in the future. If not, the world, philanthropy and good architectural art, not to mention distressed tenants who are in search of moderate rents, will be the losers.

Aside from the Memorial Hall in the first story of the Harkness Memorial Tower all the rooms in the Quadrangle have a residential character and purpose. Outside of the studies and bedrooms there are four rooms of moderate size, located near the outer angles of the entire group of buildings. These are called "Commons" rooms but are not used for the purpose usually suggested by that word. They are lounging rooms, fitted up with the same attention to comfort and utility which is found in the students' apartments, and decorated with occasional relief carvings in the oaken woodwork which illustrate the life and history of the College.

III

THE outer dimensions and boundaries of the Yale Memorial Quadrangle have been mentioned. It is dominated by the most beautiful tower in modern architecture and is laid out with consummate taste for picturesque effect in matters of landscape accessories. The exterior Quadrangle encloses six interior courts of which the largest and central one is an oblong approximately measuring 260 feet by 110 feet, reaching from the High Street to the York Street interior façades. Its beautiful lawn is dotted with trees, shrubs, and bushes and is unbroken by crossing paths.

Northern and Southern Soldiers—Harkness Tower

This interior quadrangle is not conceived as an architectural unit of uniform detail and appearance, but rather as a court formed and bounded by contiguous buildings of varying and separate designs. The unifying features are the general resemblances of English secular Gothic and the character of the masonry, which is the most remarkable and the most beautiful so far known to the modern world, and presently to be described. The same appearance of variety and diversity holds of the remaining courts, three on the south and two on the west of Branford Court. None of them are designed as courts; all of them are open spaces surrounded by buildings of varied design. (The courts on the south, where there are three, are also consequently of different and smaller size than those on the north, where there are two, and this again contributes to variety of appearance in the buildings which surround them). It follows that the four exterior façades of the Quadrangle are also of different design. The infinite variety thus obtained has been carried into all the details to be subsequently described. Institutional uniformity and academic uniformity have been thrown to the winds (the latter in two senses). It remains to be added that no taint of eccentricity, of *art nouveau,* or of manufactured picturesque effect, is to be found in any of these buildings so happily and harmoniously joined together. All of them are sober and serious designs based on English secular Gothic. The character of the plans is attested by their relation to the type unit plan of study and bedrooms which has already been described. It follows from what has been said on that subject that there is not a ground plan in the whole Memorial Quadrangle which has been designed for a manufactured picturesque effect at the expense of interior utility.

Jonathan Edwards

We are thus led to recur to the fact that the style followed in the Quadrangle is English secular Gothic. It is said that the Corporation Committee on building plans recommended this style to Mr. Rogers. It must have been exceedingly grateful to him to be recommended to do what he wanted to; always supposing that he wanted to do what he actually did and this a fair supposition. That Mr. Rogers can design successfully in Renaissance is attested by the New Haven Post Office, but results in the Quadrangle show that this style would have been highly inadvisable there. Bonaparte long since told us that the style is the man. (*"Le style, c'est l'homme"*). He was speaking of literature but it is eminently true of the Quadrangle and in more than one sense. To have designed this Quadrangle in Renaissance would have robbed the architect of his big roofs, of his massive walls, with their marvelous broken colors, of his surfaces unfretted by projected pediments and Classic Orders, and of his massing and distribution of shadows in the window openings. Above all it would have robbed him of his immortal tower. To discard all rubbish about "correct styles," to design with a free hand, to use the building materials as nature gives them with their native natural surface, to be indifferent whether a window head is flat or arched (as far as style is concerned), and to be able to compose the shadow effects of these window openings with absolute freedom from classic rules and formulas—all this is to design in English secular Gothic, as understood by Mr. Rogers.

The infinite variety of these various façades, thirty-two in number if the writer is not mistaken, is controlled, however, by system. The

Colonist — Indian — Colonial Soldier — British Soldier

Bosses in cornice typifying early American Wars —Harkness Tower

Wisdom Justice Fortune Industry Security Hope

Plaster Model for Soffits of Beams

south to north buildings facing York and High Streets, are one story higher than the highest east to west buildings, excepting those on the Elm Street side. Thus, in the principal and largest court (Branford) the York Street and High Street sides are three stories high and the east to west sides are two stories high. As a matter of vistas this is obviously an advantage. To make the long sides of the oblong lower and the ends of the oblong higher, is to construct very imposing effects of distant dimension for the entering spectator who comes into Branford Court, by the Memorial Gateway or by any gateway on the street sides, not to speak of the various entries from the courts on the east and west.

The World War—Tower

The deeper method in this madness is to construct courts having the greatest possible amount of sunlight in winter days and this, of course, is achieved by the lower heights of the interior east to west façades for the north side of Branford, and the north sides of Saybrook and Killingworth Courts. It must be remembered that the problem is to house approximately six hundred and fifty students on a given area and obviously much sunlight in the courts will be sacrificed if all the buildings are of uniform height. Following this principle the Library Street façade, facing south, is the lowest in its lower divisions of all the main sides of the Quadrangle and the Elm Street façade on the north side is higher than the highest exterior south to north sides (four stories) because there is nothing gained by letting sunlight into Elm Street. This system also explains why the total difference in the height of the east to west façades is from *one story* on the interior north sides of the three courts next to the Library Street side to *four stories* on both sides of the Elm Street façade. These three courts; Linonia, Calliope, and Brothers in Unity, as the smallest of all the courts, are most in need of sunlight in winter on their north sides. As a result of the variations described it is said that the sun falls at midday in winter within six feet of the north walls of these courts. On the other hand the three divisions of the Library Street façade (on the street side) which correspond to the north sides of these courts are two stories at their lowest height. Thus the same construction has two stories on the south and one on the north; the difference in height being taken up on the north sides by a low pitched but much wider roof. On the other hand the middle east to west buildings of these courts, separating Linonia from Calliope and separating Calliope from Brothers in Unity are three stories high, and are carried as constructive units into and through the Library Street Front, where they appear on its exterior as gabled three story projections with an additional dormer in the gable. The west side of Brothers in Unity Court and the east side of Linonia Court have the three-story height which is found on the York Street and High Street sides of the Quadrangle. All this may be perplexing in verbal description, but the statement that much sunlight in winter has been obtained for the north sides of the small courts on the Library Street side of the Quadrangle is unimpeachable. The farther statement that a delightful and infinite variety of architectural effect has been obtained by commonsense and conscientious attention to the comfort and welfare of the students in the matter of winter

Detail of front of a Window Seat

Athletics. The Crew
Harkness Tower

sunlight is also veracious.

On account of the relative seclusion of Library Street as contracted with the bustling life of Elm Street, it had also occurred to the architect to give the courts of the southern Quadrangle side a more intimate and more secluded and cloistered character. Hence their smaller dimensions and other phases of their design which appear in the illustrations. Hence also the appropriateness of the low proportions of the one story elevations on their north sides.

IT is difficult to realize that the most vivacious and colorful masonry of modern time has been built of granite. One is disposed to think of granite as generally of a pepper and salt or leaden grey color, worked down to a smooth surface and frequently polished for certain building uses. Granite is, of course, widely used for mausoleums and tombstones. Its qualities are supposed to be solidity, strength and durability in the matter of weathering (witness the granite temples of Egypt, as compared with the Egyptian temples of sandstone). We do not think of it as a building material of bright and cheerful color. That is because we may possibly not know about the Plymouth quarries of East Weymouth, Massachusetts. Mr. Rogers found at these quarries exactly the stone to suit his purpose and it was accordingly selected.

Stone Model of detail in a Commons

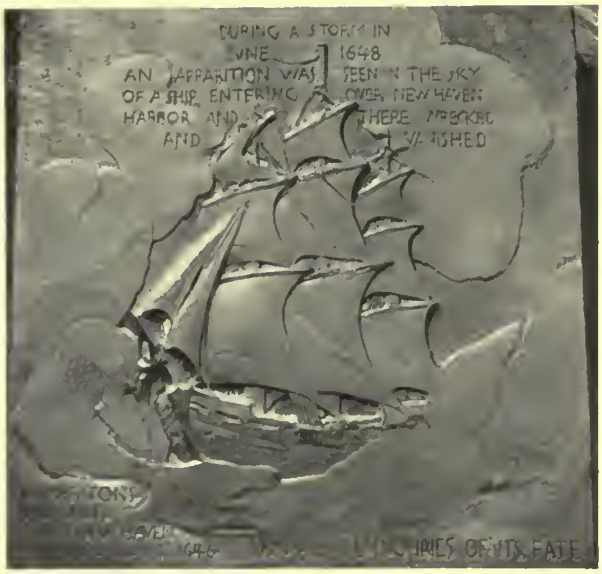
The granite masonry of the Quadrangle is not smoothed or tooled on the outer surface. The faces of the blocks show the uneven rough texture of the natural stone as it comes from the quarry. Add to this departure from precedent another; the blocks are of irregular sizes and are set in thick mortar without reference to regular courses; whereas granite, as usually known, is set with close joints and with no visible cement or mortar, in regular courses. As to color the general color effect of the Quadrangle masonry appeared to the writer as a warm grey, shot with irregular and broken effects of tawny yellow and deep reddish brown.

"Literateur"
Harkness Tower

The Plymouth quarry stone is described by an expert as being a "seam-faced" granite. Seapage into the seams of iron and sulphur derived from earth and mould has produced the stains. These have saturated the blocks to depths reaching from half an inch to eight or ten inches and sometimes penetrating its entire thickness. The setting of masonry of such bright and varied colors must naturally be directed by an artist such as Mr. Rogers has proved himself to be. The blocks of the Harkness Memorial Tower for instance start at the base with the roughest surface and the darkest browns and yellows, gradually toning over to the lighter tints by insensible graduations, the lightest colors being used toward the summit, a light colored sandstone being also employed in the upper stories, at first mixed with the granite and then alone. The gradual transition from dark to lighter tones of granite in the vertical direction, has also been generally followed in the walls of the Quadrangle. In both cases the effect is one of strength and stability at the base, and lighter weight above. As regards variations of color in the given granite it may be mentioned that the light grey Wrexham Tower is so much lighter in tone than the neighboring buildings as to suggest the use of a different masonry. This effect is due to a careful choice of the granite blocks as regards tone and this individual selection of the masonry units for effect of color and tone has been the rule throughout the Quadrangle. It goes without saying that in no other modern buildings have such persistent care and thought been devoted to the texture and broken color effects of the masonry. It need hardly be mentioned that an elementary rule of decorative art teaches that a flat tint or uniform surface of color is always inferior to broken color. This is also the reason why rough texture, which involves a greater variety of lights and shadows and consequently a greater variety of color tones, is generally superior to smooth or polished surface in any given material.

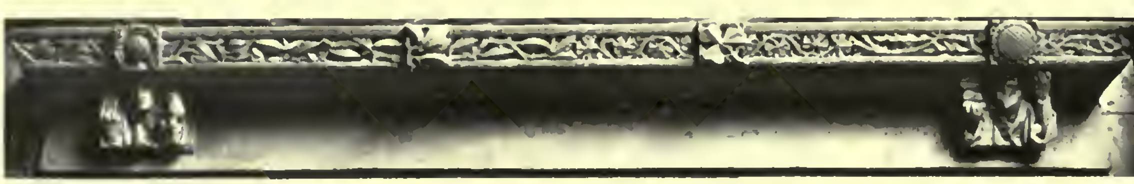
Aside from the granite masonry many remarkable instances of the persistent effort to break up and vary the monotony of uniform surface and uniform color and the monotony of *regular masonry,* are found in the three small courts of the south side of the Quadrangle. In Linonia Court courses of brick and granite have been mixed together in horizontally broken bands of irregular widths and the low-toned soft pink of the brick work is exceptionally beautiful. On enquiry it appeared that no such brick is, or can be, manufactured. The tone is obtained by using old bricks from buildings which have been torn down and subjecting them to sand-blast. Fine effects of texture and color are also obtained in this court and in its gateways by irregular courses of brick laid with careful carelessness in thick mortar. In Calliope Court use is made of the Boisé sandstone from Idaho. Delicate variations of color are obtained by surfaces which show the cuts of a saw which is operated with a mixture of steel shot and sandstone fragments. In Brothers in Unity Court seven sizes and five colors of new pressed brick are mixed with irregular courses of sandstone and limestone, and the colors of the brick work have been toned down by the sandblast.

Aside from these courts the masonry surface is Plymouth Quarry granite throughout the Quadrangle façades. Briar Hill sandstone from Ohio (streaked with iron rust) has been largely used for trim and grey Indiana limestone has also been used for this purpose. Berkeley Gateway, a passage leading from Killingworth Court to Elm Street, is vaulted with old brick formerly used for street pavements in New Haven and there are many variations of arrangement and treatment in the vaultings of the passages, mostly of granite. The sides of these passages also display an infinite variety of invention in the composition of the masonry patterns.



The "Mystery Ship," Stone over Mantel

From the foregoing account it appears that ordinary photographs can never give a correct impression of these buildings. Lumière photographs on transparent glass, showing the actual colors, will doubtless be widely used, for the benefit of those who cannot visit the buildings. As to pictures in color they can hardly be attempted even by the most gifted artists. A watercolor by Sargent might deal with some small portion of a given façade or court. The painters in oil whose temperaments would react most readily to the color schemes of Mr. Rogers are Monet, Sisley and Monticelli. Monet is the only artist who could attempt the changing and vibrating color, the evanescent feathery grace and the etherial lightness of the Harkness Memorial Tower (220 feet in height). As regards color schemes those of Sisley find a close analogy in the walls of the Quadrangle and Monticelli would have highly appreciated its texture and warm broken colors.



Detail of Mantel Top

V

The roofs of the Quadrangle are of large dimensions and are an asset of great importance to its architectural effect. Once more the unfailing preference of the architect for broken color asserts itself, but the contrast of tone with the walls is emphatic and important. At a distance the roofs appear as a dark spotted grey. At close range the tiles show colors of green, slate, brown, and dark grey, blended with agreeable effect. They are so arranged, in medieval fashion, that they have a wider exposure of surface and greater thickness at the eaves, with a gradual diminution of exposed surface and thickness toward the ridge. The surface exposure of the tiles diminishes from eight and one-half inches to four and one-half inches and the thickness decreases from one and one-eighth inches to five-eighths of an inch. The result is an optical perspective illusion of increased distance between eaves and ridge, together with that charm of effect which always attends slight variations of dimensions in apparently corresponding units of design. The tiles are originally red, then subjected to reglazing and refiring in the quoted colors, a method which is the invention of Mr. Rogers. Before the first baking their surfaces are roughened and corrugated by hand. The purpose of this procedure is to retain the dust so that it may offer a soil which will promote the growth of lichens and moss, and thus improve the toning of the roofs.

An exterior view showing moat wall on Library Street,

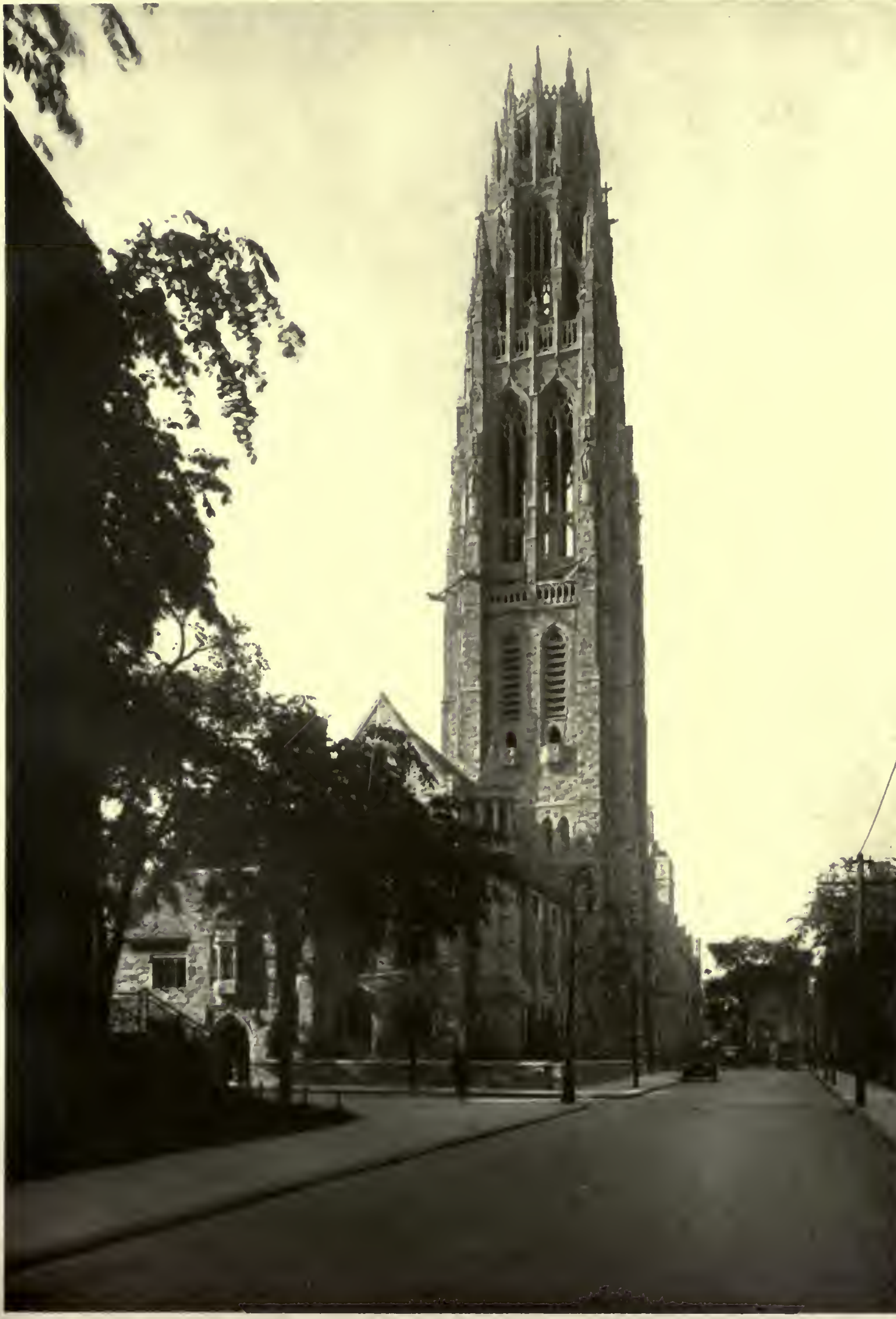
THE Memorial Quadrangle is a memorial in more than one sense; not only of the man whose name is specifically mentioned only in connection with the Harkness Memorial Tower, but also of the history of Yale College. And this thought has been so abundantly and consistently carried out as to add one more element of varied effect and of food for thought to this wonderful creation.

The naming of the various courts after the three localities with which Yale history is first connected and after the three great public debating societies which flourished (two of them at least) down to the third quarter of the last century, is only the beginning of an elaborate monumental revival of the historic associations of the University and of the memory of its many illustrious graduates.

Yale College is so named after Elihu Yale, a rich India merchant whose donation in the first decade of the eighteenth century of five hundred pounds' worth of goods was the first substantial contribution to the support of the College. He is buried near the tower of St. Giles Church at

A corner in one of the courts

Wrexham in Wales. Hence the free copy of the tower of this church at the angle of Branford Court, diagonally opposite to the Harkness Memorial Tower. It is by no means, however, a purely decorative appendage of the Quadrangle. Its five lower stories are devoted to students' rooms and its louvres conceal one of the two tanks which furnish the water supply of the Quadrangle. (Another tank is concealed behind the louvres of the Harkness Memorial Tower). Statues of heroic size of eight leading Yale worthies are placed on the Harkness tower at about half the height of its belfry; they represent Jonathan Edwards, Elihu Yale, Eli Whitney, Samuel F. B. Morse, John C. Calhoun, James Fenimore Cooper, Noah Webster and Nathan Hale. The gateways and entries of the various courts are not only named after distinguished benefactors and famous graduates, but they also carry inscriptions giving names, dates, and a brief record of their contributions or serv-



HARKNESS MEMORIAL TOWER FROM YORK STREET, NEAR CHAPEL, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

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MEMORIAL GATEWAY, LOOKING IN

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

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MEMORIAL GATEWAY, FROM BRANFORD COURT

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

3/2[3]

WREXHAM TOWER, FROM BRANFORD COURT

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

WREXHAM TOWER, FROM SILLIMAN ENTRY

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

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DETAIL OF FACADE ON LIBRARY STREET, SHOWING MOAT WALL

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

3/2 6

THE AMERICAN ARCHITECT—THE ARCHITECTURAL REVIEW
VOL. CXX, NO. 2379 OCTOBER 26, 1921

LOOKING TOWARD LIBRARY AND YORK STREETS

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

NOAH WEBSTER ENTRY, KILLINGWORTH COURT

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

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WAITE ENTRY

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

MASON ENTRY

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

10
3/2

DAVENPORT GATEWAY

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

312"

PIERPONT GATEWAY FROM LINONIA COURT

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

3/2 '2

CORNER IN LINONIA COURT

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

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CORNER IN SAYBROOK COURT

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

DUMMER PASSAGE

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

912 '5'

VIEW IN KILLINGWORTH COURT

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

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ices to Yale or of their distinctions in the field of learning. About fifty names which are famous in the annals of literature, science, mathematics, philology, theology, philosophy, economics, law, medicine, and politics are thus given a monumental celebrity. Even from the standpoint of architecture alone the abundant and carefully lettered carved inscriptions in old English Gothic, modern Gothic, Uncial, and early American lettering, above and near the gateways, are an addition to the varied effects of the architecture. From the standpoint of Yale College which has hitherto rather neglected its early days and the memory of its great men, this monumental version of the history of the University is a positive contribution to literature. It is also calculated to inspire the ambition of the students and to teach them that a College stands for something more than fame in athletics. No visitor to the Quadrangle should omit to purchase the pamphlet which furnishes complete details on this subject; written by Stanley T. Williams, 1911, at the request of the Committee on the inauguration of James Rowland Angell as the fourteenth president of Yale University and entitled, "The Memorial Quadrangle and the Harkness Memorial Tower."

In the matter of the abundant monumental symbolism and significant decorative sculpture of the Memorial Gateway and of the Harkness Memorial Tower this pamphlet should also be consulted. The writer much regrets to slight this important subject but it has been completely covered by Mr. Williams. The touches of personal and contemporary interest which are given to the Memorial Gateway by the portrait heads of Mr. Rogers and some of his assistants which decorate the bosses of the vaulting, must however, be mentioned. It may be added that the front of this gateway above the arch offers the only instance of a tooled masonry surface to be found in the Quadrangle. The idea is obviously to differentiate the masonry of the gateway from that of the tower which adjoins it on one side and from that of the High Street façade which adjoins it on the opposite side. The fact emphasizes the general preference of the architect for rough texture. It is also significant that the Memorial Gateway does not centre on Branford Court, but is placed at one of its angles. There are no central gateways in the Quadrangle. The advantage in the matter of vistas is obvious. As for the ironwork grills and gates they are not yet in position but there is no doubt that they will add one more touch of beauty, of good taste, and of competent workmanship to the total effect of the Quadrangle.

Mention must also be made of the fan-vaulted Memorial Hall which forms the interior room (about twenty-two feet square and forty feet high) of the first story of the tower. It has an oak wainscot fifteen feet high. Its memorial features have still to be determined. It will be used for official meetings. Higher up are the louvres which conceal the watertank (previously mentioned). Above these will be placed the chimes which have an unusually elaborate musical equipment.

As regards the exterior design of the tower the writer prefers to refer to the illustrations and more especially to actual vision. To describe it in words is rather futile. The tower has no rival in modern architecture and has no reason to shun comparison with the famous creations of the Middle Ages. It is so superior to anything of the kind so far erected in this country, or in modern Europe, as to create a standard by which future similar efforts must be judged. It is so close a rival of the finest medieval Gothic towers and spires as to leave one in doubt whether it may not be the equal of any. It appears not to have been mentioned so far in print, that its remarkable soaring effect is largely due (aside from the change in tone from dark to light in the rising direction) to its remarkable diminution, which is most unusual in its amount (when towers are considered as distinct from spires). This diminution produces an optical illusion as regards the height. The eye recognizes the diminution but discounts part of it into an effect of greater height*.

The beauty of the tower is also due to a strong effect of entasis, resulting from the successive and gradual contractions in size. This effect of vertical curvature is very obvious in the illustrations. The entasis is also widely used in medieval spires and towers, but is obtained in these cases by successive bends in straight lines. (This is also the case in Greek horizontal and vertical curvatures which are never true curves in the horizontals, although the contrary is generally supposed. The vertical entasis in Greek art is also generally produced by bends in straight lines).

It is evident that residential college buildings with ground floor rooms used for studies, bedrooms, and lavatories, and with windows facing directly on the sidewalks of immediately adjacent streets, must have some sort of protection from thieves, marauders, and curious or otherwise obnoxious persons. Gratings are not to be thought of and high walls would be a serious detriment to the architecture. The expedient is obvious, after Mr. Rogers thought of it, perhaps not equally so before, to surround the Quadrangle with a moat. Of course there must be a wall to keep passers by, on the sidewalk, from falling into the moat, and also to serve as an additional barrier of protection, but this wall is of such low height as not to dam-

*On this subject see Thiersch, *Optische Taüschungen auf dem Gebiete der Architektur*, in the *Zeitschrift für Bauwesen*, 1873, p. 15; also quoted in full by Goodyear, *Greek Refinements*, with diagram of a Doric column showing the optical effect of increase in height, due to its diminution, pp. 155, 156.

age the appearance of the exterior façades. The deepest moat is on the Library Street side, perhaps because this street, being the most secluded, needs the most protection. Its wall is three and one-half feet high. The moats diminish in depth and the walls increase in height on the High Street and York Street sides and the walls reach their greatest height of six and one-half feet, near the corners formed by the meeting of Elm Street with York and High Streets. These variations in the moat wall are an additional feature of the unconventional conflict with uniform and monotonous construction, which the architect has so persistently waged. The high moat walls near and at the corners of Elm Street (on the east, west and north) must be explained by the fact that the busiest life and bustle are on the adjacent streets, especially on Elm. How then can we explain it that beyond the corners of Elm Street the shallowest moat and the lowest wall (only about two feet high) are found on this front? The answer is found in the main central portion of the Elm Street façade with its splendid and imposing sequence of eleven great Gothic traceried arches. These arches are a decorative openwork screen, behind which is concealed, and by which is protected, the true wall with its lavatory and bedroom windows (there are only three studies in this arcade). Thus we understand the double reason why the finest façade of the exterior Quadrangle is apparently unprotected from the street. The façade needs no protection and the low wall and shallow moat are needed in order to give full display to the beautiful traceried arches.

Many fine appreciations of the Memorial Quadrangle have been published. Among these is that of Professor William Lyon Phelps, who comes to the front as its warm and frank admirer. He considers the Harkness Memorial Tower as "one of the Lights of the World" and adds that the architect of a cathedral "was prophet, priest, dreamer, artist and clown. Whenever a freak thought occurred to him or a flash of humor illuminated his fancy, he perpetuated the fleeting waif. So, as one wanders around the Memorial Quadrangle, viewing it from without and within, one sees bits of humor, sardonic embellishments, queer platforms and recesses that (thank heaven) are without any useful purpose and do not make for efficiency. . . . There are so many delightful whimsicalities in these buildings that one must go to the medieval cathedrals to find a true parallel . . . . The architect ought to be doubly happy—first in having dreamed such dreams, second, in having the marvellous art to make them all come true."

The cost of this amazing contribution to the cause of learning, of education, and of architectural art, is not quoted. The architect had *carte blanche* and his achievement is priceless.

Editorial Note—At the suggestion of Mr. Goodyear the Editors will supplement this article with a republication of Mr. Williams' matter on the details and decorative sculpture of the Harkness Memorial Tower and with proper credit.

THE HARKNESS MEMORIAL TOWER

Being extracts from a pamphlet written by Stanley T. Williams, ('11), at the request of the committee on the inauguration of James Rowland Angell as President of Yale University

IN studying the Quadrangle there is a continual seduction from the logical and orderly approach to its beauty, because of the constant charm of its detail. It is, indeed, a veritable "confusion of delight." Spontaneity itself, it will not tolerate a methodical and monotonous study of its infinite variety. Like a picture it should be examined slowly, and at many times; studied not efficiently like a factory, but negligently, almost aimlessly, by walking through its cloisters, letting tho special appeal of its imaginative beauty lead where it will. At one time it may be its rhythm, at another its variations of color, at still another its shadings of moulding or tracery. Here "a blossom germinates," here a face, elsewhere a grouping of tower and tree, and many times a name that stirs old memories. Forever the charm of irregularity, of "imperfection." "The foxglove blossom,—a third part bud, a third part past, a third part in full bloom,— is a style of the life of this world. And in all things that live are certain irregularities and deficiencies which are not only signs of life, but sources of beauty. No human face is exactly the same in its lines on each side, no leaf perfect in its lobes, no branch in its symmetry. All admit irregularity as they imply change; and to banish imperfection is to destroy expression, to check exertion, to paralyze vitality. All things are literally better, lovelier, and more beloved for the imperfections which have been divinely appointed."

So that to see the Tower, as with Baedecker in hand, is a formality which defeats its own end. If the visitor, then, follows the order of this paper, which is at best a literary device, and not the official and only way to see the Quadrangle, he misses much. As he crosses Branford Court to its opposite side for the best view of the Tower, he passes a thousand beauties on the way, which were well yielded to. But if time is important, and if he reserves these for a later and orderly inspection, the best sight of the Memorial Tower may be had from Johnson Entry, near the Mather Gateway, on the York Street side of the Quadrangle.

The Memorial Tower, rising two hundred and twenty feet above High Street, rests upon caissons filled with reinforced concrete, carried through the New Haven sand to bed rock. Above the Memorial Room, already described, is the Belfry, lighted by long lancet windows which appear above the first gallery. The stage above the Belfry is the Lantern. Blending with this, and melting into it imperceptibly is the Crown. For this is a "Couronne" Tower, done somewhat in the style of St. Botolph in Boston, England, a church rich in Puritan tradition through its association with the name of the Reverend John Cotton. So far as known, it is the only "Crown" tower in America, and the only one built in modern times. It has, in fact, a double crown as the result of a geometrical feat in providing a perfect octagon for the crown top. At the base of the Tower is placed dark stone which gradually grows lighter as the Tower rises, till the crown has a dazzling whiteness. The ease of the color transitions is due in large measure to Mr. George Nichols, the supervising architect, who, when the Tower was covered with scaffolding in the process of building, carried in his mind the precise shading of each succeeding portion of the Tower. Seen from Johnson Entry the combined effect of the diminuendo in color and size of the Tower is impressive. Its simple base makes it seem an inseparable part of the Quadrangle, but as it leaps upward, with the colors ever lighter and the ornament ever richer, it achieves an individual character which makes it rightly the dominant and the most brilliant feature of the whole.

Too much cannot be said of the originality and thought which inspired this feature. And before examining the ornament one should notice the development of the lines of the Tower to its climax. The lower shaft, with its louvres, is in harmony with the lower buildings, yet every line points upward to the Lantern, and the Lantern in turn, merges perfectly into the Crown. Similarly every angle of the Crown is linked with a phase of the Lantern, and the octagonal angles of the Crown are in the centers of the Lantern façades.

Note, moreover, how gradual is the rising wave of symbol and statue. On the level of the floor of the Belfry, on all four sides, are the first real traces of ornamentation: the reclining student, and other architectural humoresques. Above, at about one-half the height of the Belfry stage, are eight statues of heroic size occupying canopied niches in the main buttresses. These are figures of Yale's benefactor and her most famous sons. Beginning at the northeast corner, facing High Street they are: Jonathan Edwards; southeast corner, facing High Street, Elihu Yale; then, continuing around the Tower, Eli Whitney, Samuel F. B. Morse, John C. Calhoun, James Fenimore Cooper, Noah Webster, and Nathan Hale.

Looking further up, on the mullions of the Belfry windows are Greek figures typifying the Arts and Sciences (Phidias, Homer, Aristotle, and Euclid). Over the finials of the label mouldings of the belfry windows, and under the Lantern gallery, are bulldogs, and in the corners are grotesque birds. On the parapet of the Lantern gallery are free standing allegorical figures of Law, Business, Ministry, and Medicine, and engaged in niches in the buttress angles at the same level are figures emblematic of Life, Progress, War, Death, Peace, Prosperity, Effort, Order, Justice, Truth, Freedom and Courage. At a higher level are martial figures of the soldiers of the nation's wars, from the Revolution to the last war. The projecting gargoyles are representations of students suggestive of various undergraduate activities: Scholarship, Athletics, Literary, and Social Interests (notice the pen and the teacup!). Besides these there are various other minor sculptures, such as the bulldogs at the base of the statue of Elihu Yale; and beneath the statue of Nathan Hale the carving of the Indian head. The Arts and Sciences are supported by the figures of Adam and Eve. Excellent places from which to study the detail of the sculptured figures are: the campus between Dwight Hall and the Old Library; Linonia Court, Branford Court, or from the roof near the small High Street tower.

THE GREEKS AND ARITHMETIC

A COMMUNICATION

To the Editor,
The American Architect and
The Architectural Review.

MAY I be permitted, as a reader of your paper, to dissent from some statements made by Mr. Kane in his article on the Hambidge Theory, appearing in your October 12th issue?

The Hambidge Law of Dynamic Symmetry is beautiful and his classic work on the Greek Vase has influenced designers as nothing else influenced them since the days when the Greeks were masters of the plastic arts. Mr. Hambidge seems to have discovered Nature's law for the formation of the repetition of parts in a completed whole. It happens that the law is geometrical. The reason for the employment of this law of symmetrical development was not due to any ignorance of arithmetic on the part of the ancient Greeks. The result looked for could best be obtained by geometrical reasoning. That is all. Arithmetic could be, no doubt was, used in practical applications in order to simplify operations. The basis, however, is geometrical and too minute descriptions of ancient surveying methods detract from a presentation of the theory of Mr. Hambidge.

The Parthenon was begun about 450 B. C. by Ictinus, under the political direction of Pericles and the artistic presidency of Phidias. This incomparable triumph of architecture was preceded by 150 years of progress in arithmetic and geometry by the Greeks. Although it is known that quadratic equations were first solved 1,000 years earlier, algebra did not appear until later and trigonometry did not become a separate branch for many centuries later. The Greek mathematicians knew only arithmetic and geometry.

Pythagoras was a Phoenician, supposed to have lived from 580 to 500 B. C. The greater part of his life was spent in Greece and he is honored as a Greek philosopher. Of him Cajori in his "History of Mathematics" said, "Pythagoras raised mathematics to the rank of a science. Arithmetic was courted by him as fervently as geometry. In fact, arithmetic is the foundation of his philosophic system." Note that Pythagoras is believed to have died 50 years before Ictinus began his labor on the Parthenon.

Thales (640-546 B. C.) was a Phoenician according to Herodotus, but some Greek writers claim he was an Ionic Greek of Phoenician ancestry. He spent some years studying in Egypt from which country he took to Greece about 600 B. C. all the Egyptians had taught him of geometry. He measured the heights of the pyramids by the lengths of their shadows and measured the distances of ships at sea by the use of triangles. All of this means ability to use proportion, a knowledge of multiplication and division and the use of surveying instruments, perhaps the goniometer, an angle measuring instrument used for many centuries by the Egyptians. Greek numerical symbols occur as early as the time of Solon, 638-559 B. C. Note that Thales died 96 years and Solon died 109 years before the foundations were laid for the Parthenon.

Geometry was developed by the Egyptians as a land surveying science because the annual rise of the Nile destroyed landmarks. Arithmetic was developed by the Semitic peoples on the Sumerian plain and in the valley of the Tigris for commercial purposes. The Phoenicians as merchants and navigators brought together all the known mathematical knowledge of the times so that prior to 600 B. C. the Egyptians, Phoenicians and Chaldeans computed eclipses, made tables of the movements of the planets, etc. As early as 3000 B. C. there were well developed systems of weights, measures and coinage, the workmen of Tyre and Sidon supplying neighboring peoples with weights, measures and astronomical instruments.

Babylonian tablets known to have been made some time between 1700 and 2300 B. C. prove that the decimal system was in that epoch in common use. There was also employed a sexagesimal system, surviving today in our circle divided into 360 degrees, with each degree divided into 60 minutes and each minute divided into 60 seconds. One tablet contains a table of numbers up to 60 with their squares and remarks which prove the Babylonians were well acquainted with progressions. In Egypt was found the Ahmes papyrus written 1700 B. C. and known to be a revised and rewritten work, the first edition of which appeared in 3400 B. C. Its style indicates that it was written for the elite among Egyptian mathematicians and references are made to other treatises. From this work we learn that common fractions were in use in Egypt as early as 2500 B. C.

Common arithmetic was early known to Greek merchants, but the philosophers and learned men ignored it as something for common people. When Thales brought geometry to their attention, they pursued this science with enthusiasm, the coming of Pythagoras making arithmetic a science alongside of geometry. By 450 B. C. when the Parthenon was commenced, arithmetic, that is addition, subtraction, multiplication and division, proportion, involution and evolution and mensuration was as well developed as it is today. According to Aristoxenus it was the glory of the Pythagoreans that they raised arithmetic above the needs of merchants. It was their boast that they sought knowledge and not wealth, or, in the language of one of their maxims, "a figure and a step forwards, not a figure to gain three oboli." Readers who may doubt the foregoing statements are referred to "A Short History of Mathematics" by W. R. Ball. "A History of Elementary Mathematics" and "A History of Mathematics" by Florian Cajori.

I am a believer in the Hambidge Theory, but cannot accept the idea presented by Mr. Kane that it was used by the Greeks because of their ignorance of, or inability to use arithmetic. We must assume that in their geometrical studies the Greeks stumbled upon and developed the law of dynamic symmetry and a few inspired master builders had sense enough to apply it in designing their masterpieces.

DEPARTMENT OF SPECIFICATIONS

THE subject discussed in this department in the last issue was the matter of surveys and of questions that should be answered before the actual preparation of working drawings is commenced. During the time the survey information is being obtained it is presumed the drafting room has been engaged in the preliminary studying of designs, both exterior and interior, and the determination of interior room arrangement. Immediately the question as to materials arises and the co-operation and assistance of the specification writer are essential to a unified development of the entire scheme.

This does not mean that the specification writer is to determine or even suggest what finish materials such as marble, plaster, wood, etc., should be used but since he must know what is desired he should be brought into discussions at this point. Perhaps the best, and most simple, means of obtaining some preliminary settlement of the materials that are to be used for exterior and interior treatment may be accomplished by means of a tabulation or schedule of all rooms and spaces. It is not necessary that choices of kinds of marbles, plaster finishes or woods be made at this time but in the majority of operations it is possible to say whether the floor will be wood, tile, marble, cement for carpet or for cork tile or linoleum. In the case of base it may be marble, slate, structural glass, wood, terrazzo, metal, tile, cork or other materials. All other finish materials should be given similar consideration and when it is impossible to arrive at a tentative determination question marks should be used as concrete indications that no decision has been made.

This tabulation or schedule should be laid out on a large sheet of paper with horizontal lines spaced about one inch apart and columns made about two inches wide. Then, in the first column at the left hand side of the sheet make a list of all rooms and spaces throughout the entire building. Each vertical column should be given a heading, such as floor, base, dado or wainscot, chair rail, picture mould, wire mould, cornice, general wall surfaces, window stools, window trim, door trim, ceilings, ventilation grilles, radiator grilles and such special headings as may be applicable to the case in hand, among these being fire-place hearth and surround, electrical lighting outlets, electric call or signal system outlets, etc. Rooms that are to be designed in period styles could very well have a column for hardware so that when making up the hardware schedule such factors will be expressed clearly and unmistakably.

On the schedule sheet there should appear notations as to exterior finish materials such as stone, brick, marble, tile, stucco, door frames, window frames, grilles for door or window openings, cornice and all other features of major importance that probably have been fixed to a certain extent at this stage of the work.

If the general layout of the floor plans is fairly complete a type schedule of door and window openings next should be prepared, this schedule to describe graphically the material of which the door and jambs are to be made whether there are glass panels, ventilation registers, transoms having glass or wood panels and other data that it may be necessary to have at hand. If certain factors are still undetermined spaces can be left for later notations. Eventually it is expected that all openings will be given certain numbers or else numbered consecutively according to some easily understood system but in the preliminary stages of the work it will probably be possible to fix on the various types of openings. Consecutive numbering, cannot, of course, be made until the drawings are so far completed that there will be no further re-arrangements.

On the door and window schedule there should be noted the kinds of hardware that are to be used, such as butts, floor hinges, checks, transom operators, kick plates, and bottom bolts, door holders, spring catch and chains for transoms, letter drops for office doors and the window sash lifts, locks, pole sockets, butts and locking devices for hinged sash and all other hardware trim.

THE next step will be the arrangement of the outline. No matter from what source the general clauses are drawn, whether from a card index file or a loose-leaf master specification book the outline for a specific building always should be prepared separately and with as great care as has been spent on the index or master specification. Although previous articles have discussed this subject with a certain degree of thoroughness it is thought best to record once more the work that must be done and how it should be done in order that the best results may be accomplished.

The outline should be started by setting down at the top of separate sheets each of the trade divisions, such as demolition of existing buildings, excavation, etc., devoting one sheet to each operation that is to be made the subject of one section of the specifications. Each possible subdivision of the section outlines should be listed in proper consecutive order, thus making as complete a skeleton form as possible. Then, as the work progresses, the outlines can be extended in as complete detail as seems necessary. The first outline may be quite rough, especially for buildings that are to be trimmed and finished in an elaborate manner and as the work on the drawings proceeds the elaboration necessary will suggest itself. Too much stress cannot be laid on the rule that outlines should be made as complete and comprehensive as the nature of the work permits as a clear understanding of the problems and factors involved can only be had through such media.

In offices that restrict their practice to one or a few classes of building it is very probable that the master specification and master outline will have been so subdivided and grouped as to give all outline information necessary to proceed with the writing of the specifications by making copies of the outline with sufficient space between each item to permit the insertion of items peculiar to the particular structure. The judgment of the specification writer must be depended upon to guide him in this respect.

As the work on the drawings proceeds the specification writer will find it of great advantage to look over the drawings every day with a view to giving advice or suggestions as to how certain objects are to be accomplished, as to what should be indicated for more extended exposition in the specifications or as to what should be shown on the drawings in as great detail as possible so as to permit of brief description in the specifications.

It should be borne in mind that the specifications should be qualitative and not quantitative. That is to say, the specifications should be restricted to the quality of material and workmanship, what is to be furnished or omitted and similar factors and should not describe in detail how much of one thing or another is to be furnished or done. This latter service is distinctly a function of the drawings, more particularly in those cases where the complexity of the structural and architectural finishes preclude the possibility of the specifications treating quantities in as accurate or understandable a manner as can the drawings. It is in this connection that the assistance of the specification writer is of value in the drafting room. While making notes from drawings for future use one should make sure that reference notes are made for all sections or trades that may be affected by any one particular item so that work that is to be furnished by other contractors to accomplish the satisfactory and correct installation of that item may be specified or else, if more convenient, shown on the drawings.

The effective and whole-hearted co-operation between the drafting room and the specification writer is one of the main desiderata in the proper co-ordination of the work. In those offices where the specifications are written by the man who is in charge of the drafting room (and this is the condition in the majority of offices) there will, of course, be no question as to the amount of co-operation it is possible to effect. And in those offices that are departmentalized it is probably true that there is this co-operation because of the esprit-de-corps that invariably rules. Yet it is quite essential that attention be drawn to its necessity for the good of the specifications.

SOME suggestions in respect to the checking of the drawings seem to be in order at this stage of the work. Proper checking is most difficult of accomplishment unless the checker is thoroughly conversant with the desires of the client, the intention of the architect and his organization to meet these desires in proper fashion, the materials that are to be used or that are available in those cases where esthetics have no control and, perhaps the most important of all, the processes of shop and field practice as it affects the work that is to be done. There are usually more wrong ways to accomplish a desired end than there are right ways and of the correct methods that are available there can be no case imagined wherein there will not be found one scheme that stands supreme over all others.

It is for these reasons that too great emphasis can not be laid on the all important fact that the specification writer should be familiar—thoroughly conversant—with the various processes of manufacture, fabrication and finishing of raw materials and the most economical and efficient means for the accomplishment of their installation. It is, of course, understood that those responsible for the production of the drawings will attempt to do everything in the correct and economical manner that, especially now, is so necessary, yet, as the specification writer is usually the last one to check the drawings, he too, should possess all of these qualities.

Furthermore, in the checking of drawings, they must be approached from the viewpoint of three dimensions. That is to say, when looking at the drawings, one must place himself in such a position, mentally, that he can look around him and see how one thing will intersect with another, how super-position must be obtained from the consideration of structural integrity and how the linear representation truly or entirely represents one of the features of the work. In order that this may be done effectively the checker not only should be thoroughly familiar with all of the drawings but he should know what future drawings, such as large scale and full size details will or should show and also whether methods of construction detailed or merely indicated are the proper ones to use. The mental visualization of all of these factors is an absolute necessity, otherwise the confusion and errors of omission or commission will be too glaringly apparent in the field for the peace of mind of their perpetrators. In those cases where, for one reason or another, it is not considered essential to show how particular results are to be obtained it must be ascertained whether the indication presented is sufficiently clear so as not to cause rebellion on the part of the contractor when he receives the later large scale or full size detail or else the specification writer must make his specifications so clear in all details that the contractor, when reading them, can have a mental picture of the detail drawings that he knows will be submitted to him at a later date.

The checking of the drawings will be facilitated to a very great extent if the various schedules mentioned heretofore have been prepared and kept up to date during the progress of the work on the drawings. Then too, the specification outlines, that is, the master outline and the outline in preparation for the specific structure, will act as checking lists and again will justify the great care that should be put into their preparation. As the outline develops the checking of the drawings can be made more intensive and this giving of the attention first to one and then to the other will tend toward obtaining a more accurate set of drawings and specifications.

One important matter that must be kept in mind when checking the drawings is the use that will be made of standard methods that have been adopted or that seem desirable for adoption. New draftsmen, unless they have been made familiar with the details of office practice by means of printed instructions or notes, are prone to do their work in the way to which they have accustomed themselves, regardless of any possibility of standards. Despite the vigilance of the one who is in immediate charge of the preparation of drawings errors do creep in through the fault of no particular person and the specification writer must look for such things while he is doing his checking. He can then see to it that the draftsman is made acquainted with the way in which the office wants such work shown and, after a number of such incidents he will probably make sure that a more comprehensive method of instruction is prepared for the strangers.

IN the matter of the use of standard articles or methods it should not be assumed that because they have been denominated such they are not subject to change or modification. Unless the work of an office comprises one or two classes of buildings that do subject themselves to such standardization great care should be exercised in the constant use of standard articles to make certain that the conditions that made standardization possible are present in that particular instance. Standards are quite desirable to have about oneself if they are used judicially and if one knows when they should be modified or when they should be rejected *in toto* and new methods developed.

Then too, in the case of buildings that are to be erected in localities new to the architect, unless he has made certain that average building conditions there are the same as they are in the locality in which he is accustomed to do work, the use of standards involving a great deal of work should be approached with caution. Here the ingenuity of the specification writer must be brought into play while checking the drawings as he should be certain that the requirements of the drawings can be accomplished with ease and facility by the contractor who will be expected to do the work.

When the drawings have been carried along fairly well and most of the information necessary for the intelligent writing of specifications is available the work of assembling the detail clauses for each section should be commenced. Too often the seemingly urgent necessity for finishing the work offers the temptation to commence the writing of the specifications before they should be started. In most cases there is a great deal of information that will not be available until almost the last minute and then, as has been suggested heretofore, there should be a period of several days after the drawings are finished before the last touch is given the specifications. This is necessary to permit the specification writer to do his final checking and make sure that the co-ordination of the drawings and specifications have been accomplished in the proper manner. It is nonsensical to spend a great deal of care in the preparation of specifications in their preliminary stages and, at the end, rush them to a hap-hazard state of completion, at the same time very possibly doing them a great deal of harm. The additional few days that should be devoted to the final polishing-up processes will have been forgotten when the building has been completed and it is quite possible that thanks will be given that the extra time was taken in order to insure a happy termination of the construction work.

However, this should not excuse the specification writer in knowingly delaying his work either because of procrastination or a general desire to take a great deal of time in the execution of his share of the work. The specifications should be started whenever there is sufficient data available to warrant the spending of even a few hours' time each day on them as, from the inception of the work there are certain matters that must of necessity be fixed at once. But there should be no pre-judgment or anticipation of what the requirements of the drawings will be unless it can be established that conditions can be foreseen in sufficient detail to justify the preparation of a few clauses here and there on the understanding that the drawings will be made in conformity thereto. Sometimes assumptions will be made with the best of intentions but because of misplaced notes or neglect to inform the drafting room of such assumptions conditions entirely different will be developed. These may be caught in the checking of the drawings, as they should be, but the fewer the errors that must be discovered during the work of checking the fewer will be the opportunities of letting such errors pass for later discovery in the field.

If the specification writer can check the drawings with the ultimate object of seeing that everything has been included that should be included and that all things are correct rather than be forced to look for errors here and there and everywhere his work will be made a great deal easier. This is dependent on the precision obtaining in the drafting room and can only be obtained where there is complete co-operation and intimate mutual understanding of the work. Under such conditions the specifications should be in co-ordination with the drawings and real success then will be assured.

Masonry Detail—Memorial Quadrangle, Yale University, New Haven, Conn.

James Gamble Rogers, Architect

DEPARTMENT OF ARCHITECTURAL ENGINEERING

Residence of Mr. E. B. Meyerowitz, So. Orange, N. J. The permanent character of slate roofing permits it to be laid on varying pitches without changing the head-lap

SLATE AS A PERMANENT ROOFING MATERIAL*

Introduction

DURING recent months the Bureau of Mines has conducted a detailed study of the slate industry, the results of which will be incorporated in a forthcoming bulletin. The purpose of this preliminary paper is to bring to the attention of slate producers certain modifications in manufacture and classification which would encourage a wider use of slate; to direct the thought of roofers toward the importance of proper laying of slate, and to acquaint the general public with its enduring qualities.

**Abridgement of a paper by Oliver Bowles, Mineral Technologist, Bureau of Mines.*

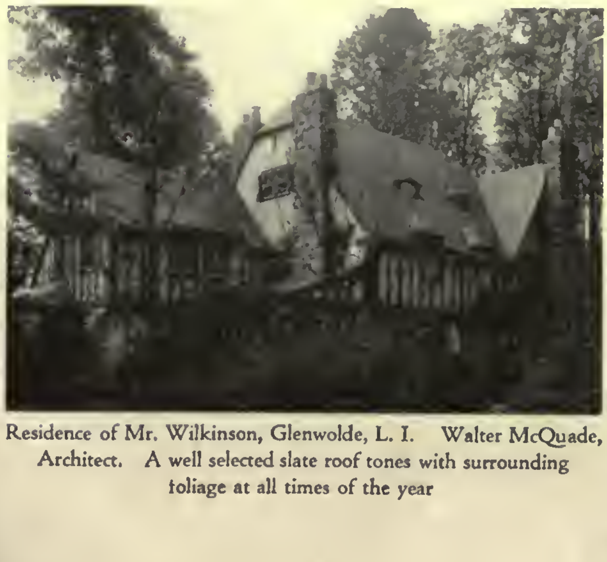
Origin and Character

It may be of interest to the general reader to know that slate is originally formed from mud or soft clay, carried down by streams and laid down in successive layers in deep water. The pressure of superimposed materials gradually compresses the clay into a firm rock known as shale. In many places this shale was, during the succeeding ages, subjected to intense pressure and folding due to mountain-building forces within the earth. This intense pressure, together with high temperature, changed the clay into other minerals such as mica, chlorite, and silica, which are resistant to weathering, and also developed a definite cleavage or splitting direction which characterizes the rock as slate. It is this property which renders slate of value for roofing, for, by using a broad chisel and a wooden mallet, a slate worker can readily split it into thin sheets which are later trimmed into rectangles of various sizes.

Slate roof with curved surfaces. Kew Gardens, L. I. Walter McQuade, Architect. The selection of vari-colored slates, for this roof is particularly appropriate for half-timbered construction

Possible Improvements in Manufacture and Classification

Slates should be graded and classified in such a way that the consumer will not be deceived by their characteristics. Instances have occurred where a purchaser requesting and expecting an unfading slate has been supplied with fading slates simply because the producer could not supply the desired quality and did not wish to lose the sale. Such operators commonly meet with failure after a brief and inglorious period of deception, but during the short span of their activities much harm has been done to the reputation of slate.



Residence of Mr. Wilkinson, Glenwolde, L. I. Walter McQuade, Architect. A well selected slate roof tones with surrounding foliage at all times of the year

It is believed that a truer classification of the established grades would render slate more popular. For example, the professional roofer knows the changing effects of "sea green" slate, but the purchaser commonly does not know that the original color alters to various shades. Such variability in color is by no means undesirable, for it gives many beautiful effects, and such slates are much in demand. If the inexperienced purchaser, however, buys "sea green" slate with the object of obtaining a green roof, he will find that he has made a mistake. It would be better, therefore, to employ a more descriptive term for "sea green" such as "weathering green variegated." As the term "sea green" is long-established, it might be bracketed after the new term until the latter had become well known.

The term "variegated" when used alone also leads to confusion. The experienced dealer knows that "variegated" is a mottled green and purple, but there is nothing in the term to convey this im-

Residence of Mr. V. A. Wiss, Morris Plains, N. J. Stone walls, stucco walls and a slate roof make a fire resistant house

pression to the public. Would it not be better to have trade names that briefly and definitely describe the slates, and that give the purchaser reliable information as to whether the colors are fast or changing?

Slates from some localities are much weaker than from others. Weakness in the material results in excessive waste from breakage in punching, and in the frequent appearance of broken slates in the finished roof. As a protection to the public, and to maintain a high reputation for slate, it would seem advisable to conduct frequent tests of transverse strength, and to reject all slates that fall below a certain standard. Many products such as cement are sampled and tested frequently, and continued purchases are made only if the product conforms with certain fixed specifications. The slate dealer would do much to popularize his product if the same rigid tests were applied, and all slates that failed were summarily rejected. Some slate selling organizations now classify slates according to strength, and adjust prices in conformity with their relative qualities.

The dealer should endeavor to cater to the demands of the consuming trade in so far as such demands do not impair the quality of the product. One of these demands is for a thickness sufficient to prevent excessive breakage. In certain regions slate splits with great freedom, giving thin uniform slabs. As slate is sold on the basis of surface area, it is obvious that a slate maker can obtain greater returns from a block split into thin slabs, than he can obtain from the same block split into thick ones. Also the weight per square is less, which involves lower charges for haulage. Consequently there is a tendency to make thin slates from free-splitting rock. If slates fall below 3/16 inch in thickness they are likely to be so weakened that undue losses occur from breakage during punching and laying. While such breakage may involve the loss of considerable slate, there are even more serious aspects to the use of weak slates. The staging which supports the workmen while they place the upper courses of a roof must rest on the lower courses already finished and its supports may break weak slates in these lower courses. Furthermore painters, window cleaners and other workers may at various times find occasion to stand on the roof, with resulting breakage of weak slates. Such breakages involve replacement of broken slates on the finished roof, which is somewhat difficult, and slates so placed are never as satisfactory as the original ones. The annoyance and expense involved in the use of weak slates have had a detrimental influence on the use of slate. It is believed that if slate producers would maintain a thickness a little greater than 3/16 inch rather than less, the advantage gained from this better service to the consumer would be ample to offset the slight saving in material or in the freight charges involved in making the thinner ones. Rejections of orders have resulted from deficiency in thickness of slates, and it is much better to keep right up to standard or even to excel it. A satisfied customer brings repeated orders, and a satisfactory roof is the very best advertisement.

Residence with slate roof, So. Orange, N. J. The wide spacing of the slates on this roof accents the artistic lines of the building

A fine example of slate roof with broken and curved surfaces. Kew Gardens, L. I. Walter McQuade, Architect

Another way in which the manufacturer can render his products more salable is to specialize in popular sizes. A slate maker can manufacture more squares of the larger sizes in a month than he can of the smaller ones, and there is a tendency to regard volume of production as an item of more importance than the manufacture of sizes that the trade demands. If the customer is by any means persuaded to take the larger sizes, he will probably be dissatisfied, and may not only cease to purchase from this particular producer, but may even turn to other types of roofing manufactured in standard popular sizes.

The Roofer's Responsibility

To secure a roof of high quality, part of the responsibility rests on the roofing contractor. The contractor's duty is to lay the slate on the roof in accordance with the most approved practice. It is commonly stated that any carpenter can lay slate, and many roofs are laid by inexperienced workmen. Slate roofs give much better service when placed by men who specialize in such work. For example, most carpenters in placing slates drive the nails "home," just as they would in securing wooden shingles, with the result that when the sheeting dries and shrinks the slates are cracked. A skilled slate roofer does not drive the nail to its full depth, but allows the slate to hang loosely.

Another common error is due to mistaken economy or, in some instances, even dishonesty on the part of the roofer, for in order to save slates he may give a head-lap less than the regulation requirement of three inches. As a result the roof may leak, not through any fault of the material, but through improper workmanship. The law in some States renders it illegal to place slates with less than a three-inch head-lap.

Parochial Residence, Hackensack, N. J.

Occasionally the nail holes in slates are punched by the manufacturer before shipment. However, the practical roofer usually punches the slates at the place where they are to be used, and during the punching process he selects them into three grades, thin, medium, and thick. The heaviest slates are then placed near the eaves, those of medium thickness midway, and the lightest at the ridge, which gives a very uniform roof.

Residence with slate roof, Glenwolde, L. I.
Walter McQuade, Architect

Upon the roofing contractor, to a great extent, the reputation of slate depends, and his efficient and honest service is reflected in the satisfaction of all those who may be sheltered by the roof of his construction.

The Enduring Qualities of Slate

No practical roofing material has yet been found that can excel natural slate for permanence or satisfactory service. In judging the permanence of a roof, the age of the building it covers is commonly regarded as being the age of the roof, but this may not be a true criterion. It is reported that in the Peach Bottom slate district of Pennsylvania and Maryland the same slates were used on seven successive buildings during a period of over 100 years, and in England, slates have commonly been moved from one structure to another. American history covers so brief a period that it can properly record only the initial stages of the life of a slate roof, and on this account multitudes of people have little conception of the actual period of useful service a slate roof is capable of rendering. Consequently one must go to the old world to obtain records of real value. In England and Wales, and in France many buildings constructed in the 15th and 16th centuries were roofed with slate, and the roofs are still in excellent condition. There is a record of a chapel in Bedford-on-Avon in Wiltshire, England, roofed with slate in the 8th century, and after 1,200 years of climatic exposure the roof is moss-covered but in good condition.

A roof which illustrates the possibilities of slate as a material for broken surfaces. Glenwolde, L. I.
Walter McQuade, Architect

Every household knows that a leaky roof not only is a source of continual annoyance, but that it seriously impairs the walls and ceiling, and probably the contents of the structure that it is designed to protect. In the first place, therefore, it is well to point out that properly manufactured slates laid according to established practice on uniform and strong supports of moderately steep pitch will provide a roof that will not leak. Furthermore, as pointed out in earlier paragraphs, a roof so constructed will maintain its quality for very many years without any repairs or treatment other than the occasional replacement of a broken slate. A more general recognition of the inherent qualities of slate would no doubt lead to its wider use, for, while the first cost is greater than that of many types of roofing, the low maintenance and replacement costs render it an inexpensive roofing material when long service is considered.

Residence of Major Hawkins, Montclair, N. J. M. J. Stillman, Architect. Slate is the proper material for the roof of this house

CONCRETING IN COLD WEATHER

Suggestions for precautions to be observed in placing concrete in the Fall and Winter months.

A reader of *The American Architect* suggests that this is the time of year to sound a warning on the subject of mixing concrete during the Fall months. He says that the days of continuously lowering temperature are more dangerous than days when the temperature is below freezing and even the least intelligent men deem it essential to protect fresh work. He states that in his experience there are more concrete building failures in October and November than in other months because the mild weather is deceptive and forms are removed too soon. Low temperatures retard setting and sometimes stop it completely. Though the concrete may not be frozen it falls far short of having the required strength and a failure results if load is applied before the surrounding air is warm enough to permit the setting to be completed.

The following extracts from specifications for a reinforced concrete structure were enclosed in the letter:

"Concreting During a Period of Lowering Temperature."

"The inspector will paste in his daily report a clipping of the daily local weather record and forecast. The contractor will keep on the job three thermometers approved by the engineer, one to be close to the mixer, one on the floor where concrete is being poured and one outside his office, the conditions of exposure being as nearly as possible identical. After work is enclosed a fourth thermometer must be provided within the enclosure.

"When the temperature is close to 50 deg. Fah. at 5 P. M., the contractor must provide an enclosure around the work being poured, place a thermometer within the enclosure and provide heat to maintain the temperature within the enclosure at not less than 50 deg. Fah. for not less than four hours after pouring is stopped for the day.

"When the three thermometers, or any one of them, outside the enclosure register a temperature as low as 50 deg. Fah. before noon and the indications point to lower temperatures than 50 deg. Fah. within four hours after pouring is stopped for the day, the contractor must use warm water in mixing concrete. Similarly when the temperature falls as low as 40 deg. Fah. at any time during the day, the contractor must warm all water, sand and coarse aggregate. The temperature within the enclosure where concrete is being poured must not be permitted to fall below 50 deg. Fah. while concrete is being poured nor fall below 40 deg. Fah. within four hours after pouring is stopped for the day. The temperature within the enclosure must not be permitted to fall below 36 deg. Fah. at any time within 48 hours after concrete has been poured, a sufficient number of thermometers being used to permit easy observation of temperatures at several places within the enclosure at all times.

"When the outside temperature is below 32 deg. Fah. all material piles must be free from ice and lumps of frozen material. No lumps of frozen material shall be put into the concrete, even when the materials are being warmed, but they must be thrown out or be thawed in some other container than that in which materials are warmed before going into the mixer. No concrete shall be deposited in forms containing, or coated with ice."

"Testing Frozen Concrete."

"If there is reason for suspicion that concrete is frozen no reliance shall be placed on the hammer test alone, nor shall reliance be placed upon hardness determined merely by trying to drive nails into the concrete. To test concrete in beams, girders, walls or posts two thick girdles of burlap shall be placed about six inches apart with a covering of burlap between these girdles. The burlap shall be kept wet with boiling water for a period of at least one hour, after which tests with hammers and nails may be made to ascertain the degree of softening, if any. To test concrete in a floor construct a dam four to six inches high of clay and rope or cloth, around an area four to five feet square and fill the enclosure with boiling water, changing it when it becomes cold until the floor has been under water for not less than one hour. If no softening is apparent the concrete may be assumed to be set and not frozen. No tests for frozen concrete shall be made when the outside air temperature is below 36 deg. Fah. No forms shall be removed when suspicion exists that concrete may be frozen until after the foregoing tests have been made, after which the forms shall remain in place for not less than ten days with the outside temperature higher than 36 deg. Fah."

Lumber From Bagasse

BAGASSE is dried sugar cane from which has been extracted all contained sugar. In the State of Louisiana over 400,000 tons of this material must be disposed of annually as waste and the cost of this disposal increases the cost of sugar making. A method has been perfected for the making of wood from bagasse and a half-million dollar plant has been built in New Orleans to make this new by-product. It is a fibrous material made into boards ¾-in. and 1-in. in thickness. All pieces are four feet wide and in standard lengths of eight and twelve feet. The process of manufacture is such that pieces can be furnished up to twelve feet in width and of any length. The claim is made by the manufacturers that waterproofing material incorporated in the pulp during manufacture makes the lumber waterproof so it is equally serviceable for inside and outside work. The weight is approximately 8-lb. per cubic foot, which makes it practically an artificial cork but much stronger. On account of the cellular composition it is said to be ideal for insulating purposes, in addition to being valuable as a wall board and for the making of packing boxes.

A Wall Base Conduit

A new metal wall base is on the market which is a combination base, electric conduit for high and low tension wires and a continuous electric outlet box. The accompanying figure shows in detail the natural bronze mop-mold at bottom, the plaster mold at the top and the removable base front. The upper space is for high tension

wires and the lower space is for low tension wires. The base front is made in sections so that all the wiring in a room may be exposed to view and outlets may be placed at any point with ease. The use of this base will obviate much wiring for prefixed base outlets and eliminate changes of wiring for each tenant.

THE AMERICAN SPECIFICATION INSTITUTE

As heretofore produced specifications have been largely the product of individual effort and as such have varied in many features that can be conventionalized so as to be common to all. Owing to a present lack of means for collecting and distributing information concerning specifications and the writing thereof, there is a needless duplication of study, research and labor on the part of specification writers. Practically all other professions are so organized that the interchange of knowledge is affected with resulting improvement in the quality of production and professional standing. It is to improve the conditions affecting the writing of specifications and to benefit by organized effort that The American Specification Institute is organized. This organization is intended to be national in scope and invites co-operation of all those interested in specifications.

The purpose of The American Specification Institute is to increase knowledge concerning and improve the methods of writing specifications. The kinds of specifications included are those for buildings, engineering structures and all works whatsoever in which materials of construction and labor are used; for the installation and use of mechanical and sanitary apparatus and equipment; for the fabrication and installation of all furnishings and furniture; for all ornaments and ornamentation, both interior and exterior; for paving, planting, embellishing and improving of grounds and waterways; and for such other things as are produced or sold on specifications.

A recent issue of Engineering News-Record contained the following editorial:

How the Product Is Made

"In a recent bulletin the National Paving Brick Manufacturers' Association expresses the wish that every engineer and public official might find time to visit a paving brick plant in its operating hours. It contends that the time will be well spent by the visitor and is frank to say that the paving brick manufacturer would profit from the time that he would contribute as guide and host. It would be a reflection upon the intelligence of engineers and contractors to argue the case in favor of careful inspection, and even study, of the manufacturing processes by which construction materials are produced. Nevertheless, the experience of manufacturers is that relatively few of their customers interest themselves in the operations by which the materials are made available. Buyers know what these processes are in a general way, but lacking acquaintance with details, are unacquainted with the factors that go to make a good or a bad product. We do not mean that one must be thoroughly familiar with manufacturing processes to be able to specify a proper material, but we do believe the joint interest of user and producer would be served by more familiarity on the part of the user with the manufacturing processes. The corollary, of course, also holds—yet the producer should know the conditions of use. Many efforts toward securing this mutual understanding have been made, the greatest being the continual efforts of The American Society for Testing Materials. These efforts would be much furthered if the thought expressed by the National Paving Brick Manufacturers' Association were more often acted upon —that engineers and contractors and public officials would visit brick plants and the establishments of other producers of materials as well."

There is presented in this editorial the almost universal conviction that one who attempts to write specifications for architectural or engineering work needs to be acquainted with the various processes through which a finished article has passed in order that it may be made available for use. Although this editorial has been written with special reference to the civil and structural engineering professions the sentiments expressed are equally as applicable to the architectural profession.

Intimately related to the desirability of knowing how any product is made is the knowledge of its economic worth in respect to the work of which

it will eventually become a part. A knowledge of what is called "engineering economics" is becoming of increasing importance, especially since it seems that construction costs are seeking a stabilized level considerably above that to which most of us became accustomed during the five year period before the World War. This knowledge is not to be gained by those who wish for it unless they attempt to study the question from a broad knowledge of the factors that are fundamentally in control. There is hardly a building constructed but that there arises the question as to which of two or more materials or methods should be used in case the structural characteristics are on a level but the dollar price varies. A correct understanding of economic values can not fail to be of very great assistance where utilitarian motives govern; and it may act as a guide in those cases where esthetic value seems to be about equal to economic value.

The American Specification Institute has been organized to stimulate the acquisition of knowledge of engineering economics and to put into the hands of its members all known facts relating to the production of the materials that they deal with. Intimately connected with this study will be a program of discussion as to the best methods of erection and installation work to the end that structures, their equipment and embellishment, will be erected and installed in the best possible manner.

As stated in the "Plan and Scope" two of the activities of The American Specification Institute will be:

1. Study of materials in respect to
   - a—The production and physical properties of raw materials.
   - b—Methods of manufacturing, fabrication and finishing.
   - c—Relative value based on appearance, initial cost and maintenance, effect of combinations with other materials and proper materials for various types of buildings of varying grades.
2. What methods of construction and installation should be used.

IT is, of course, obvious that everyone can not inspect, personally, all plants that manufacture the thousand and one things that he specified and the average person will procrastinate if he is left to his own devices in acquiring the understanding of materials as he should have it. By means of frequent bulletins The American Specification Institute will place in the hands of its members either a complete resume or else a bibliography of available literature covering specific subjects, such for instance as paving bricks, which are mentioned in the editorial quoted. A comprehensive knowledge of materials and their most economic use in building construction will be accumulated from the experience of members each of whom, by his membership, has shown an intense interest in all those questions that must be met by a specification writer if his efforts are to be successful.

The architect or engineer who is responsible for the design and construction of a building or engineering structure must be intimately acquainted with a vast number of materials and processes and, as his knowledge of these and his skill in their use, increase he will find his objective more easy of accomplishment. The person who writes specifications for such structures must have a thorough knowledge of the subject matter of the various subdivisions of his specifications and since the average mortal can not hope to learn through personal experience all he must know in order that he may achieve success he must look to some source or sources of authoritative information for assistance. The American Specification Institute will render to its members every possible assistance in producing specifications of the best quality.

The work of The American Specification Institute is of vital interest to all members of all technical professional societies who are interested in construction work and its related activities. The restrictions that are placed on membership, namely that each candidate must be engaged, to some degree, in preparing specifications for building and engineering structures, their equipment, etc., assure a membership having a single purpose —the study and improvement of specifications— and, it is hoped, preclude the giving of attention to extraneous matters that might occur if the interests of the members were of a diverse character.

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PERSONALS

A. H. Hubbard, architect, is now located at 204 South Madison Avenue, La Grange, Ill.

It is announced that Charles Urbanek, architect, is now at 76 West Monroe Street, Chicago, Ill.

Charles S. Keefe, architect, wishes to announce the removal of his offices from 368 Lexington Avenue to 331 Madison Avenue, New York City.

John Reed Fugard and George A. Knapp, architects, announce their removal from 64 East Van Buren Street to 212 East Superior Street, Chicago, Ill.

Arthur D. Dean, who was formerly located at 403 Builders' Exchange, 614 Race Street, Cincinnati, Ohio, is now practicing his profession at 228 East Fifth Street, Montana Building, that city.

Announcement is made that Oppenhamer & Obel, architects and engineers, have opened an office for the practice of architecture and engineering at 408 Bellin Building, Green Bay, Wis. Manufacturers' catalogs and samples are desired.

Announcement is made that Lynn Fry has been appointed part time architect for the State of Michigan. Mr. Fry is associated with the Building and Grounds Department of the University of Wisconsin.

William Tallman, architect, formerly located at 218 North Main Street, Fairhaven, Mass., is now at 92 Green Street, that city. Mr. Tallman expects to leave for Europe for a year's travel and study about November 1st.

Announcement is made that Swirsky and Miller, architects, Herberich Building, Akron, Ohio, have dissolved partnership. Mr. Swirsky is now practicing under the firm name of F. Swirsky & Company, at the same address.

It is announced that Lund and Durham, architects and engineers of Minneapolis, Minn., have been appointed one of nine firms to serve as consulting architects and engineers to the National Tuberculosis Association.

C. W. Hopkinson was recently elected president of the Cleveland Chapter, American Institute of Architects. Other officers chosen were W. R. McCornack, vice president; William W. Sabin, secretary, and William Koehl, treasurer.

Funk and Wilcox Company, architects and engineers, Old South Building, Boston, Mass., wish to announce that they will be located at more extensive quarters at 26 Pemberton Square, Boston, on and after November 1st, and are desirous of receiving a complete line of manufacturers' samples and catalogs.

It is announced that Winsor Soule, John Frederick Murphy and T. Mitchell Hastings have formed a partnership for the practice of architecture in Santa Barbara, Cal. Mr. Soule has been a practitioner in that city for many years, the other two members of the firm being from the East.

F. E. Fowler, formerly of the firm of Fowler, Capelle & Troutman, architects, Evansville, Ind., is now directing architectural work for the Consolidated Realty and Theatres Corporation, 332 South Michigan Boulevard, Chicago, Ill. Manufacturers' samples and catalogs are desired.

William Cox, Bellingham, Wash., a pioneer architect of the extreme Northwest, has recently passed away. Mr. Cox first received his education in the profession of architecture in England. For some years, due to failure of his eyesight, Mr. Cox was forced to spend his life in comparative idleness. As a result of this, he was obliged to abandon work after the designing of the Elks' Home at Bellingham, one of his most creditable works.

Warren W. Day, of the architectural firm of Day and Bullard, Peoria, Ill., has again been honored by being appointed for the second time a member of the Public Action Committee of the Illinois Society of Architects. This committee, which has ten members, is made up of architects from Chicago, Moline, Bloomington, Springfield, Peoria and Rockford. Mr. Day will represent the interests of the local society and of the architects from this part of the state.

Announcement is made that K. G. Malmgren, for many years an architect in Spokane, Wash., has recently died. Mr. Malmgren first entered Eastern Washington as a draftsman in the firm of Cutter and Poetz. Upon the retirement of Mr. Poetz, Mr. Malmgren was admitted into the firm and the majority of early constructions in Spokane were designed by Cutter and Malmgren. A few years ago this firm was dissolved and Mr. Malmgren practiced alone until he took C. I. Carpenter into partnership, this partnership existing up to the time of Mr. Malmgren's death, which occurred in his fifty-eighth year.

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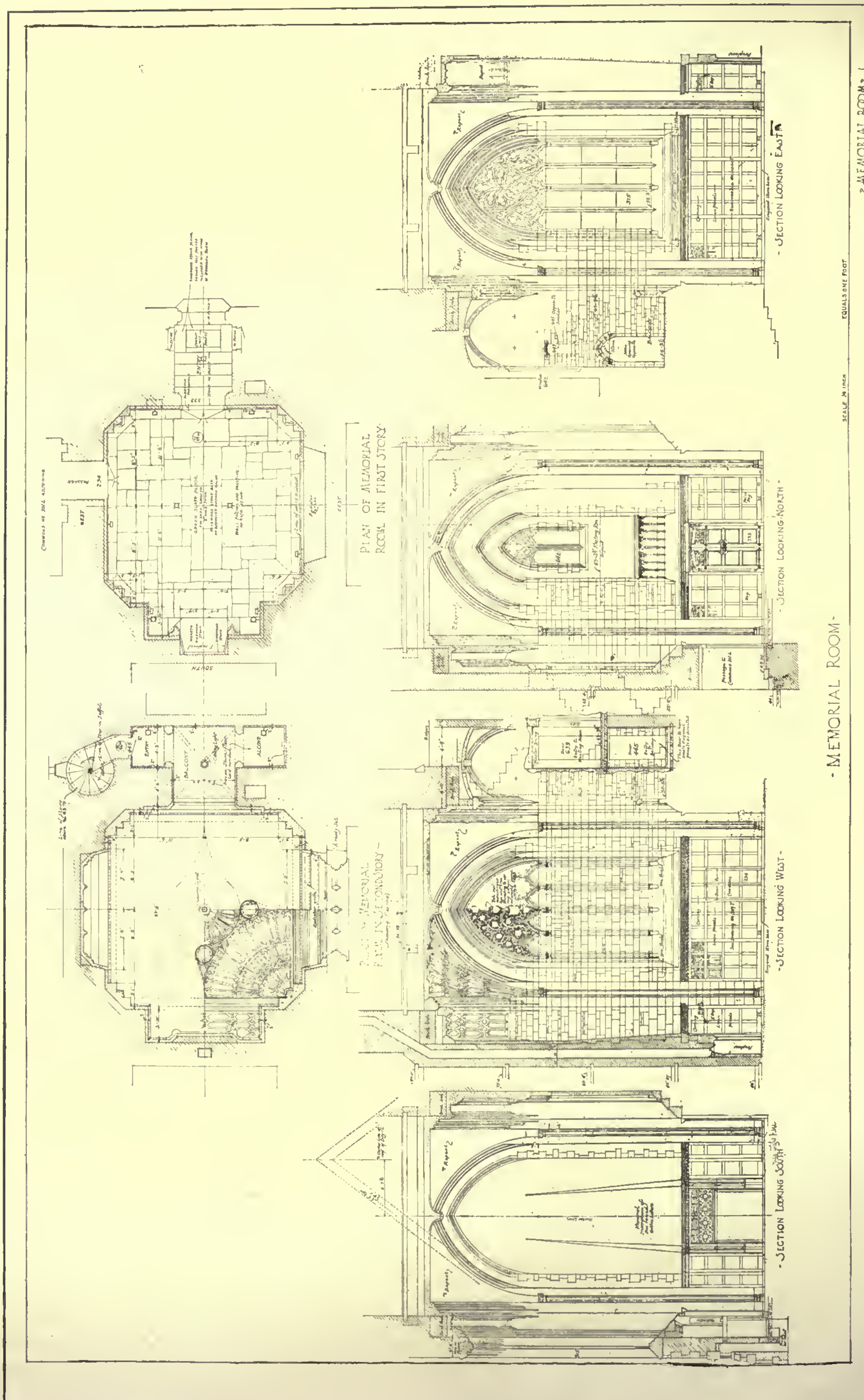


HARKNESS MEMORIAL TOWER, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

STUDY FOR MEMORIAL ROOM

HARKNESS MEMORIAL TOWER, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

est or impulse and co-operation. Voluntary co-operation of the office. Voluntary co-operation of the client. Voluntary co-operation of the builder.

Untiring work is so well known to all of the profession that I will pass that over by simply saying that it is in the program of the architect's life "a mandatory requirement."

Interest or impulse is used instead of the word "inspiration" which conveys to me the wrong impression, as I believe in our work it does generally to the public. Interest or impulse is better be-

Sketch in Main Quadrangle

cause they mean a force that is something active and dynamic, that seems to spur on to a better purpose as for instance, in the case of these buildings, the great history of the able active men of Yale and their great doings which must make a good impression on any designer who works on a building of which they are in any way a part.

IN olden times when the great monumental buildings were erected there was an architect, a master builder who stood responsible for the whole structure and all its details, at times even doing actual work on the building himself. More truly was he the architect than is possible in this day of complex fabrication and speed of construction. As time was not as it is today, a measure of money value, and also a necessity, there were really but two major features to demand his close attention. Beautiful design and structural safety were the essence of competent building. These are, or should be, essential today, but the insistence of speed of construction has become so important that there is not time enough for any architect really to design the whole structure with all its numerous details, and therefore he must have able lieutenants to look after the various parts.

In those early days the architect or master builder might stand before his work as the artist-painter does before his easel. He could direct every detail of construction at the very moment of its placing. He might alter or reject, add or take away. Today the process is different. All the different pieces must be made practically at one time and designed in such a way that, though made in various parts of the world, they will not only fit when brought together but form a good architectural composition and be artistically correct in their details.

It is therefore, necessary to have made with rapidity, all these items that will be correct months afterwards when brought together, and so it is that much more necessary that the architect organize a group of capable and trained men who can not only do their own particular part, but also keep the harmony of the perfect whole. These men the architect will work with as lieuten-

Sketch on Library Street

Plaster Model for horizontal beams

ants to whom he will be the inspiration and guide to secure, in the numerous and varied details, the spirit of the whole. The architect today is the architect of the general idea only, but the will and force of the details. He is the general of the able lieutenants who really make the building.

You can appreciate, therefore, that it is just and fitting that proper acknowledgment be made to these able lieutenants, captains rather, in this regiment of which, as architect of this group, I was the commanding officer. In this connection I wish to express my appreciation first of all to Mr. Otto Faelten and to Mr. Adolph Bernhard whose great ability and loyal co-operation made possible many of the best parts of this Memorial Quadrangle.

Further it was fortunate to have had the services of Mr. George Nichols as superintendent on the work where he made proof that on a building of this nature the competent, merely practical, man would have missed many points of artistic value which add much to the building if they can be settled while the article is actually being put into place.

Anyone having the services of the genius of Mr. Lee O. Lawrie can feel assured that the sculpture and ornamentation will be works of art.

Sketch of a Bay

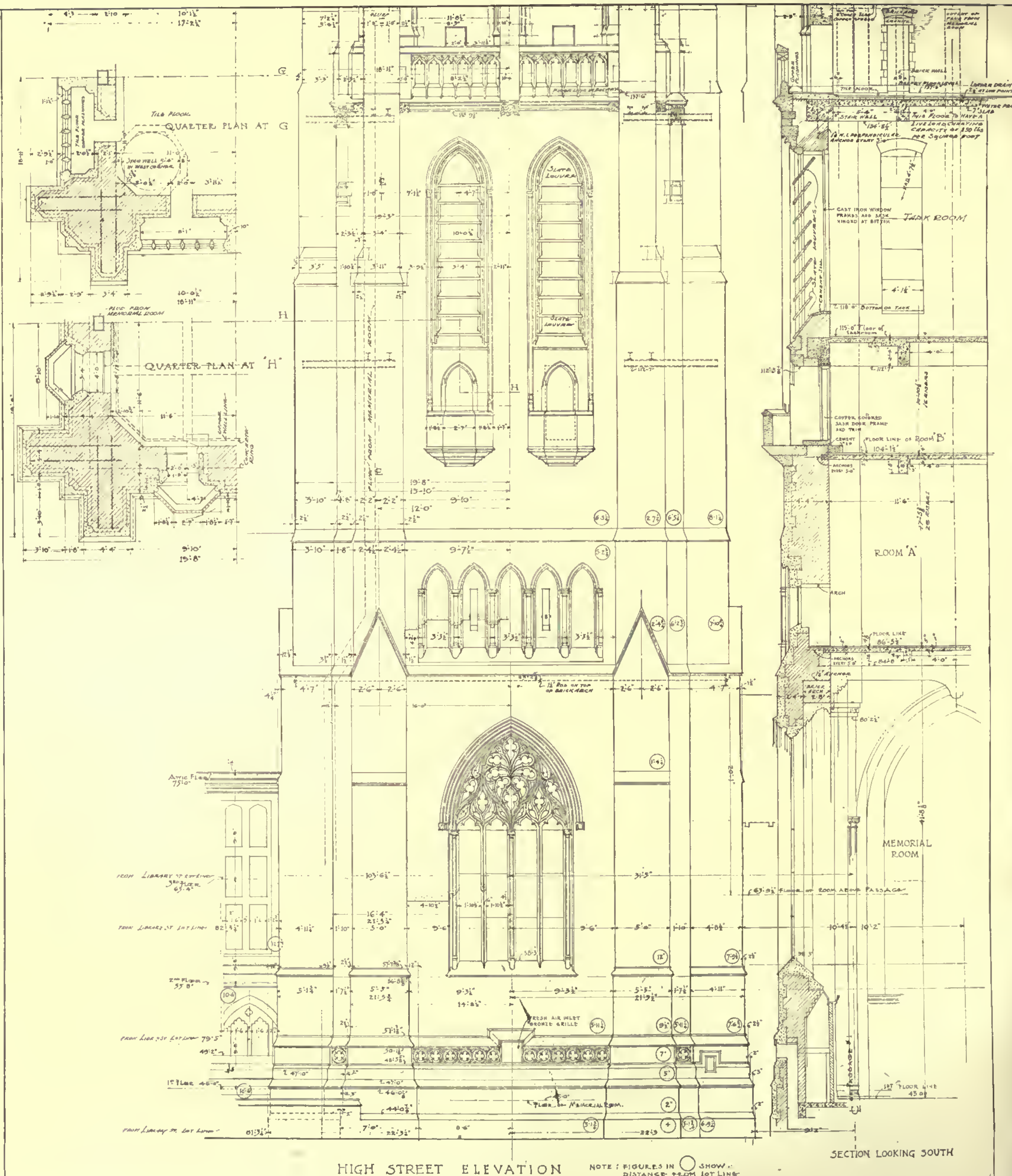
While Mr. Ronald Robb was only for a short time a member of this staff, his keen appreciation of details and his ability to express them will be found in lasting ornament in many parts of this group.

In the mechanical work there are many evidences of the care and thoughtful study of Mr. Cornelius J. Davis.

These lieutenants and the men in the architect's office might be called, continuing the military simile, the "Regulars." From these regulars the architect must have co-operation if he hopes to do good work, but it would be unfortunate if mention were not made of the value of the "Volunteer" co-operation that to the full extent of each individual labored to bring about the final result.

EXTENUATING conditions nullify the absolute verity of the statement that the building is always good enough for the owner. Still there is much truth in it; for if the owner knew enough first to choose a capable architect and then not hamper him, the result would be a good building. I am certain, however, that such a procedure would produce a building missing in a certain feeling, a definite intangible charm that comes only from close interest and participation.

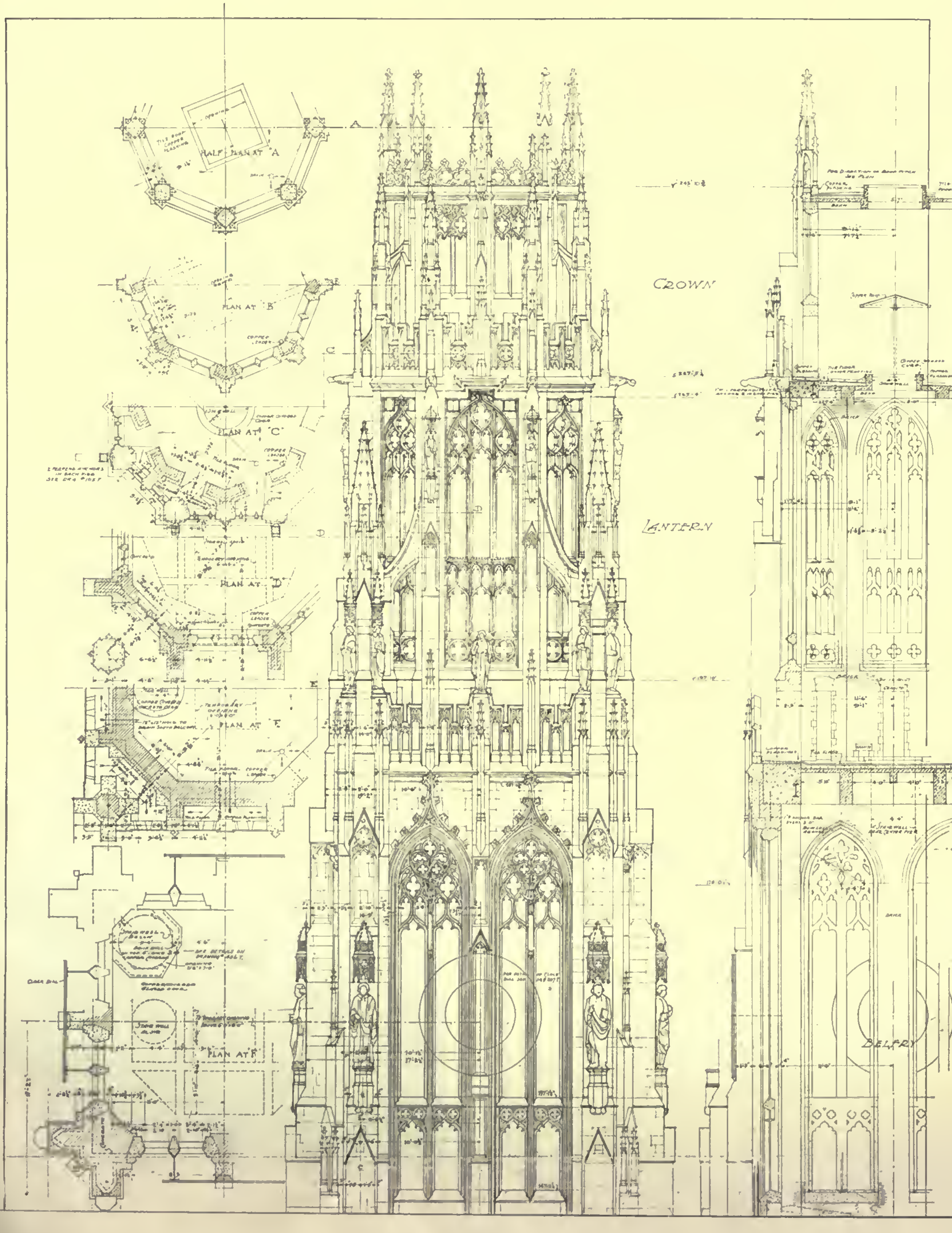
Detail of carving of a cornice and frieze



DETAIL OF LOWER HALF

HARKNESS MEMORIAL TOWER, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

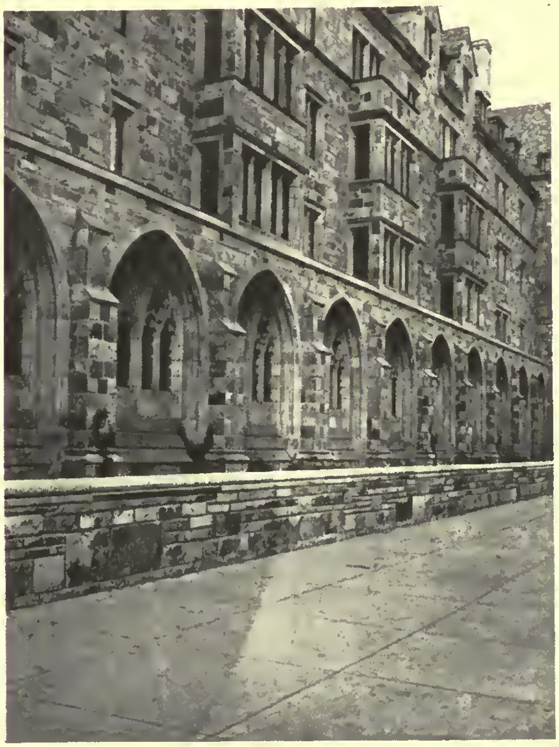


DETAIL OF UPPER HALF

HARKNESS MEMORIAL TOWER, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

I have often thought that architecture was even a more vital thing and that the character of the client is truly expressed in the building. Is it not always true that the person of intelligence and artistic sense has a more attractive house than that which the same architect has built for another less knowing client? On the other hand, do you not often



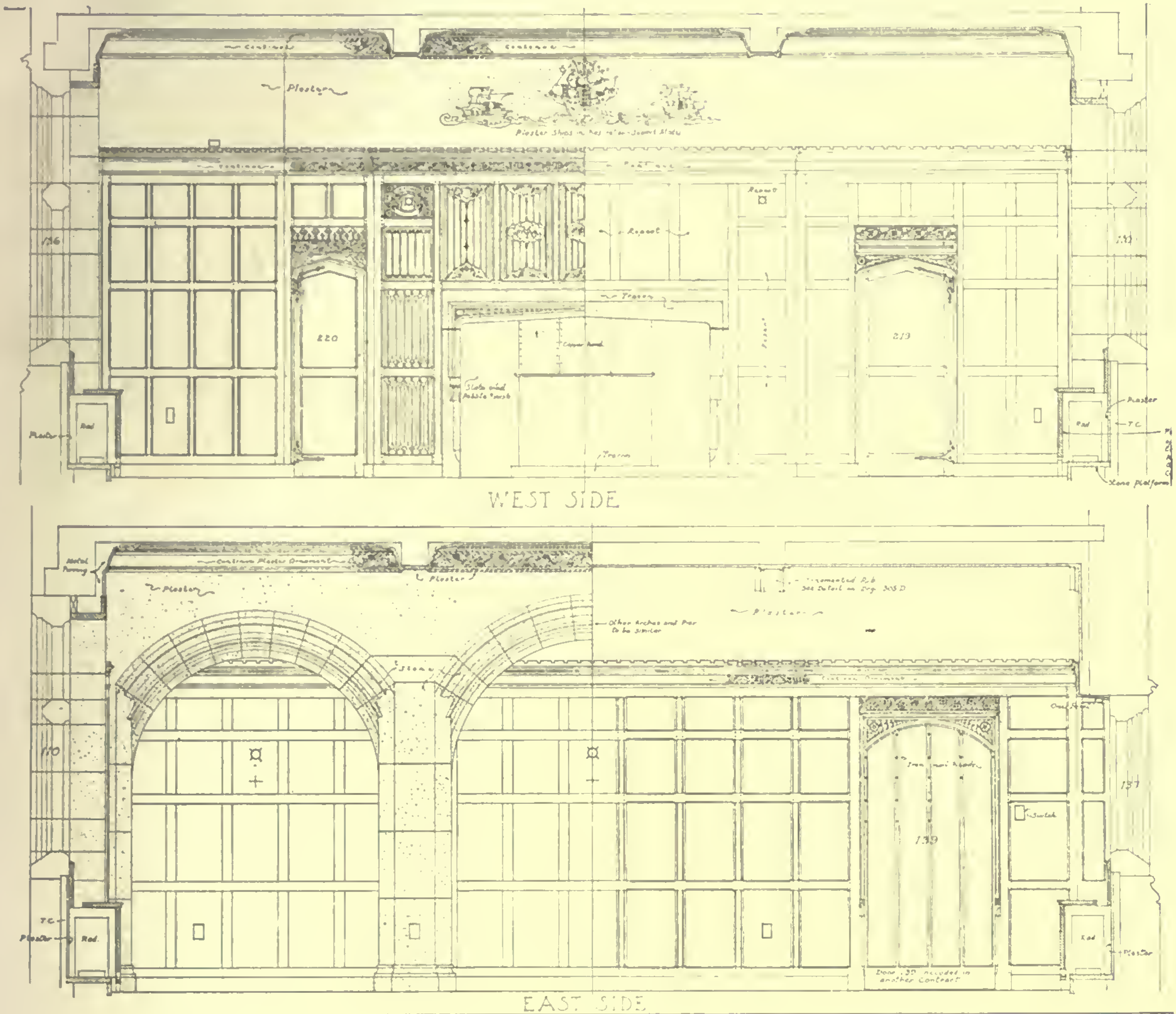
Looking along Elm Street

see architecture ruined so evidently by the insistence of a client's holding to an idea of a detail that spoils a whole? It is certain that next to the architectural ability of the designer, the most important power for the success of the building is the owner.

In the case of the Memorial Quadrangle we can call the owner the two men, Mr. Samuel H. Fisher and Mr. Edward S. Harkness who represented the donor, and much of this building is due to their broad vision, integrity of purpose, their active interest not only in the building, but in Yale. Such men of foresight with whom all questions can be discussed openly and entirely on their merits, are an assurance in themselves of the welfare of the operation. Their choice of the kind of contract, namely one in which the builder cooperated with the architect from the inception of the plans and their choice of the builder, Marc Eidlitz & Son, Inc., are only some of the evidences of the help they have given in this piece of work.

It would not have been possible under the ordinary form of contract to have designed this building as it is designed for we would not have been able then to have utilized the war delays to restudy and redesign various details so necessary to the artistic merit of the group, but instead we would have been compelled to hold to the original design for fear of wasteful extras. Without in any way depreciating the value of the architect's services, we know that no matter how well a building may be designed, it can be made or marred by the work of the builders and when they successfully perform their work, we cannot but appreciate our good fortune. In this particular case from Mr. Otto and Robert Eidlitz themselves, and of their men on the building, Mr. Hedden, Mr. Sutton and Mr. Blaney, we feel that we have had in addition to the regular work, a "Volunteer" service of inestimable value to the good of the buildings. Outside of those actually employed on the work there has been a "Volunteer" interest such as the services of help and inspiration in the numerous good suggestions given by such men as Anson Phelps Stokes, and Mr. George Seymour. Is it any wonder then that in following the old custom of carving on the building the likenesses of those who had been of service to the structure we should feel it incumbent to put in additional to those University Officials who should be there, also the above men who had given such service in giving to Yale the Memorial Quadrangle and the Harkness Tower?

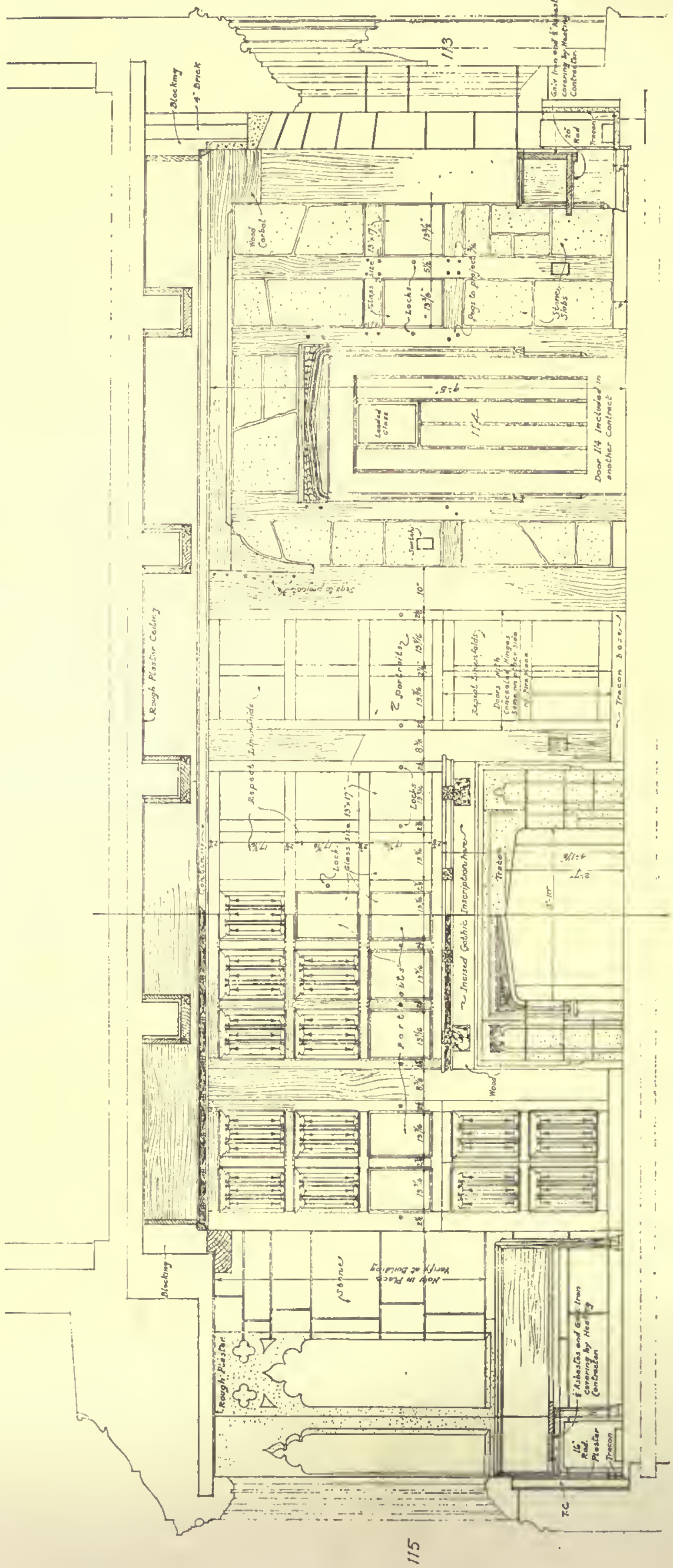
St. George—Detail in Library



DETAIL OF
COMMONS 108-D

MEMORIAL QUADRANGLE,
YALE UNIVERSITY,
NEW HAVEN, CONN.

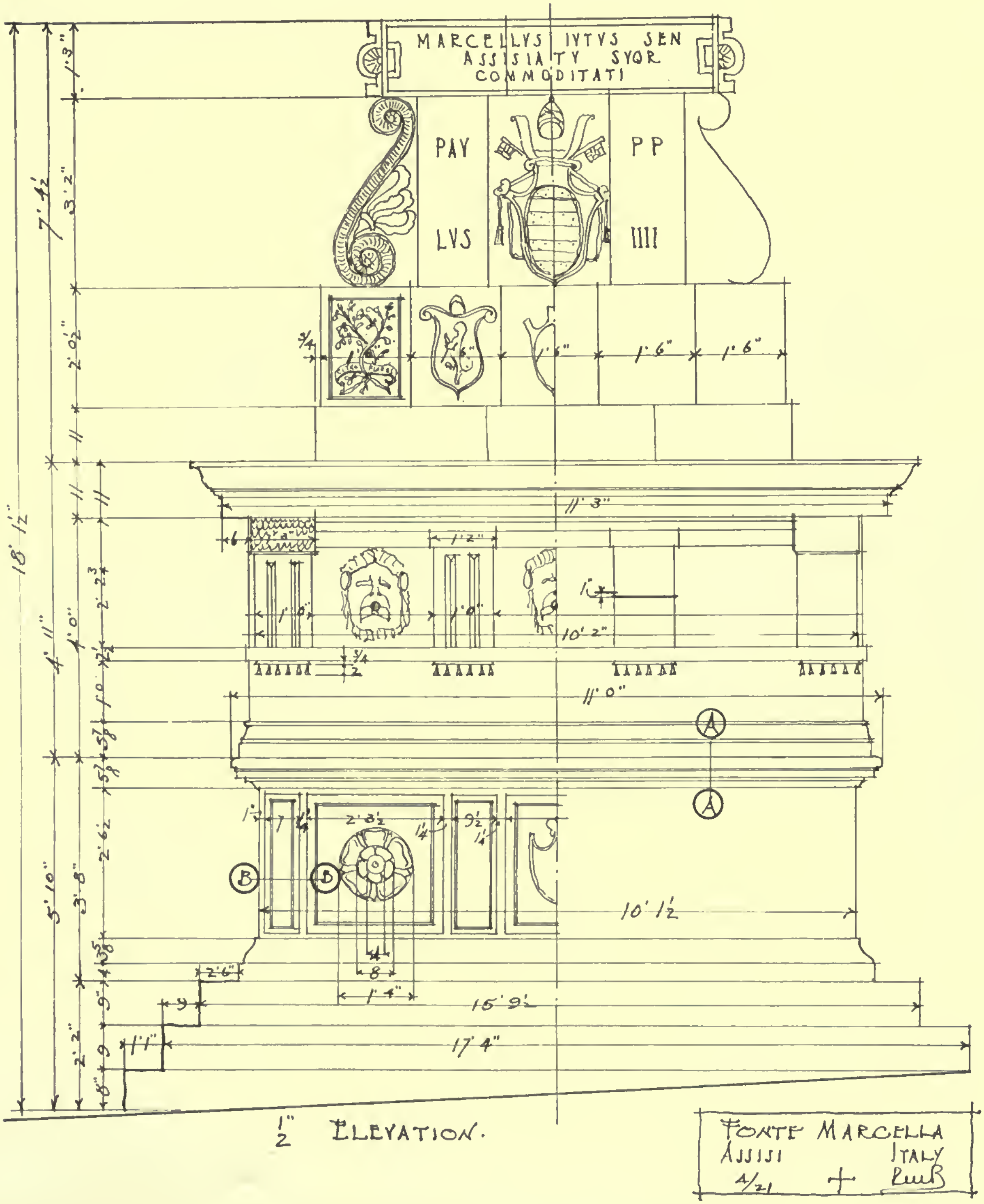
JAMES GAMBLE ROGERS,
ARCHITECT



WEST SIDE OF COMMONS 101-L

MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT



MEASURED AND DRAWN BY ROBERT M. BLACKALL,

35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

(See Frontispiece for general view of this subject)

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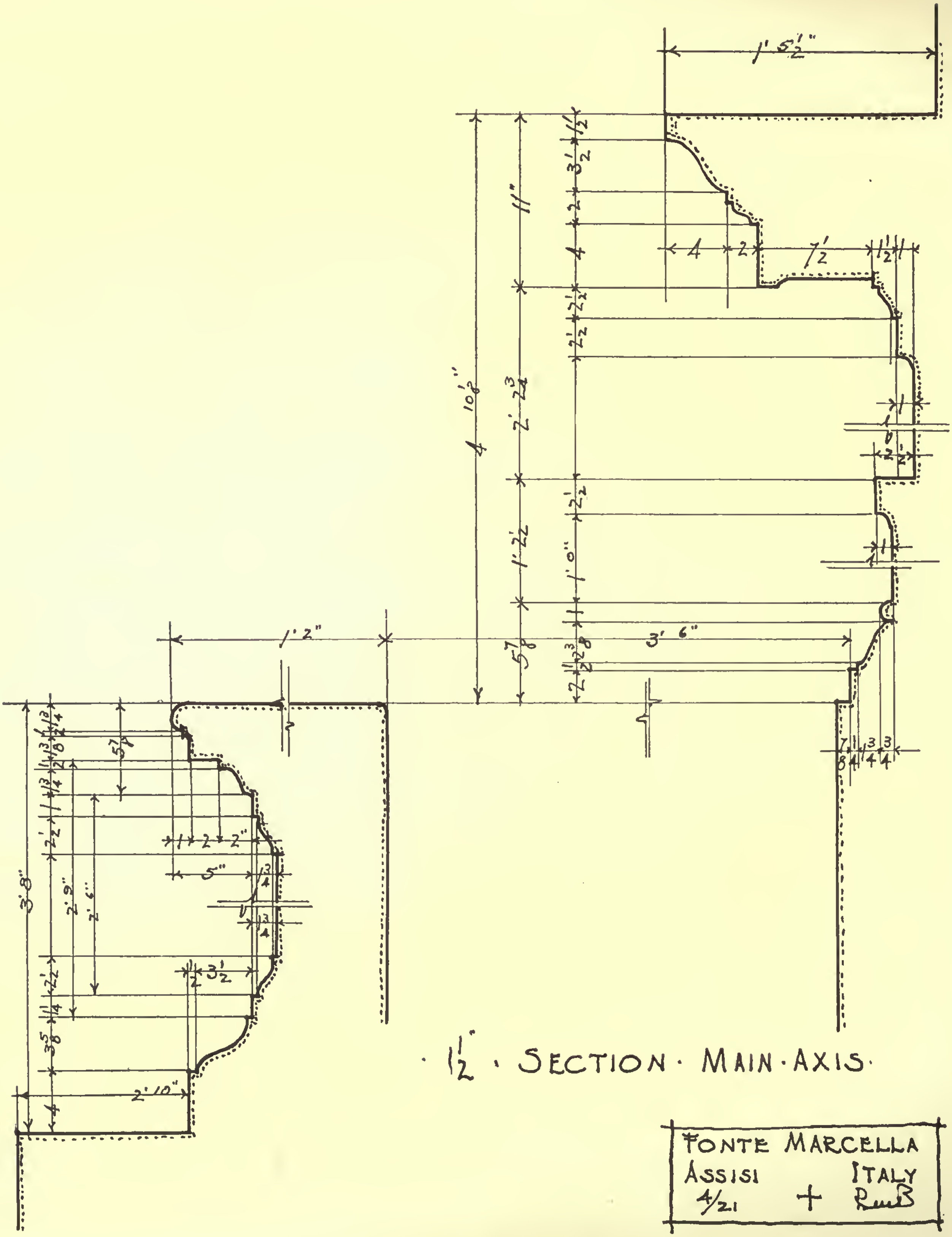

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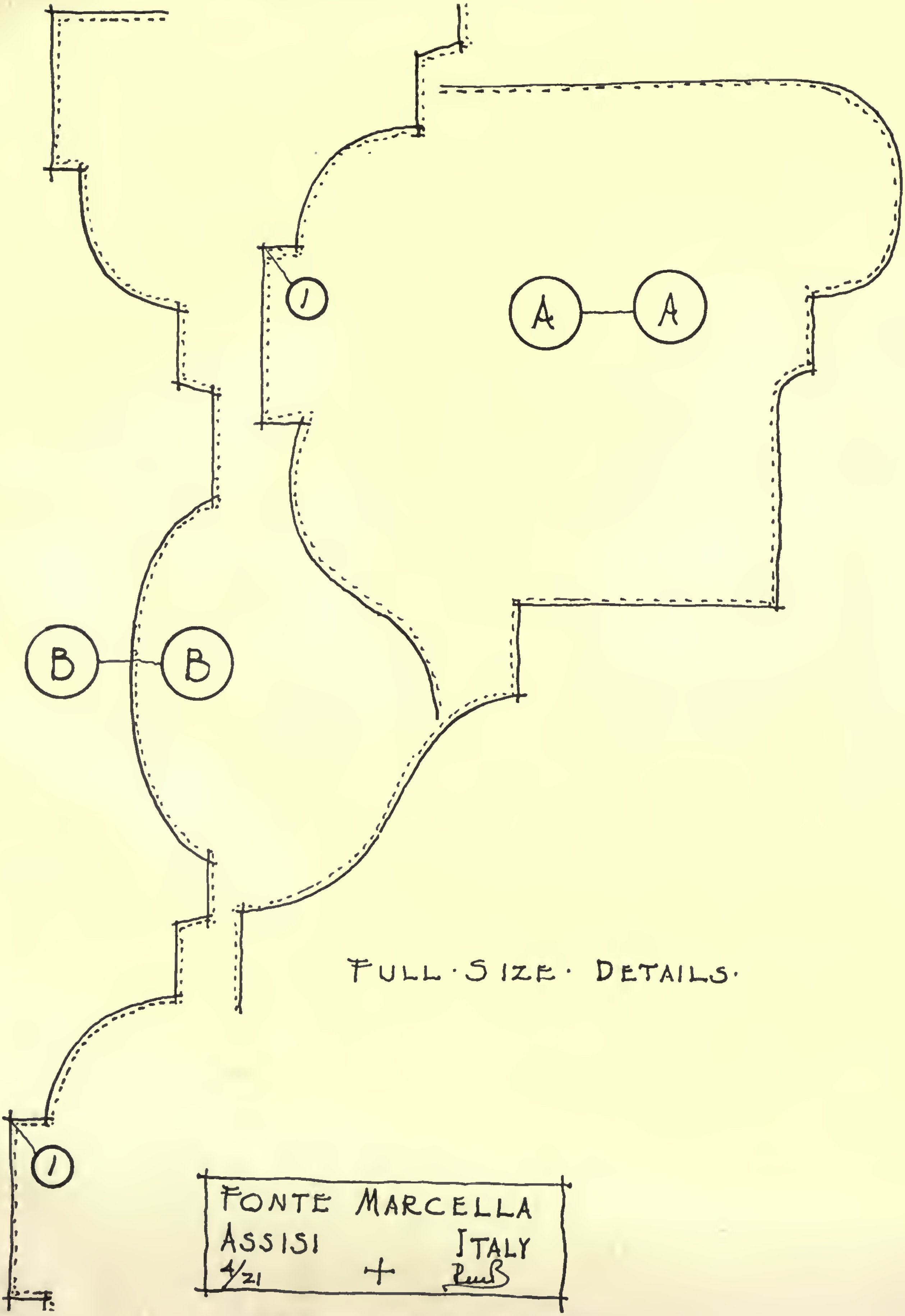

MEASURED AND DRAWN BY ROBERT M. BLACKALL,

35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

(See Frontispiece for general view of this subject)

Christ Church, Philadelphia

(See reproduction of original drawing by O. R. Eggers on opposite page)

THIS FINE CHURCH, one of the oldest now standing in Philadelphia, was built in 1727. Its history is linked with that of other and perhaps better known historical buildings in that city. It has been maintained with the most zealous care, as near as possible, in its original state, and is affectionately regarded by every citizen as one of the many revolutionary landmarks in which the people take a very proper pride.

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PIERPONT GATEWAY

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

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CORNER IN LINONIA COURT
THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.
JAMES GAMBLE ROGERS, ARCHITECT

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WREXHAM COURT FROM DUMMER PASSAGE

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

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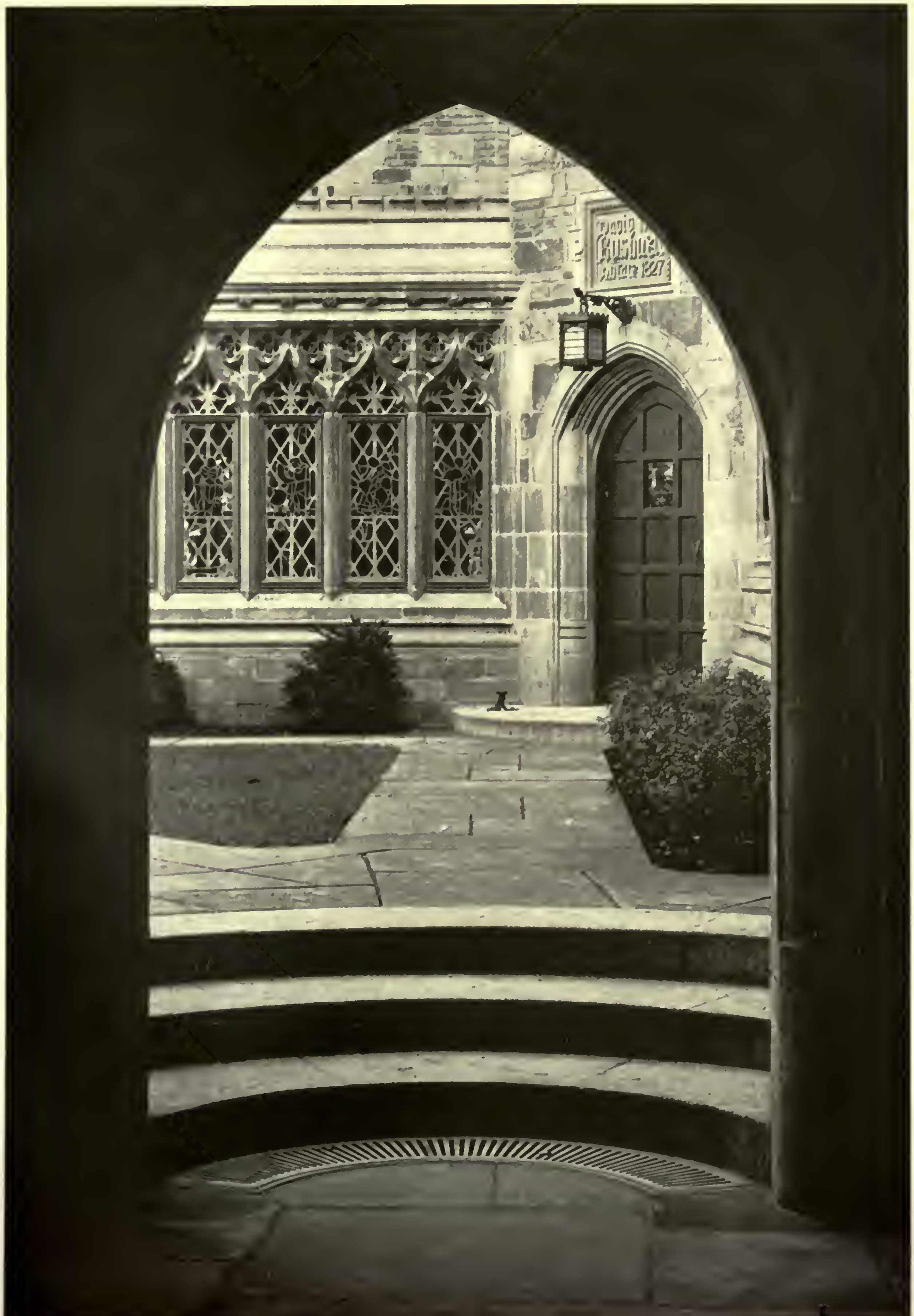

BUSHNELL ENTRY FROM DAVENPORT GATEWAY

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COOPER

FITCH GATEWAY

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LIVINGSTON GATEWAY TO BRANFORD COURT

BUSHNELL ENTRY

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DWIGHT ENTRY

DAVENPORT GATEWAY

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

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BRANFORD COURT LOOKING TOWARDS CALLIOPE COURT

WEBSTER ENTRY IN KILLINGWORTH COURT

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WINDOW TRACERY IN WREXHAM COURT

DWIGHT ENTRY TOWARDS CALLIOPE COURT

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

JAMES GAMBLE ROGERS, ARCHITECT

346 13

BEAUX-ARTS INSTITUTE OF DESIGN

DIRECTOR OF THE INSTITUTE, LLOYD WARREN

ARCHITECTURE, RAYMOND M. HOOD — SCULPTURE, JOHN GREGORY

INTERIOR DECORATION, ERNEST F. TYLER — MURAL PAINTING, ERNEST C. PEIXOTTO

Official Notification of Awards—Judgment of April 26th, 1921

PROGRAM

CLASS "B"—IV ANALYTIQUE

The Committee on Architecture proposes as subject of this Competition:

"AN ENTRANCE THROUGH A COLONNADE"

A colonnade connects two wings of a chateau. The center bay of this colonnade forms the entrance to the court of honor of the chateau.

The total height of the colonnade including the top balustrade is 25'-0". The total width of the entrance motif proper shall not exceed 25'-0", and its height, including any crowning feature that may be used, shall not

A. E. Thomas — Dallas Architectural Club

1st. MENTION PLACED

Class "B" IV Analytique—An Entrance through a Colonnade

exceed 45'-0". In the entrance motif a single passage only is required, but this shall be at least 10'-0" wide in the clear.

Architectural treatments of this sort are seen in the Chateau of Compiegne, the building of the Legion of Honor in Paris, and in the Chateau at Fontainebleau.

Jury of Award—H. O. Milliken, F. C. Hirons, H. Chapman, A. L. Guptill, W. H. Beers, A. E. Flanagan and F. C. Farley.

Number of Drawings Submitted—129.

AWARDS—

C. H. Disque — Cincinnati Architectural Society

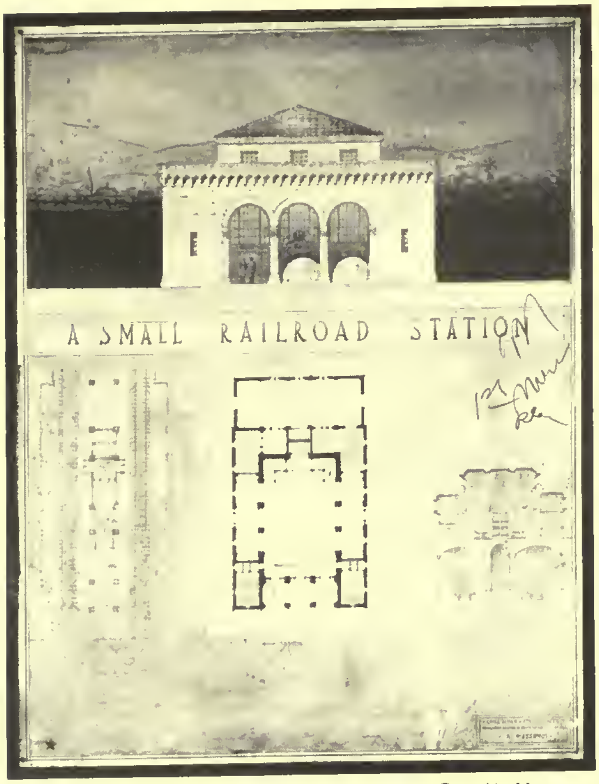
1st. MENTION PLACED

Class "B" IV Analytique—An entrance through a Colonnade

FIRST MENTION PLACED:—C. H. Disque, Cincinnati Archtl. Soc., Cin.; A. E. Thomas, Dallas Archtl. Club, Dallas; O. L. Warady, Atelier Hirons, N. Y. C.; J. H. Jones, George Washington Univ., Wash., D. C.; A. E. Rupp, Richmond Archtl. Club, Richmond.

FIRST MENTION:—W. E. Lominel, Cincinnati Archtl. Soc., Cincinnati; A. F. Euston, Atelier Hirons, N. Y. C.; J. H. Lapish and C. L. Nutt, George Washington Univ., Washington, D. C.; Adelbert E. Shrimpton, John Huntington Poly. Inst., Cleveland; L. S. Youngs, Pratt Institute, Brooklyn, N. Y.;G. M. Nedved, Atelier Parsons-Chicago Archtl. Club, Chicago; F. Raudenbush, "T" Square Club, Philadelphia; V. C. Edades, Univ. of Washington, Seattle.

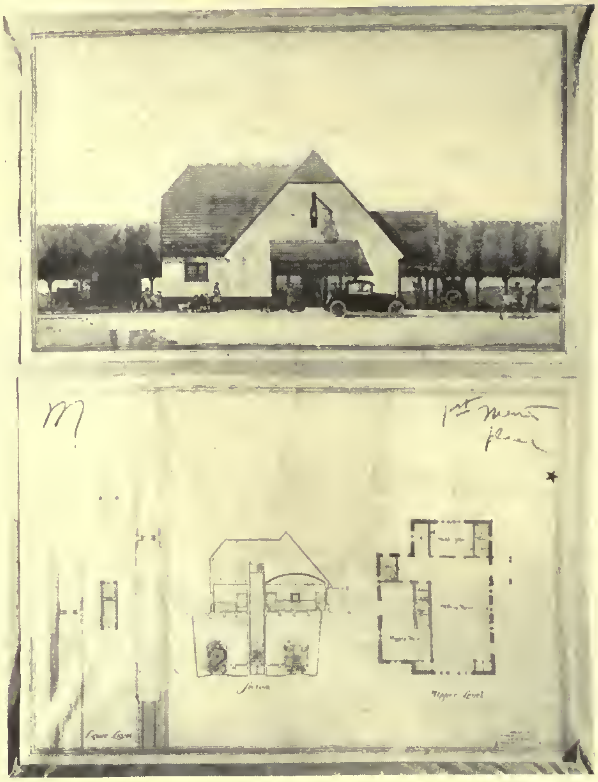
MENTION:—E. Weston and W. McDermott, Boston Archtl. Club, Boston; H. Johnson, Atelier Cairns, Memphis; S. Pelton, J. L. Barth, V. Sberna and A. Perrella, Columbia Univ., N. Y. C.; G. M. Dennis, Atelier Birmingham, Birmingham; J. S. Wood, J. T. Blair, L. L. Broida, V. A. McGowan, Louise Barton, W. C. Pyle, A. S. Vincent and G. D. Schade, Carnegie Inst. of Tech., Pitts.; J. McNamara, B. H. Voor and J. P. Bills, Catholic Univ., Wash., D. C.; R. E. Stiffler, Atelier Denver, Denver; J. Grellinger and C. E. Meyer, Atelier DeGellcke, Milwaukee; S. W. Pike, Archtl. League of Indianapolis, Indianapolis; J. W. Hanson and L. G. Clark, Atelier Hirons, N. Y. C.; L. Chatelain, Jr., F. L. Sears, M. C. Hobson, Dorothy Sigman, L. A. Moore, J. F. Wolfe and F. A. Elliott, George Washington Univ., Wash., D. C.; F. Sakata,



K. Matsunoi Columbia University

1st. MENTION PLACED

Class "B" IV Projet—A small Railroad Station



J. H. Geissel T. Square Club, Philadelphia

1st. MENTION PLACED

Class "B" IV Projet—A small Railroad Station

V. Machacek, D. Nisnosky and Dell Jansen, John Huntington Poly. Inst., Cleveland; B. L. Schlanger, Harlem Even. High School, N. Y. C.; L. E. Allen, I. L. Johnson, R. H. Johnson, F. Eiseman, H. B.Collins, D. R. Lundberg, W. M. Knezicek, C. Callahan, J. G. Rehder and J. R. Hulfield, Atelier Parsons-Chicago Archtl. Club, Chic.; R. H. Crawford, Univ. of Southern California, Los Angeles; G. F. Bennett, F. C. King, Jr., P. Becker, S. E. Chambers, A. F. Eldridge, H. T. Woolley and D. C. Doig, Syracuse Univ., Syracuse; Martha F. Doak, C. R. Gaskill, Jr., Hilda Urbantke, G. Wilson, C. G. Wright, June Hunter, E. H. Sammons, R. Ainsworth, V. D. Phenix, E. F. Webster, J. W. Lawless and Rinewell Waters, Univ. of Texas, Austin; W. W. Lund, C. W. Haas, E. R. Duckering, Jenness Bonnell, A. E. Fulton, J. C. Jordon, H. Schippmann and V. L. Annis, Univ. of Washington, Seattle; A. B. Harris, R. E. Middlekauff, A. Graves, Jr., F. X. Thorne, C. M. Van Keuren G. M. Beal, E. M. Robinson, O. F. Nicholson and L. E. Freeman, Univ. of Kansas, Lawrence; C. R. Seward, Univ. of Minnesota, Minneapolis; W. E. Herrick, Atelier Wynkoop, N. Y. C.

H. C. :—H. Silverman and L. G. Adams, Atelier Licht, N. Y. C.; H. Pembleton, 511-9th Avenue, Astoria, L. I., N. Y.; L. Mersfelder, Univ. of Texas, Austin.

PROGRAM

CLASS "B"—IV PROJET

The Committee on Architecture proposes as subject of this Competition:

"A SMALL RAILROAD STATION"

The upper level of a suburban railroad station is placed at the level of the avenue along which it faces. The two railroad tracks cross the avenue at right angles, 25'-0". below the grade of the avenue. The track platform is located between the two tracks and is 12'-0" wide. Access from the platform to the upper level of the station is obtained by means of stair-cases; also by two elevators, one for freight and one for passengers.

The space to be occupied by the railroad station at the upper level shall not exceed 60'-0" in a direction parallel to the avenue 100'-0" at right angles to it. In the station at the upper level a ticket office, a newsstand, a baggage room and the usual toilet conveniences shall be provided.

Jury of Award—R. M. Hood, L. Warren, H. W. Corbett, G. A. Licht, F. B. Hoffman, Jr., M. Flagg, C. Butler, H. I. Cobb, Jr., J. F. Harbeson, and T. W. Ludlow.

Number of Drawings Submitted—123.

AWARDS—

FIRST MENTION PLACED:—K. Matsunoi and S. Rockower, Columbia University, N. Y. C.; F. B. Smith and J. J. Keil, Carnegie Inst. of Tech. Pitts.; P. Goodman, Atelier Licht, N. Y. C.; J. H. Geissel, "T" Square Club, Phila.

FIRST MENTION:—J. Aronson, Columbia Univ., N. Y. C.; H. H. Lefkowitz, C. C. Agee, L. E. Considine, K. H. Snyder and G. A. Brink, Carnegie Inst. of Tech., Pitts.; W. H. Speer, Atelier Denver, Denver; G. S. Johnson and G. G. Greulich, John Huntington Poly. Inst., Cleveland; E. A. Beihl, H. A. Allen and C. A. Langzettel, "T" Square Club, Phila.

MENTION:—O. E. Friedhof, Cincinnati Archtl. Soc. Cin.; A. O. Angilly, I. Tron, A. M. Taylor, W. Platt, M. C. Hills, A. Marshall, E. Kaeyer, J. M. Paul, W. Conley, O. W. Wilson, F. J. Woodbridge, H. C. Porter, S. R. Moore and M. B. Mead, Jr., Columbia Univ., N. Y. C.; J. H. Delo, M. C. Bert, A. Taormina, C. J. Pellegrini, H. A. Page, E. O. Anderson, K. B. Weber, J. W. Minick, H. C. Kreisle, M. G. Uslan, C. E. Landefeld, G. O. Schoonover, H. C. Douden, N. P. Rice, J. D. Mawhinney, G. A. Fister, W. T. Spann, C. J. Billmeyer, A. A. Lewis, F. M. Highberger, J. Franklin, L. B. Christman, C. B. Marks, W. L. Gibb, Jr., P. F. McLean, H. E. Rudy, R. McKee, D. D. McGervey and F. H. Floyd, Carnegie Inst. of Tech., Pittsburgh; J. J. Carey, T. Lane, E. R. French, and R. C. Danis, Catholic Univ., Wash., D. C.; C. F. Bieler, C. H. Kellogg and R. L. Linder, Atelier Denver,

Denver; A. Wuchterl, Atelier DeGelleke, Milwaukee; W. Harris, T. R. Edwards, and H. Bradley, George Washington Univ., Wash., D. C.; H. Van Der Lyn, Atelier Hirons, N. Y. C.; E. C. Rising, L. A. Balicki, K. G. Koltukian, J. E. Miller, K. Steinbach and H. P. Whitworth, John Huntington Poly. Inst., Cleveland; W. H. Kraemer, 171 East 83rd Street, N. Y. C.; R. N. Hazlewood and C. H. Hinman, Post and Lintel Club, Minneapolis; F. K. Cheetham, G. S. Beach, R. E. Dando and J. Schierhorn, Atelier Parsons-Chicago Archtl. Club, Chicago; W. P. Crabtree, Jr. and C. I. Cromwell, Syracuse University, Syracuse; R. E. Tatum and R. R. Hibbs, Univ. of Kansas, Lawrence; M. Jenkins, Univ. of Virginia, Charlottesville; W. S. Chinn and Elizabeth Ayer, Univ. of Washington, Seattle; E. Penfield and A. Harrer, Atelier Wynkoop, N. Y. C.

H. C. :—S. Dresser and P. Simonsen, Columbia Univ., N. Y. C.; E. Hughes, L. L. Nusbaum, T. G. Tiffany, W. M. Burke, V. H. Stromquist, B. H. Lawson and T. C. Topnick, Carnegie Inst. of Tech., Pitts.; K. Sasagawa, Atelier Hirons, N. Y. C.; H. T. Plumer, "T" Square Club, Phila.

DEPARTMENT OF SPECIFICATIONS

THERE are several methods that the specification writer can use in the actual composition of his specifications and there is one method that is to be condemned (as it has been by everyone who has the slightest understanding of what good specifications consist) and that is what has been termed the scissors and paste method.

In discussing this phase of the work let us first consider the last mentioned method. To many architects there comes the temptation to prepare a new specification by changing the titles of an old one, making a few hurried changes here and there and having it re-written without reading over the text carefully to weigh each old clause in the light of conditions that must be met on the new work. As a general rule those who follow this slip-shod method are the ones who are amazed when errors of a ridiculous sort are called to their attention and furthermore are quite positive that their specifications are good enough for the reason that they do manage to get their buildings erected and equipped in some fashion, in spite of errors of all kinds.

It is mental laziness to write specifications in such a manner and cannot be too strongly condemned.

A recent specification for a high-class apartment building had a paragraph captioned "Automatic Fire Doors" under which there appeared a note that the building had none. It was somewhat puzzling at first to deduce the reason for such an absurdity, for if there were none why mention the fact unless the same rule was followed throughout the specification and everything that one could encounter in writing specifications was specifically excluded if it was not to be included. A little thought brought to mind the fact that the author of the specification had never before written one for that class of building and had used a specification for a theatre as a skeleton framework on which he attempted to hang the dress of an apartment building. The specifications were then read very carefully and earmarks of theatre construction were apparent throughout the work. Is a contractor to be blamed for holding in contempt such a specification—and also its author?

A variant of the typical cut and paste method has many merits if handled with the exercise of good judgment, by an experienced specification writer. This scheme consists in using previously written paragraphs that have been studied and developed sufficiently so that their author feels sure they satisfy every requirement of clearness and brevity. Such paragraphs generally will cover only those materials or methods that have become standard, to some extent, and whose work as specifications has been proved through previous use in construction work. The remaining parts of the specification, which will comprise all special features and particularly those peculiar to the work in hand, must be written especially. If a specification has been prepared in accordance with this latter method, under the guidance of an outline and a materials schedule and if all "standard" paragraphs have been read over carefully there is no reason why the specification should not be a good one.

Some experienced specification writers, especially those whose daily work is confined almost entirely to the work, find it quite convenient to hang up the drawings that are to be studied while writing the specifications. This method has many points in its favor, and among which may be mentioned the ease with which one can look, first at one drawing and then at another and see, at a few glances, how any particular item is presented in plan, elevation and vertical section. On the other hand, if there be a considerable number of drawings, a large amount of space will be required for the proper hanging of the drawings and, at the same time, the writer will have to do a great deal of walking back and forth which, to some, will be objectionable.

Other specification writers of experience find it perfectly feasible to spread out the drawings on a long table placed behind the desk so that all one needs to do while writing the specifications is to turn around to this table and find the drawings conveniently arranged. They may be bound or left loose according to the convenience desired and the number of sheets. A trained specification writer, if he has accustomed himself to this method of arrangement of drawings, will find this method satisfactory, especially when his work is of one or a few classes of construction and he knows what to expect or not to expect in the work. For any particular case it would be exceedingly difficult to determine which scheme of arrangement of drawings would be best.

However, if the specification writer goes about his work in the proper manner he will not have a great deal to puzzle his head over in the matter of how he is to arrange the drawings about him. As has been said in previous articles he should commence his specifications before it would be possible to obtain prints of them that would be of any great value to him and, of course, the only way to obtain this information will be from his outline, master specification, schedules and from circulating through the drafting room and acquainting himself with the work while it is in progress.

Then, when the specification writer wishes to check over the completed set of drawings before giving his specifications the final touch he will not find it too inconvenient to leaf over the various sheets while before him unless he prefers to hang them on the wall for any added convenience or efficiency that may result.

As to the methods of assembling of the specifications—that is, the composition of them—the judgment of the individual as to choice will be determined to a very great extent by the facilities that are at hand. For the specification writer who is learning the work or for the one who only occasionally writes them it probably will be found that the most convenient method will be to write out, in long hand, the complete document except where paragraphs can be clipped from old specifications and pasted in their proper position. In this way it will be possible to have every item fixed in its proper relative position and to refer to other sections while working on one section that may have to be co-ordinated with them.

The dictation of specifications is most difficult of successful accomplishment for anyone but the experienced writer. This can be very easily demonstrated in any section of the specification, no matter how simple it seems from a cursory study of the problem. The experienced specification writer has at his command all sorts of helps that act as guides for his thoughts and, while he dictates, he has these before him or else firmly fixed in his mind. The inexperienced specification writer or one who has not given very much attention to the systematic preparation of specifications does not have these helps and because of their absence will flounder helplessly. He must concentrate his thoughts on the things that are of immediate importance in his dictation and will find it exceedingly difficult to think of the supplementary details that one or the other sub-contractor must furnish in order to complete the installation of a particular detail in a proper manner.

Because the specification writer of little or no experience does not have the helps that one of experience possesses and, furthermore, cannot develop them without gaining more experience, he should not attempt to dictate any of his work except those parts for which he has guides or suggestions that have commended themselves to him. He will find confusion worse confounded if he does attempt to plunge blindly into the writing of a specification and will find it exceedingly difficult to correct in the field errors that have crept into his work. The only safe course for him to follow is to begin at the beginning, prepare his outline and seek all possible assistance and then step by step, build up his documents in long-hand, to a completed whole. It is only through such a method that he will be able to obtain a well-balanced specification as he will have all parts of the work constantly before him for criticism and analysis.

The specification writer who wishes to re-organize his work, abandoning all previous styles and forms to start afresh should write his first specification under the new order in long-hand as has been advised for the inexperienced writer. The piecing together of the various paragraphs will permit rigid analysis of the applicability of the various clauses, their sequence, and their relation, one with the other. Then, as the various sections accumulate, it will be possible to refer to sections previously written, not only to remove conflictions but also to assure co-ordination. At the same time reference of some sort can be indicated on outlines for succeeding sections. This might seem laborious and perhaps useless at first glance but the efforts required will produce beneficial results if the work is carefully done and the specification writer then will have some substantial basis on which his future work can be built.

One fundamental basis of good specifications is the document known as the General Conditions of the Contract. These general conditions control the acts of the owner, contractor, sub-contractor, material man and the architect and in a way, may be termed the silent watch-dog of the entire construction operations. The American Institute of Architects has published and made available to all architects and engineers a very complete and authoritative set of General Conditions that can very well be used by anyone without very great fear of a contretemps because of the blind use.

However, it is well for the specification writer to analyze these General Conditions and assure himself that their requirements will be enforced to the letter, not only in respect to the rights of the owner or architect but to the contractor as well. There is no sense in including stipulations that will be impossible of enforcement or that one does not expect to have accomplished and, in many cases, it is injurious to the attitude of fairness and equity to all concerned to have General Condition clauses that are meaningless. This statement has been reiterated so often that it has become trite yet the underlying thought should be kept constantly in mind.

NOT very long ago there appeared in *The American Architect* a series of discussions by Mr. Clinton H. Blake, Jr., to which reference heretofore has been made. These discussions placed several warning signals in the way of free and blind use of the General Conditions mentioned above. It is to be noted that The American Institute of Architects in their "Notes On The Standard Documents" says:

> "An Agreement, Drawings and Specifications are the necessary parts of a building contract. Many conditions of a general character may be placed at will in the agreement or in the specifications. It is, however, wise to assemble them in a single document and, since they have as much bearing on the Drawings as on the Specifications, and even more on the business relations of the contracting parties, they are properly called the 'General Conditions of the Contract.' As the Agreement, General Conditions, Drawings and Specifications are the constituent elements of the contract and are acknowledged as such in the Agreement, they are correctly termed the Contract Documents. Statements made in any one of them are just as binding as if made in the Agreement.
>
> "The Institute's forms, although intended for use in actual practice, should also be regarded as a code of reference representing the judgment of the Institute as to what constitutes good practice, and as such, they may be drawn upon by architects in improving their own forms. Although the forms are suited for use in a single or a general contract, they are equally applicable to an operation conducted under separate contracts . . . .
>
> "In some cases the articles as printed do not include all necessary General Conditions of the Contract. The architect will then add such others as he deems wise.
>
> "Many architects include in their General Conditions one or more of the subjects named below. Most of these are better placed in the specifications for the various trades; and others, though suited for inclusion in the General Conditions, are not always needed. Among these subjects are:
>
> Bracing building during construction,
> Charges for extra copies of drawings,
> Chases,
> Checking by surveyor, and his certificate,
> Contractor to keep the work in repair,
> Contractor to lay out the work, giving lines and levels,
> Contractor to work overtime if required,
> Fences,
> Heating during construction,
> Insurance against lightning, wind storms, hail and earthquake,
> Keeping building and cellar free from water,
> Ladders,
> Lanterns,
> Offices and their furniture,
> Permission to use articles or methods other than those specified,
> Photographs,
> Protection and care of trees and shrubs,
> Protective coverings in general,
> Sanitary convenience,
> Scaffolding,
> Sheds,
> Sidewalks,
> Special cleaning other than "brown clean,"
> Stoppage of work in freezing weather,
> Telephone,
> Temporary enclosure from weather,
> Temporary stairways,
> Temporary wiring and electric lights,
> Vault permits,
> Watchmen."

The above quoted recommendations can be followed with every assurance that well studied results will be obtained. The especial point to be made is that the specification writer should be thoroughly familiar with the contents of his General Conditions and the accompanying Agreement of Contract in order that he may assure himself that nothing will be omitted and that nothing has been included that will be superfluous or that will tend to cloud any issue.

There are a sufficient number of books on specification writing that deal almost exclusively with the general conditions and articles of agreement and there is no reason why this department should add any words to those that have gone before except to remind the specification writer that in no place in all the documents that accompany and supplement the drawings does he need to be any more particular than in the preparation of his General Conditions. His judgment must, of course, be depended on to guide his actions along the correct channels and in subsequent articles an attempt will be made so to elucidate the art or science of writing specifications for building or engineering structures of any description that his judgment will be shaped, or will be guided, toward the proper channels.

Throughout subsequent discussions in this department numerous references will be made to matters that, of necessity, will have direct bearing on the subjects that are ordinarily treated in General Conditions in the hope that an extended description of how best to meet certain conditions will form a basis for the composition of General Condition clauses that will be to the point.

In the writing of many specifications it is necessary to include a list of Instructions To Bidders. The contents of such a list ordinarily will contain the announcement of a call for bids, a description of the work to be done and other matters that relate to the form of procedure in submitting bids and closing the contract.

This subject also is treated at great length in all books that discuss the legal aspects of the articles of agreement and the general conditions of the contract, because of their intimate connection. The conditions to be met are of such a diverse character that there seems to be no reason to discuss these Instructions To Bidders at any great length. The reader is commended to the learned discussions of those who already have prepared very good suggestions on this subject, with the repeated caution to make sure that whatever he uses will not cause difficulties or erroneous impressions. If his judgment can prevent him from taking wrong steps it is very probable that such superfluous steps he does take will have no bad effect on the conduct of the work under his specifications.

Commencing with the next issue of *The American Architect* the writing of detailed specifications for all materials, and labor and installation that are used in buildings or engineering structures will be discussed.

Window Detail on Elm Street

THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.

James Gamble Rogers, Architect

LEGAL DEPARTMENT

Conducted by

CLINTON H. BLAKE, Jr., of the New York Bar

THERE seems to be a very wide-spread and continuing impression among architects, that the plans remain under any conditions the property of the architect, and that ownership thereof does not pass to the client. I have already pointed out in various writings, the fact that this is not legally true, in the absence of an agreement that the plans shall remain the property of the architect. There still seems, however, to be some uncertainty in the minds of many on this point. Within the last few weeks, for instance, *The American Architect* received a letter referring to one of my Architectural Quicksands articles, and saying that they thought the article must be in error on this point, in view of the provision of the rule of The American Institute of Architects, that drawings and specifications, as instruments of service, remain the property of the architect. Possibly a brief recapitulation of the law on this point may serve to clarify any similar misunderstandings.

The basic point to be remembered is that at common law, and in the absence of any express agreement to the contrary, the client who pays for the preparation of the plans, thereby acquires a property right in them and becomes the owner of them. The fact that The Institute adopts a rule to the effect that the plans should remain the property of the architect, does not affect the title to the plans in the slightest, unless it is agreed between the architect and the client that the Institute rule is to be followed and that the plans shall belong to the architect. No special form of contract is necessary, but there must be a definite agreement at the least whether it be in the form of letters, a signed and printed contract, or otherwise. If the parties agree that the rules of the Institute shall govern, it would follow, that the rule covering the ownership of plans would apply, even though no more specific reference to the point were made.

Of course, the better way is to enter into a contract, such as the Institute form of contract, which covers the question specifically. There can then be no misunderstanding or ground for the client, at a later date, claiming that he did not understand the agreement. If direct reference to the point be made in the contract, the question of whether or not the client was ignorant of the rule cannot arise.

The law is and has been, for many years, well settled, both in England and in this country, and was determined in New York State as long ago as 1902. The agreement that the plans shall remain the property of the architect is a reasonable one and consistent with sound policy from the point of view of the profession, emphasizing as it does the personal element which enters into the making of a design, just as it enters into the execution of a painting or a bit of sculpture.

THERE is still another and distinct question, and that is the question involving the right of the public in the plans. One phase of this question was involved, for instance, in the recently published correspondence between *The American Architect* and Mr. Magonigle. In considering how far third parties or the public generally have the right to make use of an architect's plans, to publish them or to copy them, each case must be treated on the basis of the special facts which it involves, and each situation will in all probability be somewhat different from the next.

There will have to be considered the question of whether what the law calls a "publication" of the plans has been made, that is to say, whether they have been so openly presented, that the public has acquired a right in them, and the architect, by allowing them to be presented generally or publicly, has similarly lost such right as he might otherwise have retained. It is also possible, in proper cases, for the architect to secure patent or copy-right protection, and where this is done, the case, of course, immediately passes into another class, and if the patent or copy-right is good, the protection which it gives must be generally recognized. In speaking of the publication of plans, the publication in the ordinary sense of having them printed and distributed as a book or article is published is not meant. The filing of the plans with the Building Department of a City or some similar act, opening them to the public, may in legal contemplation be a legal publication.

To summarize briefly:—If the architect wishes to retain his property in the plans as against the owner, he should be careful to see that a written agreement be made with the owner to this effect, and this agreement should be made in the first instance and before the plans are prepared and delivered and paid for. Otherwise, the owner, upon paying for the plans or tendering payment therefor, may become the owner thereof and the architect's rights therein be lost. If the architect wishes to prevent any third parties acquiring an interest in the plans, he should similarly use care in sec-ing that no act is taken which may be construed as a legal publication, and if the situation be important enough to warrant it and the facts such as to make it possible, copy-right or even, in a proper case, patent protection should be secured.

As between the architect and the builder, the custom has been recognized that the builder, although the plans may remain the property of the architect, shall have the right to have them in his possession and use them while the building is being erected. This, of course, is consistent with common sense and the necessities for the building operation.

The cases cited this month on this page all deal with the points discussed above and include some of the earlier and basic decisions, as well as some of the more recent.

LEGAL DECISIONS

IN an action by an employe of a sub-contractor against the general contractor for damages resulting from a fall down an elevator shaft in a building under course of construction by the general contractor, it appeared that at the time of the accident, the building and shaft had been substantially completed and the doors to the shaft put in. At the request of the owner, however, a change was made to increase the headroom in the doorway. The change had been completed when the accident occurred. The Trial Court charged the jury that, under the Labor Law, of New York, if the defendant failed to provide the barrier which the law requires, this would in itself, be evidence of negligence. There was a question of fact, as to whether the general contractor had furnished a proper guard or barrier for the shaft. On appeal, it was held that the charge of the Court was erroneous, because it appeared that there was no work going on about the unguarded elevator shaft at the time the accident occurred of the character that would make the definite requirements of the Labor Law, as to the providing of protective barriers, applicable. The Labor Law in question provides in substance, that shafts and openings on each floor of a building or elevator shall be closed on all sides by a barrier at least eight feet in height while the work is in progress. It appeared that the plaintiff had been working on the change in the door ten minutes before the accident, and had just quit work to get lunch, when, in passing the shaft, he was accidently pushed into the opening. The Appellate Court further held that it was not proper to leave the jury the simple question of whether the defendant was negligent in failing to put a guard across the opening, between the time when the plaintiff left it and the time when he fell, for the reason that, under such a charge, the jury might have found that the defendant had in fact provided the guard, required by the Labor Law, but that it had not happened to put the barrier up within the ten minutes which elapsed between the quitting of work by the plaintiff and the accident, and that it was error to submit to the jury the question of "whether it was negligence for the defendant to fail to replace in so short a time as ten minutes proper barriers which it had provided, particularly when it had no notice that the plaintiff had left the place in question unguarded."

Korfanta v. Vanderbilt Avenue Realty Co. and ano., 193 New York App. Div. 763.

IN the absence of special agreement, an architect has no right of ownership in a plan furnished to, accepted by and paid for by another.

Wright v. Eisle, 86 *N. Y. App. Div.* 356.

PLANS which form an essential part of the building contract, unless proven to be the property of the architect, are deemed to be the property of the employer.

Moffat v. Scott 8 *L. C. Jur. (England)* 310.

WHERE various architects submit competitive designs, the architect to whom the award is tendered loses his right in the plans and the person who makes the tender is entitled to use them.

Walsh v. St. Louis Exposition etc. Assn., 101 *Mo.* 534.

WHERE an architect furnishes a plan under the rules of a contest offering a premium for the best plan submitted and is awarded the premium and receives it, the plan which he submits and the idea embodied in it become the property of the person by whom the premium is paid.

Windrim v. Philadelphia, 9 *Philadelphia* 550.

AN architect was employed by the owner to do all the things necessary in the way of designing and carrying out the building operation for a fee of 5% on the contract price. Pursuant to the employment, the architect prepared plans and over-saw the proper carrying on of the work and the owner paid him the agreed 5%. It was held that under these conditions, the property in the plans passed to the owner and they could not be retained by the architect.

Gibban v. Pease, 1 *Kings Bench (England)* 810.

DEPARTMENT OF ARCHITECTURAL ENGINEERING

SOME PROPOSED INVESTIGATIONS IN STRUCTURAL ENGINEERING*

STRUCTURAL steel design is largely a mathematical process and is looked upon by many structural engineers as an exact science; nevertheless the mathematical processes are often based upon assumptions which have never been verified, and many of the mathematical operations are nothing more than the solution of empirical equations. Too often these equations lack experimental verification. The changes which are made in specifications from time to time, indicate that the concensus of opinion relative to the fundamental assumptions and relative to the empirical relationships are continually changing. Structural Engineering is, therefore, not a fixed science, but a science which is rapidly developing.

A study of the discussions which accompany changes in specifications indicates that, whereas, some revisions are the direct and inevitable result of additional scientifically established facts, other revisions grow out of a change in what is nothing more nor less than the opinion of the structural engineers. Although this opinion may be entertained by the leaders in the profession, as long as scientific confirmation is lacking, the opinion is liable to further change with additional experience. It is therefore highly important that all basic assumptions and all empirical relationships be checked by scientific experimental work.

It is believed that certain problems in structural engineering should receive further experimental study. In presenting these problems the position is taken, not that our present practice is necessarily wrong, but that we have not sufficient knowledge to justify us in forming a final and definite conclusion.

The following are a few of the many problems which affect either the cost or the safety of structures.

Abridged from paper by W. M. Wilson, Associate Professor of Structural Engineering, University of Illinois, published in August, 1921, Journal of the Western Society of Engineers, Chicago, Ill.

1. Effect of Reversed Stresses on Riveted Joints

TESTS of riveted joints show that the resistance to slip is due to friction between the plates induced by the tension in the rivets. Moreover this slip, an inelastic strain, occurs at stresses considerably below the stresses for which connections are designed. These statements being true, if a stress on a connection acts in one direction there will be a slip in that direction; and if the stress is reversed, the slip is in the reversed direction. By repeating the cycle, the repeated slip will result in wear which relieves the tension on the rivet and thus reduces the resistance to slip. Therefore, a large number of reversals may result in an amount of wear which will permit a small stress to produce a large slip.

That the action outlined does take place is evidenced by the fact that connections of members subjected to reversed stresses do work loose. This has been observed in a number of structures.

To establish further the action outlined, a few tests were made to determine the effect of repeatedly reversed stresses (unpublished tests made at the Engineering Experiment Station of the University of Illinois by W. M. Wilson). These tests show that connections subjected to reversed stresses, if designed in strict accordance with our present specifications, may be expected to develop loose rivets.

This being true, changes in the usual specifications should be considered. But before the specifications can be changed intelligently, more complete knowledge relative to the behavior of riveted connections subjected to reversed stresses is needed. Experimental data are desired to answer the following questions:

1. What is the proper unit stress to be used in designing a rivet subjected to reversed stresses?
2. What is the relative value, as judged by their ability to resist reversed stresses, of rivets driven by different methods?

3. Is it possible to develop a method of driving which will increase the ability of rivets to resist reversed stresses?

Because of the increase in the weight of rolling stock, railroads are compelled to subject their bridges to stresses considerably greater than the stresses for which the bridges were designed. Following the recommendations of the American Railway Engineering Association, the stress in tension for rating old bridges made of open-hearth structural steel is 26,000 lbs. per sq. in., while the corresponding stress in shear on rivets is 22,-000 lbs. per sq. in. In both cases the allowable stresses are reduced if the stresses are reversed; the reduced stress for tension on steel is 17,333 lbs. per sq. in., and for shear on the rivets is 11,000 lbs. per sq. in., if the reversal is from a stress in one direction to an equal stress in the opposite direction.

Fatigue of metal tests indicate that a tensile stress in steel considerably greater than 17,333 lbs. per sq. in., can be reversed millions of times without breaking the metal, whereas, tests indicate that if a shear on rivets of 1,000 lbs. per sq. in., if reversed only a few thousand times, the rivets are loosened. It therefore seems probable that overloading bridges will injure the bridge, not by injuring the metal, but by loosening the rivets. This being true, an extended investigation of the behavior of riveted joints subjected to reversed stresses assumes unusual importance.

II. A Comparison of Various Types of Wind Bracing for Steel Skeleton Buildings

THE usual method of stiffening the frame of a steel-skeleton building so that it will resist wind pressure, is to make the joints connecting the girders and columns rigid, so that they can resist moment. Two types of connections are in general use. With one type, in order to erect the girders, it is necessary to slip the gusset plate, a part of the column, between the flange angles of the girder. As this operation takes place high in the air, the erection is quite difficult. With the other type, erection is accomplished by swinging the girder between two adjacent columns, and riveting the outstanding legs of the connection angles to the outstanding legs of the column, a very simple process. In spite of the fact that the first type is much harder to erect than the second, the former is replacing the latter, as it is believed to be more rigid. A very limited number of tests (Bulletin No. 104, Engineering Experiment Station, University of Illinois, by Wilson and Moore) show that there is but little difference between the rigidities of the two types of connections; and that, if there is any difference, the second is slightly stiffer and therefore better than the connection of the first type. It is desirable to determine definitely the relative merits of these two, and also of other types of connections.

III. Distribution of the Stresses Among the Rivets of Large Gusset Plates

IN designing a riveted connection which is not subjected to moment, it is assumed that the total stress on the connection is equally distributed among the rivets. Gusset plates are usually much wider than the members from which they receive stress. Under these circumstances, it seems probable that the stress in the rivets in a line with the axis of the member may be greater than in the rivets near the edges of the gusset plate.

In riveted joints, as in elastic material, the stress is approximately proportional to the strain. Because of the difference in stresses in the gusset plate and in the member, the slip, the relative motion between the two, may not be the same at all points. As the stress depends upon the slip, a variation in the slip will cause an uneven distribution of the stress among the rivets.

A limited number of tests by Cyril Batho (Journal Franklin Institute, Vol. 182, page 553) indicate that the stress on a joint is not evenly distributed among the rivets. The maximum stress will, therefore, be greater than the total stress divided by the total number of rivets, as now assumed. A thorough investigation of the distribution of stress among rivets is desirable.

IV. Effect of the Restraining Action of the End Connections Upon the Stringers of Through Truss Bridges

THE stringers of through trusses are connected to the floor beams by means of connection-angles which run the full depth of the stringers. Tests show (Bulletin No. 104, Engineering Experiment Station, University of Illinois, by Wilson and Moore) that these connections are quite rigid. This being true, two stringers meeting end to end act as a continuous girder. While this action reduces the moment at the center of the stringer, it also produces a large, suddenly applied moment on the stringer connection. And the stringer connection is not designed to take moment. It is desirable to determine the moment on the connection-angles and, if it is found to be dangerous, to devise alternate possibilities of design.

V. Effect of Not Fitting the Ends of Intermediate Stiffness of Plate Girders to the Outstanding Legs of the Flange Angles

STIFFENERS of plate girders are fitted carefully to the flange angles. This involves grinding the ends of the stiffener angles to exact length and shape, and involves either the use of thick fills or of crimping the angles. Taken altogether this fitting adds materially to the cost of the girder.

The function of intermediate stiffeners is to prevent the web from buckling. The stiffener does not in any sense transfer stress to or from the flange angles. It would therefore seem that the requirement that the ends of intermediate stiffeners be ground to fit the outstanding legs of the flange angles is without a rational basis. It is desirable to make tests to verify this statement.

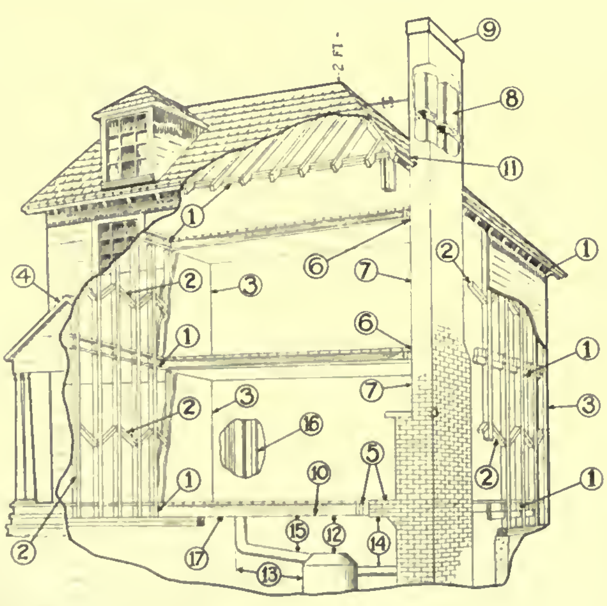
VI. Mathematical Study of Secondary Stresses

THE exact theoretical determination of secondary stresses is a very laborious process. This is true to such an extent that secondary stresses are neglected except for very important structures, in spite of the fact that it is known that, theoretically at least, secondary stresses are often almost as great as primary stresses. It is desirable to make a careful study of secondary stresses with the idea in mind of establishing empirical rules for determining secondary stresses. These rules should be accurate enough for purposes of design and should also be so short that they will be used by the practicing engineer. Such rules have been established for wind stresses in steel skeleton buildings (Bulletin No. 80, Engineering Experiment Station, by Wilson and Maney) and it should be possible to establish them for secondary stresses in trusses.

(To be continued.)

MODERN DWELLINGS OF WOOD

THE accompanying figure showing details to be followed in constructing a fire resistive frame dwelling is one prepared and distributed by the National Lumber Manufacturers' Association. It emphasizes items which have been recommended for many years as good practice but often slighted or omitted because of the undue importance given to first cost. Were all frame dwellings designed and construction supervised by architects the owners of these buildings would receive more for their money. For example the herringbone bracing between studding is regarded as bracing alone and is often omitted when diagonal sheathing is used. This bracing should be as wide as the studding in order to close the space and confine fires in the walls to limited areas. Covered with not less than one inch of mortar spread to fill the hollow space between plaster and sheathing, or weatherboarding in case sheathing is omitted, a more effective protection is obtained against flames and the wall in addition is divided into air insulated spaces which make it warmer in winter and cooler in summer. The embedment of metal lath in the mortar stops rats from travelling from floor to floor. The fire stopping at all intersections of walls and partitions with floors, ceilings and roof should be similarly treated with mortar and metal lath. The drawing should be studied and the suggestions put to use whenever a frame dwelling is designed.



(1) Fire stopping at all intersections of walls and partitions with floors, ceilings and roof.
(2) Herringbone fire stopping in partitions midway between floor levels.
(3) Partition and wall corners framed solid.
(4) Wall between porch attic, and house sheathed solid.
(5) Header beams 20 inches from the fireplace breast. Incombustible hearth.
(6) Wood members 2 inches from chimney, space between filled with loose incombustible material.
(7) Plaster applied directly to chimney breast.
(8) Flue lining in chimneys.
(9) Top of chimney 2 feet above peak of roof.

The National Board of Fire Underwriters reported for the year 1918 that more than 40 per cent. of the dwelling house losses came from "strictly preventable" causes, as contrasted with 23 per cent. for losses on all classes of property. In other words, "strictly preventable" causes, meaning inexcusable carelessness, constituted nearly twice as large a factor in "home" fires as in the average of all fires. The reports of underwriters for 1918 show that 65 per cent. of all reported fires occurred in dwellings and that the loss represented 28.5 per cent. of all damage.

For the year 1913 the per capita annual fire loss in the United States was reported to have been $2.10 as compared with 49 cents in France, 33 cents in England, 28 cents in Germany and 11 cents in Holland. The fire loss in the United States is exceeded only by that in Canada, it being a curious coincidence that these two nations lead the world in the use of all-wood dwellings. The per capita fire loss of the United States for the period of 1914-1919 was $2.71. The per capita loss for the year 1920 was reported to be $4.73, the re-adjustment of business conditions being held responsible for a rise in the insurance factor known as the "moral risk." The figures quoted do not include the expense of maintaining fire departments, water supplies for fire protection purposes and expenditures of organizations in fire prevention work. Nor are the available statistics complete as it is impossible to obtain information on all fires. The losses are undoubtedly larger than published reports indicate.

The 1921 Report of the Committee on Statistics and Origin of Fires, of the National Board of Fire Underwriters contains data from 341 cities in the United States having a population of 20,000 and upward. The fires are classified for the period 1914-1919 under, Brick and Stone buildings, Frame buildings and Other than Building Fires. One hundred and nineteen cities reported the numbers of each class of buildings as well as the number of fires in each class. From these cities fires were reported in 13,494 brick and stone buildings out of a total of 749,383, which is 1.8 per cent. From the same cities fires were reported in 20,622 frame buildings out of a total of 1,328,502, which is about 1.5 per cent. These percentages would no doubt be greatly altered were complete statistics obtainable from all villages, towns and cities, for the best available information indicates that of all dwelling houses in the United States not less than 83 per cent. are frame.

Frame buildings are those with outside walls of wood. Brick and stone buildings differ from frame buildings only in the walls, as a rule. There is as much wood used otherwise in the interior. In the United States, wooden dwellings will be constructed until increasing cost of lumber eliminates the cost differential between frame and brick wall. The American people like them and they are an American tradition. It is the duty of the architect as such to educate builders of frame houses to make them as fire-resistive as possible.

(10) Protection over heating plant.
(11) Roof framing 2 inches from chimney, flashed, permitting free movement of chimney.
(12) Top of heating plant 15 inches from ceiling.
(13) Furnace 8 feet from warm air riser.
(14) Smoke pipe 1½ times its diameter below the ceiling.
(15) Heat pipes 6 inches below ceiling.
(16) Doubled tin pipes, ½-inch air space between, in partitions, kept 1 inch from all woodwork. Steam and hot water pipes 1 inch from woodwork.
(17) Heat pipes running through floors, fire stopped with loose incombustible material.

Essential Details for Wooden Dwellings

The figures show that fire resistive construction is only a beginning. Of all the causes of known fires in dwellings, 42 per cent. fall in the "strictly preventable" or "carelessness" class, 34 per cent. fall in the "partly preventable" or "lack of intelligence, accidental and criminal" class, which leaves 24 per cent. of known fires as due to "unknown causes," these being probably largely preventable. Fire resistive construction reduces the amount of loss by fire and lessens danger of conflagration but does not reduce the number of fires. Education alone will do this.

The relative per capita annual fire losses in the United States and France for the year 1913 are better understood by members of the 1917-1919 American Expeditionary Force than by people who did not get over to France. The French are frugal, nearly all dwellings are warmed by fireplaces and most of the French heating stoves are ridiculously inadequate from the viewpoint of an American. Central heating is almost unknown and a temperature considered by the average Frenchman and his family as endurable, drove his "locataire" to the cafes and estaminets for comfort. Thousands of fires occurred in French homes when the billetted soldiers attempted to heat their quarters to temperatures they were accustomed to at home. Nearly all the fires were caused by defective flues and chimneys, as many of the offices and billets occupied by our forces were supplied with modern British or American stoves. Roaring fires in fireplaces frequently burned houses down, for in many places in France masonry was laid up in mud instead of lime mortar. Fully as much wood is used in the interior of French houses as in American houses and it is dry and tindery because many houses are very old. The people are thrifty and careful and it is largely due to these traits that fire losses are smaller in France than in America.

Furthermore every fire in France is investigated and some one must pay. The man found responsible, if one may credit the statements of responsible French Officials, is punished and may also have to pay for the time of the extra policemen used as a guard while the fire is being fought; for the time of the firemen and rental of the fire fighting apparatus; for the water used in putting out the fire. He may be sued by neighbors who suffered damage during the fire and by adjoining storekeepers who suffered loss of trade while the crowd blocked access to their shops. If he is guilty of gross carelessness the landlord may sue him for damages and cancel the lease. Wherever he goes insurance rates will be increased on any building he may occupy and on adjacent structures. It is stated that similar laws exist and are rigidly enforced in all European countries. It must be so, for there are fire traps in European cities in spite of brick and stone walls and tile roofs. The narrow crooked streets increase the difficulty of fighting fires yet the loss by fires in Vienna in 1913 is said to have been one-eighteenth as great as in Chicago, a city having the same population, for that year.

Stainless Steel and Iron

ABOUT eight years ago a method was discovered in Great Britain for making stainless steel and iron. The result was the revolutionizing of the Sheffield cutlery trade. Thousands of members of the American Expeditionary Forces brought home souvenirs from England, France and Belgium in the form of knives with blades of stainless steel; knives made to cut and which look better than the nickel and silver plated American knives which do not cut.

It is now reported that the production of stainless iron in Great Britain is keeping pace with the production of stainless steel. Stainless iron has been largely used for the production of golf clubs; it has attracted the attention of makers of stove grates and is being used for kitchen ranges, grates, and fenders. An important and useful direction in which the material has been applied is in the fitting of motor cars; it is supplied in sheets for making hoods, and there is in contemplation its greater use for bodies and, since it does not tarnish, for replacing nickel-plated parts. It is made up into a wide variety of kitchen utensils and is used for shop signs and door plates. One British firm is producing the material in wire form, to be made up into door mats, and it is also being used for spring mattresses.

Another important development in contemplation is the use of stainless iron for the furnishing of railway carriages, engines, and rolling stock generally. The proposal is that it should replace brass for door handles, brackets, and many other fittings. Meanwhile if stainless iron and steel are being made or used in the United States, there is a singular reticence manifested by the advertising departments of the concerns interested.

Formula for Strength of Rope

AT the Bureau of Standards laboratories in the Department of Commerce, tests have been made that have resulted in the following formula:

For three-strand regular lay manila rope from ½ to 4½ inches in diameter, the average breaking load in pounds equals 5,000 times the diameter of the rope in inches, multiplied by the diameter of the rope increased by one.

The working load or the load that a contractor or safe-hauler may apply with proper safety and precaution must be considerably less than the load given by the formula.

Other data on rope are contained in Technologic Paper of the Bureau of Standards No. 198, by A. H. Stang and L. R. Strickenberg, which has just been issued.

Common Sense in Economics

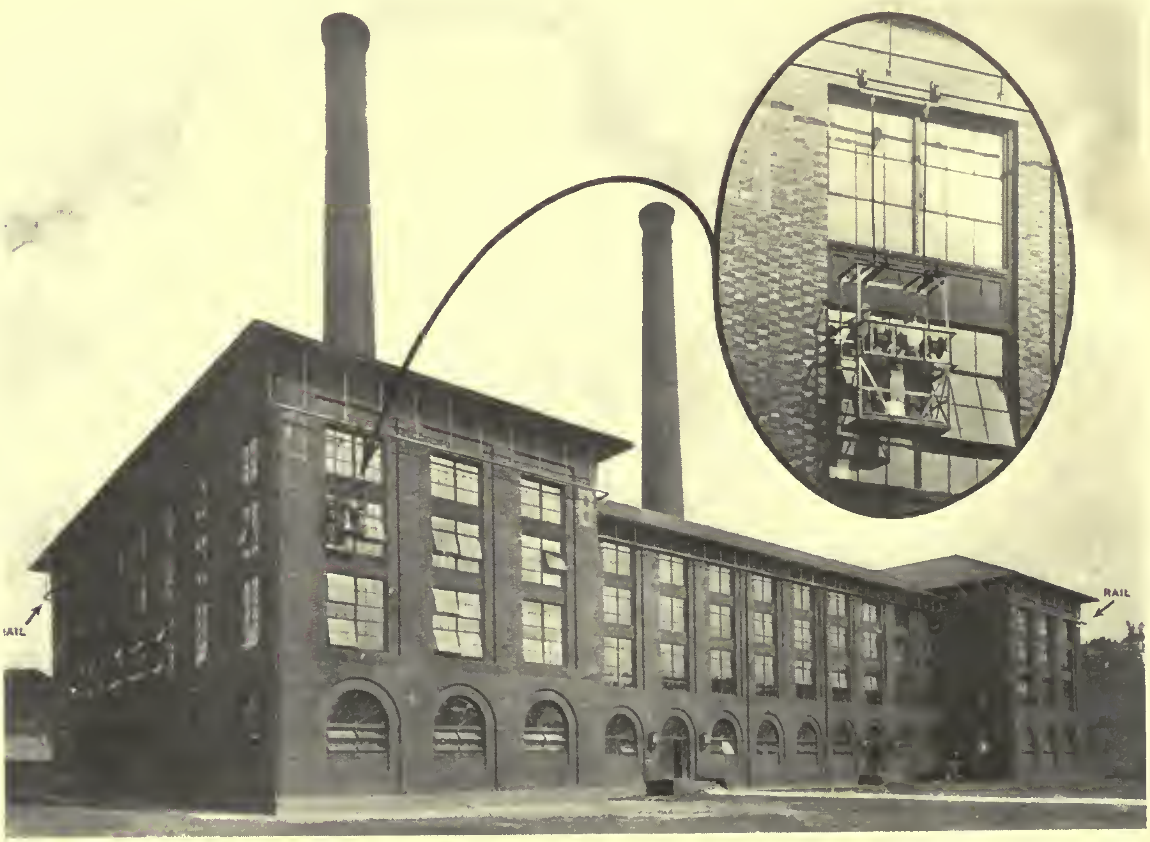
IN 1896 the Free Silver movement was defeated as the result of a campaign of education. Today many unsound hypotheses are being exploited and at no time since 1896 has there been manifested so general an interest in economics. A campaign of education should be conducted now so the public will be able to judge the merits of controversies filling the pages of the daily press. One drawback is the lack of simply written text books which stress essentials. The editor of the Valve World wrote a series of articles on the basic principles of economics and they excited so much interest that they were reprinted in book form. The book, "Common Sense Chats on Political Economy," is well worth reading. Copies may be had free of cost by addressing the Valve World, Crane Company, Chicago, Ill.

Thermal Conductivity and Diffusivity of Concrete

A BULLETIN with the foregoing title has been prepared by A. P. Carmen, Professor of Physics and R. A. Nelson, Assistant in Physics, Engineering Experiment Station, University of Illinois, Urbana, Ill. It is an illustrated report of experiments, with a summary of results and conclusions. According to the authors, as a result of the rapidly increasing use of concrete in various forms of construction it has become important to have some definite information as to the thermal conductivity and diffusivity of different concrete mixtures. During the last ten years the composition and methods of preparation of concrete mixtures have been studied and standardized, and present investigators have had the advantage of dealing with concrete mixtures which can be described much more definitely than was possible a few years ago. The results of only a few determinations of the thermal conductivity of concrete have been published previously, and to a large extent these lack definiteness in regard to the composition and method of preparation of the material. The bulletin is No. 122 and the price is 20 cents.

The Window Washing Problem

THE use of glass in walls is so beneficial in many ways that no question is raised today concerning it. The square foot cost is so close to that of any other wall material as to affect but slightly preliminary estimates of cost. The only drawback is the cost of cleaning if the greatest benefit is to be obtained from the transparent material.



A Permanent Installation for Washing Windows

This cost varies with the character of the industry and in some lines of business it is said to be cheaper to let the glass go without cleaning and reglaze the sash at intervals of three or four years. The reason for the high cost is usually the lack of facilities.

The accompanying cut shows how the problem was solved on the Division Street Water Station, Cleveland. The height of the building is 60 feet and the walls contain 4,600 panes of glass. The suspended tramrail enables two men with ease and safety to clean windows and walls, replace broken glass and paint sash and downspouting. The carriage travels around the entire building and is raised and lowered by means of a double winch. It is stated that windows are now washed at a saving of two-thirds the cost of the former method used, besides which the work is performed more frequently.

The suspended rail may offend the artistic sensibilities of some designers but the principle is sound. With some study it should not be difficult to design cornices to carry a concealed tramway rail and this piece of equipment should form part of every building with large areas of glass in the walls.

Ideal Brick Wall Not New

THE Common Brick Manufacturers' Association of America states that from the Republic of South China comes word that the Ideal wall has been used in that semi-tropical climate for hundreds of years; and dwelling houses upwards of fifty years old with Ideal walls in the cold country of Sweden are considered ideal to live in by their occupants.

AMONG the new items for the specification writer may be mentioned luminous house numbers. They are approximately 3-in. high and are of a cream color during the day. During the night they have an intense glow visible at a considerable distance. They are guaranteed to glow in the dark for at least five years.

Relative Values of Dry Kilns

ALL dry kilns now on the market are either progressive or compartment kilns. In the progressive type the drying conditions increase in severity from one end of the kiln to the other, the material being moved into severer conditions as it dries. In the compartment type the same temperature and humidity prevail throughout the kiln at any one time, beginning with mild conditions and increasing in severity as the material becomes dry.

The kiln-drying data and experience of the Forest Products Laboratory, Madison, Wis., indicate that each type has particular advantages on certain points, as follows:

The progressive type of kiln requires less skill of the operator, and reaches its greatest heat efficiency in drying from the green state. It is most useful in circumstances which permit of its being supplied continuously with green lumber of one thickness and class. It is, however, impracticable with this type of kiln to give individual attention to special loads of lumber.

The compartment type of kiln is more flexible and is better adapted to meet the varying requirements of different kinds of material. It is most useful where exact and careful drying is required, as in the handling of refractory woods.

Wood Acids

IT is stated on the authority of the Forest Products Laboratory, Madison, Wis., that the amount of acid normally present in any native wood is not sufficient to warrant its rejection for any purpose involving contact with metals.

In the research of the Forest Products Laboratory, only three chemicals correctly called acids have been found existing free in wood; these are tannic acid, acetic acid, and formic acid. Tannic acid is very feeble and has very little corrosive action on metals. The other two acids are also feeble in comparison with sulphuric, nitric, or hydrochloric acids.

A very small amount of acetic acid and a still smaller amount of formic acid apparently exist in all native woods, probably as the result of a slow action of water on wood at ordinary temperatures. All native species are also alike in that both of these acids can be produced very readily from them by the simple action of steam or hot water, a reaction for which there is no simple preventive treatment. Acids formed in the wood by the agency of steam or hot water are doubtless responsible for the results frequently attributed to acid supposed to have been in the wood originally.

BOOK NOTES

The Clerk of Works*

A man who writes specifications should be thoroughly trained in office practice and with some experience in supervising construction. A man who supervises construction should have a sound knowledge of materials and their fabrication into structures. Some training in structural design will be helpful. Proper training in structural design should be based on a thorough foundation course in mathematics and physics.

Counting upon a resumption of building activity in the near future, a number of publishers are issuing books for popular consumption, on the planning and construction of buildings. The one under review "Modern Building Superintendence and the Writing of Specifications" is an attempt to prepare young men lacking in basic knowledge, to perform the duties of a clerk of works or superintendent of construction. The style is that of a lecturer in a popular lecture course or a megaphone carrier on a "sight-seeing" wagon. One cannot deny that the author is possessed of a knowledge of his business. The pity is that he regards his profession so lightly, assuming him to be an architect, as to profess to believe that this book is of real value as a text on the important subject with which it deals.

Superficiality is the curse of today and the professions of architecture and engineering contain too many men who know just enough to "get by." Bribery and corruption are the logical results of putting men imperfectly trained, in positions of responsibility. Architects insist upon having proper foundations for buildings. They should insist as rigorously upon their aides having as a foundation for professional training a sound knowledge of and real information on the materials and processes of building construction. The architect is not wholly a designer; he is also the "Master Builder" and adequate training for so dignified and honorable a calling cannot be obtained from the reading of books written in the style demanded for the pages of popular magazines.

**Modern Building Superintendence and the Writing of Specifications. By David B. Emerson. New York, Charles Scribner's Sons.* 247 *pp.* 4½x6¾ *in. Cloth.* $1.75.

The Electrical Code*

THE National Electrical Code is a fine example of standardization of practice. It was written to safeguard life and property by competent men and was accepted willingly, even

**The Code at a Glance. By Hubert S. Wynkoop, M. E. 96 pp. Pocket form. 3x7 in. Flexible covers. New York, National Association of Electrical Contractors and Dealers.* $1.00.

cheerfully, because every modern house is supplied with electricity. The demand for electrical installations was sudden and insistent allowing architects and builders but little time to post themselves on electrical theory. From the first safe practice was insisted on and the code is free from compromises and serious defects because the authors and annual revisionists were, and are, free from interference of men with half knowledge and men with special interests to forward. Would that the same could be said of building codes!

Code violations more often result from difficulty in correlating various sections than from intention to do wrong. Mr. Hubert S. Wynkoop, M. E., in charge of electrical inspection, city of New York, after reviewing thousands of code violations that came to his notice during the past twenty-five years, conceived the idea of compiling code requirements in alphabetical form, freely cross-referenced. The completed work is in handy size and shape to be carried in an upper vest pocket. Code requirements are grouped under correlating subjects in the form of chapters and then alphabetically arranged. The work has been well done and the handy glossary defining words and terms that are often misinterpreted gives to all users of the National Electrical Code a useful guide.

Engineering Construction*

THE third edition of the first volume of Engineering Construction by Prof. Warren deals with steel and timber. It has been carefully revised and results of recent experiments on materials and structures have been included. References to American authorities are so frequent that it is a useful text in this country even though the author is an Australian. Following a discussion in two chapters on the physical and mechanical properties of steel and timber, there are chapters on the mechanics of structures and the design of beams, girders, columns, trusses, etc., and proper connections for same. A knowledge of engineering mathematics is assumed. On the subjects treated it is a compact and satisfactory text book preliminary to practice.

**Engineering Construction. Part I. Steel and Timber. By Prof. W. H. Warren. New York, Longmans, Green & Co. Third edition.* 1921. 486 *pp. Ill.* 6x9¼ *in. Cloth.* $10.00.

The Designing of Hospitals*

CONSTRUCTION news reports indicate that much hospital building is contemplated for the coming year, with many hospitals now under construction. The time is opportune for the new edition of Stevens' treatise on the development of medical institutions, both in Europe and in America, since the beginning of the present century. The author states that the original text has been thoroughly revised and much new matter added, together with over one hundred and fifty new illustrations. It is a satisfying work on the planning and design of modern hospitals and contains nearly five hundred illustrations, including plans, details and photographs of what the author, as the result of wide experience, believes to be good examples.

**The American Hospital of the Twentieth Century. By Edward F. Stevens, Architect.* 380 *pp. Ill.* 7x10 *in. Second edition, revised and enlarged. New York, The Architectural Record Company.* $7.50.

Brick*

ACCORDING to archæologists brick has been used as a building material for not less than ten thousand years. Notwithstanding complaints of architects and builders it was impossible to compel brickmakers to agree upon a standard size until the year 1920 A. D. This oldest of modern building materials felt the competition of young modern standardized clay tile and concrete blocks and the standard 2¼x3¾x8in. brick was adopted.

Stucco on wood and metal frame walls appeared as a formidable competitor on the score of cost and the friends of brick developed the "Ideal" wall, a form of construction for which great economy in material is claimed. "Everybody knows brick" proved to be a good advertising slogan and the brick buildings to be seen on all sides apparently prove the truth of the statement.

The average home builder, however, finds that estimates of cost for brick buildings of moderate size are difficult to obtain, while advocates of other materials are always ready to give figures which are very satisfactory. The brick manufacturers are now manifesting great interest in small houses and the third edition of the book on brick by William Carver, Architect, is on sale. This excellent work contains everything architects, contractors and prospective builders should know about brick. It is a worthwhile treatise which could serve excellently as a text in vocational schools. It is a text on construction, on brick-laying and on estimating the cost of brick work.

**Brick, How to Build and Estimate. By William Carver, Architect.* 72 *pp. Many illustrations and tables.* 8½x11 *in. Cleveland, Ohio. The Common Brick Manufacturers' Association of America.* 25 *cents.*

A REVIEW of RECENT ARCHITECTURAL MAGAZINES

BY C. HOWARD WALKER

THE Journal of the American Institute of Architects, October, 1921. Mr. Whittaker in Shadows and Straws thinks we quarrel over Rights in regard to Capital and Labor and forget Needs, that the consumer is forgotten because we "have a form of ownership which dictates the control of industry." He goes on to define and analyze types of land ownership—their social significance, etc. He thinks the condition "Cataclysmic" and in an attempt at amelioration this number of the Journal is devoted to those questions.

From "The Architectural Record"

County National Bank and Trust Company, Santa Barbara, Cal.

Myron Hunt, Architect

First Mr. Thomas Adams writes upon reserving productive areas within and around cities, a proposal to substitute wedges for concentric zones. This, when analyzed, merely acknowledges that urban areas and agricultural areas are benefited by being interspersed. The manner in which this should be done being dependent upon water sources, contours, character of land, propinquity to other centers, etc., etc. This is mere ordinary commonsense and its application varies with every occasion for its use.

Mr. Whittaker thinks it is unusual for a magazine to assay an effort to lift architecture and the realm of things worth while, and praises *The Century* for the effort in Mr. Price's article in the September issue. He in one sentence admits that the illustrations distort (therefore, they do not illustrate) yet he thinks that this is the way that an apathetic public may be inspired to look at architecture. This is a peculiar logic, and a more peculiar philosophy. By all means let us say the thing that is not with authority, so that the misguided public may learn the thing that is. This way madness lies. Is this the message that we wish to get "across to the crowd"? We confess we are bewildered by Mr. Whittaker's writing. One moment it has an almost maudlin sentiment for the ills of the under dog as he sees him, and then he is ready to "get things across" to that pathetic animal so as to educate him. We are interested to know what he would say to certain elements of our own faith. First, that men are not born free and equal. Second, that rewards are very apt to be placed where they are deserved and to be of the character which is deserved. Third, that the exceptions prove the rule. Fourth, that sound and good education is not served by any pabula of dramatic and sensational statement, or by the thrashing of straws.

From "The Architectural Forum"

Housing Development at Crompton, R. I.

The Housing Company, Architects

The second article is by Mr. Henry Wright asking "Shall we Community Plan"? Also, shall we return to "Normalcy"? We recommend Jack Bunsby's remarks, "If not, why not"? etc.

Mr. Benton Mackaye who writes the third article "An Appalachian Trail" recognizes the element of the undeveloped span Time and advocates more life in the open, and the refreshment of recreation, and then maps his Appalachian Trail which is a good one.

Mr. George Herbert Gray writes on the Land Question as related to City Planning Housing. He especially analyzes Manhattan, which is valuable for Manhattan, which by the way is unique. His further analyses and conclusions are valuable, but we note the use of that delightfully vague adjective "adequate" which, of course, leaves "adequate" leeway.

From "The Architectural Record"

County National Bank and Trust Company
Santa Barbara, Cal.

Myron Hunt, Architect

From "The Architectural Record"

Door Detail—Residence of Miss E. S. Cushing, Waban, Mass.

Grandgent & Elwell, Architects

Meantime the Appellate Division of the Supreme Court in Brooklyn has decided that a reasonable rent is 10 per cent. This puts it up to the tenant as to what he demands, more than it does to the owner as to what he provides, and there is a very decided fly in that ointment. And this suggests that sanitation, heating, electricity of a superior character are demanded under City Building Laws; that areas of stairs and of egresses, and fire escapes are also required that the safety of the community has forced items of construction and of maintenance to a degree which is as far as possible fool-proof and thorough. And upon that side the government, Federal, State and Civic, has incurred expenses which must be met by taxes and rentals. That those who pay the least taxes are precisely those who injure and destroy the precautions that are necessary for their protection, and for the safety of the community and these are the people who are condoned. Here is a chance for a "new approach" to the subject, for any one who wants it. The demands of areas for the offices of public officials, (not the rooms for the working staff, but for the officials) is notoriously so great as to areas that it would be well to say how many square feet many of these officials require. These gentlemen, however, it is fair to say, are not condoned.

From "The Architectural Forum"

Detail of Main Façade—Girls' School and Lower School, Milton Academy, Milton, Mass.

George F. Shepard, Architect

The working classes have now (only as a step to further demands) a slogan "Eight hours' sleep, eight hours' rest and recreation, eight hours' work (which is not always intensive). How many independent workers, professional or otherwise, abide by that schedule and succeed? What has become of the midnight oil? Why do we have correspondence schools, or technical schools or colleges? Is the ideal life to which a man is looking the return for two-thirds of his life in something which will allow him to do nothing for two-thirds of it? It seems like an exaggerated economy of opportunity. Yet these gentlemen are condoned, and are to be fostered. Let it be stated frankly that if those subject to crime and disease, fostered by laziness and idleness were not poisonous in their exhalations and therefore to be controlled by force and edict, the world would long ago have let them decimate themselves. The beneficial factors of modern life are safeguarding themselves, and in so doing have diverted the merciless and salutory punishments that nature inflicts upon the violators of decency. We are pauperizing the morals and morale of a considerable part of our populace. When a man delights in what he can do, well done; when he balks at bad work and poor work and will not do it, we will hear less about lack of employment, minimum wage and hours and housing problems. Self respect is a silent virtue.

From "The Architectural Forum"

View of Main Façade—Service and Sales Building, Cadillac Motor Co., Detroit, Mich.

Albert Kahn, Architect

The Architectural Record, July, 1921. The Carson College for Orphan Girls at Flourtown, near Philadelphia, by Mr. Albert Kelsey is delightful. The article explains that Mr. Carson left several millions to found a home for orphan girls, stipulating that no two children should be dressed alike, in order that they should not be instantly marked as from an institution. The Japanese dress their school children all alike so that no unusual quality of cloth or ornament may make distinctions or cause jealousies. That is the opposite

From "The Architectural Record"

One of the Gables of Thistle Cottage—The Carson College for Orphan Girls

point of view. But charitable institutions have always caused a feeling of pity and occasionally of superiority in the minds of those who needed the charity. The uniform became a slight brand, not as in the case of organized bodies for concerted action, a mark of distinction. Mr. Carson deliberately, therefore, forbade uniformity of dress. Variety was desired and requested. The trustees and the architect have responded in the very best manner. The buildings are colleges with individual character, and named after flowers and with symbolism expressive of their names. The imagination of the child, that precious quality which can be so heedlessly ignored, is appealed to in carving, in sculpture, in details. Instead of the grim rows of identical rooms and windows in identical

(Concluded on page 368)

Photo by Underwood & Underwood

THE AMPHITHEATRE, UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE, VA.

FISKE KIMBALL, ARCHITECT

LOOKING TOWARD MECHANICAL LABORATORY

Photo by Underwood & Underwood

LOOKING ACROSS STAGE

THE AMPHITHEATRE, UNIVERSITY OF VIRGINIA
CHARLOTTESVILLE, VA.

FISKE KIMBALL

Architect

REVIEW OF ARCHITECTURAL MAGAZINES
(*Continued from page 356*)

façades, these colleges have individuality, change face to greet the sun at various angles, and while maintaining the same pitch to their roofs, which insures a general harmony, they are never twice alike. The uniformity is the uniformity of nature, i. e., that of type with constantly variant details, and it is the loving attention to these details that appeals throughout the work.

Never since the days of the facades that are on the courtyard of the Museum at Rouen, or upon the ends of Shrewsbury gables, have vergeboards been delightfully carved, and decorated in color. Textures whether of wall or of roof-chimneys, doors and their jambs, have all received careful attention. We have long speculated why a group of architects in Philadelphia have, more than any others of the profession, shown the faculty for taking infinite pains in their work. This quality is characteristic of Cope & Stewardson, Wilson Eyre & McIlvaine, Day & Klauder, Medary, Kelsey and others. It cannot be too highly praised, or too often followed, and the lack of it is responsible for much perfunctory and dreary work and for many lost opportunities.

Mr. A. Lawrence Kocher contributes his eighth article upon Early Architecture of Pennsylvania Mantelpieces, illustrating with excellent and simple examples.

Mr. Frank Chouteau Brown has Part II of Tendencies in Apartment House Design Remodelling, an interesting article showing research.

The Portfolio of Current Architecture illustrates Mr. Myron Hunt's County Bank & Trust Company building, Santa Barbara, Cal., which is quite like a church in the interior of the banking room, having nave and aisles and a wooden roof, although without clere-story windows. The exterior also resembles a church. There seems to be no reason why mammon should not reside in a church, as he has for years resided in temples.

Grandgent & Elwell's house at Waban is one of the delicately detailed, well proportioned Colonial houses of which many are now being built.

The Architectural Forum, June, 1921. The opening article is upon Charles Bulfinch's church at Lancaster, Mass. It is not one of the best of his works, the solids of its tower leaving something to be desired in their relative proportions, especially above the colonnade. Also the sun burnt buttresses are undesirable. The interior has beauty and fine proportions and the pulpit has unusual merit.

Mr. Wirt Rowland illustrates buildings relating to the automobile industry. These are practically loft buildings, and it is gratifying to find that they are being treated so sanely and are receiving careful attention. Especially is this the case with the Durant Building for the General Motors Company and the Service and Sales Building for the Cadillac Company in Detroit.

Mr. W. N. Crowen's Hotel Somerset, Chicago, like all buildings with many uniform windows, whether they be for automobiles or for human beings, is treated at its base and crown, leaving the intermediate stories simple. That is good commonsense. Mr. Crowen, accenting his crown with center motives, has overdecorated those motives at the top and driven them too far into the cornice.

Mr. Shepard's Girls' School, Milton Academy, Mass., is good and has delicately detailed porticos.

The Housing Company's developments in New England are of different degrees of merit, those at Crompton, R. I., being the best. All are to be commended for their simplicity and for their restraint in gable ramp projections.

Authentic Precedent in Colonial Interiors is illustrated by excellent interiors littered with collections of incongruous though excellent pieces of antique furniture. It is perfectly natural that these old houses should become museums of donations, but there is no reason why discrimination should be lacking in the association of the pieces, and the appropriateness to the room, and also to the number of pieces in a room.

Delano & Aldrich have a rich, well designed, proportioned and detailed mantel for the living room of the house of James A. Burden, Syosset, Long Island, N. Y.

Corbels supporting beams over a fireplace
THE MEMORIAL QUADRANGLE, YALE UNIVERSITY, NEW HAVEN, CONN.
James Gamble Rogers, Architect

THE AMERICAN SPECIFICATION INSTITUTE

127 North Dearborn Street, Chicago.

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A Discussion of the Plan and Scope of The American Specification Institute

A specification as used for building and engineering construction and equipment should be a qualitative description of the materials, methods and workmanship, which, when assembled in orderly fashion in accordance with a studied arrangement as expressed in the drawings accompanying it, will produce a building or engineering structure or equipment that is economically constructed for efficient use. A specification must be brief, concise, coherent, comprehensive without verbosity and an explicit statement of all elements necessary to the satisfactory accomplishment of the desired result.

In almost all cases, an engineering or architectural specification is accompanied by drawings that express, in a quantitative manner, the desire of their author in the fabrication, manufacture or construction of the engineering or architectural structure or equipment. Thus the scope of any project is usually outlined by linear measurements and illustrations of architectural, structural or equipment requirements in the drawings and through description by the specifications so that the estimator, the contractor, the owner and all others concerned in the accomplishment of the work have all the necessary data available.

The engineer or architect who is responsible for the design and construction of a building or engineering structure must be intimately acquainted with a vast number of materials and processes and, as his knowledge of these and his skill in their use, are increased he finds his object more easy of accomplishment. The person who writes specifications for such structures must have a thorough knowledge of the subject matter of the various subdivisions of his specifications and since the average mortal cannot hope to learn, through personal experience, all he must know in order that he may achieve success, he must look to some source or sources of authoritative information for assistance.

A certain amount of knowledge with respect to the writing of specifications is possessed by all who are engaged in technical work but there is a great deal of knowledge that is not easily accessible to all writers of specifications.

Every specification comprises certain elements that are necessary in order to convey to the mind of the reader all fundamentals that will govern in the execution of the work. Although it is not expressed in so many words, practically all specifications have been prepared with a view to the economic use of materials and methods, consistent with the component parts available to use and with the results that are considered most desirable. Economic values always must be considered, else the wasteful processes that will be encouraged by a disregard of such consideration will bring to the engineer or architect a reputation that will not be to his credit.

Certain standards of excellence in workmanship or materials must be specified so accurately that there will be no question as to the aims of the author of the specifications. Likewise it is oftentimes necessary or desirable to present to the one who is to execute the work a choice of several alternative ways of accomplishing the ends sought. In order that both of these elements may be provided for with scientific precision, it is necessary that the architect or engineer become acquainted with the standards and alternatives that are available for use and that are most desirable for any particular operation. The description of materials, methods and their use cannot be made in a brief, concise, coherent and accurate manner unless the one writing the specifications has, at his finger tips, all facts that will be of assistance to him in formulating his judgment.

Another element of specifications is the use made of them as the instrument of instruction to all concerned as to how each step in the work is to be accomplished. Specifications should not only describe materials and methods but they should, in addition, instruct the men engaged in active construction or installation work as to the means by which the materials and methods are to be used in order that results will conform with those conceived in the mind of the engineer or architect. This element is intimately bound in with the general descriptive element of specifications, yet it should not be confused with it.

All specifications for building and engineering structures and for many classes of equipment or co-related operations must be accompanied by general contract conditions and instructions to bidders. It is rare to find these elements missing although they may not have been given sufficient consideration to give them prominence.

SPECIFICATIONS may be divided into four classes insofar as their contents are concerned. These classes are materials, methods, construction and equipment. Many specifications and, in fact, most specifications that are used in building and engineering structures, combine three of these four elements, that is to say, for building and engineering structures the specifications will embrace materials, methods and construction while for the equipment there will be these same elements with a sub-element of installation after shop construction.

Specifications are essential to the proper and orderly conduct of the business of all those concerned in buildings, engineering structures of all classes and for all manner of equipment of whatever kind which may be placed in or about such works. We have, then, the following classification of users of specifications: Engineers, architects, contractors, manufacturers, vendors, labor, owners, buyers, operators.

Each one of these classes is vitally interested in having at his disposal good specifications, the intent and purpose of which cannot be questioned. To each of them a good specification brings the assurance that there will be smooth operation and cordial relations for all concerned, whereas mediocre specifications mean everything but cordiality and happiness.

Owing to a present lack of means for collecting and distributing information concerning specifications there is a needless duplication of study, research and labor on the part of specification writers. This condition tends to make the work seem arduous, as it is quite often, if there has been no effort expended toward meeting the conditions present in the individual office. Those specification writers who have had sufficient vision to analyze the problems that they must meet and who have attempted to organize their work in some more or less methodical fashion, have been gratified to find the time so spent has been well spent.

Practically all other professions are so organized that the interchange of knowledge peculiar to their profession, such as the deliberations of committees which formulate proposed standards for basic operations and the results of researches undertaken by scientific laboratories, is effected in such a way as to result in the improvement of the quality of specifications produced and as a direct consequence, has resulted in an improvement in the professional and business standing of their authors.

The American Specification Institute has been organized to improve all those conditions surrounding the writing of specifications and to bring to specification writers the benefits that are to be obtained from organized efforts of men accustomed to study and write these essential documents.

The kinds of specifications that are to be studied and for the preparation of which informative data is to be compiled and distributed to members, include those for buildings, engineering structures and all works whatsoever in which materials of construction and labor are used; those for the installation and use of mechanical, electrical and sanitary apparatus and equipment; those for the fabrication and installation of all furnishings and furniture; those for all exterior and interior ornaments and ornamentation; those for road paving, planting, embellishing and improving of landscapes, estates and waterways; and those for all miscellaneous matters and things that are produced and offered for sale under specifications written by the engineer or architect.

These activities will be of interest to all those architects and engineers who are striving for perfection in their "instruments of service" and especially to such as have to do with the engineering or architectural features of the following classes of structures, and their equipment for efficient and economical use:

Industrial Buildings, Public Buildings, Residential Buildings, Power Plants, Highways, Bridges, Railroads, Street Railways, Public Service Distribution, Combustion Apparatus, Sanitary Works, Hydraulic Works, Flood Control works, Marine Works, Illumination.

The American Specification Institute will cooperate with all national and local engineering and architectural societies and with all manufacturers and trade associations that are endeavoring to formulate standards for materials and methods that should be available to all writers of specifications. The members of each society or association are kept informed of the activities of its committees and other deliberative bodies within its organization and occasionally have brought to their attention the activities of other societies that may be of interest to them. It is these activities that The American Specification Institute will bring to the attention of its members so that their great value will be available to all possible users of the informative data released for publication.

The engineering and architectural professions will, through The American Specification Institute, gain benefit because of the consequent more intense development of specification writers and the development of specifications that will eliminate cause for argument and guesswork and produce more economical and efficient construction and equipment installation by the elimination of waste of labor and materials.

To Preserve the Lorelei

THANKS to the enterprise of a local athletic club, the Lorelei Rock, famed in song and legend of the Rhineland, is to be preserved for all time against injury at the hands of an ever-changing world. Whatever may be the fate held in store for the Rhine country, the dwelling-place of the mythical and terrible maiden will remain as an abiding landmark in the Rhine panorama. For a consideration of 7,000 marks, reports the Boston *Transcript*, the Lorelei Rock has been bought by a neighboring athletic club, who propose to use its summit as the parade and exercise ground for gymnasium classes.

The world certainly has no quarrel with the Lorelei—either with the rock itself or with the legend. The mythical maiden was, to be sure, a terrible and fearful being; she delighted to ensnare the helpless fisherman, dragging him down to a miserable death. But in their death were not these fisherfolk infinitely better off than those who were caught, like rats in a trap, in the Lusitania, and scores of other vessels, to whom was not even given the chance of turning a deaf ear to the siren's voice of death? Better a hundred Loreleis than the flesh and blood realities of the von Tirpitzes and the Bernhards.

By all means, therefore, let the Lorelei be preserved. For it is one of the rapidly diminishing ties which bind the twentieth-century Germany to the legendary life of the Rhineland; to the days when Weltmacht was a thing unknown in the German world, even in its dreams.

A Few Facts About China

CHINA has the largest population of any country in the world, one-fourth of all the world's people.

China has coal deposits as great as those of the United States, yet is still importing coal from Japan.

Chinese farmers get the largest yield per acre of any farmers in the world.

In some sections a large portion of the tillable area is covered with the unmovable graves of ancestors.

Wages in China are low. Women silk-reelers in Shanghai get from eight to eleven cents a day for eleven hours' work.

Steel workers in Hanyang, common laborers, get three dollars a month.

In 120 of China's silk mills thirty-five per cent. of the women and children employed are under fourteen years of age.

Moving pictures are popular in China, particularly those of the slap-stick kind.

China has one of the world's best postal systems. Rates are cheaper and deliveries more frequent in Canton than in New York.

Half of the world's cigarettes are smoked in China.

The Chinese invented printing before the West.

Shanghai publishes seventy-three newspapers.

Over ninety per cent. of all the Chinese are illiterate.

Not one woman in a thousand can read or write.

Old Latin Quarter to Yield to Modern Office Buildings

NO portion of the French metropolis is more familiar to the people of the New World than the so-called Quartier Latin. For centuries it has been the haunt of the students of literature, of art and of every sort of science. It is picturesque, dingy and unhealthy. But every artist, every scientist from this side of the Atlantic who has lived in Paris for the purpose of study has at one time or another made his home in the Latin Quarter, while tourists from all parts of the world would not dream of leaving the French capital without visiting this particular region, which has furnished the theme of so many novels and pen pictures and that has been the home of so much comedy, tragedy, drama and romance.

For purely sanitary reasons it ought to have been done away with years and years ago. The houses were built without any regard to ventilation and when modern plumbing was utterly unknown. How men and women can exist there today in these unwholesome but picturesque, well-nigh medieval surroundings, and, above all, how they can give free rein there to their genius and to their art without being oppressed to the point of asphyxiation by the unhealthy stagnation of the atmosphere has always been a matter of surprise to foreigners.

Now, however, the municipal council of Paris has become alive to the necessity for reform. Much metropolitan land is being set free by the demolition of the walls of Paris and of its old fortifications. The city authorities have accordingly voted to devote some 40 acres of this land near the Parc de Montsouris to the establishment of a sort of university settlement for the students of the University of Paris. It is proposed to construct in the center of tree-shaded playing fields buildings in which the students, now crowded together in the Quartier Latin, can be comfortably housed at the most moderate charges. The buildings will include restaurants, a library, recreation rooms and gardens, with accommodation for some 5,000 students of both sexes.

The estimated cost is about $8,000,000, and of this sum the multimillionaire philanthropist and deputy Deutsch de la Meurthe has already contributed a gift of a couple of million dollars. Canada, Sweden and Argentina, countries which send so many of their young people to Paris for the

completion of their studies, have expressed their intention of contributing to the expense, while the transformation of the land now occupied by the Quartier Latin, in the center of the city, into well-lighted, well-ventilated office buildings and apartment houses, with all the sanitary arrangements up to date and of the most modern description, will furnish a handsome revenue now and in the future to the municipality in bringing about this long-needed reform.

Artists Above Ethics?

THE Philadelphia *Public Ledger* has opened an interesting discussion on this topic. In a recent issue it is stated that a curious ethical problem is raised by the public exhibition of certain portrait busts of the leaders of the Bolshevik tyranny by a young woman who disclaims all intention of propaganda in exploiting their lineaments and excuses her seeming ignorance of or indifference to the real horrors of Russia under Bolshevism by a naive plea that is akin to saying that artists, if not art, need not be moved by questions of moral right or wrong.

Why, when the whole world is coming to a moral judgment on the evils of Bolshevism, art should be represented as indifferent to the shame of the thing is something that has not yet been explained by the artist who has represented herself as wanting to see a revolution because life was "so dull" in Moscow, and who is quite unconcerned as to what her subjects were or stood for so long as she could get them to sit for her. It is a most curious kind of casuistry that has justified this rushing into Russia in order to parade before the world the visages of those whose evil indifference to all standards of humanity has had such hideously grim results. Indeed, the most subtle form of propaganda is that which invests those who serve the Devil with the livery of Heaven; in this case the glamour thrown over the unspeakable Reds by invoking the fine arts in their behalf. For, after all, people are not compelled to send flowers to murderers nor is art forced to limn the "heroes" in murderer's row, or to debase its talent at the feet of those from whom the world shrinks in unfeigned horror.

Taking Pleasure in the Home

IT is a rare home today where the recreational center of gravity has not shifted outward, remarks the *Minneapolis Journal.* When the family wants a good time, it seeks it outside of the family circle. The modern home has been defined as the place where one goes to change his clothes in order to go somewhere else. Pleasures and recreation are sought outside of the home circle, for the most part, rather than in it.

As one looks back to earlier days through a domestic tribute like Whittier's Snowbound, he is surprised to find what self-sufficiency, poise, quiet joy and rich reward dwelt within the confines of that simple pioneer New England home. This early home did not have music or many books, great art or rich rugs, but there was a quiet, pervasive joy that knit the family together. Such a circle was its own recreational center of gravity.

It argues something bare and cheap in a home where the family become habitual migratory seekers after pleasure outside the home. The best housing conditions in the world may prevail; but it is a poor family life if the members are always mobilizing to find their pleasure elsewhere. Community centers are good in their place. Libraries and art galleries render valuable service, but at best, they are poor substitutes for the home as a recreational center, where young and old alike ought to have the best kind of a good time all around.

Recent Disclosures as to Pompeii

A NEW idea of the ancient city of Pompeii and the life led there is gathered now that recent excavations have been made, according to Edward Robinson, director of the Metropolitan Museum of Art, who recently returned from a visit there. Previous excavations showed one-story buildings, with straight, plain walls in front. The new excavations show that Pompeii was a town of two-story buildings, with balconies at the fronts of houses, most of which had shops in them with awning-like projections.

"The recent discoveries show that the shops were usually closed on the street fronts by large wooden shutters made of slats which opened and shut like modern blinds," stated Mr. Robinson, at the Willard. "When the shutters were closed, they were fastened on the inside with a long bar. In most of the buildings only the front part has been excavated—the shops and the entrances leading into the residences. In many of the shops were found the things that had been on sale. The aim has been to restore the shops as they were before the eruption.

"In the interior of many of the houses Prof. Spinazzola, who is in charge of the work, has discovered, in addition to the central courts with peristyles, little gardens. Some of these are hardly larger than the top of a good-sized table. From the flower designs in the frescoes on the wall Prof. Spinazzola has learned the varieties of flowers that the inhabitants of Pompeii knew and has replanted the gardens with the flowers that decorated the beds 2,000 years ago. Where formerly Pompeii was resurrected dead Prof. Spinazzola is making of it a living city."

PERSONALS

Batchelder and Scales, architects and engineers, announce the removal of their office to 426 Board of Trade Building, Indianapolis, Ind.

Chambers & Thomas, architects, announce the removal of their office to Reconquista 491, Buenos Aires, Argentina.

Theodore L. Perrier, architect, has removed his office to 305 Marine Bank Building, New Orleans, La.

Stephens and Pearson, architects, have moved their office from 74 De Menil Building, St. Louis, Mo., to 1425 Chemical Building, that city.

It is announced that James R. M. Morrison, architect, is now located at 64 West Randolph Street, Chicago, Ill.

Henry P. Whitworth, architect, is now practicing architecture at 402 Hickox Building, Cleveland, Ohio.

Allen & Collens, architects, have moved their architectural offices from 40 Central Street to 75 Newbury Street, Boston, Mass.

Charles L. Browne, architect, announces that he has associated with R. V. Martin, with offices in the Milwaukee Building, Houston, Texas. Manufacturers' catalogs and samples are desired.

J. Osborne Hunt, architect, announces the removal of his architectural offices from 114 North Montgomery Street to 219 East Hanover Street, Trenton, N. J.

Edgar & Verna Cook Salomonsky, architects, announce that they have removed their architectural offices from 368 Lexington Avenue to 331 Madison Avenue, New York City.

Announcement is made that Edward Burnett, the Farm Expert, has moved his offices from 367 Lexington Avenue to 331 Madison Avenue, New York City.

Harrison Earl Baldwin announces the opening of an office for the practice of architecture at 28 Carmel Street, New Haven, Conn. Manufacturers' samples and catalogs are requested.

George C. Burnett, architect, formerly of Waco, Texas, has opened an office at 315-16 Herald Building, El Paso, Texas, and is desirous of receiving manufacturers' catalogs and samples.

Announcement is made that the H. H. Winner Company, bank architects and engineers, have removed their offices to the second floor of the Cunard Building, 503 Market Street, San Francisco, Cal.

H. W. Goetz, architect, wishes to announce that he has opened offices for the practice of architecture in the Falls Building, Memphis, Tenn., and desires to receive manufacturers' samples and catalogs.

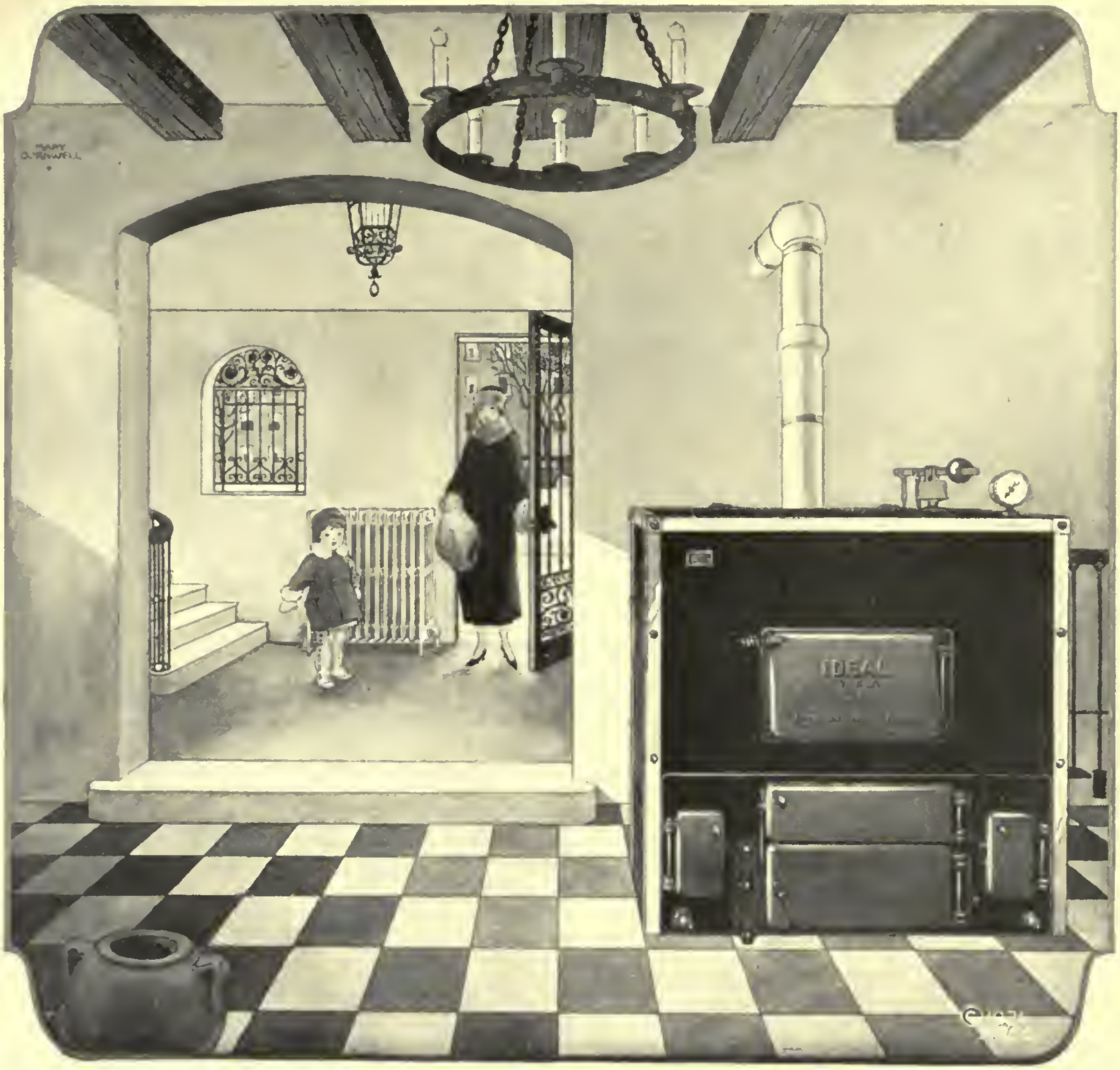
Smith & Reynolds, architects, formerly Juul, Smith & Reynolds of Sheboygan, Wis., have opened an architectural and engineering office in Manitowoc, Wis. Edward A. Juul will continue the business formerly conducted by the firm in Sheboygan.

Announcement is made that the partnership existing between Pendleton & Corrubia, architects, has been dissolved, and a new partnership has been established by Angelo B. M. Corrubia and Gale E. Henderson, who will practice their profession under the firm name of Corrubia & Henderson, architects, with offices in the DeMenil Building, 119 North Seventh Street, St. Louis, Mo.

Philip Horton Smith, formerly with Kilham, Hopkins & Greeley, and Edgar T. P. Walker, formerly with Cram & Ferguson, have formed a partnership for the practice of architecture under the firm name of Philip Horton Smith & Edgar T. P. Walker, architects, with offices at 1260 Little Building, Boston, Mass. Manufacturers' samples and catalogs are requested.

It is announced that George Issenhuth, architect, has recently moved his office from 215½ to 222½ Dakota Avenue, Huron, South Dakota, where he will continue the practice of architectural and engineering work. Manufacturers' catalogs and samples are desired. Mr. Issenhuth also wishes to announce that he is desirous of forming a partnership with a high grade, experienced professional worker.

George O. Hugill and Wilfred F. Blatherwick have formed a partnership for the practice of architecture under the firm name of Hugill & Blatherwick, with offices at 366-67 Boyce-Greeley Building, Sioux Falls, South Dakota. Mr. Hugill has been practicing in that city for several years and Mr. Blatherwick was formerly head draftsman and designer with Perkins & McWayne. Manufacturers' samples and catalogs are desired.



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Tabulation of Building Costs

Seventh of THE AMERICAN ARCHITECT'S series of cost tables, figures for which were furnished by Architects throughout the United States. The first compilation appeared in the January 12, issue.

Type of Building	Location	Type of Construction	Equipment	Foundations	Total cubic feet	Contract price or bid received	Cost per cubic foot	When figures were taken
Juvenile Detention Home and Court-house	Chicago, Ill.	Fireproof; brick bearing walls; reinforced concrete joist floors.	Vapor heat; electric light; enameled iron plumbing; front elevator; ash elevator.	Reinforced concrete.	1,940,000	$785,000	.41	Sept. 1921
6 Story Apartment	Chicago, Ill.	Fireproof; brick bearing walls; reinforced concrete joist floors.	Vapor heat; electric light; porcelain tubs; vitreous lavatories and toilets. 3 passages and 2 front elevators; electric push button control.	Reinforced concrete.	800,000	350,000	.44	Oct. 1921.
Bank	Lyndhurst, N. J.	Fireproof, concrete.	Heat; electric light; good plumbing.	Concrete	105,200	59,471	.56	Sept. 1921.
Bank	Hightstown, N. J.	Fireproof, concrete.	Heat; electric light; good plumbing.	Concrete	88,000	58,057	.65	Sept. 1921.
Bank	Camden, N. J.	Semi-fireproof; brick walls; terrazzo floors.	Webster modulation heat; electric light; good plumbing.	Reinforced concrete.	107,242	54,925	.51	April, 1921.
School	Delair, N. J.	Semi-fireproof; brick walls; concrete and wood floors.	Hot air heat; ventilation; electric light; plumbing.	Concrete	251,328	57,198	.23	July, 1921.
School	Woodland Manor, N. J.	Semi-fireproof; brick walls; maple floors.	Vapor heat; ventilation; electric light; plumbing.	Concrete	131,328	40,824	.31	July, 1921.
4 Story Office and Bank Bldg.	Chicago, Ill.	Fireproof; 2 sides stone and 2 sides brick walls; concrete and tile floors.	Steam heat; electric light; plumbing roughed in for fut. off. division; 2 electric elevators.	Floating concrete.	725,000	355,000	.49	July, 1921.
Hospital	Portland, Ore.	Fireproof; walls hollow tile, concrete and brick; floors reinforced concrete.	Steam heat; fan ventilation; electric light: first class plumbing; 2 electric elevators.	Reinforced concrete; spread footings.	350,000	205,000	.58	July, 1921.
Medical School	Portland, Ore.	Fireproof; walls concrete and brick; floors reinforced concrete.	Steam and fan heat; electric light; first class plumbing; one electric elevator.	Reinforced concrete; spread footings.	432,000	246,000	.57	August, 1921.
School	Oswego, N. Y.	Fireproof; tile and brick walls; concrete and wood floors.	Steam and fan heat; electric light; plumbing.	Concrete piers.	1,480,665	444,515	.30	July, 1921.
Club Building	Ossining, N. Y.	Ordinary; brick walls; steel trusses; wood floors.	Hot water heat; electric light; plumbing.	Stone.	299,520	65,000	.21	August, 1921.
Residence	Ossining, N. Y.	Wood frame; stucco; 2 story; 7 rooms.	Hot water heat; electric light; plumbing.	Stone.	19,740	9,000	.45	August, 1921.

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ARCADES OF THE GALLERY—CHURCH OF S. VITALE, RAVENNA, ITALY

THE AMERICAN ARCHITECT
The ARCHITECTURAL REVIEW
VOL. CXX WEDNESDAY, NOVEMBER 23, 1921 NUMBER 2381

THE PARTHENON, WEST FRONT AND NORTH SIDE
From Greek Refinements—Studies in Temperamental Architecture, by William H. Goodyear, M. A.

GREEK PROPORTIONS THEORETICALLY AND OTHERWISE

BY EGERTON SWARTWOUT, F. A. I. A.

I AM always interested in speculation. This is not to be construed, as the specification writers say, to mean an interest in Wall Street or in the graphs and tables which always conclusively show that activity in the building trades will not be general until the heavy solid line representing the price of labor more nearly approaches the curve of a dotted line which stands for something else, but I have always had a keen interest in that particular form of speculation which finds its expression in an attempt to show just what led an architect, or an artist either, to do a certain thing in a certain way; and so I have been interested for some time past in the endeavors of various gentlemen to show that the design of a Greek temple or of a Greek vase was really the simplest thing in the world; was purely a mathematical process, so to speak; one had only to take a square or a rectangle and whirl it round like a pinwheel and there you were. Simple indeed! And could be, and perhaps was, taught in correspondence schools. You can picture Iktinos coming into the office late after a hard night and sitting down at his desk, no need of a drawing board there, and taking a few whirls out of a square, dictating a short note of instructions to his stenographer, and calling it a day. The Parthenon was designed—just like that. Easy—why, nothing to it!

How sad it is to think we have wasted tracing paper and burned the midnight Mazda all for nothing, and how curious this obvious fact should not have been discovered before. And in that con-

Iktinos takes a few whirls out of a square and calls it a day

nection (this specification English will persist) I would like to sound a note of warning to Mr. Hambidge et al that there is grave evidence to warrant the impression that they may be guilty of plagiarism. I have heard from an apparently authentic source that Captain Walter E. Traprock, F. R. S. S. E. U. in a description of an early trip to the Filbert Islands, advanced the theory that the nests of the Fatu Liva bird were scrupulously laid out on a multiple system using the egg as a module—it is to be remembered that the eggs of this remarkable bird are square—and that the quaint markings on the eggs arranged in mathematical progression established the co-efficient of expansion or bending moment of the nest. Unfortunately there were difficulties in the way of a complete demonstration of this theory as the nests were in such a ruinous state that their lateral and vertical dimensions could not be accurately determined; but it was a pretty theory none the less, and there is much to warrant the belief that an early Greek architect might have been cast away on these charming islands and learned the secret from these

The nests of the Fatu Liva bird were laid out on a multiple system, using the egg as a module

intelligent birds. And even if it is true that the lateral and vertical dimensions of the nests cannot be accurately determined, what of that? Are not most Greek temples in the same condition? Captain Traprock may well place his case in the hands of the Committee on Practice.

BUT to revert to the theory of Dynamic Symmetry and the speculations thereon, I have just read an article in The American Architect and The Architectural Review* on the subject by Mr. James A. Kane, which not only gives easy directions showing how to lay out a building by a rope, by roping it as it were, a quaint method which if put in general practice would go far toward relieving the lack of employment now so prevalent among the ranches of Colorado, and would also lend a spice of color to those drab sections of the Bronx and Brownsville to which our housing developments are chiefly confined; but Mr. Kane, as I started to say, does not merely confine his article to telling you how to do it, he really does it, and for a tail-piece gives a practical example of a civic center, or is it a railroad station?† It cannot be a State Capitol—but anyway the design is there and I have no doubt that a careful search among the squares and diagonals would reveal the title or give some clue to its real meaning. It may well be that the enclosing rectangle, which with its diagonals resembles the back of an envelope, may be a subtle indication that the building is a Post Office; but it is uncertain, and I suppose this very uncertainty is part of the charm of the idea. When one starts whirling a square one never knows. Iktinos for instance might have whirled his too far around, and drawn a theatre or a Greek vase instead of stopping in the temple sector. Still it is an interesting theory, and the results, as the illustration shows, are masterly.

Mr. Kane in the text which accompanies his engravings says that no one will acknowledge that the leaders of our profession nowadays are inferior to the Greeks in artistic ability and therefore they, the Greeks, must have obtained their ultimate perfection, the absolute of the Parthenon, by the assistance of a method of which we are ignorant, and this method must have been his method, or rather Mr. Hambidge's. Now to my way of thinking the whole trouble with the exponents of this system, or of any system which presupposes a mathematical formula as the inception of what we may call design, the whole trouble is that these gentlemen, not being designers themselves, with all due apologies of course to the authors of the tail-piece above referred to, cannot put themselves in the state of mind of an artist, or of an architect, who is producing an original conception. Their method is deductive; the other is intuitive. They start with an accomplished fact, the Parthenon, for example, as it is shown in elevation only, on a restoration which may or may not be correct, and they square it and diagonal it and finally arrive at a certain theory of proportion based on the relation of its areas and of its parts. Naturally all buildings, all things that are dimensional, have certain relations and proportions. It may happen, and it often does

* *Issue of October* 12, 1921, *No.* 2378, page 261.

† *See page* 265, *issue October* 12, 1921.

happen, that these relations take the form of curiously exact mathematical ratios, but this fact does not prove that the building was designed by mechanical adherence to this formula. Mr. Kane in his article states that the rectangle used as the basis of the design of the Parthenon was "a rectangle composed of a square plus the rectangle whose length was the diagonal of two squares on its end." It is a puzzle to me just how this statement can be proved. Such a demonstration must be of necessity graphic. Now I know as a practical fact that it is impossible to scale accurately at less than a scale of three-quarters of an inch to a foot. Even at this scale a mistake of an inch or so in a hundred feet would not be surprising. But in measuring the intersections of a long diagonal with a vertical or horizontal on account of the acute angle formed, it would be very easy to make a mistake or variation of three or four inches. In other words in order to show that this theory of proportion will fit the Parthenon it would be necessary to make a scrupulously exact drawing of the two façades and a plan of the Parthenon at three-quarter scale, and even with these enormous drawings and with the employment of the greatest care the result would be only an approximation. In the case of most of the other temples it would not be an approximation, it would be a guess; for while we are in possession of the exact measurements of the Parthenon, our knowledge of the dimensions of the other temples is generally very incomplete; the measurements exactly obtainable are few and in some instances even the height of the order is problematical. Therefore the statement that this or any particular theory is applicable to Greek work is at least an approximation in the Parthenon and a mere guess in other work.

LET us assume for the sake of argument that it could be proved that this theory was applicable to all Greek work. These questions then arise: (1) Why should the proportions of all Greek temples vary if the Greeks were in the possession of a sovereign short-cut to ready made design? (2) Was this mysterious rectangle handed down on a table of stone from Olympus in the Mosaic fashion or was it the result of tradition and experiment? (3) Why was the selection of this particular rectangle made in the case of the Parthenon and why not some other shape? (4) How was the principle applied when adopted, and (5) how can a theory of proportion based on two dimensions be applied to a building which has three? A definite answer would be interesting, but I am afraid we may hope only for vague generalities.

Now I don't question that there is some element of truth in it all, but it is only a half truth, or perhaps a tenth truth. And as in innumerable other instances this half or tenth truth has been so magnified and its real meaning so warped that the whole fabric falls in spite of the poor little pillar of truth at the bottom. Greek temples were generally rectangular in plan. It was a natural form, and probably tended to become to a certain extent standardized. The form and general arrangement may have been dictated by some religious observances or by some tribal tradition of which we are ignorant, and it is conceivable that in time these rituals and traditions may have been expressed in some such method as advanced by Mr. Hambidge, that is to say the ground plan may have been approximated but not absolutely dictated by a method of squares or portions thereof—but there it ended. It could by no conceivable means be extended to their vertical dimensions. I am told that in Japan rooms are, or were, dimensioned by the number of mats it took to cover the floor, and that in their temple architecture a room of certain dimensions had to be of a certain height. Here is standardization in another, but in a similar, form. The Greeks were temple builders; their architecture was extremely simple, and they generally adhered to one type, the rectangular Doric temple. To the lay mind these temples were very much alike; in reality they differed extremely in proportion and in detail. There was a gradual but very perceptible improvement in design from the clumsy primitive form to the grace and strength of the Parthenon. This improvement was due, as such improvement always is due, to a careful study of the defects of work already executed. The architects were undoubtedly familiar with all the other temples in existence, and they undoubtedly had their complete dimensions and also probably models of their detail. They felt a certain temple was too low or too high or too heavy and in the new temple they endeavored to correct these defects. It may be that the measurements they had of these temples were not all linear. They may have had a certain modular method of expressing their proportion, and this modular method may have been not only linear but may have been based on a proportion of areas; but this could only apply to the plan. The statement that the Greeks had no means of making linear measurements is ridiculous. The men who laid out the Parthenon with an average builder's error of two-tenths of an inch were no tyros with the tape. But the important fact in regard to these modular or dimensional proportions, a fact which is either unknown to, or disregarded by, the proponents of the theories under discussion, is that they were only methods of recording the proportions of work already done, and that they were not the rules under which the work was actually done. For example, a set of measurements of the Parthenon in feet and inches, no matter how carefully made, would be of but little use to an architect unless he wanted to reproduce the Parthenon or some of its columns at exactly the same size as the original. In order to be of use for a different sized column, the linear dimensions must be reduced to modular dimensions, and similarly, as the temples were never of the same size, a method of proportions in area would be of advantage, particularly if they could be expressed in a simple way. It may even be imagined that vertical dimensions were sometimes expressed in relation to the area of the building or one of its sides or even a diagonal. I don't know, nobody knows; but this I do know, if they were ever so expressed it was only for purposes of record.

I THINK I can explain my point of view a little better if I revert to the speculation idea referred to in the opening of this article and venture to advance my own speculations as to how the Greek temple was designed. It is merely the wildest speculation, to be sure, much as Father Brown might have speculated if he had been an architect. In the first place it is fair to assume that the Greek architect had the same general way of approaching a problem as we of today have. Two thousand five hundred years or so is a short step in the history of mankind. The mental processes of the Greeks probably differed little from ours. The Greek architect of the Periclean age started from something definite just as we do, and that something definite was the instructions of his client, the exigencies of the site, and the limitations of the material at his disposal. I don't doubt too the price of it cut quite a figure. When the various projects for the Acropolis were begun under Pericles there was probably a situation comparable to that in Chicago at the time of the World's Fair. Don't imagine that I'm comparing those lath-and-plaster structures to the classic marbles of Greece; but the direction of the work was in the hands of a group of the best men that Greece could produce and they collaborated as well as any group of men could in the work that was to be done. There were probably board meetings presided over by Phidias, and they probably fought among themselves quite as much as any earnest souls of our days would do under similar conditions. Iktinos probably reported on the Parthenon; took up the question of site and the possibility of using the foundations and some of the materials of the old Parthenon, but undoubtedly urged the scrapping of the old work and doing a bigger building.

The question then was how big could they build. A representative of the Pentelic Quarries Co., Ltd., who was present, accidentally of course, stated that his company could furnish Number One stock for the architraves up to say 14'0", but stipulated the architrave must be split in two or perhaps three vertical slabs. Immediately there was a fight. Iktinos said he'd throw up the job if the thing was going to develop into a commercial proposition, but the Pentelic Quarries Ltd. was quite a power in the Third Ward and with the aid of an elder Archon who had a rather shady record as a lobbyist the thing was put over; but Phidias incurred so much enmity among those higher up that there were open threats that they would get him, as they expressed it in their classic Greek way, and they did get him later on a trumped-up charge of grafting in gold leaf. But that, as R. K. says, is another story.

But to resume. Having settled the length of the architrave blocks and thereby establishing in a general way the inter-columniation, Iktinos was asked by the chairman how high his order would be. He said he could not tell exactly, but he thought about thirty to thirty-two feet. It would be a good big scale anyway, but he had been making some studies and had decided to diminish the height of the entablature somewhat, and make the columns a little more graceful, and he thought an octostyle portico would be about right, with say seventeen columns on the flank. There was quite an argument over this; Phidias not liking the idea of reducing the size of the metopes, but Iktinos carried his point by promising to eliminate the triglyphs all together under the portico and to substitute a great sculptured frieze which would really give the sculptors much more opportunity than the small isolated metopes, no matter how large they were. Phidias was delighted, and they adjourned in a body to the Cafe Hellenikon, Iktinos remarking to his partner, "Pretty neat the way I put that over! That damned interior frieze has always bothered me, the triglyphs never would work out, and now they have a chance to make a Pan Athenaic procession out of it and everybody's happy."

Work then began in earnest, the Quarries Company started a large force of men on the architraves, and the rough stock for the ashlar, and the architects made a number of models of the column and entablature of various sizes, trying the new proportions of the entablature and the spacing of the metopes. A number of columns were made, unfluted at first for economy, and finally one was cut in marble and set up in position. There seemed to be a little too much entasis on this one, and another was hurriedly made in rough stone and covered with stucco. A stucco entablature was set up over these columns, and the new plaster was colored to take the curse off it, and the sculptors set one of the metopes. It was now ready for the inspection and final approval of

Pericles, who, after lunch—inspections always take place after lunch—came in great state, and as the colloquial Greek phrase has it, gave it the once over. Generally he liked it, though he thought the top of the triglyph looked a little crude, but Iktinos took a little piece of stock mould, a bead and reed that some modeler had been working on, and applied it to the cast. The effect was fine, and the day saved, and Pericles went home and told Aspasia how he had really designed the Parthenon. "You know, my dear, I'm not an architect, of course, but I do know what I like."

That evening in the Styx Club a prominent Hoplite remarked to Iktinos, "Hail, O Iktinos, (or winged words to that effect) Say, listen, did you really lay out the Parthenon with a rope and a little square dewdad you twisted around, as I saw in the interview in to-night's Argos?"

"Not much I didn't, son, but the dear public likes to be fooled, and if they thought there was no mystery about it and knew it was just hard work and tracing paper, they wouldn't be strong for it; Why, do you know, the other day over in the sculptor's place they were sketching out a model for the East pediment, and some reporter blew in and actually wanted to know what it meant, who the figures were, and all that. Of course they had just made lumps of clay here and there where they wanted the spots and had worked for the shadows, and they didn't know whether that particular spot was a god or a horse; but Phidias was smart, he just named them off and made up a wonderful story, and the joke of it was it was published, and now he has to work that way. It's a great world. Boy! A beaker!"

"It's a great world" said Iktinos,
"Boy! A beaker!"

OUT-DOOR SKETCHING AS A HELP TO THE ARCHITECT

BY T. O. FRAENKEL

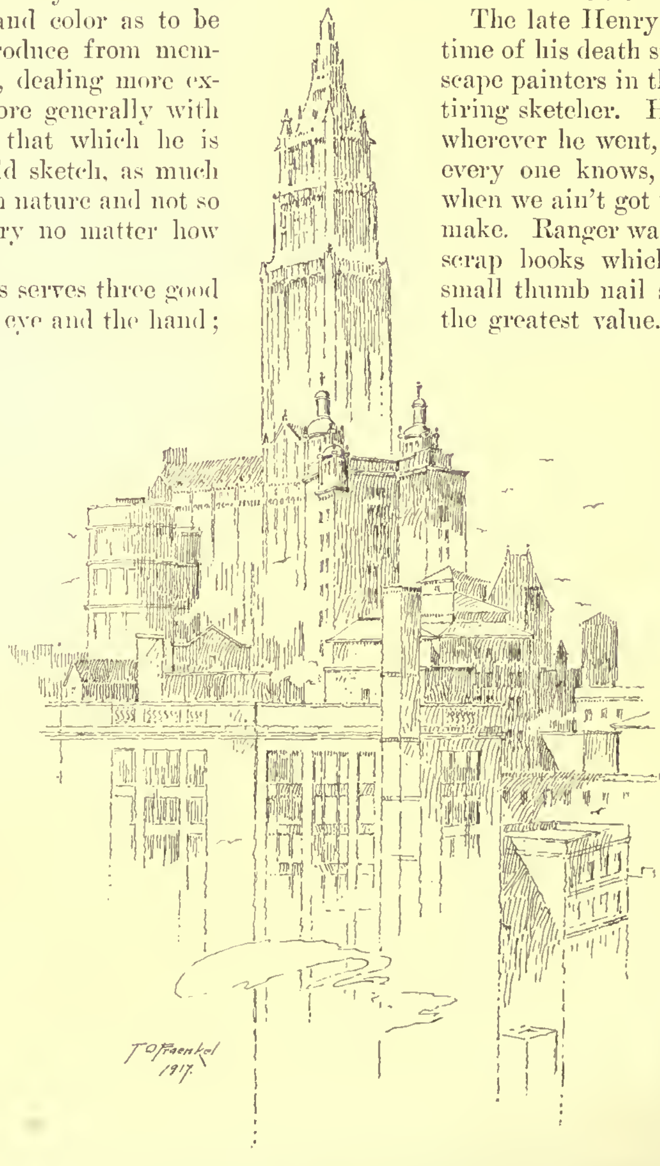
Illustrated by sketches by the author*

ARCHITECTURAL sketching out of doors is a means of inspiration and a source of education. Nothing will more accurately train the eye nor better cultivate the memory. While the artist painter may so train his appreciation for form and color as to be able artistically to reproduce from memory, the artist architect, dealing more exactly with facts and more generally with details, the essence of that which he is striving to collect, should sketch, as much as possible, directly from nature and not so much depend on memory no matter how well it may be trained.

Sketching out of doors serves three good purposes: It trains the eye and the hand; it enables one to accumulate much valuable material and it takes a man out into the open and gives him what he very often neglects, certain healthy physical exercise.

Further, sketching out of doors is a restful recreation. Any man who sketches out of doors knows the absolute absorption of it, knows how it occupies his mind to the exclusion of everything else. There is a sense of refreshment after a day in the open with paint box or sketching pad, that is always something worth while.

The knowledge gained through sketching is in proportion to the persistence with which it is followed. No student—and by student we mean the full rank and file of workers from the office boy to the "boss"—is too young or too old to be unable to benefit by sketching. It may very well become a habit and one different from most, to be encouraged to the fullest possible extent of one's time and opportunity.



Sketch of the Woolworth Tower made from an office window, eighteen stories above street level, half a mile from the building

The late Henry W. Ranger, who at the time of his death stood at the head of landscape painters in this country, was a never-tiring sketcher. He always had with him, wherever he went, a small 4 x 5 pad. As every one knows, it's "the shots we see when we ain't got no gun" that we want to make. Ranger was always ready. He left scrap books which contain thousands of small thumb nail sketches. They were of the greatest value. They not only served further to cultivate an already well developed ability to sketch from nature, but they were at all times an almost inexhaustible fund of valuable suggestion.

Every architectural designer knows the value of training the eye and hand to work harmoniously together. It does not greatly matter what one sketches. It is the mental and manual training that counts. Sketching best gives that training.

It can be a landscape of the simplest composition, a rail or stone fence, bushes, or what not. A shadowy grove in the middle distance with sunny fields and the blue hills beyond. The sketcher will not choose this composition unless he finds good proportion in outline and color. Just here is where it is a wonderful help to the seeker after betterment in design, and the practice greatly

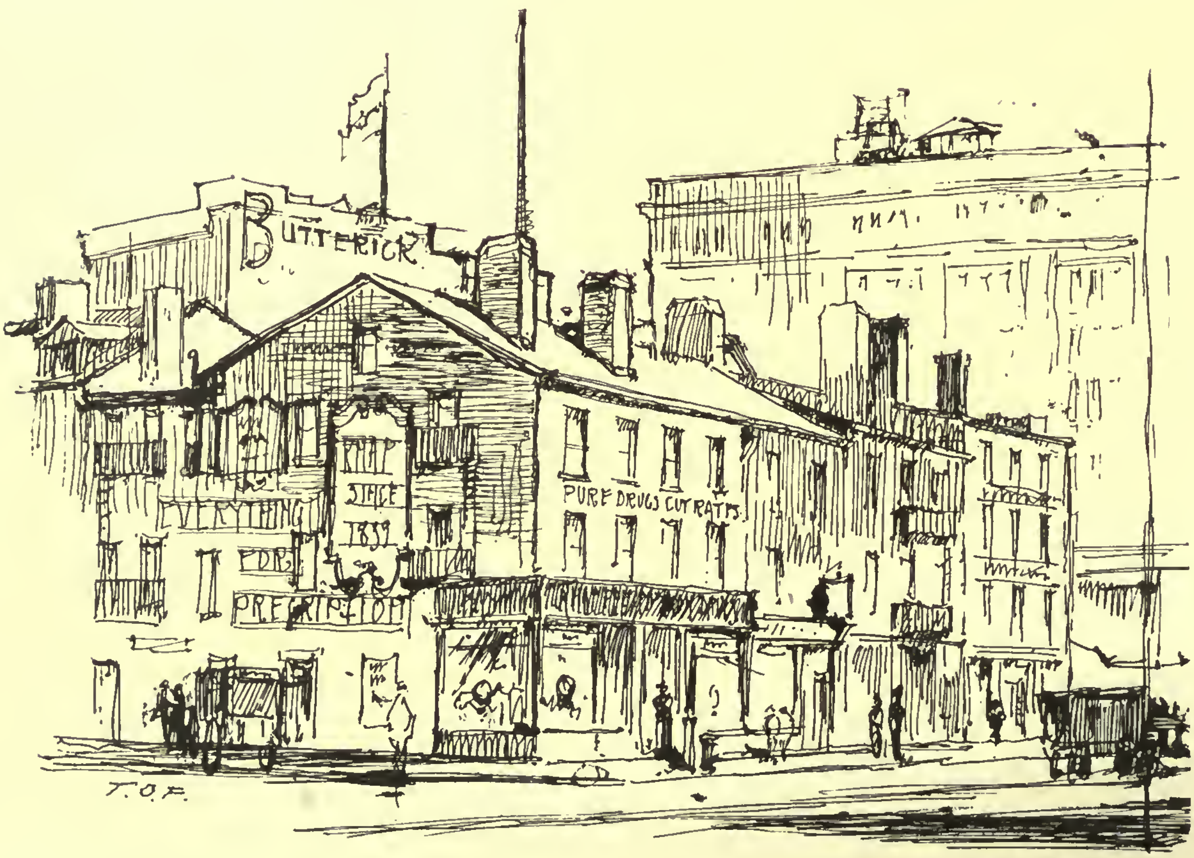
**The sketches accompanying this article are, in part, preliminary to a series of fifty water color sketches on view at the Historical Society's galleries in this city.*

Old house on Queensborough Boulevard—Outlined for Color

Old Houses, Mulberry and Prince Streets, New York

Relics of a once aristocratic section

The Cooper House, Greenpoint, L. I., near Newtown Creek
Outlined for Color



Present state of an old house in Greenwich Village,
(corner of King and Hudson streets) New York

helps in rendering, leading up to assurance and stamps the work with individuality. After dabbing in the open for a period, one may try compositions in the city, for they are to be found in great abundance.

The principle of architecture is to house, and the simplest and most restful work produced is the best. In other words, it is not how much we can pile on a structure; it is just how much we can forego and leave off, and yet secure good composition.

These many motives are all to be found before you in nature. One can strive to get all there is in light and shade and end in a well-balanced picture, and as one advances, he will not overlook a note that is of value, both in color and detail. This description can be applied verbally to all work in the office.

Sketching puts one on good terms and understanding with all things that are worth while in the vast out of doors. One gets to see things properly that formerly were overlooked and will separate that of nature from that of man, and learn to note the use of things and how applied.

Pleading an excuse of not having the subjects to sketch one would like, is often the cry of home-town men. In West Michigan, I once met an artist who complained of not having rocks in his section. New York artists raved over the picturesque beauties of the Chicago River during the World's Fair time. But it took a St. Louis artist, Paul Conoyer, to see and put on canvas the broad, shadowy vistas that lie across the city plazas of New York.

This sketching, as a help to the architect, need not be of a mansion, or a Venetian palace or a Nuremburg house, but just sketching, first in good drawing in form and proportion, and after that perhaps with color and the thrill that always goes with it. The latter is one of the greatest by-products of these efforts and will improve as the drawing shows value in his color work.

The writer maintains that few colors are needed, for with but few to keep track of, one gets to know them and their use. Have in your box, say, two reds, vermillion and light red; two blues, say, cobalt and antwerp; two or three yellows, cadmium, ochre and one other bright yellow; burnt sienna, vandyke brown, emerald and Hookers Green No. 2, one lake or carmine. Avoid all neutrals, grays, whites and blacks, for too many colors in the gamut add to the bewilderment of the worker and retard progress. The colors and pigments that have been eliminated can be easily mixed from those in your box.

It is well known that an artist can be called on to fill in the wants we need in the form of a picture, but that does not advance us one bit in

Old Shops in Fourth Street, Near the Bowery our knowledge; he may be called on to render inferior work and expected to turn out a beautiful thing when the drawing was not right in its original conception and the blooming thing "won't jell."

Someone has said that the man that cannot do the work properly is not normal; from that we deduce that the man nearest the top is somewhat nearer perfection, and the rest of us are somewhere in the scale. The knowledge gleaned in these efforts of out-door sketching will be carried to the office, and that knowledge will be applied unconsciously to the every-day problems in form, detail and color, and the worker will turn to his office duties with renewed stimulation, with a more cheery manner, and fresh in mind the vision and spirit of the fields. He awakens to the realization that there are other things in store beside the hackneyed rut of common mannerisms that are almost a law in the average office, when he is spurred on to better ideals.

It is, after all, a matter of growth in application and observation in all ways of the recognition of nature, the source of all that is best and good. If this article succeeds in stirring up some dormant workers and proves a help, of which there is no doubt, the writer's best wishes will go with them.

BEAUX-ARTS INSTITUTE OF DESIGN

Official Notification of Awards—Judgment of May 24th, 1921

PROGRAM

CLASS "A"—V PROJET

The Committee on Architecture proposes as subject of this Competition:

"A BANK AND OFFICE BUILDING"

Jury of Award—R. M. Hood, H. Greenley, E. A. Dennison, H. Hornbostel, P. P. Cret, and F. C. Hirons.

Number of Drawings Submitted—54.

AWARDS—

FIRST MEDAL:—G. K. Trautwein and H. J. Toombs, Univ. of Pennsylvania, Phila.; T. F. Price, Atelier Wynkoop, N. Y. C.

SECOND MEDAL:—R. E. Dake and F. K. Draz, Carnegie Inst. of Tech., Pitts.; I. Clavan and G. P. Turner,

P. C. Reed — Carnegie Institute of Technology

3rd MEDAL

Class "A" & "B" Archaeology—V. Projet—A small Villa in the style of Palladio

Univ. of Pennsylvania, Phila.; A. H. Goddard and P. N. Jensen, Atelier Wynkoop, N. Y. C.

MENTION:—L. H. Rank, K. A. Snow, W. J. Perkins, L. E. Considine, L. I. Nusbaum, E. A. Earley, R. V. Murison, J. G. Tood, A. P. Herrmann, C. H. Sorber, and M. Pohlmeyer, Carnegie Inst. of Tech., Pitts.; C. S. Bernard, Chicago Sch. of Archt., Chicago; L. Rombotis, Los Angeles Archtl. Club, Los Angeles; H. S. Atkinson, E. C. K. Schmidt, R. Nickel and L. Z. Slawter, "T" Square Club, Phila.; H. Behlen, K. A. McGrew, A. E. Egeressy, L. R. Price, E. Coscia, A. B. Emery, O. M. Olsen, T. F. Mulrooney, J. J. Healy, D. Royer, R. Spangenberg and D. R. Cochran, Univ. of Pennsylvania, Phila.; D. K. Frohwerk

T. E. Ash — T. Square Club, Philadelphia

3rd MEDAL

Class "A" V. Esquisse—Esquisse—A ceiling Decoration

and W. M. Icenhower, Univ. of Kansas, Lawrence; H. B. Marsh, Atelier Wynkoop, N. Y. C.

H. C. :—L. S. Lashmit, L. J. Rockwell, C. L. DePrefontaine, N. D. Kutchukian and C. W. Hunt, Carnegie Inst. of Tech., Pitts.; A. B. Baumann, Jr. and R. Gleeson, Univ. of Pennsylvania, Phila.; S. J. Makielski, Univ. of Virginia, Charlottesville.

PROGRAM

CLASS "A"—V ESQUISSE-ESQUISSE

The Committee on Architecture proposes as subject of this Competition:

"A CEILING DECORATION"

The ceiling of the lobby of a large hotel consists of a series of groined vaults which, in the case under consideration, are of the usual classic type, i. e., formed by the intersection of two cylindrical vaults.

The character of the hotel permits of an elaborate decorative scheme, and as the ceiling is constructed of plaster, it is possible to treat it either entirely with painted decorations, or with modelling, or with a combination of both.

The ceiling of one bay only of the vestibule is required in this problem. This bay is 20'-0" in each horizontal dimension.

Jury of Award—H. O. Milliken, M. S. Wyeth, F. C. Farley, J. Wynkoop and T. S. Holden.

Note—This Jury also served as Jury of Award for the Class "B"—V Esquisse-Esquisse, Class "A" and "B" Archaeology—V Projet and Class "A" and "B" Archaeology—V Measured Drawings.

Jury for Awarding the Karnak Temple Chapter of the Scarab Fraternity Prize—H. O. Milliken, M. S. Wyeth, F. C. Farley, and T. S. Holden.

Number of Drawings Submitted—15.

AWARDS—

THIRD MEDAL—T. M. Harllee, Atelier Curtis, New Orleans; T. E. Ash, "T" Square Club, Phila.

MENTION—R. K. Galbraith, Archtl. League of Indianapolis, Indianapolis; W. L. Hindenach and R. Nickel, "T" Square Club, Phila.

PROGRAM

THE KARNAK TEMPLE CHAPTER OF THE SCARAB FRATERNITY PRIZE COMPETITION

The gift of the Karnak Temple Chapter of the Scarab Fraternity, offered for the best solution of the Fifth Class "B" Esquisse-Esquisse of the season.

PRIZE, $50.00

CLASS "B"—V ESQUISSE-ESQUISSE

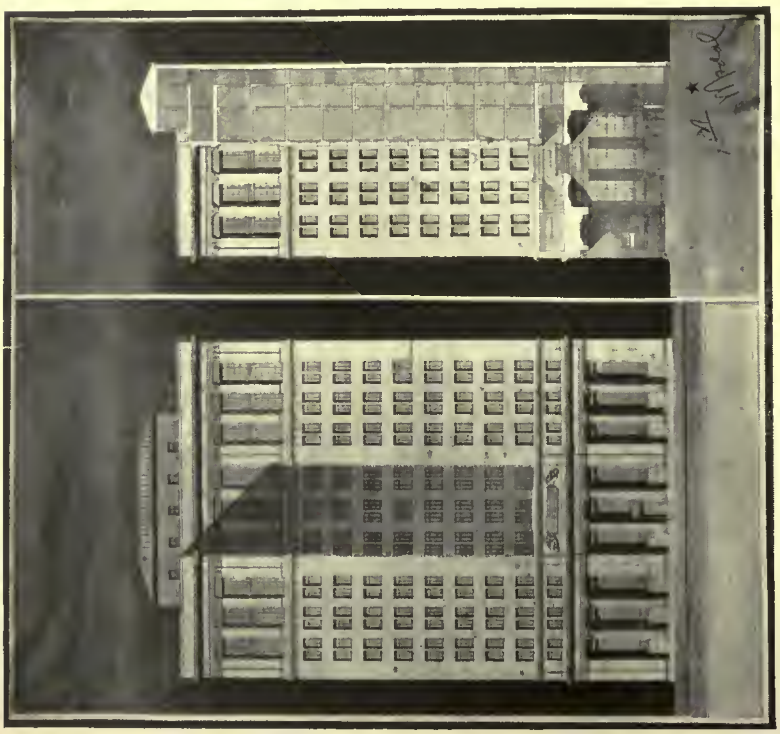
The Committee on Architecture proposes as subject of this Competition:

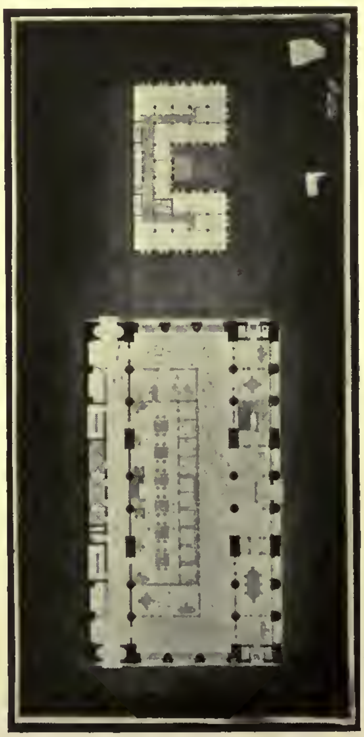
"AN ARTIST'S STUDIO"

E. W. Klee — Carnegie Institute of Technology

3rd MEDAL

Class "A" and "B" Archaeology—V. Projet—A small villa in the style of Palladio

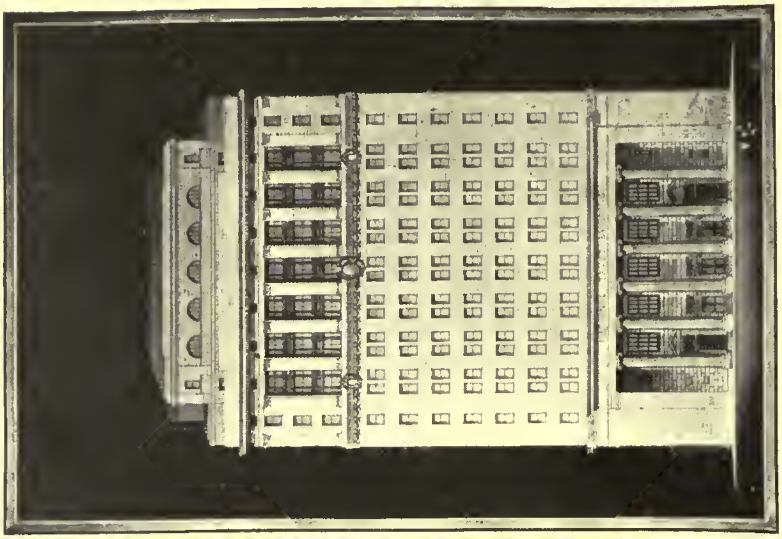


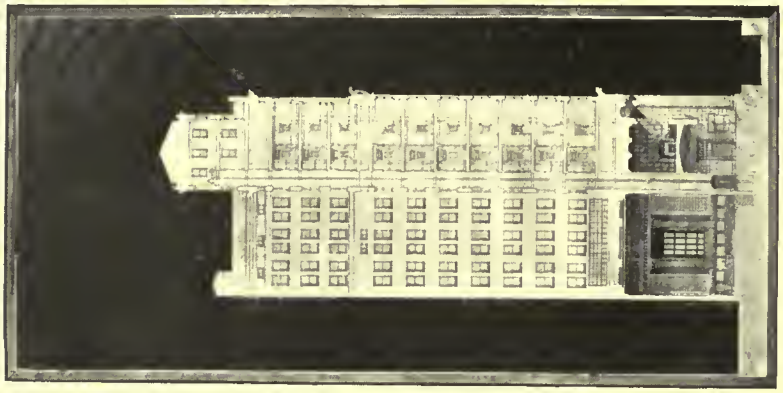


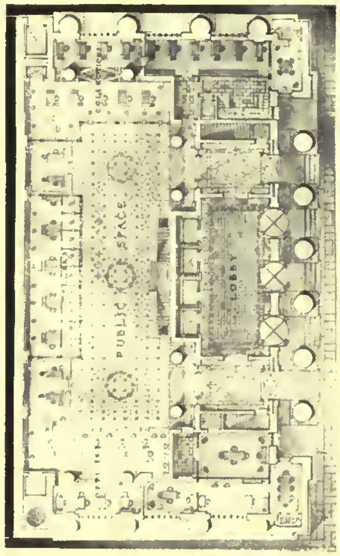
T. F. Price

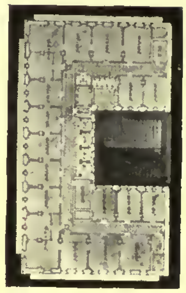
1st MEDAL

Atelier Wynkoop









G. K. Trautwein

1st MEDAL

University of Pennsylvania

Class "A"—V. Projet—A Bank and Office Building—Student work, Beaux-Arts Institute of Design

A luxurious type of studio apartment called "The Duplex," has been developed in many of our large cities. In it, the studio or main living room runs through two stories, the dining room, entrance and service being at the studio level, with the bed-rooms directly above. This arrangement gives the opportunity for an unusual and attractive treatment of the studio, permitting, as it does, the use of interior windows or balconies at the upper level.

In this problem, the studio itself is 35'-0" long, 24'-0" wide and 22'-0" high in the clear. The other rooms of the apartment open on one of the long sides of the studio. The staircase leading to the upper floor may be placed

P. R. Williams   Los Angeles Architectural Club

PRIZE ($50) and 1st MENTION

Karnak Temple Chapter of the Scarab Fraternity Prize Competition
Class "B" V. Esquisse - Esquisse—An artist's Studio

in the studio itself, or shall open directly out of it at the option of the student.

Number of Drawings Submitted—27.

AWARDS—

PRIZE—($50.00)—P. R. Williams, Los Angeles Archtl. Club, Los Angeles.

PLACED FIRST (Disqualified for Prize)—L. F. Fuller, Los Angeles Archtl. Club, Los Angeles.

FIRST MENTION—P. R. Williams, L. F. Fuller and G. Chittenden, Los Angeles Archtl. Club, Los Angeles; H. S. Kelly, Yale Univ., New Haven.

MENTION—T. M. Harllee, Atelier Curtis, New Orleans; C. F. Bieler, R. L. Linder and C. H. Kellogg, Atelier Denver, Denver; M. Sabransky, Los Angeles Archtl. Club, Los Angeles; M. A. Pardo, Yale Univ., New Haven.

PROGRAM

CLASS "A" AND "B" ARCHAEOLOGY—V PROJET

The Committee on Architecture proposes as subject ot this Competition:

"A SMALL VILLA IN THE STYLE OF PALLADIO."

No European period or style of architecture is of greater interest to the designers of American homes than that which flourished during the seventeenth century in the north of Italy under the guiding genius of Palladio. It was there that the English architects gained much inspiration and from England in turn sprang the Colonial architecture of the early days of our country. So direct is the line that no one can help being struck by the resemblance between the small Italian villas of the north and the best examples of our southern Colonial work.

The subject of this program is the design of a small villa on the banks of a river in the style of Palladio. The main portion of about 1500 sq. ft. ground area shall contain a basement and two stories and shall be joined to lower wings on either side by colonnaded or arcaded galleries. The site is approximately level with the river to which the gardens lead, the villa being approximately 200'-0" from its banks.

Number of Drawings Submitted—16.

AWARDS—

THIRD MEDAL—P. C. Reed and E. W. Klee, Carnegie Inst. of Tech., Pitts.; W. R. Fisher, "T" Square Club, Phila.

MENTION—L. C. Page, R. Paterson, W. M. Burke and A. W. Chesterman, Carnegie Inst. of Tech., Pitts.; E. F. Horley, John Huntington Poly. Inst., Cleveland.

CLASS "A" AND "B" ARCHAEOLOGY—V MEASURED DRAWINGS

Number of Drawings Submitted—4.

Subject—The Curtin House Doorway, Bellefonte, Pa.

AWARD—

THIRD MEDAL—C. Hersh, Pennsylvania State College, State College.

Subject—Early Pennsylvania Doorway from Boalsburg, Pa.

AWARD—

THIRD MEDAL—F. O. Paul, Pennsylvania State College, State College.

Subject—Colonial Fireplace in Old Tavern, Linden Hall, Pa.

AWARD—

THIRD MEDAL—H. R. Gamble, Pennsylvania State College, State College.

Subject—Adam Style Mantel Piece in Diller House, Queen Street, Lancaster, Pa.

AWARD—

MENTION—H. T. Hamel, Pennsylvania State College, State College.

A Street Scene in Providence

(See reproduction of original drawing by O. R. Eggers on opposite page)

WHEN, in 1636, Roger Williams was expelled from Massachusetts, he journeyed along the shores of what is now known as Narragansett Bay. He bought a tract of land from the Indians and founded the town of Providence in Rhode Island.

A complete and distinct separation was made between spiritual and temporal affairs. The religious intoleration that existed in Massachusetts was here set aside and freedom of action in religious matters unequivocally guaranteed.

From the days of its founding up to the present, Providence has been typically New England in its growth and development. This may be noted in the older part of the city where the thoroughfares are narrow and crooked, and where may be found many interesting early American houses similar to the one that has been so admirably sketched by Mr. Eggers.

The high box stoops shown in the illustration are common to New England, and many are to be found in Providence. They mark a certain period of domestic architecture. It is satisfactory to know that the patriotic spirit of the people of Providence is the reason for the conservation of many of these valuable architectural details.

DETAIL OF A HOUSE IN PROVIDENCE, R. I.
THE AMERICAN ARCHITECT Series of Early American Architecture

392

BUILDING FOR THE GENERAL MOTORS COMPANY, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

392

BUILDING FOR THE GENERAL MOTORS COMPANY, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

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BUILDING FOR THE GENERAL MOTORS COMPANY, DETROIT, MICH.
ALBERT KAHN, ARCHITECT

392 4

BUILDING FOR THE GENERAL MOTORS COMPANY, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

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BUILDING FOR THE GENERAL MOTORS COMPANY, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

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BUILDING FOR THE GENERAL MOTORS COMPANY, DETROIT, MICH.
ALBERT KAHN, ARCHITECT

7927

BUILDING FOR THE GENERAL MOTORS COMPANY, DETROIT, MICH.
ALBERT KAHN, ARCHITECT

3928

BUILDING FOR THE GENERAL MOTORS COMPANY, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

DETROIT GOLF CLUB, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

992¹⁰

DETROIT GOLF CLUB, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

992"

DETROIT GOLF CLUB, DETROIT, MICH.
ALBERT KAHN, ARCHITECT

DETROIT GOLF CLUB, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

392[13]

DETROIT GOLF CLUB, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

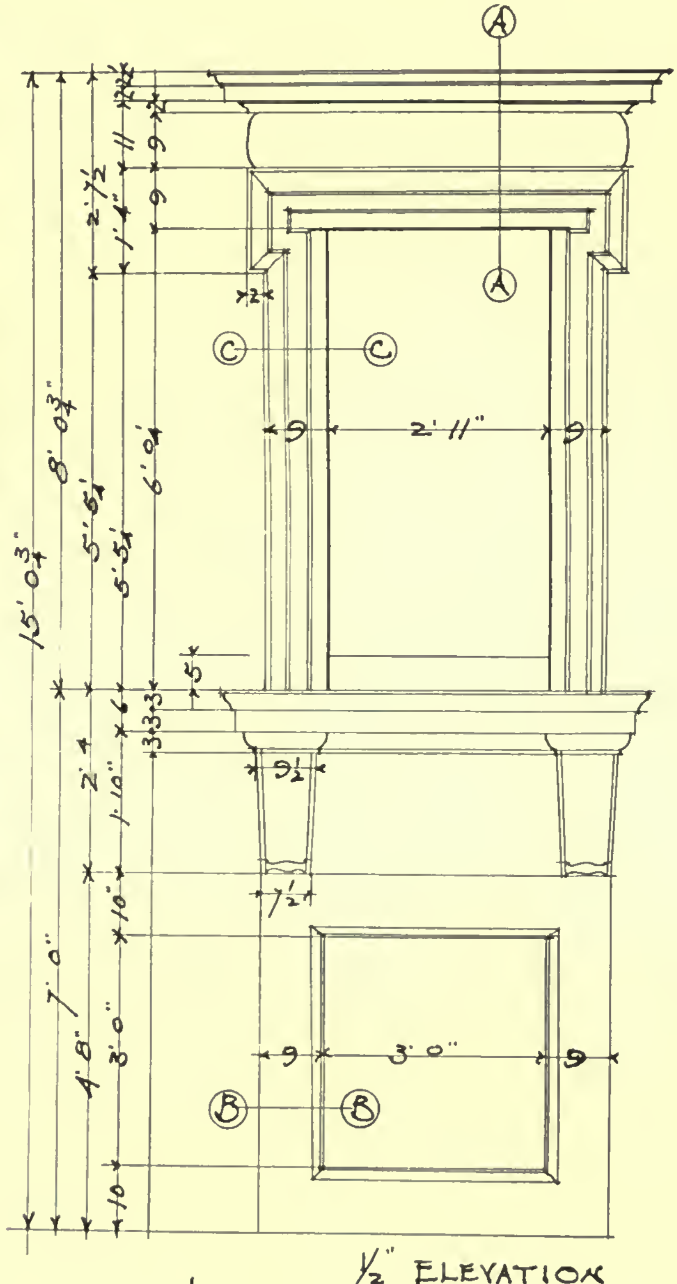
392^{14}

DETROIT GOLF CLUB, DETROIT, MICH.
ALBERT KAHN, ARCHITECT

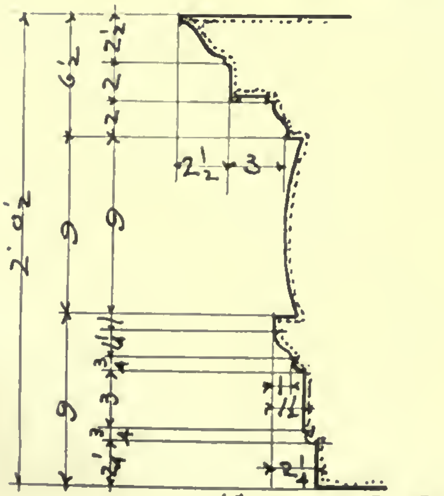
392 15'

DETROIT GOLF CLUB, DETROIT, MICH.

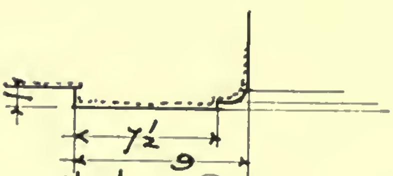
ALBERT KAHN, ARCHITECT



1/2" ELEVATION



1 1/2" HEAD (A)-(A)



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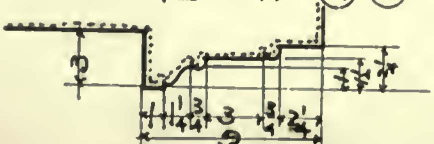
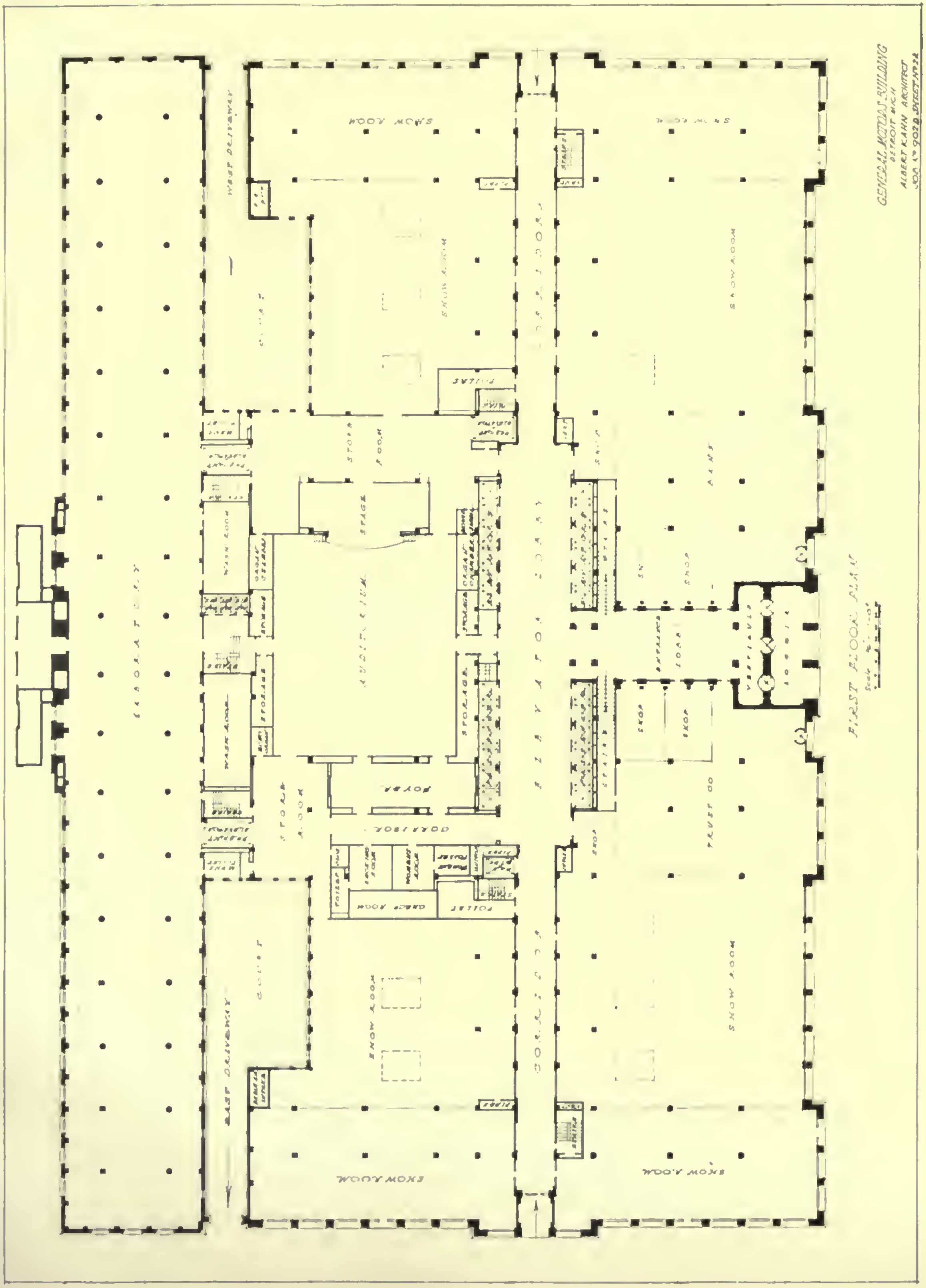


1 1/2 JAMB (C)(C)

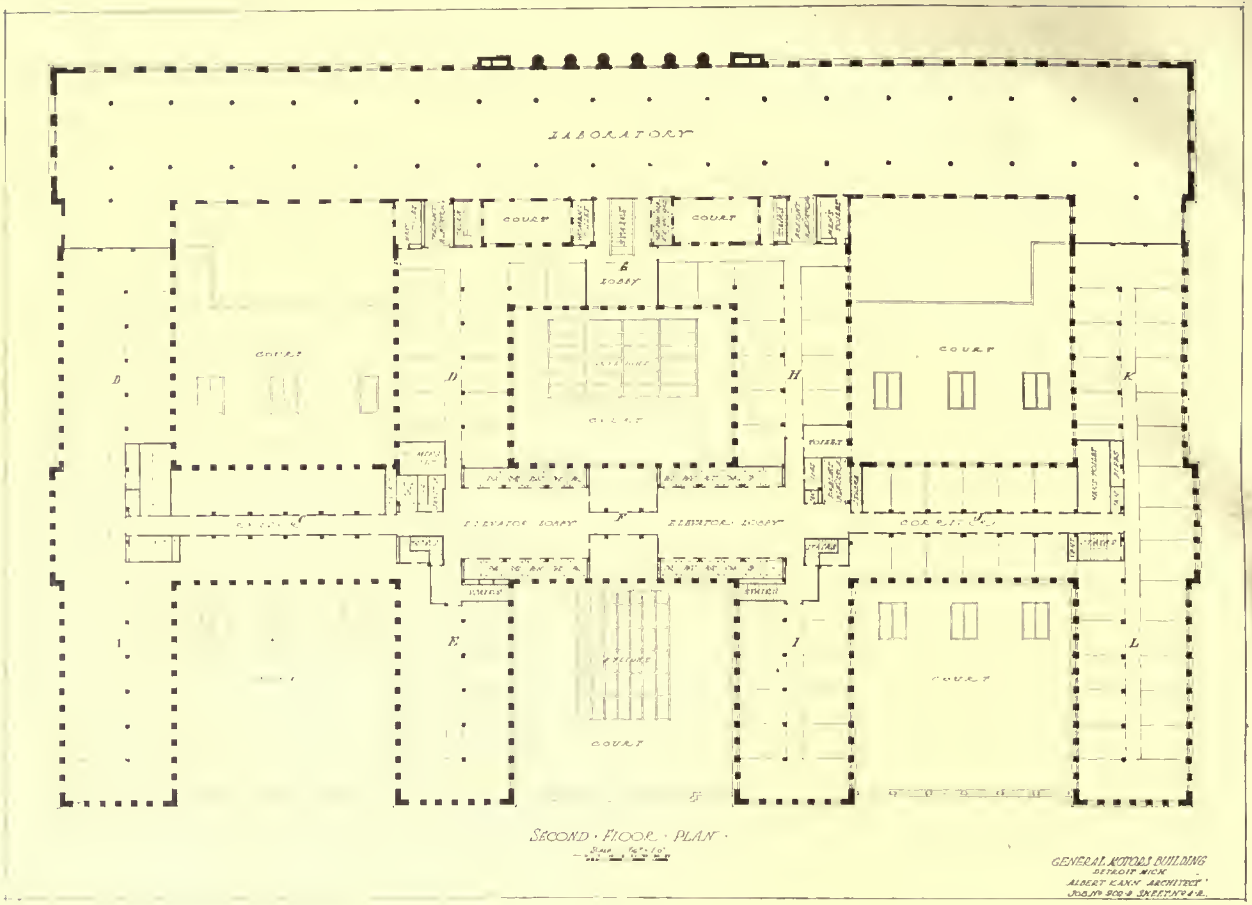
WINDOW IN THE
PIAZZA MORLACCHI
PERUGIA ITALY
4/21

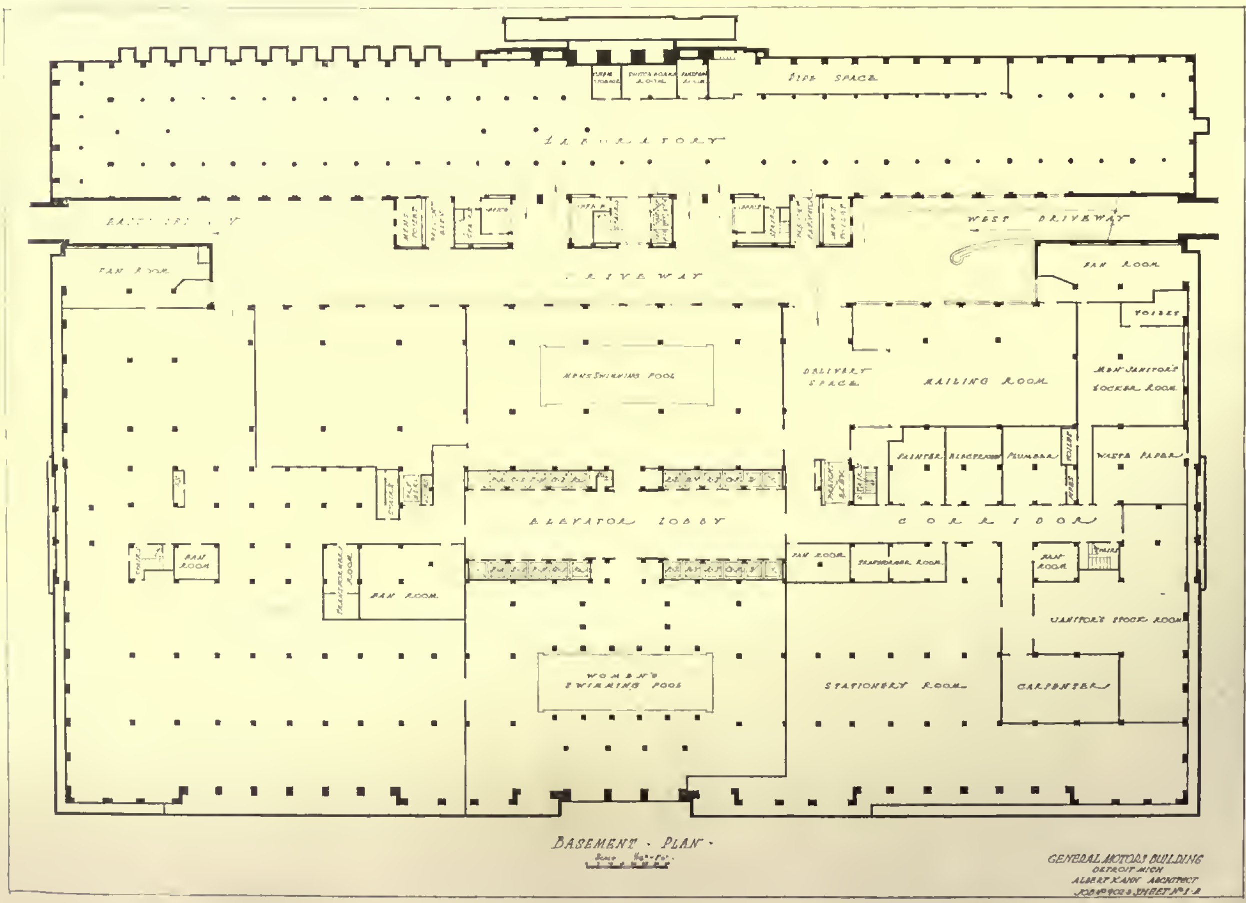
MEASURED AND DRAWN BY R. M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP



BUILDING FOR THE GENERAL MOTORS COMPANY, DETROIT, MICH.

ALBERT KAHN, ARCHITECT





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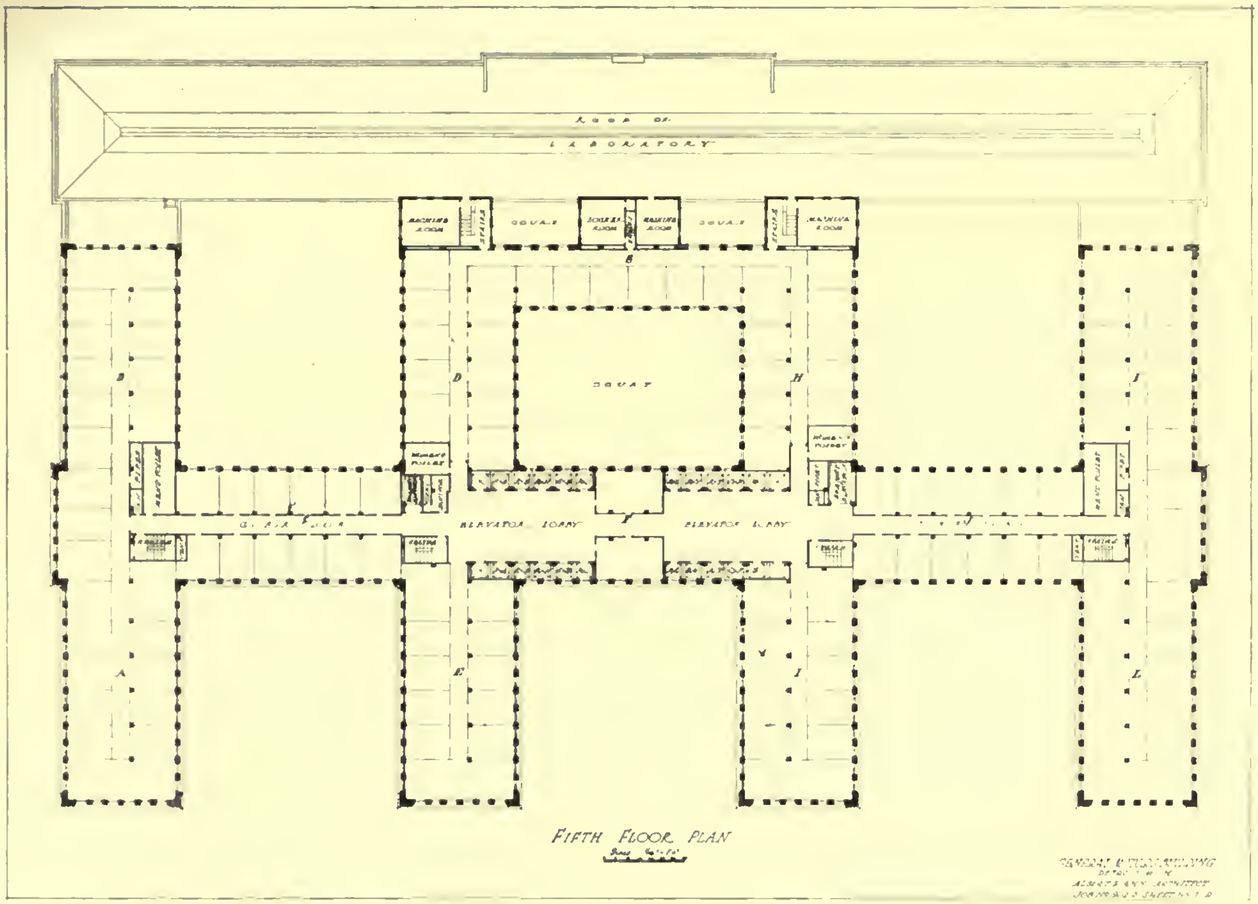
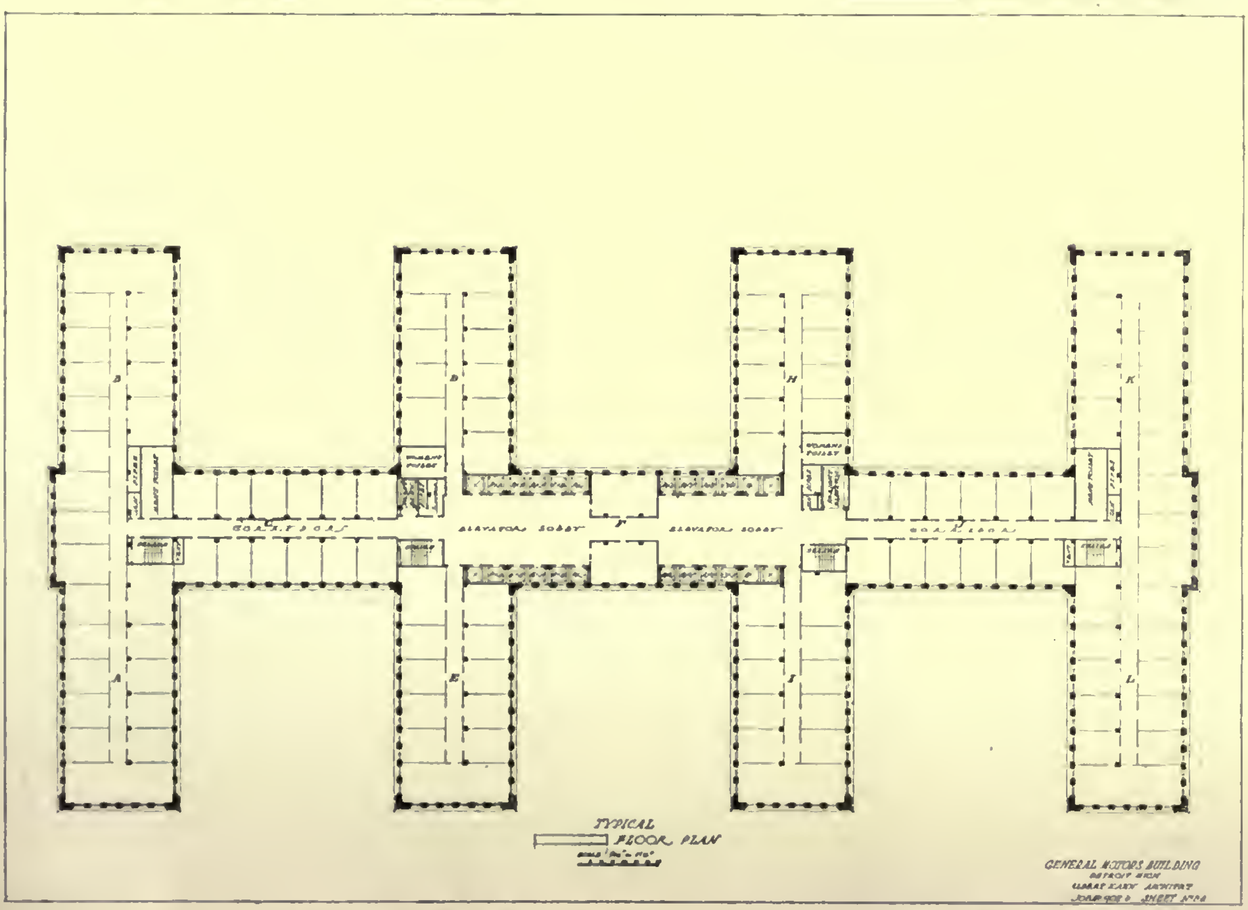
ALBERT KAHN, ARCHITECT





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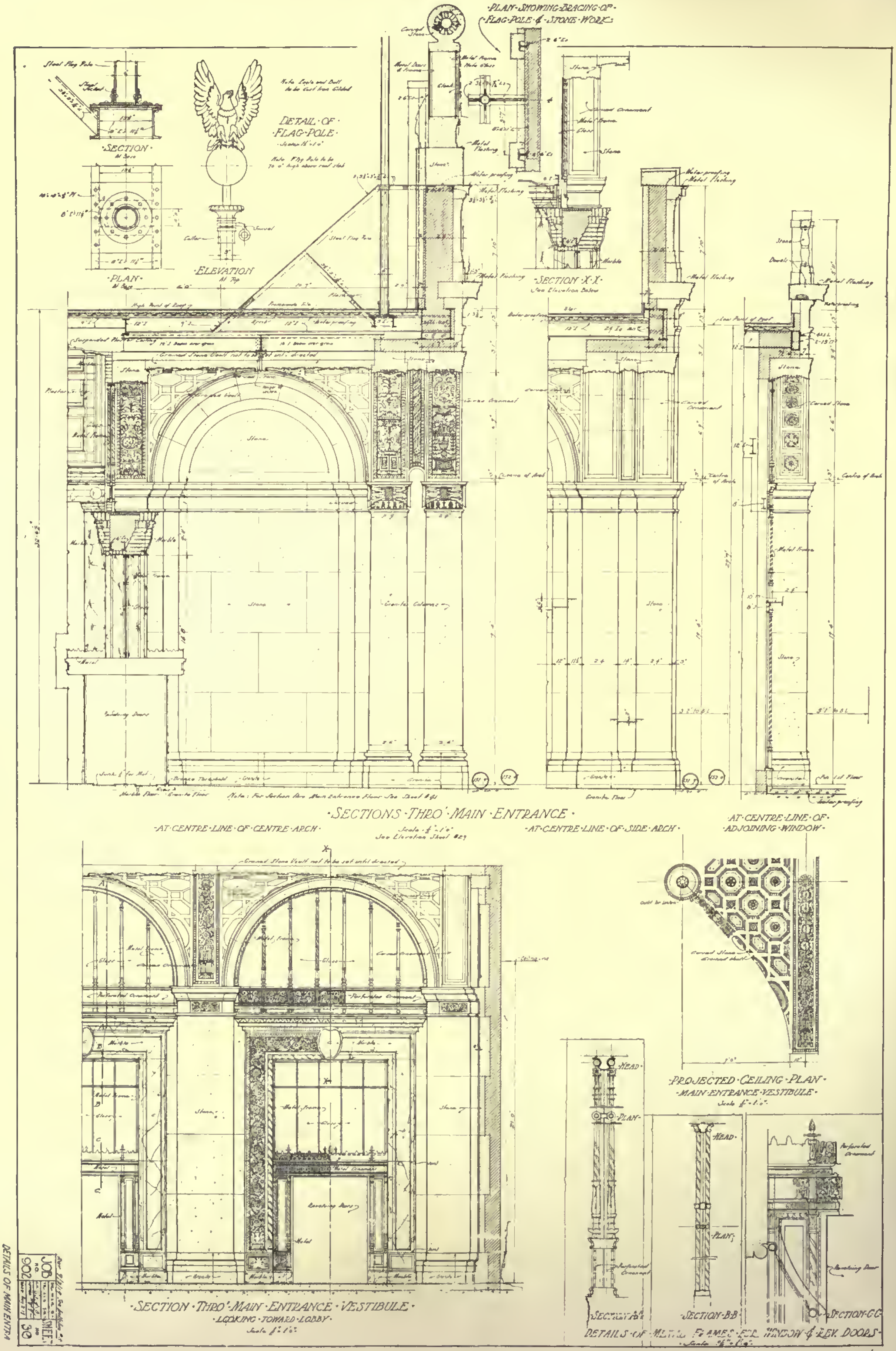

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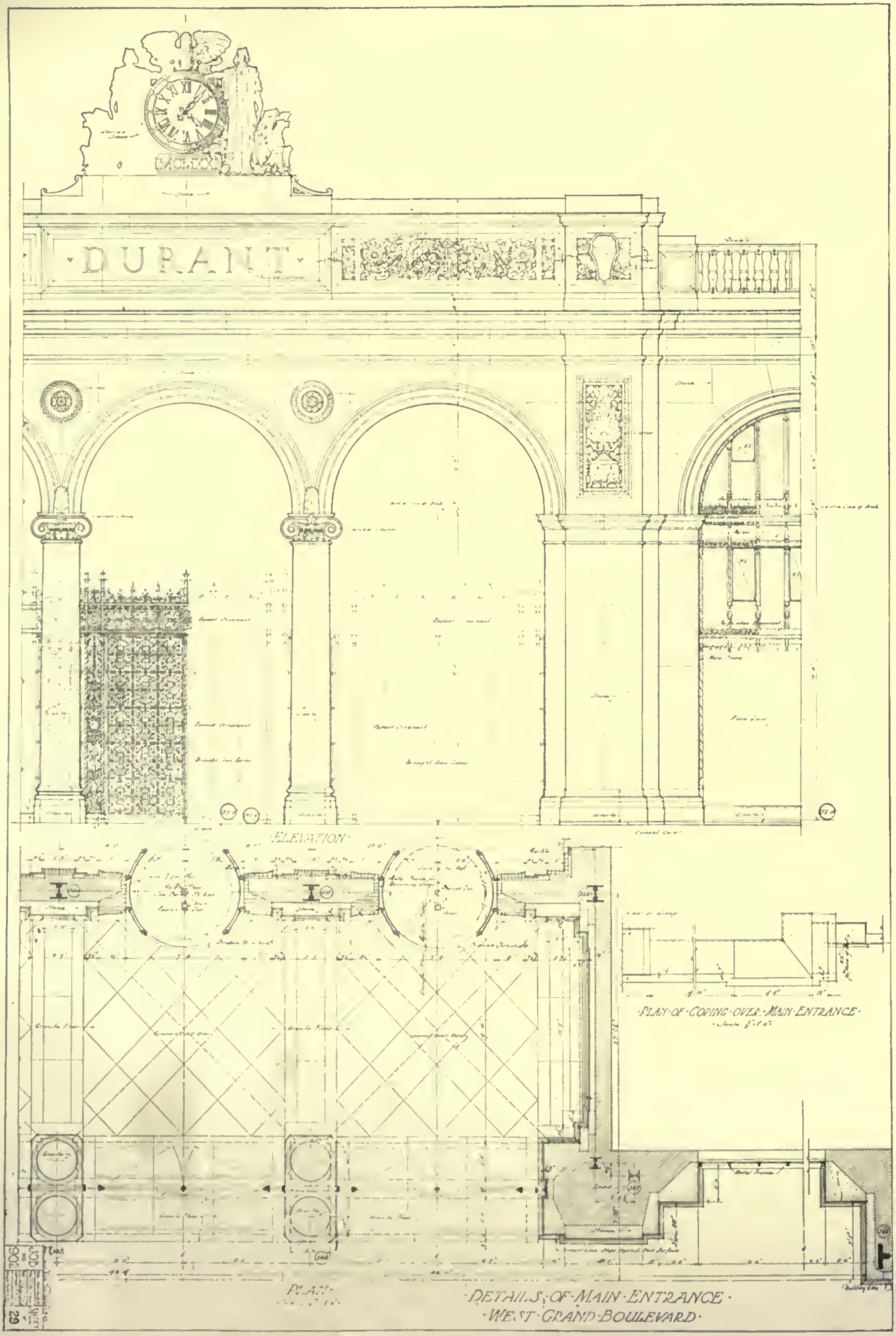

BUILDING FOR THE GENERAL MOTORS COMPANY, DETROIT, MICH.

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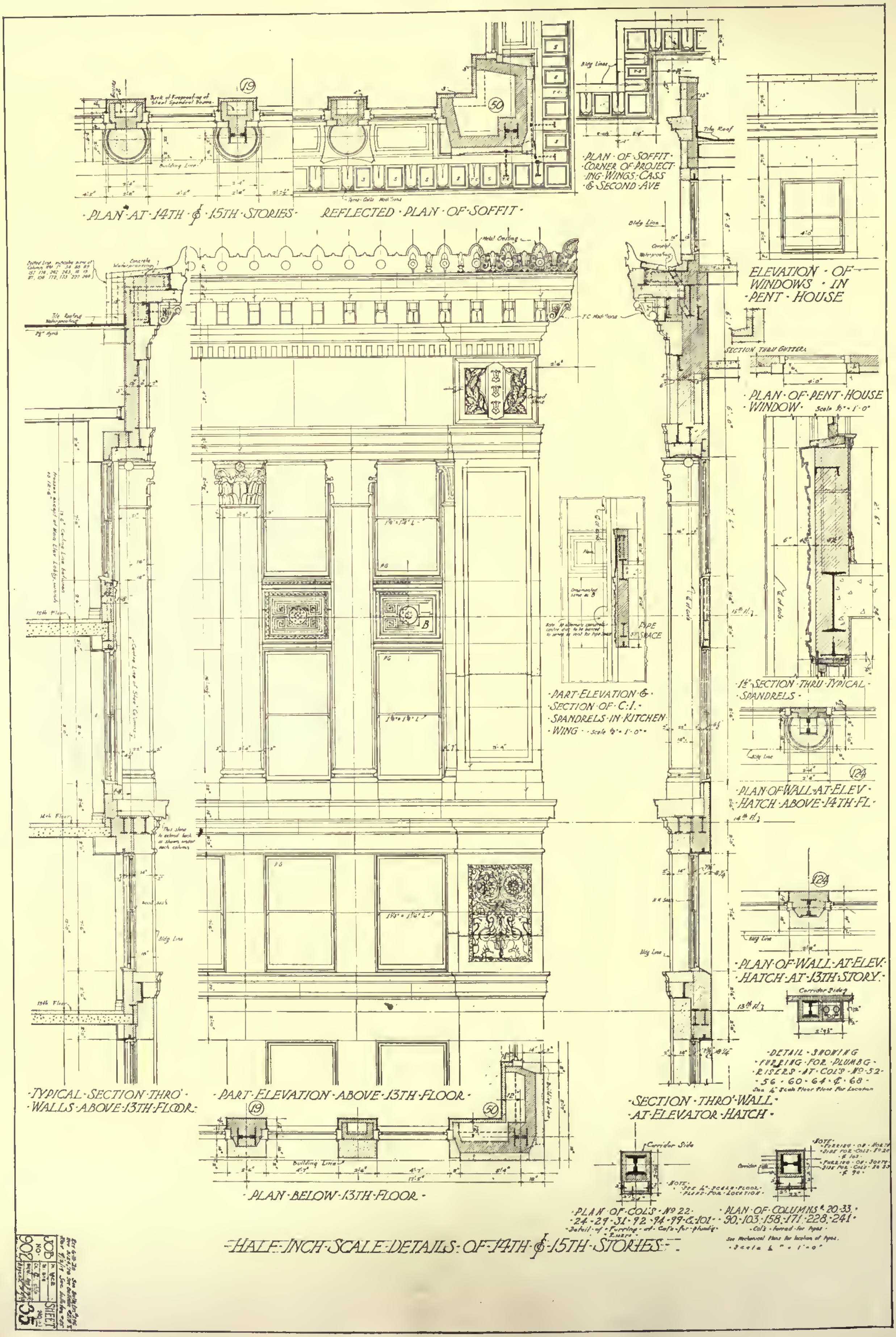
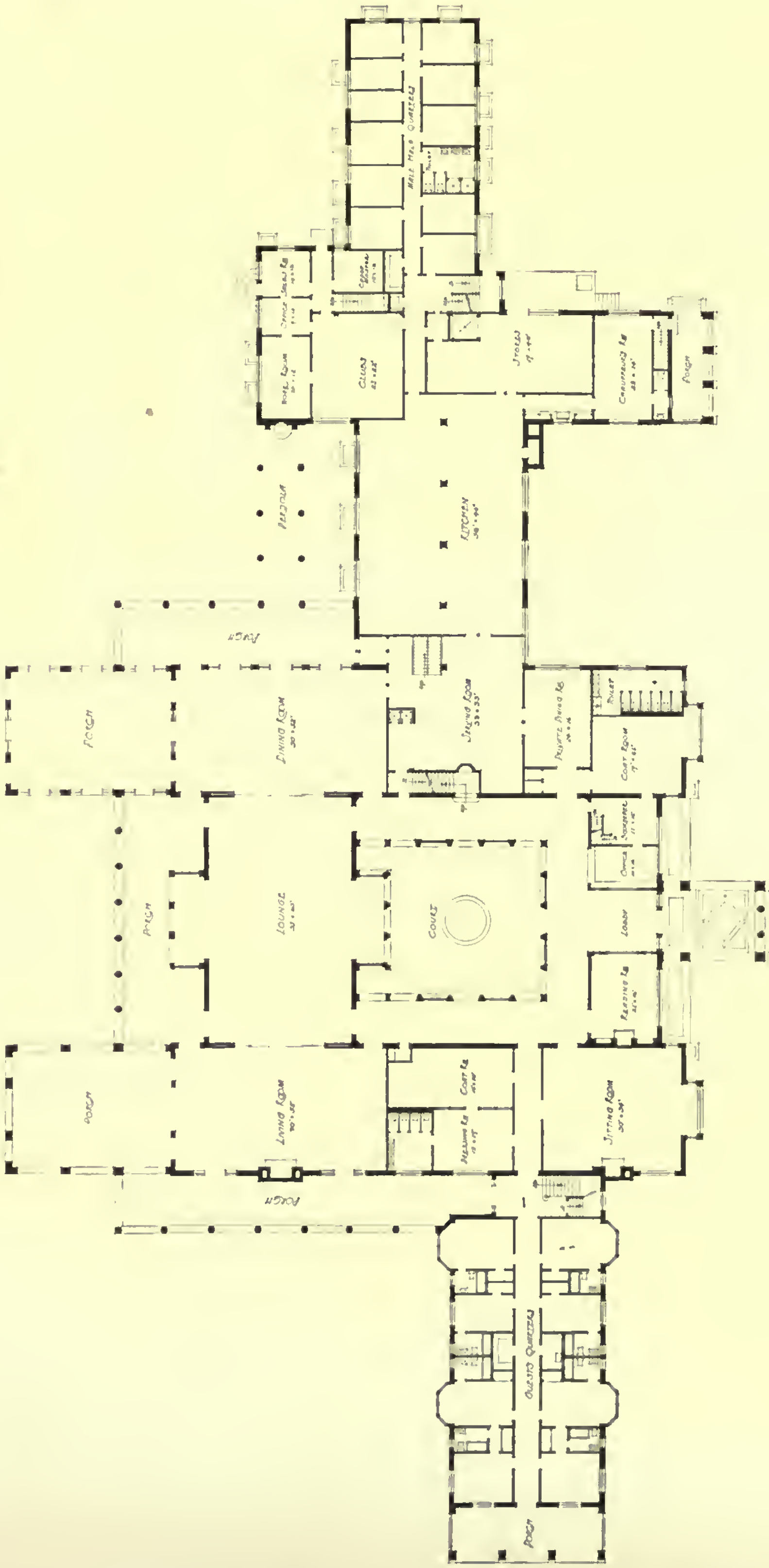


BUILDING FOR THE GENERAL MOTORS COMPANY, DETROIT, MICH.

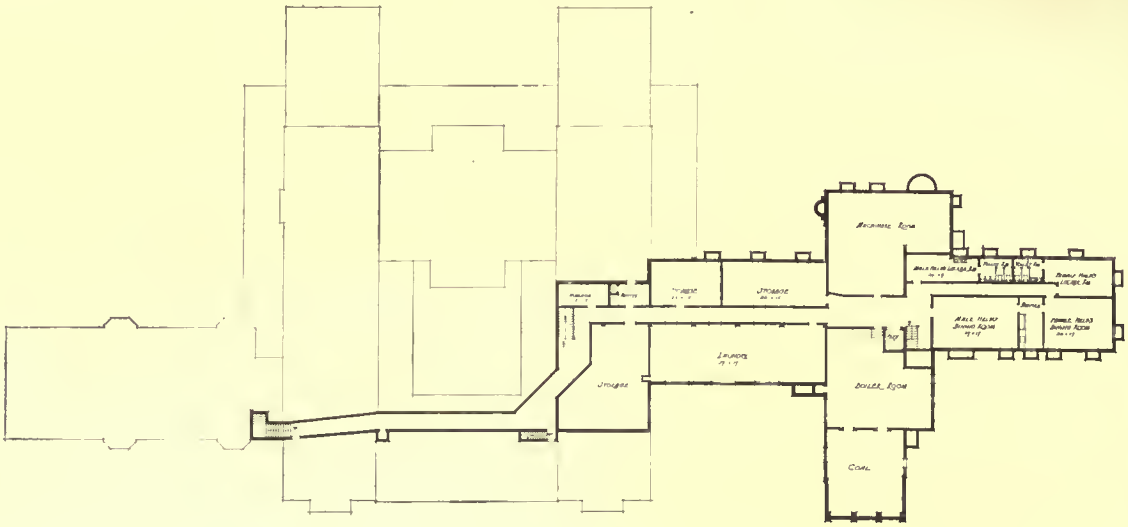
ALBERT KAHN, ARCHITECT



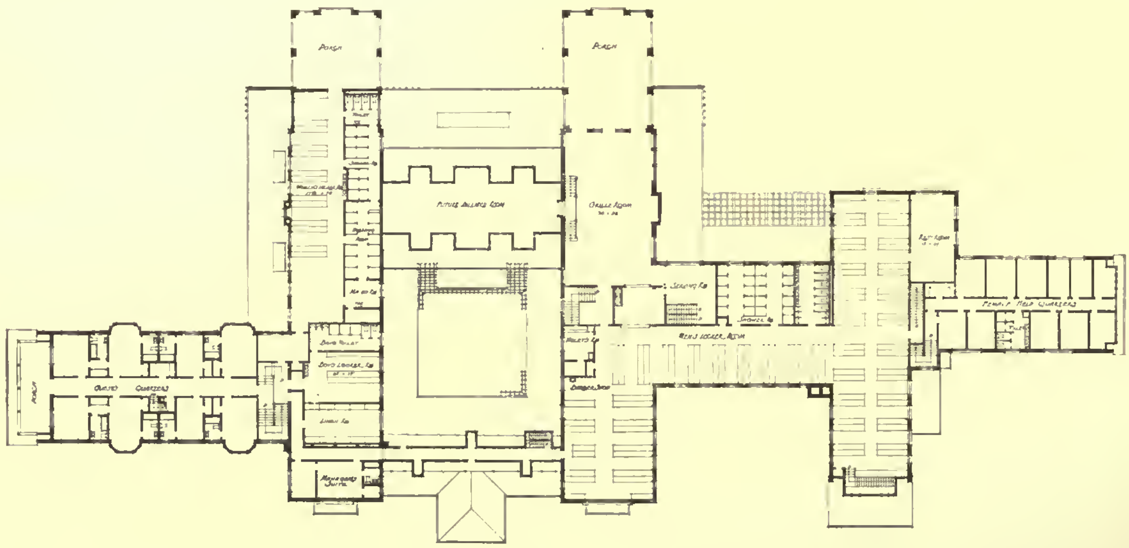
FIRST FLOOR PLAN

DETROIT GOLF CLUB, DETROIT, MICH.

ALBERT KAHN, ARCHITECT



·BASEMENT·PLAN·



·SECOND·FLOOR·PLAN·

DETROIT GOLF CLUB, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

NOTES ON ILLUSTRATIONS

General Motors Building, Detroit, Mich.

ALBERT KAHN, ARCHITECT

THIS building complies with the most rigid requirements for fire resistive construction. In portions of the building the frame is of reinforced concrete while in other parts protected steel framing was used. The floors are of concrete with metal tile arches. The exterior walls are of Bedford stone and ashlar brick with terra cotta backing. The main interior division walls are of terra cotta. Secondary partitions are of wood and plate glass. The roofing is of promenade tile. The trim is of walnut and hollow metal.

From the power plant of the company the building is heated by a vacuum steam heating system. A number of special fixtures are used in the lighting system which is electric. The plumbing throughout is of the best quality modern office building type. There are 27 passenger elevators and 4 freight elevators all electrically operated and of the micro-drive type.

Detroit Golf Club

ALBERT KAHN, ARCHITECT

THIS building is of ordinary construction with brick bearing walls, partitions of wood and tile and floors of wood and terrazzo. Tile is used for the roofing and all trim is wood. An indirect electric lighting system is used and the building is heated by the two-pipe steam system. The plumbing is modern with high grade fixtures and there are no elevators.

Two Examples of Rendering By Hugh Ferriss

HERBERT M. GREENE COMPANY, ARCHITECTS

HUGH FERRISS needs no introduction to the architectural world, nor does his work. His method of portraying architectural work is known and recognized by architects and draughtsmen to the extent that a certain added interest is lent to projects when presented through the medium of Mr. Ferriss' hand.

In this issue are reproduced (pages 413-414) two of Mr. Ferriss' renderings which are not only splendid examples of his work, but are of further interest in that the two buildings shown are landmarks in the architectural progress of the Southwest. Both buildings are now in the course of erection in Texas, one being the First Methodist Episcopal Church, South, the "Cathedral of Southern Methodism," at Dallas, and the other being the Scottish Rite Cathedral of San Antonio. The Herbert M. Greene Company of Dallas are the architects for both structures.

The Methodist Church is the largest piece of ecclesiastical Gothic that has yet been attempted in the Southwest. The design of the Scottish Rite Cathedral is of equal interest and of equal importance in showing the trend of architectural development in the new Southwestern country.

SYRIAN TILE
XV-XVII CENTURY

From the original in Metropolitan Museum of Art

DEPARTMENT OF SPECIFICATIONS

WITH this issue the Department of Specifications will commence a detailed discussion of specifications and their component parts. These discussions will be prepared with a view to cover all branches of building construction and equipment that an architectural office will encounter. No attempt will be made to differentiate between classes of construction or design except in particular instances where special mention must be made of conditions that will vary in a marked degree from different uses of the same material or method. For instance, in the specifications for mixing and proportioning of concrete it is not necessary to vary from certain standard methods except in particular cases where some condition out of the ordinary is of such paramount importance that a variation is advisable.

Suggestions that will be given in these columns will, unless otherwise noted, apply with equal force to industrial, residential, public, mercantile or other buildings. It will not be necessary that the reader have in mind any particular class of building unless he wishes to have before him a composite structure in which there will appear practically all manner of materials and methods of construction. For that reason it may be necessary to abandon, at times, the logical sequence that generally will be followed throughout.

It is quite customary to prepare drawings for a building that is to replace old structures already on the site. These buildings must, of course, be razed, *in toto*, or perhaps only partially, in order to make way for the new structure. It seems logical, then, to start this series of discussions with the operations and conditions that must be taken care of in order to accomplish the work in an efficient manner.

DEMOLITION OF EXISTING BUILDINGS

Section One

IN all cases where there are buildings to be demolished the survey questionnaire should give all information necessary to the intelligent specification of the demolition operations. If there are adjoining buildings that have independent walls or that share in a party wall the information must be specific for a number of questions, as given later.

The method of procedure of the wrecking operations must be determined before the specifications are started and this procedure very carefully explained as the scope of the contract.

For the purposes of this discussion it will be assumed that the building to be demolished is located on an inside lot on a business street, is five stories high, with a basement under the entire building, and covers the entire area of the plot; and extends from a prominent business street in front to an alley in the rear. One side wall is a party wall while the other wall is an independent, self-supporting, load-bearing wall. All walls are of brick, floors and roof of wood joist construction, interior columns of cast iron supporting wrought iron girders and store-fronts of plate glass with cast iron setting of an ornamental nature so common in the buildings erected about forty years or more ago. The building is equipped with steam heat, electric service, plumbing pipes, fixtures and sanitary conveniences.

One of the first things to be determined is whether the owner wishes to remove any of the equipment—visible or invisible—for use elsewhere or in the new building. Ordinarily such equipment is not of any use in a new structure to be used for mercantile, office or industrial purposes, yet the owner may have use for radiators, plumbing fixtures and lighting fixtures. All plate glass may be of serviceable value in buildings of rough construction but this material can very rarely be used in new work. Signs that have been painted on plate glass will be apparent after they have been removed, the sun having caused a chemical change in the glass, causing it to turn purple or a dark gray that would not be at all desirable when placed in juxtaposition with new glass. Ordinarily old plate glass has greater salvage value to a wrecking contractor than to the average owner and should be left as a part of the general building salvage.

ANOTHER matter that needs determination at the outset is the function of the party wall and the other side property line—or self-supporting—wall. It is necessary that the party line wall be maintained in a stabile condition, not only that it may be used again but because of the property rights in it that lie with the adjoining owner. At times a party wall, through settlement or lateral movement, has come to depend on—and actually require—the support that has been given it by the lateral bracing of the floor and roof constructions. If this condition exists the removal of such laterally supporting structure will require the immediate substitution of temporary supports that may be placed so as not to interfere either with the processes of demolition or with the construction operations. If this same condition exists with respect to the free-standing property line wall on the other side due precautions must be taken to ascertain the responsibility of the owner of the building being razed. If he has no legal responsibility that requires him to maintain the wall of the adjoining building, a spirit of fair dealing will suggest his co-operation with the adjoining owner and the rendering of all possible assistance in solving the problems involved. Certainly it will not be desirable to proceed with the demolition of this wall with the chance that a collapse will throw a great amount of debris on his property, causing immediate expense, the bother of law suits and possible delays that may cost more, in money and valuable time, than the exercise of due precaution in the shoring and temporary supporting of the wall would involve.

The third item, in point of importance, that deserves close attention, is that of the extent to which old foundation or retaining walls, such as those at the street or alley lines, are to be removed during the process of demolition. If these walls act as retaining walls and their removal consequently would lead to cave-ins and resulting damage to pavements and public highways they must be allowed to remain in place until the contractor who is to build the new foundations is prepared to do the necessary sheet piling or temporary shoring to permit their removal. If they must be left in place then it is necessary to determine their structural fitness to remain stabile if the floor system, which usually acts as a brace, is removed. Then, too, the street front wall may be supporting the public walk which covers sub-sidewalk space, with the retaining wall at the curb line. If so, it is necessary to decide if the existing walk is to remain in place just as long as new construction work will permit or if barricades are to be placed around this walk and the old work removed. In this construction, once again the question arises as to the need for keeping the existing first floor construction in place as a brace for the front basement or foundation retaining walls. It is possible that the foundations of the free-standing wall that is to be demolished extend below the foundations of the adjoining building. If this is the case, removal of the foundation wall may endanger the adjoining building and caution must be exercised, as suggested above, for such circumstance.

One additional point that should be given some consideration is the removal of the basement floor and of footings. Ordinarily these are left for removal by the contractor for excavation but in a particular case there may be very good reasons why they should be removed by the wrecking contractor.

The use of old brick in the new structure should be considered, as this material usually forms the greater part of the salvage value of an old building and the contractor will want to know whether the brick are to become his property or whether he is to clean and stack them on the premises or on nearby vacant ground that will serve as a storage yard. The use of old brick will be discussed later at the proper time, but their use generally should be determined before writing the demolition specifications.

These preliminary controlling factors having been determined, it is necessary to investigate the factors that have to do with the actual work of demolition. These factors concern the posting of a bond with the city authorities for protection of the public if the ordinances require it; the liability and compensation insurance that the contractor may have to procure for the protection of the public, his workmen and others; the erection of proper safeguards such as covered passageways over public walks, fences or other barricades and similar devices; the restrictions as to dust and efforts that must be made to prevent it from flying through the air; the removal of debris and salvaged material and the general cleaning up that must be done upon completion of the operations.

WITH respect to public liability bonds and liability and compensation insurance these matters should be classed as legal matters though they are factors with which the specification writer should be thoroughly familiar and are of particular importance in work of this nature. Coverage should be made as complete and comprehensive as possible so that all parties concerned in the operation will have protection. The architect should see that his interests, as well as those of the owner, contractors, sub-contractors, lessors and lessees are included in all insurance and bond protection.

The erection of proper safeguards and barricades has to do with the protection of the public and of workmen and will be controlled to a great extent by the requirements of local authorities and insurance companies; it also has something to do with the convenient and methodical handling of salvaged material and debris. Its arrangement and disposal should be left entirely in the control of the contractor without detailed instructions or hindrance on the part of the architect.

Flying dust resulting from demolition operations can cause quite a bit of trouble and annoyance and in many cities must be eliminated as much as possible. It annoys occupants of adjoining buildings and pedestrians and may cause accidents to workmen, either through getting in their eyes or causing mis-steps while clouding the working spaces. The control of dust is not difficult and always should be the subject of rigorous rules in the specifications.

When the demolition contractor is to leave the existing basement floors for removal by the excavation contractor it is customary to remove all rubbish resulting from the work. The specifications should be specific on this point in order that the responsibility of its removal may be placed, with certainty, on one or the other contractor.

It is advisable, and oftentimes is required by law, that owners of adjoining properties be notified, a certain number of days before demolition work is to be started, that such work is to be done. Such notification should state whether or not the architect or owner believes certain damage may be done to the property of such owners and every assistance should be offered these owners in seeing that their buildings are not harmed in any way by the work that is to be done.

THE specifications for the demolition operations will, then, be outlined somewhat as follows:

I. General Conditions
   a. A paragraph referring the reader to the General Conditions that will be made a part of the Contract and which should be read by all bidders.

II. Scope of Contract
   a. State what material or equipment will be removed by the owner.
   b. State what material or equipment shall be removed by the contractor for delivery to the owner or for use in the new construction operations. If the latter, state whether material or equipment is to be cleaned, have nails removed or similar work done on it and where it is to be stored.
   c. State what material and equipment shall be removed by the contractor that is to become his property and that it is to be removed from the premises.
   d. State what must be done in respect to shoring or underpinning, temporarily, the walls of adjoining buildings or retaining walls or banks at streets and alleys.
   e. State length of time which is to be given the contractor, or ask that bids include a guarantee that all work will be performed in a maximum number of days to be stipulated by him in his estimate.

III. Bonds and Insurance
   a. Required by City Ordinances.
   b. Required by State Compensation laws.
   c. Required by Owner for protection of
      1. Contractor and his employees
      2. Sub-contractors and their employees
      3. Owner
      4. Architect
      5. Lessor
      6. Lessee

IV. Permits
   a. As required by city ordinances or public regulatory bodies.

V. Notification to Adjoining Owners
   a. Formal notification in writing, delivered to owners of adjoining buildings, that demolition operations are to be commenced on a certain date (say, within ten days of date of notice) and that his property must (by him or will, by the Owner of the building to be razed) be protected as required by statutes or ordinances covering such operations.

VI. Barricades and Public Protection
   a. State governing conditions that must be met by the Contractor.
   b. State what barricades must be left upon completion of Contract.

VII. Demolition Operations
   a. State that work is to be done so as not to endanger adjoining buildings, walks, streets, etc.
   b. Require that contractor cease work at places where, it seems evident, further operations will endanger such buildings or public property.
   c. State conditions respecting removal of debris, etc., that falls into basement or surrounding premises.

If specifications are prepared somewhat as outlined above they should bring a happy ending to the demolition contractor's work.

DEPARTMENT OF ARCHITECTURAL ENGINEERING

SOME PROPOSED INVESTIGATIONS IN STRUCTURAL ENGINEERING*

VII. Experimental Study of Secondary Stresses

To a large extent, secondary stresses have been neglected by practicing engineers. The engineer has justified his action by the statement that secondary stresses are small, or that the determination of secondary stresses is based upon false assumptions, and that largo secondary stresses do not exist.

Inasmuch as computed secondary stresses are often very large, they should not be neglected, if they actually exist; and if they do not exist, the ghost should be laid. A limited number of tests show that secondary stresses do exist, and that the measured and computed stresses agree quite well. Tests by Parcel and Maney (Engineering News-Record, December 9, 1920, p. 1116), show a secondary stress equal to 85 per cent. of the primary stress at a time when the primary stress is a maximum. Further experimental data are desirable.

VIII. The Effect of the Elongation and Compression of the Bottom Chord Upon Stresses in the Floor System of a Through Truss Bridge

The stress in the bottom chord of a truss is a maximum at all points when the whole span is loaded. This being true the entire bottom chord can be subjected to a maximum stress at the same time. The elongation due to live load and impact stresses from the center to the end of a 200 ft. truss is approximately one-half inch. If therefore the floor system is erected with no live load on the span, the passing of a full live load over the bridge will produce a horizontal deflection in the end floor beams of one-half inch, a strain that is neglected in the design of the bridge. The bending of a floor beam also produces a horizontal shearing stress on the floor beam connection angles which is not considered in the design. Strain-gage measurements taken on bridges under actual conditions of service disclosed stresses very much in excess of the stresses produces by the vertical load on the floor beams alone.

IX. Why a More Exact Knowledge of the Behavior of Structures Is Desirable

Research work necessary to answer the questions which have been raised is expensive. Moreover, a more exact analysis of stresses in structures would probably require better trained designers and would probably require that more time be spent on the design of structures than is now customary. Both of these changes increase the cost of a design. The question is often raised, why is it necessary to incur this expense for research since our present designs are proving satisfactory in service? To accept the line of reasoning implied by this question is to accept the design of the ancients as the acme of structural science as these structures have stood through the centuries. To accept the line of reasoning implied by this question is also to eliminate economy as a controlling factor in an engineer's work.

All structures are designed with a factor of safety. That is, every member is made strong enough to carry a load greater than any load to which it is likely to be subjected. The magnitude of this factor of safety varies through a wide range. The fact that a structure has not failed in service is proof, not that the design is properly balanced, but that in trying to provide a factor of safety of from 2 to 5 the designer has succeeded in providing a factor of safety of at least one in each and every member.

If a designer were to specify a tension member having a cross-sectional area of 30 sq. in. at one end and a cross-sectional area of 20 sq. in. at the other end the design would be ludicrous. Such an evident lack of balance in the design would be ludicrous. Yet the only offense which the

*Abridged from paper by W. M. Wilson, Associate Professor of Structural Engineering, University of Illinois, published in August, 1921, Journal of the Western Society of Engineers, Chicago, Ill. Continued from page 357, November 9 issue of The American Architect.

designer has committed has been to provide a factor of safety of three at one point and a factor of safety of two at another point in the same structure.

Tension members are usually designed for a primary unit stress of 16,000 lbs. per sq. in. Some tension members are subjected to practically no secondary stress while others have secondary stresses equal to 50 per cent. of the primary stresses when the primary stresses are a maximum. This being true, the member which is not subjected to secondary stresses has a factor of safety 50 per cent. greater than the factor of safety in the member subjected to the secondary stresses. That is, the neglect of secondary stresses results in structures which are as badly unbalanced in design as a tension member having a sectional area 50 per cent. greater at one end than at the other. There is, however, this difference. The fact that the design is unbalanced is self evident in the one case, but is concealed by a misleading statement of the stresses in the other case. It is like two thieves of whom one is caught while the other escapes. One is counted a thief and the other is not, but they are both equally guilty.

The object of the designer should be to produce a balanced design. That is, all members of equal strategic value should have equal factors of safety. If all but one of a number of members of equal importance have a factor of safety of three, while the one member has a factor of safety of two, the material in the others in excess of that necessary to give than a factor of safety of two is wasted. And this waste is chargeable to poor design.

I have heard the statement made that so long as engineers receive as a fee a certain per cent. of the cost of the structure they will not reduce the cost at increased expense to themselves by making more careful designs. This position is comparable to the position taken by a physician who would advocate halting all medical research, as more perfect knowledge would result in better health for the community and less fees for the doctor.

Engineers bemoan the fact that their profession is so unremunerative. Yet they continue to design with a handbook and to a great extent refuse to give special problems the study which they deserve. The very fact that they accept handbook design makes it necessary for them to compete with handbook artists who do not understand the principles involved in the formulas which they use, and who make no pretense at having a professional training. Many of these handbook designers are not professional men in any sense of the word. They should be classed as mechanics. Yet so long as we are content with handbook designs we will have to compete with the handbook artist.

Many designers do not realize the source of the information which handbooks contain nor do they realize how the requirements contained in specifications are established. The well founded equations and requirements of the specifications are based upon research work of the past. Methods of design which are still in a state of flux require research work for their final determination.

I believe that what is usually known as a factor of safety should be considered as the product of two factors, one a true factor of safety, and the other a factor of ignorance. The work of our scientists has made it possible to manufacture steel where physical properties will not vary more than 5 to 10 per cent. from the standard desired. This being true, if we have a steel whose elastic limit is 32,000 lbs. per sq. in. and whose ultimate strength is 64,000 lbs. per sq. in., it certainly would be safe deliberately to plan on subjecting this steel to a stress of 24,000 lbs. per sq. in., providing we were absolutely sure that 24,000 lbs. per sq. in. is the maximum stress to which the member will ever be subjected. The ratio $\frac{32,000}{24,000} = 1.33$ (or $\frac{64,000}{24,000} = 2.66$ if the factor is based upon the ultimate strength instead of upon the elastic limit) is a true factor of safety. But because we are not sure just what load the member will be required to carry, we design for a stress of 16,000 lbs. per sq. in. The factor $\frac{24,000}{16,000} = 1.5$ is not in the true sense a factor of safety, but is in reality a factor of ignorance. We are afraid that the stress which we believe will be 16,000 lbs. per sq. in. may be 24,000 lbs. per sq. in. This factor of ignorance is a measure of the amount by which the working stress is reduced and a measure of the amount of material wasted because of a lack of knowledge of the exact stress to which a member will be subjected.

The factor of ignorance covers a lack of knowledge of the exact value of the maximum load to which the structure is subjected, and also covers our inability or our unwillingness to make an exact analysis of the stresses due to a given load. Ignorance as to the maximum value of the load in many cases cannot be eliminated; but ignorance as to the stress resulting from a given load can at least be reduced if not, in fact, entirely eliminated. The elimination of one contributing part of the factor of ignorance should justify a reduction in the factor itself, and should justify the use of higher working stresses than are now permitted.

For the benefit of those who object to increasing our present working stresses where more exact analyses are used, let me call attention to the fact that scientists who are experienced in testing materials find that it is impossible to injure structural steel with a tensile stress of 24,000 lbs. per sq. in. In the few cases where steel structures have failed, the failure has not been because the true factor of safety was too small, but because the factor of ignorance was too small. In fact, in the case of most of the failures, the ignorance on the part of the designer was so colossal that no factor could be depended upon to offset its effect. I believe that more care in stress analysis and increased knowledge of the behavior of structures subjected to load will promote economy and safety simultaneously.

x How Structural Research Can Be Promoted

There are two interested parties in every contract for a steel structure, the manufacturer who furnishes the material and the owner who pays the bill. The manufacturer wants the structure designed so that it will be easy to manufacture and, if it is a lump sum contract, he is interested in light weights. But he knows that if the structure fails his reputation will suffer. The owner having once signed the contract wants the best bridge that he can get. But he knows that if his specifications are unreasonable he will have to pay an exorbitant price. So that while the interests of the two parties at first glance seem to conflict, they really are in harmony. Both want the lightest possible bridge that will safely carry the load. Both will be financially benefited by the development of this ideal structure.

Although manufacturers and owners will both be benefited by the development of an ideal design they are both human, and neither is always willing to believe that changes suggested by the other are for their mutual benefit. The owner is likely to question innovations in shop practice, believing them to be the product of a desire to cut shop costs rather than to increase strength. Likewise the manufacturer may consider that changes suggested by the owner, increase the cost more than they increase the quality.

It therefore seems apparent that any research work which might result in changes in design or manufacture should be conducted by a disinterested party. This is necessary in order that the results may be accepted without prejudice by both parties. Furthermore, scientific investigations require long continued painstaking efforts. Both of these requirements point to our scientific organizations such as the Bureau of Standards and the Engineering Experiment Stations as the proper agents to undertake this work.

(Note. The paper by Professor Wilson is of importance at this time when a committee of technical men is preparing a proposed national building code. The factor of ignorance must be large until greater uniformity exists in floor loads and other designing data.—EDITORS.)

The Gas Danger in Garages

A recent issue of *The Journal of the American Medical Association* contained valuable data on the danger of gas poisoning in closed garages when motors of cars are running, to "warm up."

An ordinary motor car, when the engine is in motion, gives off about one cubic foot of carbon monoxide every minute. One cubic foot of this gas in 670 cubic feet of air will cause a strong man to fall unconscious if he happens to breathe the mixture. If he is not taken immediately into fresh air and given remedial treatment he will die. A single car garage 10 by 16 feet in plan with an average height of 8 feet, contains 1,280 cubic feet, so all the contained air will be poisoned in less than two minutes if doors and windows are kept closed when a car inside is running.

Architects should pay great attention to the ventilation of garages and impress upon clients the fact that the poison hazard increases with the coming of winter. Ventilation must be by doors and windows and open roof ventilators. Electrically operated fans may cause an explosion of gasoline vapor by sparking. If a garage is heated it should be by steam or hot water pipes from boilers far enough removed to prevent the possibility of gasoline vapor igniting.

One cubic foot of carbon monoxide in 3,000 cubic feet of air produces no physiological effects. A mixture of 1 part of the gas in 1,500 parts of air causes some uneasiness. Above that, headache and nausea are induced, increasing in severity with the rising of the ratio until, when it reaches 1 in 670, life is seriously impaired.

Glass Standardization

STANDARDIZATION of the different kinds, qualities, and sizes of window and plate glass used as a building material and for many other purposes was discussed at a conference between glass distributors, architects, and engineers of the Bureau of Standards of the Department of Commerce held recently at the Bureau of Standards.

The nomenclature in the glass industry will be studied and an effort made to define trade terms that are likely to be used with various meanings. Data presented at the conference showed that one jobber alone stocked more than 150 sizes of single strength window glass and nearly as many sizes of double-strength window glass. It is believed that the total number of different sizes will greatly exceed this number.

Polished plate glass is now made in thicknesses ranging from one-eighth of an inch to one and one-half inch, with weights per square foot of from two to 20 pounds. But the most commonly used thicknesses are from three-sixteenths to five-sixteenths of an inch. Plate glass can be made in practically any size up to 250 sq. ft., with maximum dimensions not more than 12 feet by 21 feet.

Lumber Standardization

MUCH dissatisfaction with wood in general resulting in the increase of substitutes, can be traced directly to confusion in present trade names. Innumerable letters are written by the Forest Service answering queries as to the differences between two or more woods which were probably the same species, such as, "What is the difference between Arizona white pine and California white pine?" between "tupelo and gum?", between "tamarack, juniper, and hackmatack?", etc.

It is not surprising that there should be a great deal of confusion on this subject when we consider that there are at least 600 different species of trees native to the United States, of which there are approximately 100 softwoods and 500 hardwoods. There are as many as 35 to 40 species of pine, about 70 species of oak, etc. Counting the overlapping of names, the 35 to 40 species of pine alone are known by about 300 common names, or an average of eight names apiece. Longleaf pine is known by at least 29 local or generally used names, loblolly pine 23, western yellow pine 21, *ad infinitum.* The present lumber standardization movement will do much to remedy the conditions mentioned.

An Industrial Use for Periscopes

IN a recent issue *The New York Times* stated that a periscope had been designed for use in a local dry goods store. The office of the power plant engineer is many feet below the street level and the periscope will enable him to observe the top of the smoke stack while sitting at his desk. In this way he may control the feed of fuel, in this case oil, under the boilers. The amount of smoke coming from a stack is a measure of the efficiency of the firemen. When the top of the stack may be seen without leaving the office it will be possible to control the firing within close limits. The idea should be kept in mind by all power plant designers.

THE National Board of Fire Underwriters, Chicago, Ill., announces that the July, 1921, list of Inspected Mechanical Appliances and the Regulations for the Installation and Driving of Fire Pumps are ready for distribution.

Chicago Uniform Working Agreement

THE Uniform Working Agreement to be followed by contractors and union workmen in Chicago was published in full in the October, 1921 *Journal of the Western Society of Engineers,* Chicago, Ill. The agreement is based on the following principles:

1. No limitation as to the amount of work a man shall perform.
2. No restriction on the use of machinery, tools or appliances.
3. No restriction on the use of any raw or manufactured material except prison made.
4. No person shall have the right to interfere with workmen during working hours.
5. The use of apprentices shall not be prohibited.
6. The foreman shall be the agent of the employer.
7. Workmen are at liberty to work for whomsoever they see fit, but they shall demand and receive the wages agreed upon by the Joint Arbitration Board in this trade under all circumstances.
8. Employers are at liberty to employ and discharge whomsoever they see fit.

Why Lumber Is Steamed During Kiln Drying

THERE seems to be a common impression that the purpose of steaming lumber is to "remove the sap." This is far from being the fact, for when lumber is steamed it takes on moisture, as a rule, instead of giving off anything, it is stated in a recent circular from the *Forest Products Laboratory,* Madison, Wis.

The reason for steaming lumber during drying depends on when it is done, but nearly always the treatment is given for one of the following purposes—(1) to heat lumber through quickly at the start; (2) to relieve stresses which otherwise would produce checking, casehardening, and honeycombing; (3) to equalize the moisture content and condition the lumber ready for use at the end of the run; (4) to kill fungi and insects in the wood.

Forest Experiment Stations

MR. Earle H. Clapp, Assistant Forester, U. S. Forest Service, is the author of a recently issued pamphlet on forest experiment stations. It contains 34 pages, is well illustrated and discusses what forest experiment stations have done; what they need to do; why the United States needs them; where they are needed and the cost of adequate stations. Copies may be procured from the Supt. of Documents, Government Printing Office, Washington D. C., at 10 cents per copy.

A REPORT ON SEASONAL LABOR IN THE BUILDING INDUSTRY

THE accompanying "Seasonal Labor Chart" was prepared by the Boston Building Congress and relates merely to the Boston district. It is not to be considered as accurate in minor detail but is as accurate as the available statistics, which are only closely approximate to accuracy and completeness.

The chart refers to organized labor and involves some 26,500 men. If unorganized labor were added the total would probably be at least 36,000 those that are busy in summer. Those that are busy in winter, that is whose high-peak period lies between October 1st and April 1st, are the Steamfitters, Elevator Constructors, Electricians, Sheet Metal Workers and Asbestos Workers. The first three of these extend somewhat over the border line into spring and fall, but the greater part of their work is done in the winter period, for they are all indoor trades. All the others are busy in the summer period, April 1st to October 1st, and

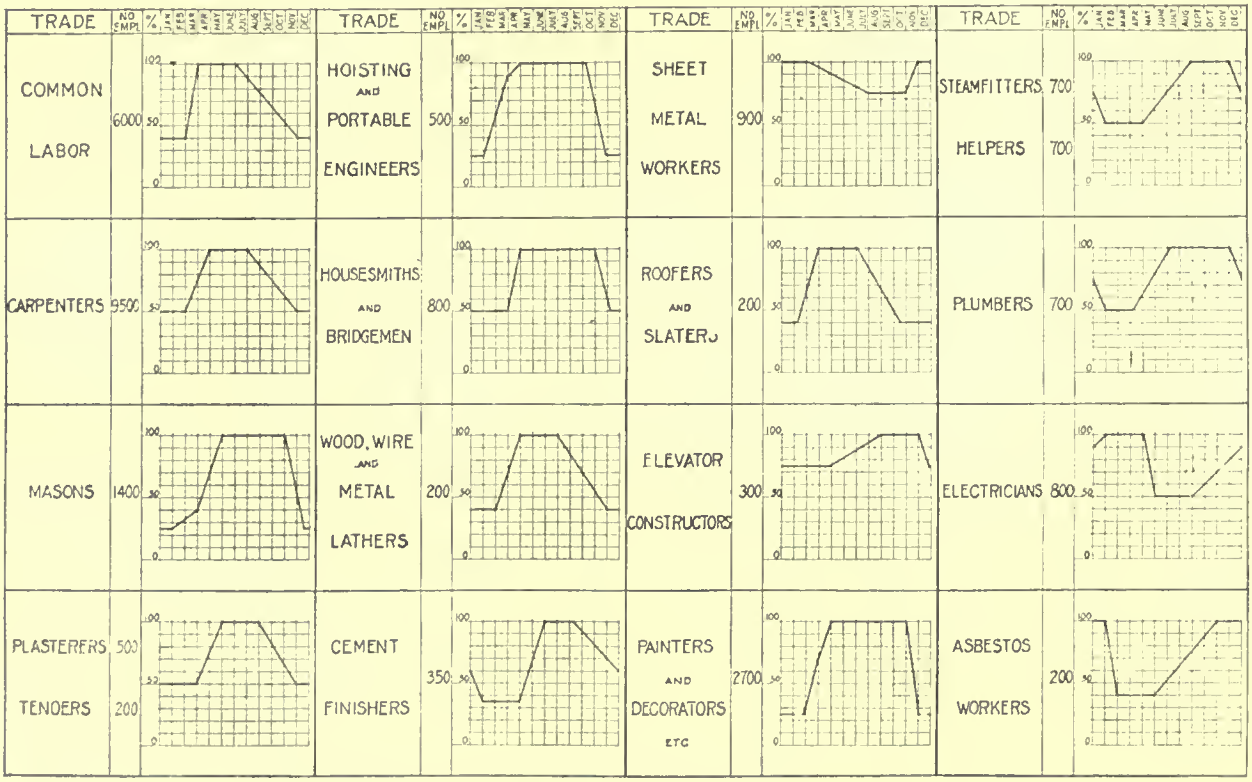


Chart showing Employment Peaks in The Building Industry in the Boston District

and the employment curves would hold for all. The chart indicates that in a normal year there is about enough work, in total, to keep 75 per cent. of the men steadily employed, or in other words, all the men in the industry are, on an average, idle for about 25 per cent. of the time, or 3 months each year. As a labor leader has aptly said, "men are paid by the hour but they live by the year." They must be paid enough in the 9 months they work to support them during the 3 months they are idle.

The chart indicates two fairly definitely marked groups, those trades that are busy in winter and at outdoor trades, with the exception of Plumbers, whose high peak extends into the early winter. Elevator Constructors and Sheet Metal Workers are the most steadily occupied, showing only 25 per cent. unemployment at the low peak.

Painters and Decorators, while they have the longest busy season, have the sharpest drop to 75 per cent. unemployment for three months. They also report the largest proportion of their work is maintenance or repair work, 60 per cent. Suggestions have been made that owners should arrange to have this work done during the normally dull period in these trades, that is, between November 1st and April 1st. Were the work really maintenance or repair work, done to keep the building in the best of condition these suggestions would be valuable. Unfortunately few owners seem to spend much thought on the item of upkeep and nearly all painting and decorating on rented and leased buildings is performed under protest to hold old tenants or to attract new ones. This is the principal reason for the sudden drop about the beginning of November. Many houses are leased in May, the month in which the demand begins for painters and decorators. This keeps them busy until the commencement of regular summer work on new buildings.

Owners and all employers of labor have opportunities for better service during the low-peak periods of employment because there is little, or no, delay in getting labor, for, to quote the report, "the best skilled men are available, their attention to the work is undisturbed, and work is sought by contractors on a smaller margin of profit, all of which results to the advantage of the Owner not only in dollars and cents but in value received. At the same time the mechanics themselves are benefited by steadier employment. The best mechanic will be the man who is most steadily employed at his trade. A mechanic who loafs for three or four months each year is not so good a mechanic when at work as he would be if steadily employed, nor so good a citizen."

Business men, whose life work consists in buying and selling, finding themselves confronted with a dull market have a habit of reducing prices in order to move goods and take care of overhead. Contractors often take work at prices which include no profit in order to keep plant and organization in good condition during dull months. It is better to face a loss of prospective profits than to risk losing invested capital. So the laborers, skilled and unskilled, organized and unorganized are unemployed on an average of 25 per cent. of their time because they hold to fixed rates of pay all the time. When laboring men adopt sliding scales of payment based on the law of supply and demand less will be heard of seasonal employment in the building industry. An appeal to employ labor, merely to relieve distress and reduce waste in the employment of labor is too altruistic for men who live by bargaining. An adjustable wage scale for odd jobs will result in maintenance and repair work being done in the months when the laborers employed on such work are normally idle.

It will be interesting to see similar charts from other cities. The United States covers a territory so vast that high- and low-peak employment will vary considerably from Texas to Minnesota and from Maine to California. The problem of ironing out the curve is entirely local. Advantage cannot be taken of shifting peaks under present social conditions by transferring labor between far distant cities and none but a communist would seriously contemplate such a solution. "Better a half loaf than no loaf" and labor leaders may easily arrange for seasonal reductions in wages so there will be no danger of abuse.

Tests on Concrete Brick

It is reported that the results of elaborate tests on concrete brick in the Testing Laboratories of Columbia University, New York, will be published in the near future. In a preliminary statement made public recently it is pointed out that: "At present the cement and concrete brick industry is handicapped to a material extent by the lack of provisions in the building codes for this new material, but before the necessary provisions in such codes can be made reliable and conclusive test data must be available. The tests now being made will furnish the necessary data."

Powdered Admixtures in Concrete

At no time has greater interest been manifested than the present in the effect of powdered admixtures in portland cement concrete. The high price of cement leads to a desire on the part of some to effect economy by adding materials which will make what is in effect a "blended" cement; many add powdered materials to increase impermeability, while others add hydrated lime to increase "flowability." The Effect of Hydrated Lime and Other Powered Admixtures in Concrete is the title of Bulletin No. 8, Structural Materials Research Laboratory, Lewis Institute, Chicago. It contains an authorized reprint from the copyrighted proceedings of the American Society for Testing Materials, with the discussion omitted. It contains also an appendix on "Further Tests of Hydrated Lime in Concrete." The results of the tests are rather important and a copy of this bulletin should be obtained by every architect, engineer and builder. The general effect is a reduction in strength of concrete at 28 days, approximately in proportion to the quantity of admixture.

City Planning

Students of city planning problems will be interested in Report No. 2, of the Citizens' Committee on City Plan of Pittsburgh. The title is "A Major Street Plan for Pittsburgh." It contains 65 pages with many illustrations and 4 folding maps. A major street plan is described as a system of main routes of travel. Minor streets, in contrast to major streets, are described as of local value and importance; they are tributary to the major streets; and they serve within limited areas. They would serve these purposes better if they were so arranged as to discourage through traffic from using them. This Major Street Plan involves the widening of 108 streets, compared with 98 in Cleveland, 50 in St. Louis and 119 in Detroit, as given in reports from the cities named. The miles of widening are: Pittsburgh 108, Cleveland 190, St. Louis 69 and Detroit 284. The number of new streets will be, Pittsburgh 36, mileage 22; Cleveland 37, mileage 23; St. Louis 21, mileage 17 and Detroit 87, with a mileage of 21.

Concreting in Cool Weather

"STUDIES on Cooling of Fresh Concrete in Freezing Weather" by Tokujiro Yoshida, is the title of Bulletin No. 123, Engineering Experiment Station, University of Illinois, Urbana, Ill. The discussion covering 55 pages, profusely illustrated with diagrams and curves, is of considerable value to architects, engineers and concrete specialists. The cost of the bulletin is 30 cents per copy. It should be studied in connection with Bulletin No. 81, "Influence of Temperature in the Strength of Concrete" by Prof. A. B. McDaniel, the cost of which is 15 cents.

Southern Pine

The Southern Pine Association authorizes the following for publication:

The forests of Southern Pine are found in the South Atlantic and Gulf States, stretching in an almost unbroken belt from Virginia to Texas, and comprising, according to the best available records, at the present time at least 260,000,000,000 feet of standing timber. At the present rate of cutting—10,000,000,000 to 12,000,000,000 feet a year—it would require more than twenty years to exhaust this supply not counting new growth, which has been estimated to exceed five billion feet a year, and which will be much more than that when economic conditions make closer utilization of the forest material possible.

The idea now prevalent in some quarters, that the Southern Pine forests are near depletion, is erroneous. To the contrary, Southern Pine (original growth) is and will continue to be for many years, available in large quantities, in all standard sizes and grades, and well manufactured, though there will perhaps be a falling off in production within the next six to eight years, during which various large saw mills will have cut their timber. These large mills will be succeeded by many smaller mills, which will operate in scattered tracts of timber, which, because of size and location, the present operators found it unprofitable to utilize. Much timber of the best character of virgin growth is to be found in these small tracts, and the lumber produced from such trees will average fully as high in quality as that which is now going to the market, including adequate supplies of dense structural material to guarantee many years of application.

From the best information available, it appears reasonable to expect a permanent supply of Southern Pine of between 5,000,000,000 and 6,000,000,000 feet annually. For at least twenty years the bulk of this production will be from virgin growth; afterward second growth timber will comprise a larger and larger proportion of the output of the industry.

The Housing Shortage

ACCORDING to figures furnished the National Lumber Manufacturers' Association by the Department of Commerce in a special report, the housing shortage in America on October 15 was approximately 1,000,000 homes. The bureau of census gives the normal residential construction as 310,000 structures. However, the report of the select committee on Reconstruction and Production, United States Senate, last March, assumed the higher figure of 400,000 structures. One-fifth of the normal yearly construction must be used to take the place of losses through fire, obsolescence, or alterations for other than residential purposes. Hence, taking the larger estimate of 400,000 houses per year as the normal construction, but 320,000 structures remain in ordinary times to house increased population due to immigration, births and marriages.

Terminals for Freight and Passengers

THE Board of Estimate and Apportionment, New York City, issued, in October, 1921, a preliminary report of a special committee of technical men concerning The Brooklyn-Richmond Freight and Passenger Tunnel, containing a discussion of the problems involved with four large folding maps and profile of the suggested routes.

BOOK NOTES

Architectural Design*

THE use of the spiral in architecture and architectural decoration has been traced to the earliest times. It appears to have developed independently, although not, perhaps, originated independently, in many cultural centers. The Ionic capital, if the general laws of architectural evolution are borne in mind, appears likely to have been developed from some primitive structural form. The evolution of the capital is the subject of an interesting monograph by Mr. Rexford Newcomb, which is a distinct contribution to the subject of architectural design now engrossing the attention of many prominent architects, due to the research of Mr. Hambidge.

A careful study of this monograph is recommended to all architects who regard their profession with the seriousness it so well deserves.

**The Volute in Architecture and Architectural Decoration. By Rexford Newcomb. Being Bulletin No. 121. Engineering Experiment Station, University of Illinois. 77 pp. Ill. 6x9 in. Paper Cover. Urbana, Ill. Published by the University of Illinois. 45 cents.*

Bookkeeping*

BOOKKEEPING is a systematic record of pecuniary transactions to determine whether a business is being conducted at a profit or a loss. The importance of the subject is realized by but few teachers in schools of architecture and engineering. It is regarded as uninteresting by ninety-nine per cent. of the students. It forces an acknowledgment of its great value upon all men in business for themselves, very shortly after they leave a salary status and embark upon the choppy ocean of remuneration by fee. No man can do business who does not keep accounts and keep them properly. In construction work conditions change on every job and systems of bookkeeping adapted to shop and factory accounting are not flexible enough to meet the needs of architects, engineers and contractors. Mr. Frank R. Walker, known as the author of a book on cost estimating and a book on cost keeping for contractors, has sent in for review a small work on accounting systems for men in the building industry. It can be recommended as adequate and the systems described in the book are complete and practical.

**"Practical" Business Methods for Engineers, Contractors and Architects by Frank R. Walker. 2nd ed. 80 pp Ill. 8½x11½ in. Paper cover. Chicago, Frank R. Walker Company. 50 cents.*

Structural Design for Architects*

THE second edition, revised and enlarged, of a book on structural design has been received for review. An extended review is obviously precluded as the author, Colonel McCullough, is now a member of the editorial staff of this journal. From the preface one learns that the author believes that ninety-five per cent. of the work done in the design of structures can be explained to men whose knowledge of mathematics does not extend beyond that taught in High School. (For years in the intervals of a busy professional life he taught in evening schools, prepared men to take examinations in building design in order to receive licenses to practice architecture and was a well known writer on building and general structural design for technical papers.) The work treats fully of building structural design in wood and steel. The title page describes it as a text and reference work for engineers, architects, builders, draftsmen and technical schools; especially adapted to the needs of self-tutored men. The needs of self-tutored men have been kept in mind on every page. In the second edition all errors discovered in the first edition have been corrected, some pages were re-written, numerous cross references inserted and a chapter added on semi-rigid frames.

**Practical Structural Design, by Ernest McCullough, M. Am. Soc. C. E., Second Edition, Revised and Enlarged. 377 pp. 196 Figs. in text. 6x9 in. Cloth. New York, U. P. C. Book Co. $3.00.*

Practical Geometry*

FROM England comes a new book intended as a text book for the architect, surveyor, student and practical men engaged in the various branches of the building industries. It is one in the Directly-Useful Technical Series, which is to embrace books occupying a midway position between college texts in which theory is emphasized and that class of practical books in which theory is ignored. It is a cleverly prepared book on descriptive geometry in which lessons are taken from practical every-day problems. It is a good text for self-tutored men and a fine reference book for draftsmen who get into difficulties with work involving intersections of solids, as well as projections of shadows, etc.

**Practical Geometry for Builders and Architects, by J. E. Paynter, Lecturer in Building Subjects, University of London, and L. C. C. Technical Classes. New York. E. P. Dutton & Co. 409 pp. 376 ill. 6x9 in. Cloth. $8.00.*

FIRST METHODIST EPISCOPAL CHURCH, SOUTH, DALLAS, TEXAS

HERBERT M. GREENE COMPANY, ARCHITECTS

(Reproduced from the original drawing by Hugh Ferriss. *See page 401.)*

SCOTTISH RITE CATHEDRAL, SAN ANTONIO, TEXAS

HERBERT M. GREENE COMPANY, ARCHITECTS

(Reproduced from the original drawing by Hugh Ferriss. See page 401.)

THE AMERICAN SPECIFICATION INSTITUTE

127 North Dearborn Street, Chicago.

BOARD OF GOVERNORS

MEMBERSHIP in The American Specification Institute is divided into four classes, as follows:

1—Active Members are persons who devote their entire time, or a part thereof, to the writing of specifications.

2—Associate Members are testing and laboratory engineers and instructors in architectural and engineering schools.

3—Honorary Members will be persons who have rendered distinguished service to the art or science of specification writing.

4—Patrons will be persons who are eligible to anyone of the first three grades but who have, in addition to the payment of annual dues, contributed to the financial support of the Institute.

Members of the following national societies are, almost without exception, eligible to membership:

The American Society of Civil Engineers.

The American Society of Mechanical Engineers.

The American Institute of Electrical Engineers.

The American Society of Refrigerating Engineers.

The American Society of Heating and Ventilating Engineers.

The American Institute of Chemical Engineers.

The American Railway Engineering Association.

The Illuminating Engineering Society.

The American Society for Testing Materials.

The American Concrete Institute.

The American Institute of Mining and Metallurgical Engineers.

The American Iron and Steel Institute.

The Engineering Institute of Canada.

The Metallurgical Society of America.

The American Institute of Architects.

The restrictions placed on membership, namely, that each candidate must be engaged to some degree, in specification work for building and engineering structures assures a membership with a single purpose—the study and improvement of specifications—and precludes the giving of attention to extraneous matters that might occur if the interests of the members were of a diverse character.

The membership fee is ten dollars and the annual dues twenty dollars, payable semi-annually, the fiscal year being from May first to April thirtieth.

The American Specification Institute is incorporated under the laws of the State of Illinois—not for profit—and is governed by a constitution and by-laws in the customary manner.

As indicated at the head of these columns the control of the Institute is vested in a Board of Governors consisting of five members. An Advisory Committee has been created to assist the Board of Governors in the discharge of its duties. This Advisory Committee will be composed of members representing each technical endeavor and an effort will be made to have each section of the United States represented. Because of the scope and nature of organization and membership of the Institute practically all activities will be conducted by correspondence. However, it is expected that by the first of the coming year a scheme of chapter organization will have been effected so that there may be chapters in all of the large cities or in any locality as soon as the sectional membership warrants them. It is possible at the present time to have chapters in Boston, New York, Philadelphia, Pittsburgh, Detroit, Chicago, St. Louis and San Francisco.

The activities of the Institute are divided into two major classes, viz:, (a) study of materials and methods and (b) study of the elements and the composition of specifications. It is highly desirable that one who writes specifications should know something of the production of raw materials and the methods of finishing and preparing them for use. Such knowledge is informative and possession of it undoubtedly will tend toward a more intelligent selection and use of materials, thus producing more economical construction. The Institute does not propose to undertake the study of raw materials—such as those that enter into the manufacture of steel, for instance—with a view to developing a specification for the manufacture of any certain basic product, but it feels that a knowledge of the physical and chemical properties is, in many cases, quite desirable in order to prevent useless or wasteful attempts to utilize a material that is unsuited or uneconomical for the purpose intended. The activities of the Institute may best be indicated in detail by the following outline:

1. Study of materials.
   a—The production and physical properties of raw materials.
   b—Methods of manufacturing, fabrication and finishing.
   c—Relative value based on appearance, initial cost and maintenance, effect of combinations with other materials and proper materials for various types of buildings of varying grades.
2. Methods of writing specifications.

A study will be made of:

a—The means of accomplishing complete co-operation between the drawings and specifications and determining

What methods of construction and installation should be used;

What the drawings should show or indicate;

What should be omitted for inclusion in the specifications;

b—The development of an outline or checking list.

c—The general contract conditions.

d—Specific requirements governed by local conditions.

e—Use of Standard Specifications of materials as prepared by societies and manufacturers.

f—The arrangement of specifications so as to conform to the sequence of construction and installation of the work.

g—The writing of specifications that are clear, concise, coherent and that can be understood by the courts.

h—The principles of contract law as it affects the writing of specifications.

i—Possible standardization of building codes.

Bulletins are issued by the Institute semi-monthly for the use and criticism of members. When the subject matter of bulletins eventually will become a standard for the members' use, all criticisms are studied with a view to perfecting the original bulletin and it is re-issued until it seems to satisfy the requirements of all members. Each member is given a loose-leaf cover in which all bulletins are filed.

The Institute will, as soon as possible, commence the issuance of a year book which will contain all bulletins issued during the preceding year and other matter of an informative nature that will be of benefit to members.

THE ANNUAL FALL CONFERENCE

THE first Annual Fall Conference will be held on December ninth at the Engineers' Club, Chicago. There will be a banquet in the evening after which papers will be read and discussions held respecting specifications.

It is hoped that this Conference will be an innovation in that all speakers will be asked to discuss specifications frankly and without gloves, and not to pat specification writers on the back to the exclusion of honest criticisms.

A discussion of specifications as viewed by the lawyer, material man, contractor, building superintendent and estimator will present to those present critical analyses from angles of diverse character that should be of very great assistance in shaping the judgment of specification writers.

Although each member will receive a copy of the papers read it is hoped that all members who find it necessary or convenient to be in Chicago or vicinity about the time of the Conference will make it a point so to arrange their affairs that they may attend and take an active part in the proceedings.

The list of speakers and their subjects will be announced later.

NEW MEMBERS

THE following new members have been elected:

Ernest Weyland, Architect, Milwaukee, Wis.

R. J. Gaudy, Engineer, Chicago.

Clinton B. Cook, Architect, Asbury Park, N. J.

Gulick-Henderson Co., Testing Engineers, New York City, Represented by Charles S. Bilyeu.

Frank W. Nicolls, Architect, Brantford, Ontario, Canada.

Robert Marr Price, Architect, St. Louis.

George A. Ferris & Son, Architects, Reno, Nevada.

E. R. Dunlap, Architect, Detroit, Mich.

Fred F. Willson, Architect, Bozeman, Montana.

Josue Smith Solar, Architect, Santiago, Chile.

Richard S. Gregg, Architect, Peoria, Illinois.

Harry J. Reiger, Architect, Springfield, Illinois.

Thos. Farr Ellerbe, Architect, St. Paul, Minn.

Alex. S. Corrigill, Architect, Winnipeg, Man., Canada.

Prospective members and others interested in the activities of the Institute are requested to communicate with the Executive Secretary's office at the above address.

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DANIEL HUDSON BURNHAM
1846 - 1912

THE AMERICAN ARCHITECT
The ARCHITECTURAL REVIEW

VOL. CXX WEDNESDAY, DECEMBER 7, 1921 NUMBER 2382

DANIEL H. BURNHAM—PLANNER OF CITIES*

BY IRVING K. POND, F. A. I. A.

CHARLES MOORE'S tribute to Daniel H. Burnham, Architect and Planner of Cities, cast in the mould of two sumptuous volumes lies before me. The work is a pleasure to the eye in its general form, typography and illustrations; it is pleasing to the mind in its bigness and simple directness. In literary style the work lacks a certain sparkle; but, quite in character with the central figure, there pounds throughout the insistent pulsing of a real force with its rhythm broken now and again by abrupt transitions. Charles Moore comes, in many particulars, more than ordinarily well qualified, to his task, the which, if I read correctly between the lines, was undertaken in a spirit of sincere admiration for his subject. Mr. Moore has had sufficient opportunity to study the Man Burnham at short and at long range over a considerable period of time embracing all those years in which Mr. Burnham was in the public eye. His writing shows in what exalted esteem Mr. Moore held the man. Mr. Moore's participation in the art life of the nation, let me say, rather, in art activities as touching the nation,—for the nation as such has no art life—no art instinct—no art inclination, nor soon is likely to have,—Mr. Moore's participation, then, budded while he was still Secretary to Senator James McMillan in 1889, and flowered with his appointment to the original National Commission of Fine Arts in 1910, when Mr. Burnham was made chairman. His fruit fortunately is still in the gathering.

It was the Chicago Fair, The World's Columbian Exposition, as it was called, that focused the public eye upon Mr. Burnham. His firm, Burnham and Root, at that time was favorably known from coast to coast for the quality as well as the quantity of its output. The designing had fallen to Root, an artistic genius rather, perhaps, than a finished artist, while to Burnham had fallen the task of administration. Root had an eclectic mind and sought various forms and manners of expression. He essayed the Romanesque and did it well. He did not continue in it as it lacked the freedom of movement in mass and line and the sparkle of light and shade which so appealed to him. He tried original forms always based more or less upon the Gothic, but mostly he used forms akin to the Flemish though never servilely but freely, spontaneously and daintily, after his own true nature. It is interesting, though perhaps idle, to conjecture what might have been the artistic development of the work of Burnham and Root had John Root lived to direct the design of the Fair. In her "romantic study of the life of John Wellborn Root," as Mr. Moore lightly characterizes Harriet Monroe's important and well considered work (p.44 foot note) Miss Monroe includes a document, said still to exist in John Root's handwriting, which is essentially the same as the "memorial" said by Mr. Moore (p.37) to have been drawn up by Burnham and presented by him to his confreres for their signatures. In these documents the fourth of the possible lines of procedure suggested was to summon architects from the outside to assist in the design of the Fair (p.39). This suggestion I am quite convinced emanated from Root, who, upon the adoption of the scheme, went East to enlist the sympathies of the selected architects in the affair. Mr. Moore makes slight mention of Root's participation in these preliminaries, making Burnham the principal factor. In the light of my recollection of the gossip of the day, I am inclined to agree with Miss Monroe. But there was honor enough for all in the management and outcome of the Fair and Burnham reaped his full share.

In this work at the Fair Burnham developed that capacity for handling men, and for attaching men to him in bonds of friendship and even of devotion, which marked so strongly his further professional experience. He was an autocrat at the time and necessarily so, and this rankled in the bosoms of some of his co-workers; but the cloud was dispelled before the echoes of the Fair had materially died away. Friendships made at that time (I am drawing on Mr. Moore for the sentiment I am now expressing) were sundered only by

Daniel H. Burnham, Architect, Planner of Cities, by Charles Moore. With illustrations. Two Volumes. Boston and New York. Houghton, Mifflin Company, MCMXXI.

the death first of others, then of Burnham himself. McKim, Peabody, Hunt, St. Gaudens, the older Olmstead, Theodore Thomas, Frank Millet were a few of those who had passed over before Burnham was called. Their words and deeds shine through the pages of Moore's work. The correspondence between Burnham and McKim was voluminous and is interestingly set forth, correspondence touching many subjects and phases from the trials of Commission activities in connection with Washington Plan and Lincoln Monument controversies to the style to be employed in the Washington Cathedral.

Whatever may have been Burnham's stylistic leanings before the Fair, certain it is that ever thereafter he was a convinced if not convincing classicist; and, reading between the lines of Moore's record of their friendship, probably due, (that is, the "convinced" part of it,) mostly to the influence of McKim. In the matter of West Point, Burnham proposed the adoption of a classic style for this military college—the style of peace, poise and repose. Evidently, in the matter of the Washington Cathedral, Burnham, due to a certain inhering religious mysticism, inclined at first to a Gothic expression, but McKim convinced him that there had been no good Gothic for several centuries (and, therefore, could be none now!). Burnham puts this in a letter to Bishop Satterlee, (II p.56 seq)—a most naive document, suggesting that one of his own talented assistants be employed to design a Classic-renaissance Cathedral, and disposing of Bodley and the Gothic thus: "Doing small gems is no proof that the same man could handle monumental work, but, on the contrary, experience has shown that the sort of architect who does the gems never succeeds in large things." Bacon and the Lincoln Monument were to come later before Mr. Burnham's mind's eye!

The entire correspondence makes excellent reading; but, after a careful perusal, including Burnham's letter of November 28, 1906, (II p.60) to the good Bishop, I cannot quite bring myself to feel that any keen sense of humor lay behind the countenance that Zorn painted. (See frontispiece to Vol. I.)

In point of fact all this correspondence seems to indicate that neither Burnham nor McKim had ever philosophically thought through the the matter of an appropriate national expression, either civic or ecclesiastical. Each was following his own temperamental line of least resistance; Burnham in the big theatricalism impressed upon him by the Fair; McKim in the refinement of mass and line which he applied at the Fair as elsewhere. (See Charles Eliot Norton's Estimate of the Fair, p.87 seq.) And speaking of classic, Mr. Moore does scant justice to Chicago's Fairtime City Hall. (p.29.) It did "belong to the classical category." It had no sign of a "mansard roof" and its one order, not at all "puny," and "superimposed" only upon a pedestaled basement, and embracing two full high stories, was crowned with an enriched attic. I have, within a few days now, heard architects of high standing remark upon the noble mass and interesting outline of that particular building. Indeed, it seems completely to have embodied Burnham's theory of design as set forth in his aphorisms* (see that on scale, II pp.168-9). In so far as mere scale is concerned, its successor was no improvement upon it, and in true classical content it was not behind certain commercial structures designed by Burnham and Co.; say one erected in 1910 (II p.212). Referring again to the "aphorisms"; I am inclined to surmise that had I been selecting Mr. Moore's material, I would have omitted that particular one near the top of page 168 and especially the concluding remark: "Then he chuckled and looked wise like an owl." It brings involuntarily to mind Carlyle's characterization of Daniel Webster as "the damnedest deception of the century." "How so?" asked a friend. "Because," replied Carlyle, "God Almighty never made a man half so wise as he looks." I am half inclined to think that the introduction of this aphorism was one of Willis's sly little Polks.

But to return to Moore and his subject. Daniel H. Burnham was a man of great force and broad vision, and sufficiently wise in his generation. He did leave an impress on city planning, and showed his wisdom in urging in all things idealism and breadth of conception. "Never think things in a small way," he might have said; and "do in a big way the little things that one must perforce do" he might have added; the idea might have modified some of his correspondence with Bishop Satterlee. Burnham's scheme for the improvement of Chicago was grand, was magnificent. The Lake Front project was not his originally but he treated it magnificently with breadth of feeling and with beauty. As to the virtue of his conception of the great city lying back of the Lake Front, especially as presented in the wonderful drawings of Guérin and others, there is some question. There are those who believe that the ideal Chicago has not been rightfully interpreted therein; the red blooded democratic American City does not appear; but in its stead stands a Paris out-Parised and garbed in the habiliments of an imperial Berlin. I know that this is partly due to the limitations of a necessarily conventional presentation on the part of the artists and the warning uttered is against the conventionalism and not at all against the idealism of the conception, supposing always that they are not one and the same. I, personally, have real sympathy with the attitude

**The Burnham "Aphorisms" were collected by Willis Polk.*

of mind which gave birth to the cartoon which Mr. Moore reproduces. (II opp. p.70.) It was induced by drawings of huge, formally cut, boxed trees along the Mall, indicating an utter absence of that sense of "scale" so dear to Burnham's heart. That same lack of scale exists in the pictorial presentation of Chicago's ideal civic center, shown incompletely opposite page 18 of the second volume. This alien cast over Burnham's public work, and over much of his private work also, is due to the foreign training, and often alien ideals, of the assistants he gathered about him. This choice he defended in print, disparaging American ideals and training. Herein, possibly, is the key to his attachment to the American Academy in Rome. As I have indicated, he never had thought out America and American expression thoroughly.

Mr. Burnham had the strong personality that Mr. Moore pictures. His friendships with Captains of Industry, with Merchant Princes, with Railroad Magnates, with Financiers, came from the recognition on their part that the elements essential to their successes inhered in him; that had he so desired he would have been a peer in their own realm. Artists were drawn to him because of his sympathetic appreciation of their individual arts—because of his underlying idea of the unity of the arts.

He worked because a primal impulse urged. He was so situated that he could, and he did, exercise his powers continuously in behalf of the community. That in many instances he gave his services without salary or professional fee does not mean that he was not fully recompensed, in so far as creation in art can be recompensed, for every moment he gave outside of the advancement of his profession. Great commissions came to him through the very fact of his public activities, from the Fair down. Instance after instance might be cited. It was a sort of morbid enthusiasm which led the National Commission of Fine Arts to incorporate in its minutes upon the death of Mr. Burnham the following sentiment which finds an echo in the pages of Mr. Moore's volumes: "All of these public services were rendered without compensation, and at a sacrifice not alone of business opportunities, but also of those domestic hours which were the greatest joys of his life." And so on. No Architect, carrying out a commission, large or small, is ever, or expects ever, to be paid for his art—that of himself which he puts into his work. He is recompensed only for the expense of his organization and overhead and receives but a modest increment to himself. Leaders in the architectural profession always have considered the profession as a means to altruistic service. This has been the watchword of The American Institute of Architects from its inception: To benefit the public and the individual.

Mr. Moore mentions the Institute and its services many times in his pages, and states Mr. Burnham's relation to it. He is in slight error in speaking of Burnham's cause for resigning from the body. (II p.148.) It was not a matter of "making sketches without compensation." The paragraph more properly should read: "Confident of the correctness of his attitude, but conscious that he was being manoeuvred into a position whereby he was compelled to violate the letter and spirit of the code by entering a competition which could not receive the Institute's sanction, he preferred to sever his connection with the Institute rather than break faith (?) with his friends and associates in the bank. This he did, but not without grief and chagrin." As I, who now write these words, was at that time President of the Institute, it devolved upon me to deal with this particular matter. I discussed the situation with Mr. Burnham, asking him to withhold his resignation, which had been addressed to me but which, hoping for a better understanding, I had not presented to the Board until peremptorily ordered by Mr. Burnham to do so. At the interview in which he gave his final decision he concealed from me evidences of his grief but not of a certain irritation due to the fact that a professional body had enacted laws which might interfere with an individual's prerogatives. Other members, to my knowledge, have lost more than Mr. Burnham then stood to lose, by remaining in the Institute and upholding its ethical standards. The Institute was grieved at the defection of Mr. Burnham. Mr. Moore has not studied Mr. Burnham's character in the light of this incident nor in that surrounding the cablegram, bearing upon the Lincoln Monument site, which "created a temporary panic among forces fighting for the Plan of 1901." (II pp.121-2.) These two incidents seem not to have impressed Mr. Moore as they did certain others who were in the thick of the fight for a high idealism, and his reaction to them seems not very profound.

As I stated at the outset, Mr. Moore's tribute to Daniel Hudson Burnham is cast in pleasing mould, and in it is incorporated a full and valuable index. But few errors are in evidence in its many pages. May I correct one of importance? Mr. E. L. Lutytens appears as Lutgens (II p.141); and may I ask if the American Academy of Arts and Letters has established a fellowship class? (II p.123.)

But these are small matters in so monumental and excellent a work which will be read with especial interest by one who is at all concerned with the battle which the Fine Arts are waging against sordid and selfish politicians and political interests and hopeless individuals in a land in which, as I have already indicated, there is no national Art life, instinct or inclination. But there is cause for hope when we cast our eyes back over the altruistic acts of the great artists and men of affairs who walk in the pages of Mr. Moore's volumes and think of Roosevelt, Elihu Root, McMillan, Newlands, Slayden, Evans, and others, politicians yes, but politicians with ideals and concerned at heart with the Art of a Nation.

A SMALL CHILDREN'S BUILDING FOR A COUNTY TUBERCULOSIS SANATORIUM

By T. B. KIDNER

INSTITUTIONAL SECRETARY, NATIONAL TUBERCULOSIS ASSOCIATION

BECAUSE the researches of tuberculosis specialists have revealed the fact that the majority of civilized people become infected with tuberculosis in childhood (although in many cases the disease never becomes clinically active), great attention is now being paid to the care of children suffering from, or suspected of having, that dread disease.

For children who are known to have been exposed to infection from tuberculosis, or are below par in their bodily condition and therefore liable to develop it, (the "pre-tuberculous stage"), such agencies as the Preventorium, the Open-Air School, the Open-Window School and the Summer Camp have become fairly familiar. All these agencies are, however, only for children who are not "active cases"; that is to say, even if the primary infection has developed conditions which enable a skilled physician to make a definite diagnosis of tuberculosis, their presence in one of these special institutions, or classes, would not necessarily be a menace to the other children. At the same time, once a definite diagnosis has been made, the child should be given proper treatment, even if he (or she) continues to attend one or other of the school agencies named above.

If, however, the child's condition is such that, either because of his weakened condition, or because of the presence of infective bodily discharges, he must receive constant medical and nursing care, his removal to a properly equipped hospital of some sort is imperatively indicated.

To meet the need of accommodation for such cases, Children's Wards in general hospitals, and in tuberculosis hospitals and sanatoria, have been established in many urban centers. Outside of the cities, the responsibility for the care of such cases usually devolves on the county medical authorities. This responsibility can be met by the provision of a Children's Unit at the County Hospital or the County Tuberculosis Sanatorium, and it is the purpose of these notes to make some suggestions for the planning of such a unit.

The floor plans shown in the accompanying illustrations were prepared with the idea that they might serve as a basis of discussion, and for the instruction of architects, by sanatorium authorities, undertaking the provision of a Children's Building.

In the writer's experience, the architect who is called upon by a Sanatorium Board to design an institution is faced with one of two dilemmas (though perhaps that is rather a harsh term); namely, either he is given no instructions whatever, or, through the influence of some local faddist, is given such minute, fixed details as to render it most difficult for him to approach the problem in the proper spirit.

Comparatively few architects throughout the country are called upon often enough to design hospitals or sanatoria to specialize in that field. Only "once in a blue moon" in the general run of practice is the average architect called upon to design a tuberculosis sanatorium, or other building for the institutional treatment of the disease; and, when a commission in that line does come along, sources of information on the subject are all too few.

It is trite to say that, as in any other kind of building, the designers must know thoroughly the purpose and the routine of administration of a building in which tuberculosis patients are to be treated. The difficulty is, however, that as the knowledge of the disease advances, corresponding changes are constantly being made in buildings and equipment.

For example, no authority on tuberculosis sanatorium construction today would countenance the erection of the flimsy type of building, all too appropriately termed "shacks," which up till a very recent period, were considered quite suitable for the housing of tuberculous persons.

To meet the need of many architects for competent advice on the subject, the National Tuberculosis Association maintains an Institutional Construction Advisory Service which, with its files of blueprints, is freely at the disposal of any one who is concerned with problems of the planning and equipment of structures to accommodate any and all of the various types of patients found in institutions for the treatment of tuberculosis.

The floor plans shown, then, are merely suggestive, but in conjunction with the notes will, it is trusted, be of some service to the readers of this journal.

Obviously, the service and auxiliary sections are somewhat compressed; the isolation quarters being quite small. It is believed, however, that all essentials are included in the plans shown and that, as indicated above, they may form the basis of instructions rather more definite than an architect usually receives from county hospital or sanatorium authorities.

Capacity of Building

Thirty children can be accommodated at one time; twenty-four on the first floor, (six each in four rooms) and six on the upper floor, (three on each side of an open ward, divided by a partition to separate the sexes.)

The three additional beds shown in the isolation section cannot be counted upon to increase the capacity, as they must be kept ready for emergencies.

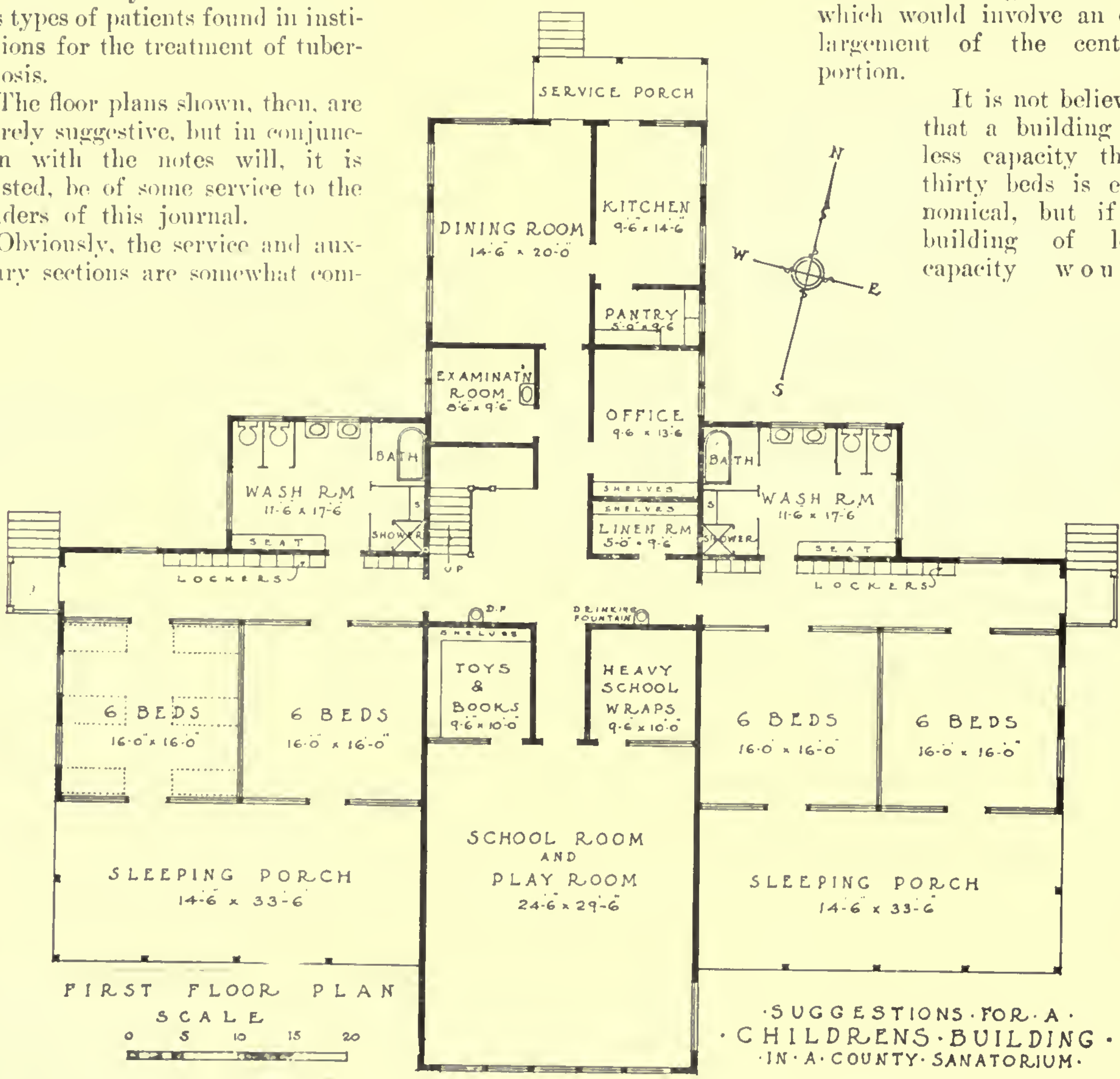
The capacity of the building could be increased by adding another room at each end on the ground floor, which would involve an enlargement of the central portion.

It is not believed that a building of less capacity than thirty beds is economical, but if a building of less capacity would serve, the plan might be re-arranged so as to provide all the accommodation on one floor.

It is scarcely necessary to say that all buildings in which bed patients are accommodated must be of fire-proof construction; although composite or slow-burning construction may be permissible in buildings of one story.

First Floor Accommodation

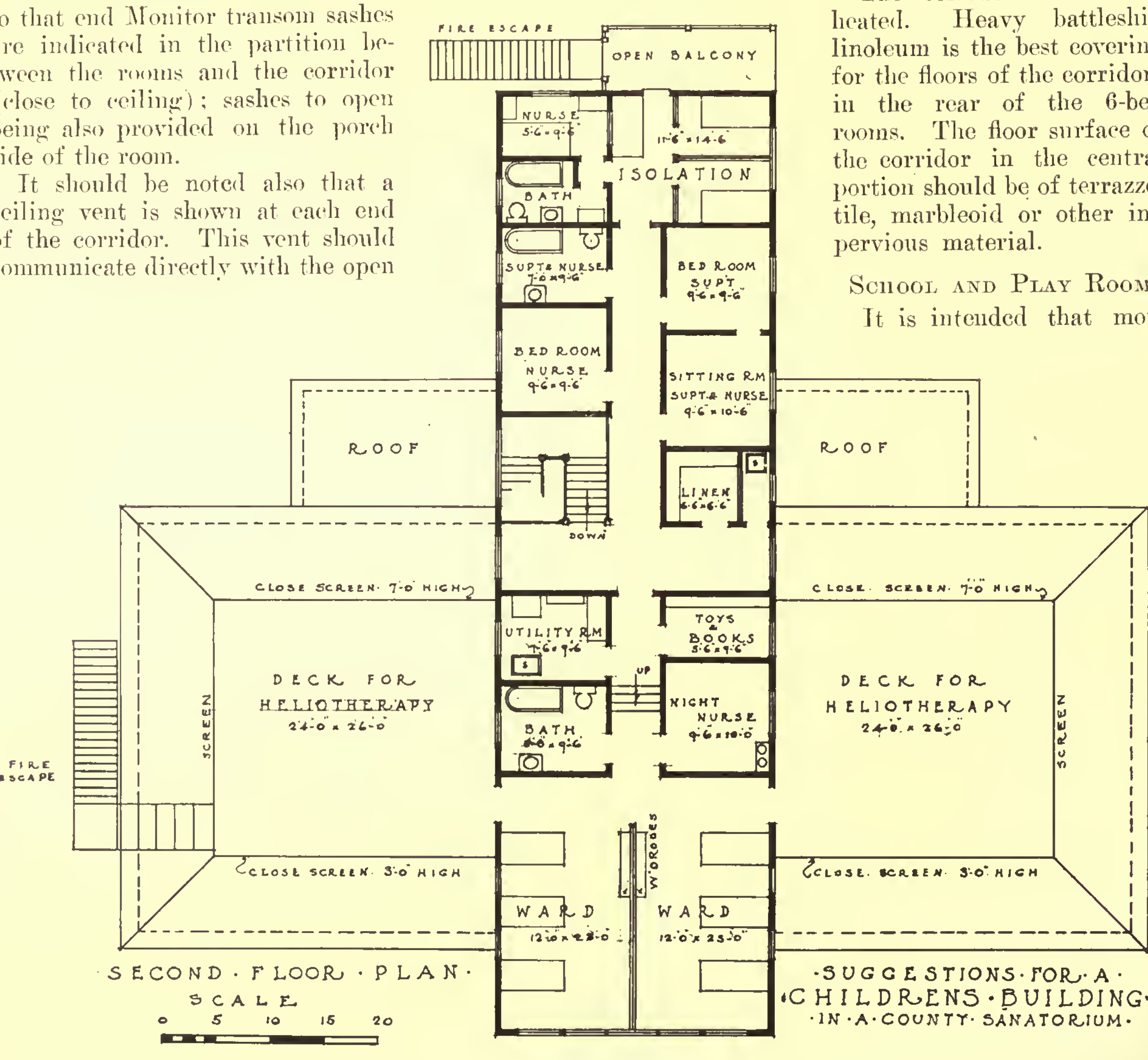
It is intended that boys shall be accommodated in one wing and girls in the other.



Bedrooms

Except in very severe winter weather, the children will sleep on the porches, but the doors of the 6-bed rooms must be wide enough (3 feet 6 inches) to allow for the cots being wheeled into the rooms for dressing, preparation for going to bed, etc. Radiation should, therefore, be provided in the rooms. Threshold strips must be omitted from the doorways. It should be possible, however, to flush the rooms with fresh air and to that end Monitor transom sashes are indicated in the partition between the rooms and the corridor (close to ceiling); sashes to open being also provided on the porch side of the room.

It should be noted also that a ceiling vent is shown at each end of the corridor. This vent should communicate directly with the open air; the exterior opening being covered with one of the several devices on the market for preventing a down draft.



The best material for the floor covering of the 6-bed rooms is heavy battleship linoleum, cemented all over to the concrete floor surface.

The partition between the two rooms should be glazed, (fixed sashes) from a height of 4 feet 6 inches above the floor to the ceiling.

Sleeping Porches

The sleeping porches should be properly screened to exclude flies and mosquitoes. Canvas shades are necessary to exclude the sun in hot weather, but should not extend completely to the top of the openings, so as to interfere with the ventilation.

Smooth concrete, or concrete finished with one of the mastic or other surfacing compositions, is suitable for the floors of sleeping porches.

Corridors

The corridors should be heated. Heavy battleship linoleum is the best covering for the floors of the corridors in the rear of the 6-bed rooms. The floor surface of the corridor in the central portion should be of terrazzo, tile, marbleoid or other impervious material.

School and Play Room

It is intended that movable desks of the Multhrop, or similar, type shall be used for school purposes and pushed to one side when the room is used for play and recreation. It should be noted that no window is provided on the west side.

The floor of the school room may be either of hard wood, laid over the concrete; or, preferably, of heavy battleship linoleum.

Janitor's Closet

No janitor's closet is shown on this floor but could well be placed under the stairs, provided that a vent to the outer air is installed.

Office

If it be deemed necessary, the room marked "office," might be equipped as a small operating room; the surgeon's scrub-up sink, the sterilizer and a hopper sink being installed on the side of the room next the linen room, and the operating table in front of the window.

It is better, however, that operative cases should be taken to the main operating room of the institution; except in a children's unit of large capacity, when a special operating room might be justifiable.

A still better plan is to arrange that cases requiring operative treatment should be removed to the local general hospital for the operation, and for the period of surgical convalescense, the case to be returned to the sanatorium for the prolonged treatment.

Kitchen and Pantry

The floors of these two rooms should be either of concrete finished with mastic or other smooth surfacing composition; or of quarry tile.

Dining Room

The remarks with regard to a suitable floor for the School Room apply also to the Dining Room.

Note: It is not good practice for children to take their meals with adult sick persons in the main dining room of the institution. Quite apart from the great amount of work involved in putting on outer garments, rubbers, etc., in wet or winter weather, the effect on the children of contact with sick adults is not desirable. Therefore, it is better to arrange the building so that the children live in it entirely.

Fly Screens

All windows and other external openings must be properly screened.

Windows

The best form of window for a sanatorium is one in which the sashes are pivoted on the sides to open outwards, the wire screens being inside. Sashes opening in this way can be kept open in stormy weather longer than ordinary sliding sashes or casement type windows, without subjecting the inmates to a direct draft.

Height of Ceilings

With the exception of the School Room, all rooms on this floor should be not less than 11 feet in height.

The School Room ceiling must be about two feet higher than the rest, so as to allow for patients in the infirmary wards on the second floor being wheeled out on the level to the decks for heliotherapy treatment.

Note: Pulmonary tuberculosis is not common amongst children, the bulk of the cases requiring hospital treatment being sufferers from glandular and bone tuberculosis. In the treatment of these forms of the disease, great reliance is placed on exposure to the direct rays of the sun, unimpeded by glass; hence the necessity for the provision of suitable space in which such treatment can be given. It will be noted from the plan that the decks are screened from the north wind and that the screens at the ends are diminished gradually to meet the front balustrade, or screen, which is about 3 feet high.

Because patients taking sun baths are generally naked, (with the exception of a breech clout) the space for heliotherapy treatment should always be arranged so that it is not in sight from the other parts of the institution.

Second Floor Accommodation

Front Portion

This part of the upper floor forms the infirmary unit for children confined to bed. The patients' quarters consist of one large room, divided into two wards, (Boys and Girls), by a partition six feet high as shown in the plan.

On each side of the room is a level deck where the sun treatment can be given.

The usual nurses' and service rooms are shown in the plan.

Rear Portion

This part of the upper floor contains the living quarters for the staff; also a small isolation section for cases of infectious disease which may develop in the institution, or for the observation of a suspicious case on admission.

Fire Escapes

Two are necessary; one on the rear and one on the side, as shown in the plans.

Note: The foregoing article was contributed by the Institutional Construction Advisory Service of the National Tuberculosis Association, which is the national headquarters of the fight against tuberculosis in this country. From Thanksgiving Day until Christmas there will be conducted the annual Christmas Seal Sale, which provides the funds for the local, state and national educational work which is slowly but surely ridding the United States of the "Great White Plague."

SOME FUNDAMENTALS IN HOSPITAL PLANNING--PART I

BY HENRY C. WRIGHT

THE planning of a hospital involves many and diverse problems. If the trustees of a proposed hospital were able to place in the hands of an architect a schedule of requirements the task would be somewhat simplified. Seldom, however, are trustees able to submit a complete list of their needs. This arises from the fact that the trustees are usually busy business men, little accustomed to measure social and medical needs and also from the fact that the members of the medical staff at times measure needs in terms of their own interests.

The writer recently, in endeavoring to formulate a hospital program for the trustees, noted that the existing children's service was unusually small, and the medical staff did not propose to increase it materially in the new hospital. This was due to the fact that the staff did not contain a pediatrist, and did not intend to add one; the general surgeons and internists were not especially interested in children. Nevertheless, the new hospital should meet a community need by furnishing more beds for children. If the staff contains a specialist in X-ray, commodious accommodations will be asked for. If no such specialist is on the staff, the X-ray needs are likely to be under-emphasized.

Regardless of the needs of the community, occasionally the staff will argue against a dispensary, since they are loath to give their time to it, and because it may tend to lessen the private practice of some doctors.

Owing to many factors similar to those above referred to, it is difficult to determine what the hospital should be in variety and size of services. For these reasons, not infrequently an unsolved problem is thrown over to an architect, which places him in a difficult position. His only recourse is to insist that the trustees appoint a special committee from the medical staff who shall be responsible for voicing the needs of the staff as a whole. After he has received their recommendation, he will endeavor to estimate the probable income from the proposed wards and private room patients, weighed against the probable operating costs. These facts the trustees should have in hand as a basis on which to determine their probable resources and liabilities. In presenting the case to the trustees, the architect should not only try to adjust the character of private rooms to the class of patients likely to patronize the hospital, but he should also measure the probable reduction in operating costs of an additional expenditure for toilets and lavatories designed to reduce the labor of nurses. A bath in connection with a private room may be considered a little-used luxury. A toilet, however, is not only serviceable to the patient, but also saves many steps for the nurse.

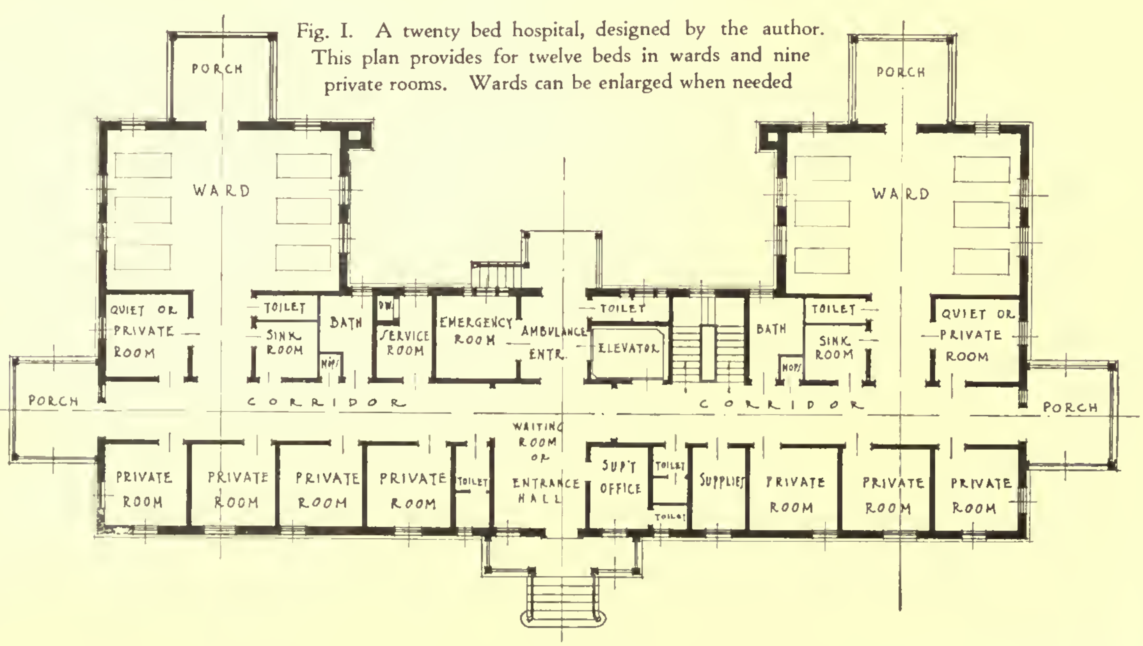


Fig. I. A twenty bed hospital, designed by the author. This plan provides for twelve beds in wards and nine private rooms. Wards can be enlarged when needed

These may be placed between rooms, and be used alternately by either room, but are at all times of service to the nurses.

A nurse serving six patients from seven to eleven a. m., will walk on an average from 4,000 to 7,000 feet. A proper location of service facilities may greatly reduce the time and distance necessitated in such service. A duplication of service rooms and facilities may mean added cost to the structure, but will greatly reduce subsequent operating costs. Thus, a general policy as to costs must be determined by the trustees.

Basement plan of a twenty bed hospital

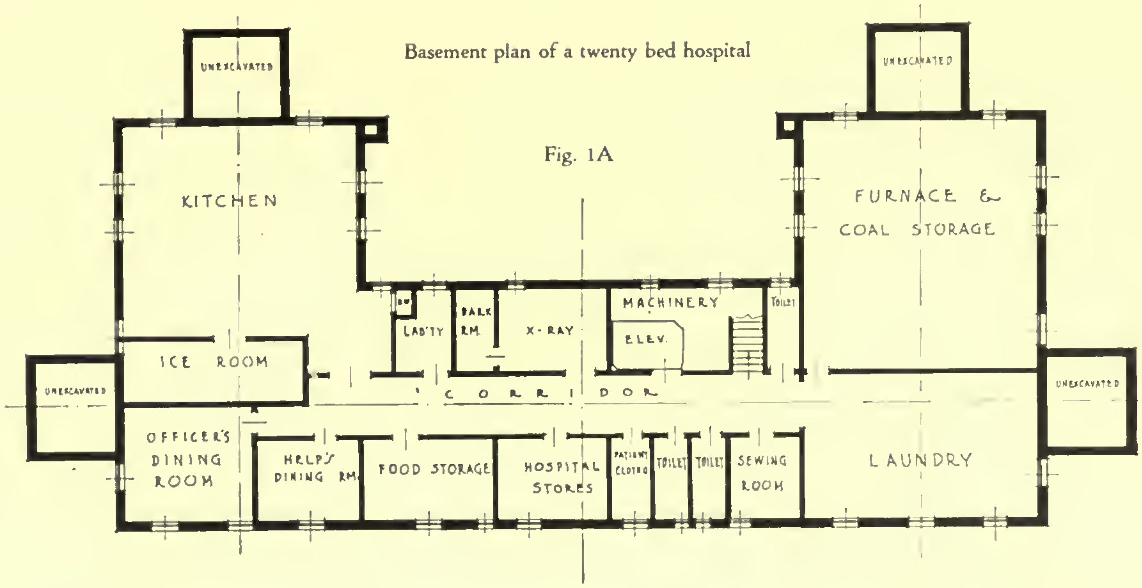


Fig. 1A

Second floor plan of a twenty bed hospital

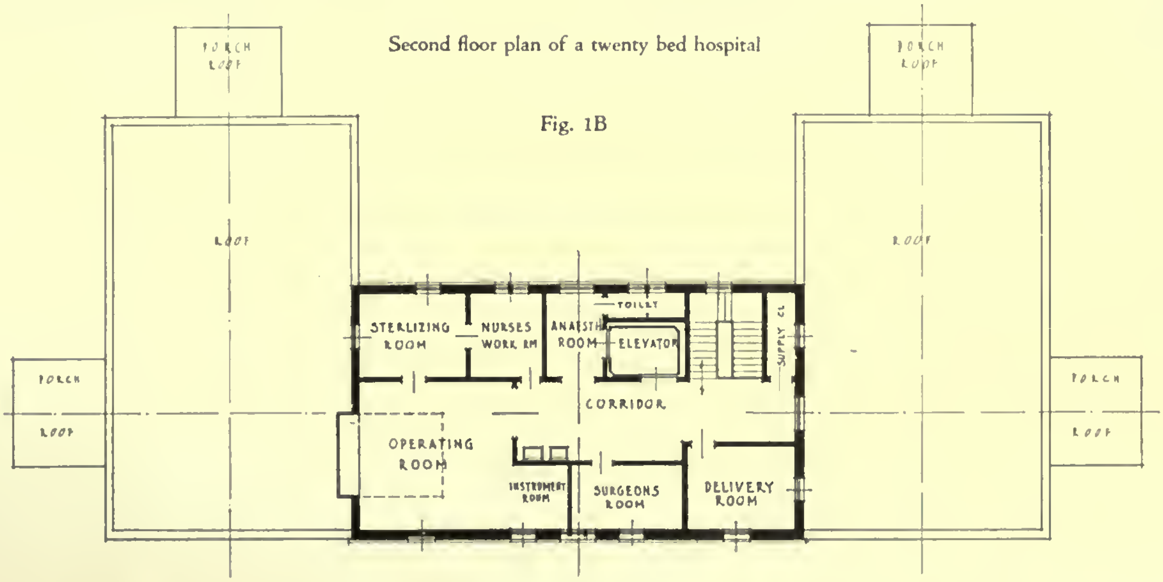


Fig. 1B

In many regards a large hospital is easier to plan than a small one, since in a large hospital all modern diagnostic facilities will be adequately provided for. In a small hospital, most of the facilities usual to a large hospital are needed, yet the funds are so limited that the spaces must be used jointly for two or more services. For instance, in one small hospital the writer visited, the X-ray machine was in a room used also as the superintendent's office. This location was not a serious handicap, since the superintendent was also the X-ray operator. In most hospitals under fifty beds, the superintendent, a woman, is superintendent of nurses, instructor of nurses, operating room nurse, X-ray operator, and general plant manager. When a hospital is so headed, facilities may be more readily combined, since but one facility is used at a time.

Having determined the general character of the hospital to be built the architect can then give attention to arrangement of entrances, administration spaces, laboratories, food service, auxiliary rooms and all the many and complex details of arrangement and accessories.

Entrances

ENTRANCES and exits should be as few as practicable, in order more easily to control the exit of employees. The main entrance for visitors, when possible, may be in two places, one for the visitors to ward patients and another for visitors to private room patients. If two entrances be provided, they should be so arranged that they will converge on one information desk. If this be not done, additional clerical help will be required. A dispensary entrance should be separated from the main entrance, and yet in a prominent and easily accessible place. Where feasible, it is advisable to provide another entrance for patients walking to the hospital. This entrance should, if possible, lead to an admission service, to which an ambulance entrance also leads. The ambulance entrance in small hospitals should be adjacent to the dispensary, so as to reduce nursing service. The ambulance entrance should be shielded from the view of the public, and also from the patients in the hospital. Likewise, the door from which bodies are removed by an undertaker. A service entrance should be, if possible, in the rear of the hospital,—at least out of view of the street. An endeavor should be made to have the service entrance far removed from patients' quarters.

The ambulance entrance should be so placed that the visiting public will not come in contact with it. Patients being removed from an ambulance always attract attention, and will cause a congestion of people if they have access to the ambulance. Removal of bodies from the wards to the morgue should be likewise guarded. Where possible, these functions should be performed on a floor below that used by the visiting public. If such arrangement can be made, on this floor also all transportation of supplies can take place.

Waiting Spaces

WAITING spaces are of prime importance. Most hospitals have designated visiting days for ward patients. On these days friends of patients frequently come to the hospital long before the hour for visiting. If insufficient waiting room be provided, the friends will collect about the door, creating somewhat of a nuisance, and in inclement weather they may suffer. In communities where many foreigners come as patients to the hospital, it is advisable to provide a general waiting room with a seating capacity about seventy-five per cent. of the ward capacity of the hospital. In this waiting room, should be the information station. Entrance from the waiting room to the wards should be controlled from this information station. In addition to the general waiting room, there should be two to four waiting rooms or alcoves wherein friends may wait during an operation.

Adjacent to the entrance for the friends of private patients, should be at least two waiting rooms. These need not be large, since visiting to private patients is not restricted to special days or hours. Thus, their friends do not come at any one time in large numbers.

On each floor of a private pavilion, should be additional waiting alcoves wherein friends may wait in case a patient cannot be seen as soon as the friends arrive.

Telephone booths should be available to all waiting spaces on the lower floor.

Administration Spaces

ADMINISTRATION spaces in size will, in the main, be in proportion to the size of the hospital. In a hospital under fifty beds, one fair sized room will answer the purpose of all administrative functions. Accounts and records are usually very limited in a hospital of this size. Larger hospitals require a separate room for accounts, one for records, and various offices for the assistant superintendent, dietitian, housekeeper, social service, superintendent and assistant superintendent of nurses, etc. In short, the scheme of administration and management must be scheduled before the spaces can be allocated.

Food Service

TWO primary considerations should be kept in view in planning the food service for a hospital. It should be so arranged, first, that the food will get to the patient hot; second, that there should be as little waste as possible in labor and food.

The kitchen should be located centrally as regards the patients, and also adjacent to the kitchen should be the dining room for the officers and help. In a small hospital the patients' trays can be set up in the main kitchen and delivered from there direct to the patients. In a large hospital, owing to the distance of the patients from the main kitchen, it is necessary to adopt some other method of food distribution. The food may be carried in thermos trucks from the kitchen to the patient, or it may be taken to food service rooms adjacent to each ward. In these rooms the trays are set up, and from there delivered to the patients. A decision must be reached as to the method that is to be employed before plans can be made.

The place and manner of washing dishes is another function which must be determined. They may be washed by hand in each food service room, or transferred from and returned to the main kitchen and there washed in a power washer. The method to be employed will condition the plan both of the main kitchen and the food service rooms.

Again, a decision must be reached as to whether the food, after it is taken from the range and pending the time it is to be served, is to be kept hot in steam tables or in thermos containers.

In determining the set equipment of the food service rooms, another question must be decided; viz., where special diets are to be prepared. If they are prepared in the food service rooms by nurses or maids, a suitable equipment in refrigerators, stoves, etc., must be provided. If they are prepared and sent from the main diet kitchen in or adjacent to the general kitchen, less equipment will be needed in the food service room.

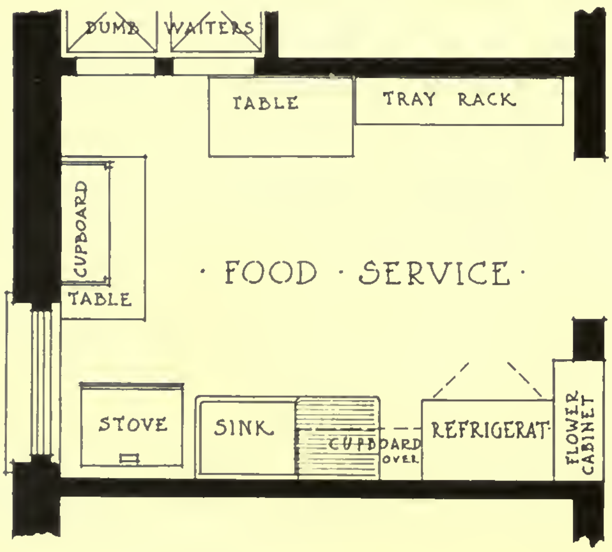


Fig. 2. This food service room assumes a service of food by means of Thermos boxes, making its equipment very simple. Flower cabinet opening into the corridor is backed against the refrigerator by which it is cooled

The foregoing matters must be decided before the main kitchen or the serving room can be planned. One factor, however, remains constant; viz., that room must be provided adjacent to the wards for the bedside trays, cutlery, condiments, napkins, etc.

The architect should raise each of these questions, and receive a decision, preferably in writing, from the hospital authorities. The writer is familiar with one expensive hospital recently built, which found it necessary to expend several thousand dollars to modify its system of food distribution. The system provided for in the plans was unworkable.

Laboratories

FOR diagnostic purposes, small hospitals need about the same laboratory facilities as do large ones. The small hospital, however, cannot afford the space for such purposes, as can a large hospital. Thus, in a small hospital it becomes necessary to use one space for several functions. In a very small hospital it is feasible to place the X-ray equipment in the room used for the superintendent's office by somewhat enlarging the room, and providing a rolling partition. Such an arrangement, however, is not desirable if a separate room can be afforded. The minimum requirement is one room, to be used for radiographic, fluoroscopic and cystoscopic work; adjoining this should be a dark room and stock closet. According to the needs of the hospital and the funds available, these should be expanded to include separate rooms for treatment, fluoroscopic work, cystoscopic work, fracture setting, view, preparation, office, records and library, stock room, plate storage, waiting room, dressing booths.

Pathologic laboratory work should have the same range in a small hospital as in a large, but it is impracticable to afford either the space or equipment in a small hospital as provided in a large one. The minimum requirement is one room with a sink, table, refrigerator and gas. In this room the usual routine determinations, including blood counts, can be made. Little beyond this is likely to be done, since the work is usually carried on by an attending member of the staff. A hospital of from one hundred to two hundred beds should have at least the following separate rooms for pathological work: chemistry, bacteriology, metabolic work, routine work by the house staff, office, records, museum, animals, a refrigerator accessible from the corridors, where nurses and house staff may secure culture media and deliver specimens at all hours.

Autopsies are seldom performed in a small hospital. A large hospital should have an autopsy room provided with a suitable table with drain, an ample sink, a cupboard for containers and instruments.

(To be continued)

Doorway in Bristol, Rhode Island

(See reproduction of original drawing by O. R. Eggers on opposite page)

BRISTOL, R. I., in the opinion of many antiquarians, is located on or near the site where the Northmen in the year 1,000 and later, built the dwellings mentioned in the Icelandic Saga.

This picturesque town on Narragansett Bay was first settled by the whites in 1680 and was incorporated as a town in 1746. It is, therefore, among the oldest of our New England settlements. The boat building industry has for many years flourished in Bristol, and the inhabitants, many of whom can trace their ancestry to the early settlers, have maintained, as far as possible, all the earlier characteristics of this interesting town.

The doorway sketched by Mr. Eggers and presented on the opposite page, is typical of the large amount of good architectural detail in Bristol that has survived the many changes that have there been made.

A DOOR-WAY IN BRISTOL, R. I.
THE AMERICAN ARCHITECT Series of Early American Architecture

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PRACTICAL PROBLEMS IN ARCHITECTURAL PRACTICE

Richard E. Schmidt, an accepted authority on hospital design, interestingly refutes the statements of a hospital superintendent, whose experience should have led him to wiser conclusions

To the Editor, "THE AMERICAN ARCHITECT"
Sir:—

During the course of an article entitled "Planning a Hospital Synthetically" contributed to the August issue of *The Modern Hospital,* Mr. Louis J. Frank, superintendent of Beth Israel Hospital, New York City, states as follows:

"In the construction of the hospital, it seems to me that the architect should serve in the capacity of a consultant. By this I mean that the architect should be instructed exactly as to what we desire, rather than that we should be compelled to mould ourselves into quarters which he may think suitable for us. An architect is a theorist. He can see to it that the structural lines are consonant; that there be no medley of Doric, Ionic and Corinthian columns, that the sense of artistic proportion be satisfied, that grace and beauty and service be planned to make a harmonious whole. But he is unacquainted with the practical work of the hospital kitchen, the X-ray department, the operating room, the wards, etc. He cannot conceive of the importance of little things which make for efficiency, of the interrelation of the various departments, of the proper division of each department into its compartments."

Not one of the many Architects in this country would willingly rest quietly under an aspersion so unjust and a statement so very wide of the facts. Mr. Frank's statement that the Architect is a theorist and "that he can see to it that there may be no medley of Doric, Ionic and Corinthian columns" indicates considerable ignorance regarding the functions and duties of the Architect. If he holds that belief after having seen the Woolworth Building, the Pennsylvania Station and other well known New York buildings, he will have set a measure of his capacity to understand.

Has he any conception of the arduous labors intervening between the first sketches and the completed building?

To the Architect in successful practice it sometimes seems as though it was all business and no theory, not to mention but little of æsthetics, and while it is obvious that the Architects engaged should be instructed in the requirements and purpose of the building, they will not lose sight of the proportionate values; that is, of the larger problem of efficiency and operation and comfort of patients while studying the detailed requirements of the scullery. Such instructions cannot be formulated by the average hospital superintendent, because of the limitation of his experience and knowledge; nor can they be rigidly adhered to after being drawn.

Every project (especially so the hospital) has limitations as to funds, site and purpose and this cannot always be moulded to fit the rigid program.

Mr. Frank's intimation that Architects unacquainted with hospital details would remain in ignorance is an aspersion of the order of the remainder of his remarks.

Buildings are constantly being promoted and erected that are absolutely unique inasmuch as they are the first of their type to be built. The perfection of their detail and their adaptability to the purpose of their erection have always been the result of the thoughtful and competent ability of the Architects to design them, and their excellence has been widely proclaimed. This experience in new types of buildings is constantly being had by every large architectural office in this country. Each has been a model of its kind, and has served as such for every subsequent development of a similar type.

The Architect unfamiliar with hospital practice must obviously familiarize himself with its numerous details. Every Architect experienced in this very technical specialty has been trained to analyze all the elements of convenience, economy of arrangement and operation of the various structures, the result of his creative work. It is quite obvious that Mr. Frank fails to understand that experience teaches the Architect to apply his knowledge to any of the problems of every kind of building in which he engages, and enables him to produce a logical, orderly, convenient, workable building of any character which he may undertake.

It is this experience in many different buildings of the same type that creates the expert Architect. This wide training enables him to visualize space requirements without employing the kindergarten methods of so-called hospital experts in the furnishing of a room or a sequence of service rooms, a method which Mr. Frank states he has used and warmly recommends.

Just now when time is such an important factor in every building operation and means money in a more important sense than it ever has before, a greatly increased demand exists in every type of building for expert knowledge based on the most practical experience. The man who has all these facts and this wide experience at his command, who has available records and data of past performances to which he can instantly turn, who knows, as he knows his multiplication table, the dimensions of apparatus, their uses, rates of production, and every one of the intricate details that enter into the daily operations of every hospital building, is enabled to work with absolute certainty and save for his clients large sums of money that are always wasted through protracted and preliminary study of problems which he should know off-hand. Further, while conserving every element of time, the Architect who specializes in any type of building is able to bring to the solution of his problems such innovations and large improvements as his wide technical knowledge will suggest.

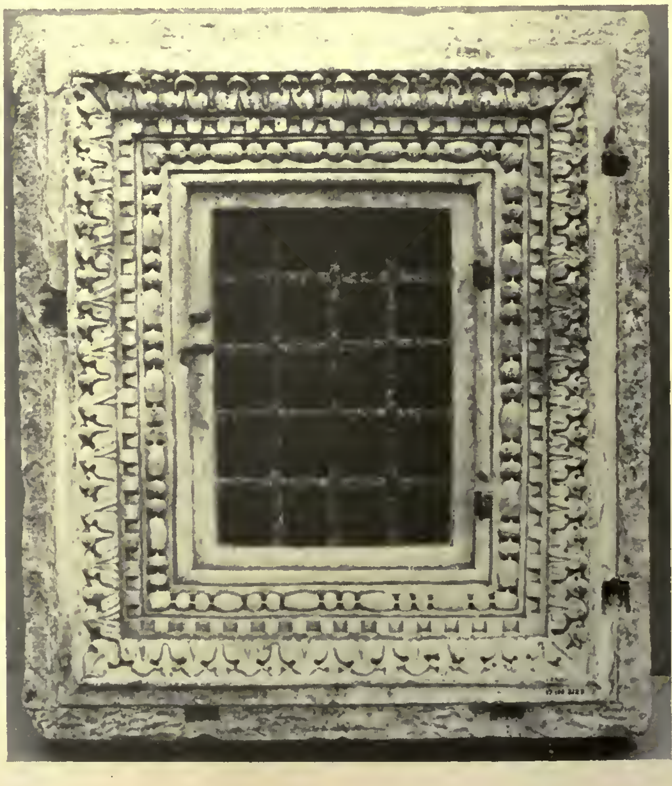
It is quite clear that Mr. Frank fails to grasp the real function of the Architect, or his ability actually to visualize his structure in three dimensions and to live the part of the technical operator or occupant of the structure that has been given to him to design. It may be a hotel where the management seeks to inaugurate new methods of service, a theatre with all the various complications with which the modern theatre building surrounds itself, a rolling mill adapted to new forms of machinery and the efficient and quick handling of unwieldy billets of iron, or a home in which the Architect hopes to lead the occupants along the lines of modern domestic life and those refinements which every Architect knows have done so much to elevate the domestic standards of the American people. And it may also be a hospital. And if it is a hospital, the Architect must be able to visualize and mentalize the cold, calculating, businesslike attitude of those who operate these institutions, and the nervous, timorous condition of the patients who are treated there, and, moreover, it is fortunate that those connected with hospital management throughout this country, do not share the same opinion as to the value of the Architect's services, as advanced by Mr. Frank.

Today the modern hospital is a refuge for all classes and conditions of the people. They know that they may find there the most expert medical service, the most complete arrangement for their comfort and well-being; the gruesomeness, and even horror, with which a hospital was regarded not more than a quarter of a century ago, has been transformed into an attitude of confidence on the part of the incoming and outgoing patients.

It is not too broad a claim to state that all of these desirable conditions have been largely brought about through the careful consideration and the very deep mental study that every Architect who has specialized in this type of building, has given to his work.

RICHARD E. SCHMIDT.

ITALIAN XV CENTURY WINDOW



Constructed of Marble and Iron

HOUSE OF LELAND H. ROSS, MADISON, N. J.

BEHR & SMITH, ARCHITECTS

4 30'

HOUSE OF LELAND H. ROSS, MADISON, N. J.

BEHR & SMITH, ARCHITECTS

430²

HOUSE OF LELAND H. ROSS, MADISON, N. J.

BEHR & SMITH, ARCHITECTS

4303

HOUSE OF LELAND H. ROSS, MADISON, N. J.

BEHR & SMITH, ARCHITECTS

4304

HOUSE OF LELAND H. ROSS, MADISON, N. J.

BEHR & SMITH, ARCHITECTS

430 5

DETAIL OF DOOR IN HALL

HOUSE OF LELAND H. ROSS, MADISON, N. J.

BEHR & SMITH, ARCHITECTS

4 30 6

MORNING ROOM

HOUSE OF LELAND H. ROSS, MADISON, N. J.

BEHR & SMITH, ARCHITECTS

ST. FRANCIS HOME FOR ORPHAN BOYS, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

ST. FRANCIS HOME FOR ORPHAN BOYS, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

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DETAIL, EAST FACADE—WOMAN'S ART BUILDING, INDIANAPOLIS, IND.

CHARLES W. NICOL, ARCHITECT

4 30"

MAIN ENTRANCE

ADMINISTRATION BUILDING, SERVICE MOTOR TRUCK CO., WABASH, IND.

CHARLES W. NICOL, ARCHITECT

430'²

·EDITORIAL·COMMENT·

The Amateur Architect

THE appointment of Mr. Brangwyn, a well known artist, to design an art gallery in Japan has moved *The Architect* of London to a discussion of the effect on architectural practice of the activities of amateurs.

"Building a century ago" comments *The Architect,* "was not the complicated undertaking it has become today." Then matters of design were predominant and men of good birth and sound education often successfully influenced the design and plan of their own houses. With correctly established ideas, combined with the practical co-operation of competent builders, there were, a hundred years ago, erected in this country and in England buildings, many of which are now extant, that may be warmly commended for their architectural excellence. In fact, most of the examples of early American architecture, cleverly sketched by Mr. Eggers and illustrated in THE AMERICAN ARCHITECT, were undoubtedly designed and built under the superintendence of these amateur architects in co-operation with the extremely clever builder-architects of that period.

But, building then and now is vastly different. A man who today sets out on an important building operation,—and all building operations have become important,—who acts as his own architect, may be placed in the same class with the man who acts as his own lawyer,—he has a fool for a client.

States *The Architect*:—"Building operations are carried on through the agency of contractors and to make a definite building contract which accurately defines the architect's responsibilities, a mass of drawings is required."

Obviously no amateur can today supply such drawings, nor can he efficiently supervise their execution.

IN the technical and trade press outside of the field of architecture, it has, we regret to note, lately become a custom slightingly to refer to the value of the architect's services and to suggest the substitution of those of men trained in special work in the buildings that may be under contemplation.

A specific instance occurs in a recent issue of *The Modern Hospital.* This is over the signature of a superintendent of a large hospital building, who bluntly makes the statement that in the details of hospital planning, the services of an architect are not essential. A refutation of this erroneous idea as to the value of an architect's services is forcefully set forth in a communication from Mr. Richard E. Schmidt of Schmidt, Garden & Martin, architects, Chicago, and printed elsewhere in this issue.

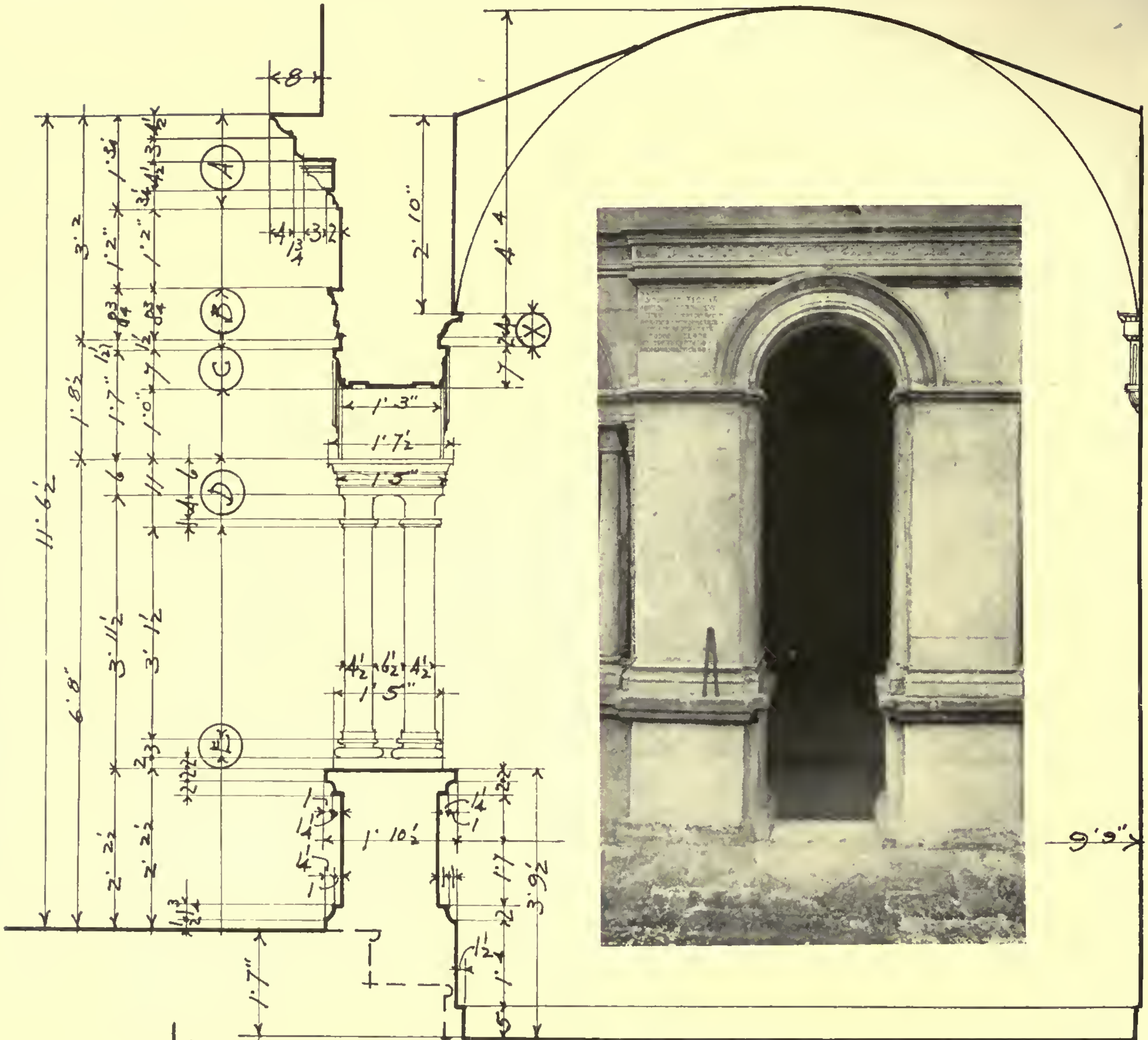
It is unfortunate that such championing of the rights and dignities of the profession of architecture as may be undertaken should be confined solely to the unofficial architectural press. It was logical to assume that a governing body of the profession might take steps to refute these ill-considered allusions to the profession and it would seem that a very valuable opportunity is offered for the organization and active work of a newly formed committee on Public Information whose duties it would be to correct misleading statements as to architectural practice. We hailed with some satisfaction the appointment of such a committee several years ago, but we were misled by its name, for the public information appeared to be purely for members of the profession and not for that large body of the laity who are becoming more and more misinformed by unwise and ignorant criticisms as to the value of architect's services.

What Does the Modern Client Expect?

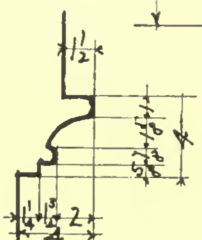
JUST what, exactly, is the modern business man coming to expect from his architect? In the Department of Legal Information, in this issue, Mr. Blake very thoroughly discusses the modern aspect of architectural practice, and brings out points that it will be valuable for architects to learn.

While architecture undoubtedly is an art, its development has made it necessary that architects should, as Mr. Blake states, be "business men, acquainted with both the complexities and the practicalities of modern business."

If the profession is to keep pace with the various elements that are so often encroaching on architectural practice, it will need very largely to revise the old conception of an architect's duties, and so thoroughly inform itself on these practicalities that it may efficiently render to clients,—the modern business men,—the services that are now generally expected. Mr. Blake very clearly points out the way that the architect may properly and safely function. His article should receive a thoughtful reading.



1/2" SECTION·



1 1/2" DETAIL X

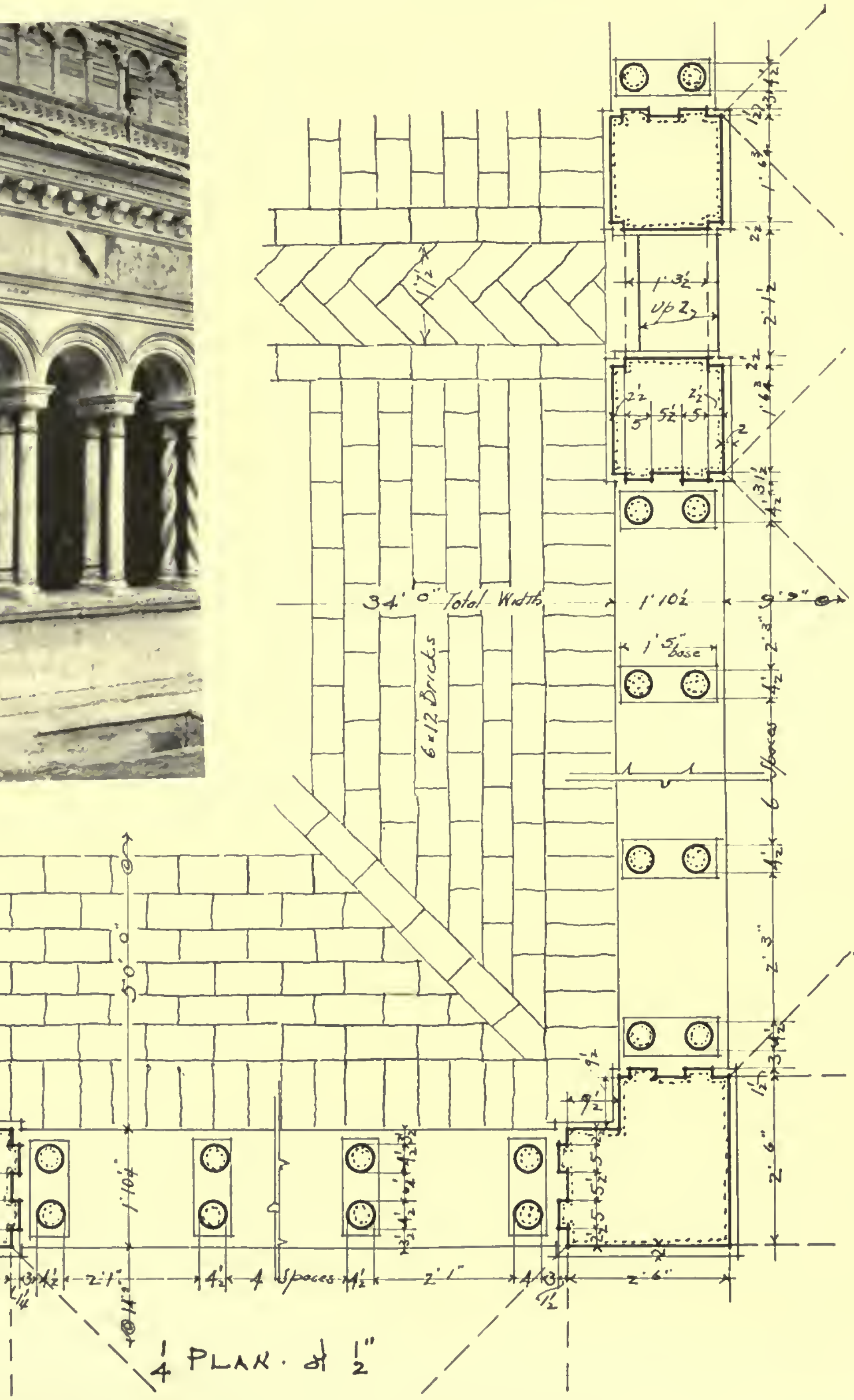
CLOISTERS, ABBEY OF SASSOVIVO, FOLIGNO, ITALY

MEASURED AND DRAWN BY ROBERT M. BLACKALL, 35TH HOLDER OF ROTCH TRAVELING SCHOLARSHIP

THE AMERICAN ARCHITECT, SERIES II. FRENCH AND ITALIAN DETAILS

THE Benedictine Abbey of Sassovivo lies among the hills about one and one-half hours from Foligno. The monastery was founded by the Benedictine Monks in 1066 and in the fourteenth century it was at the height of its power, importance and wealth. It was suppressed by Innocent VIII. It causes a shock of surprise after climbing about the neglected and ruinous building used for farm stock to enter suddenly into the small cloister, perfect in every particular.

The refined beauty of the colonnade and the grace of the whole design at once remind the traveler of the cloister of St. John Lateran, Rome, upon which it is modeled. The arches rest on pairs of small columns. The capitals are bell shaped and the lines of the cornice are relieved by mosaics worked in the style of the cosmati. The cornice is a marvel of beauty. It is a series of simple mouldings and arcadings executed in yellow sandstone, terra cotta and delicately tinted marble. The simplicity of design, the air of refinement and proportion, the beauty of color and the subtle sense of harmony make of the quiet cloister a most perfect and lovely picture and one that will give pleasure to the architectural student. The cloisters were constructed in 1229.



CLOISTERS, ABBEY OF SASSOVIVO, FOLIGNO, ITALY

MEASURED AND DRAWN BY ROBERT M. BLACKALL, 35TH HOLDER OF ROTCH TRAVELING SCHOLARSHIP

THE AMERICAN ARCHITECT, SERIES II.
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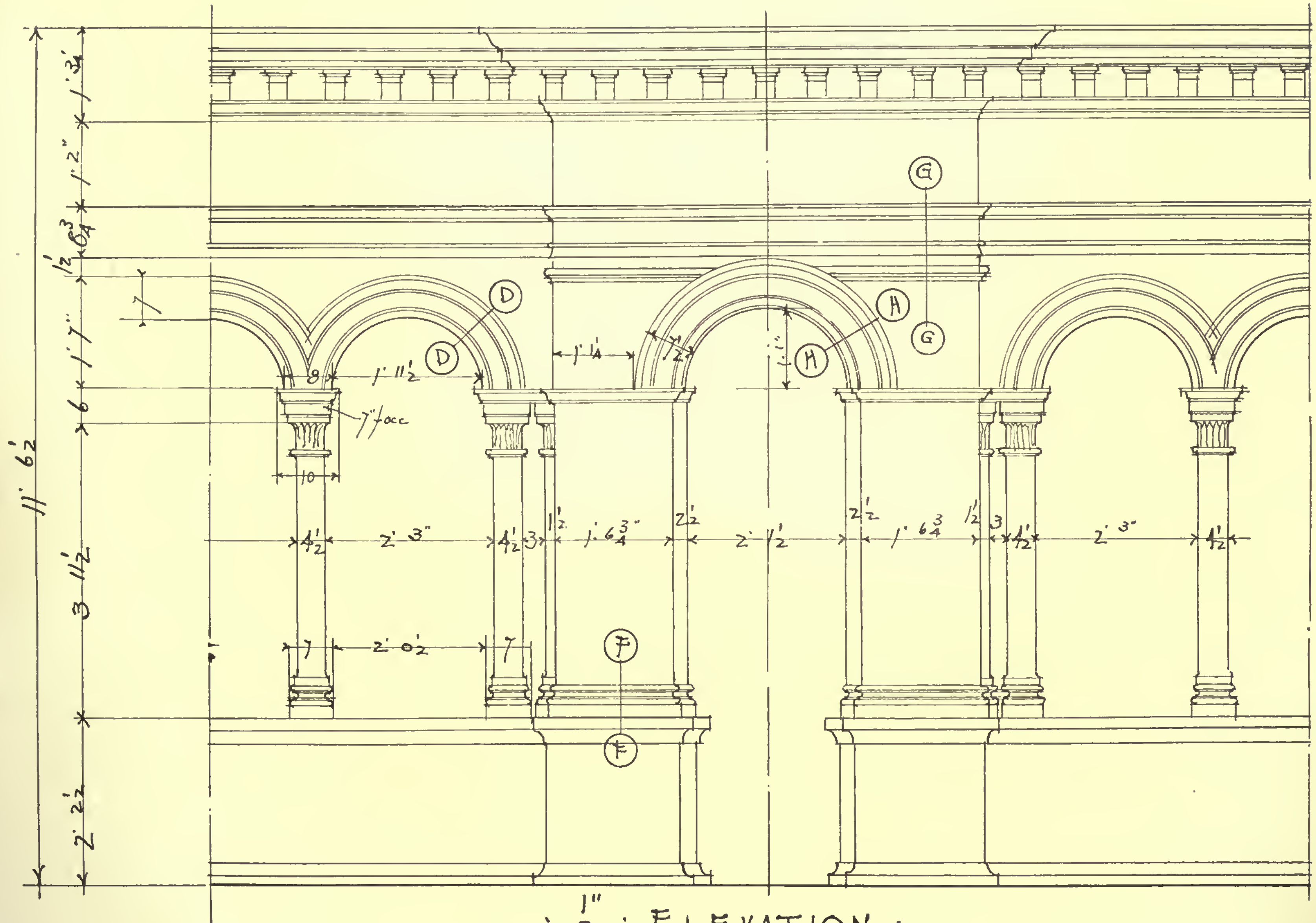

$\frac{1"}{2}$ · ELEVATION ·

CLOISTERS, ABBEY OF SASSOVIVO, FOLIGNO, ITALY

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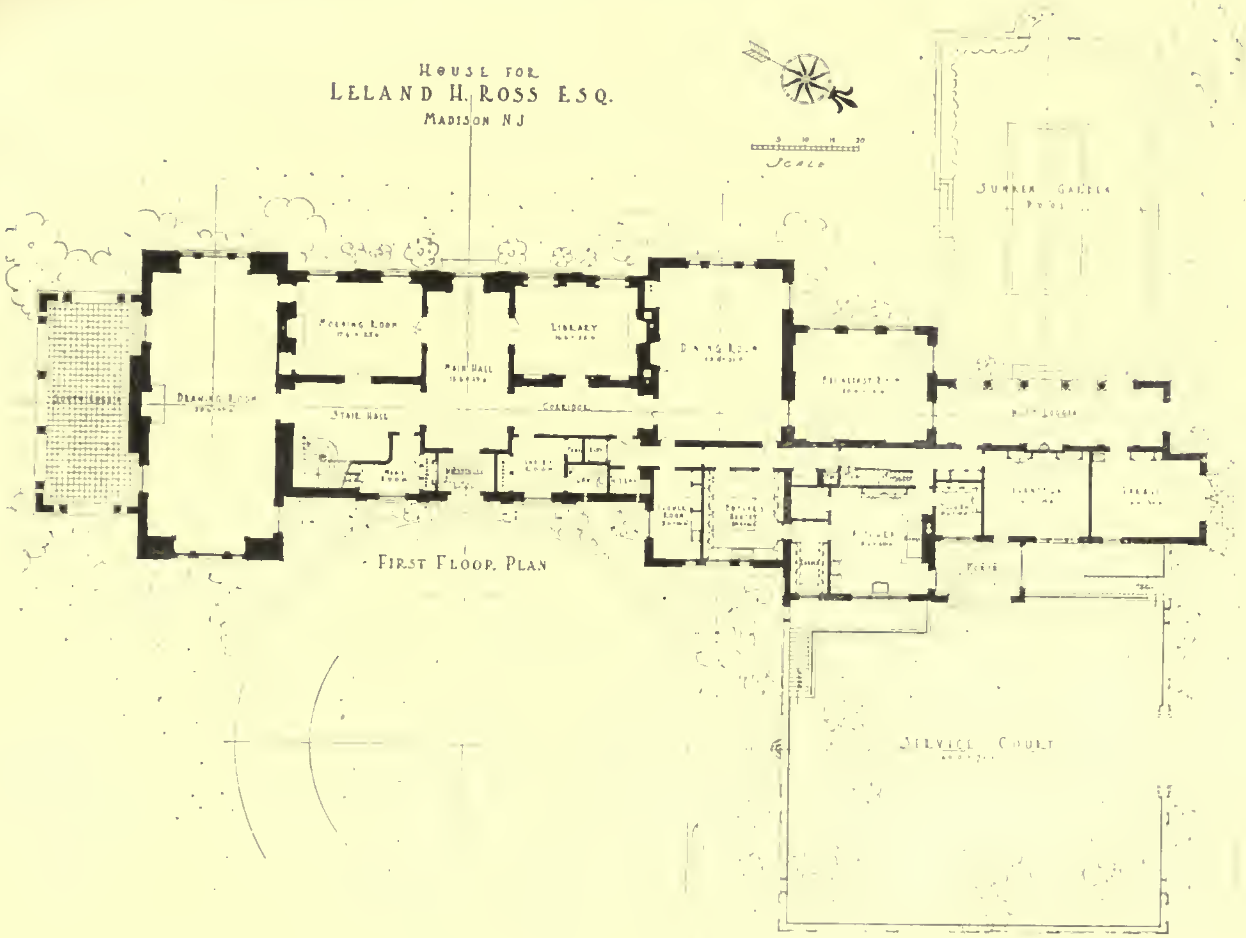
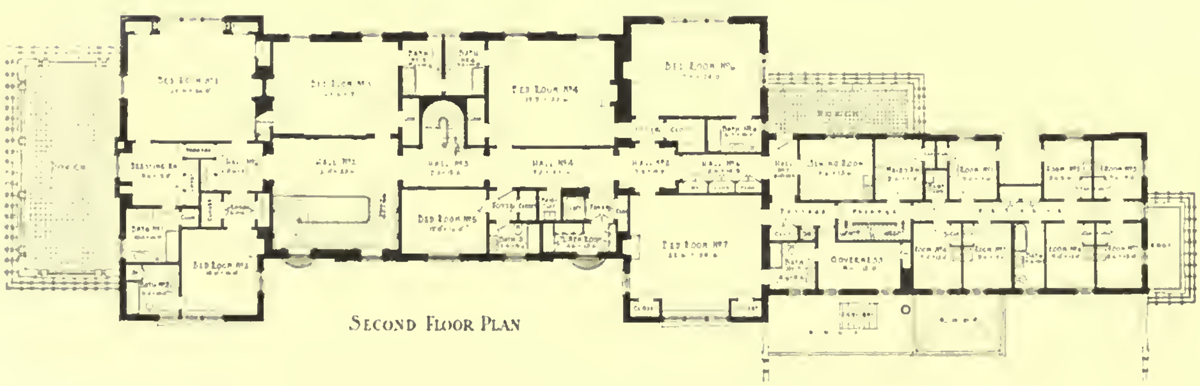
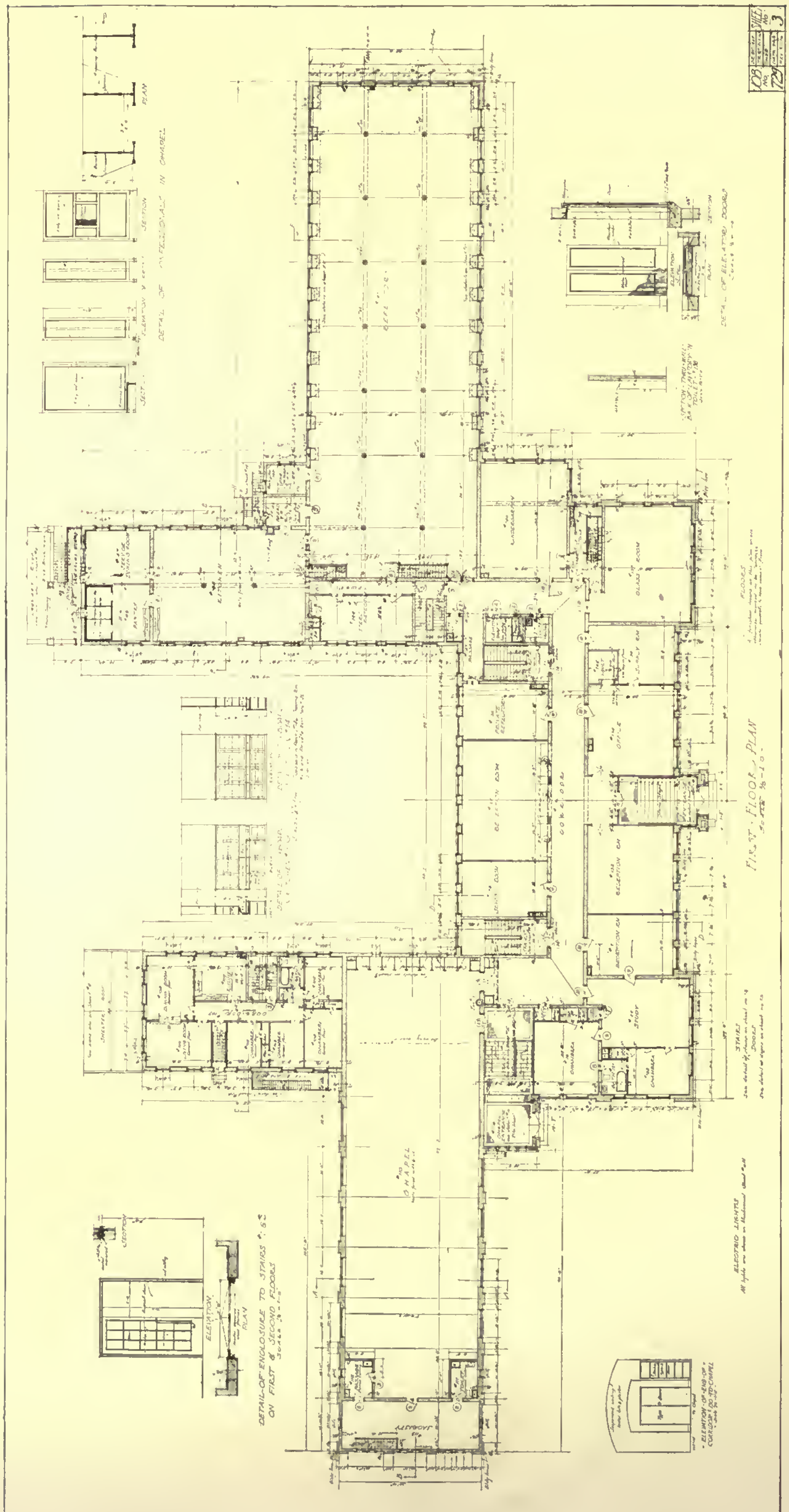




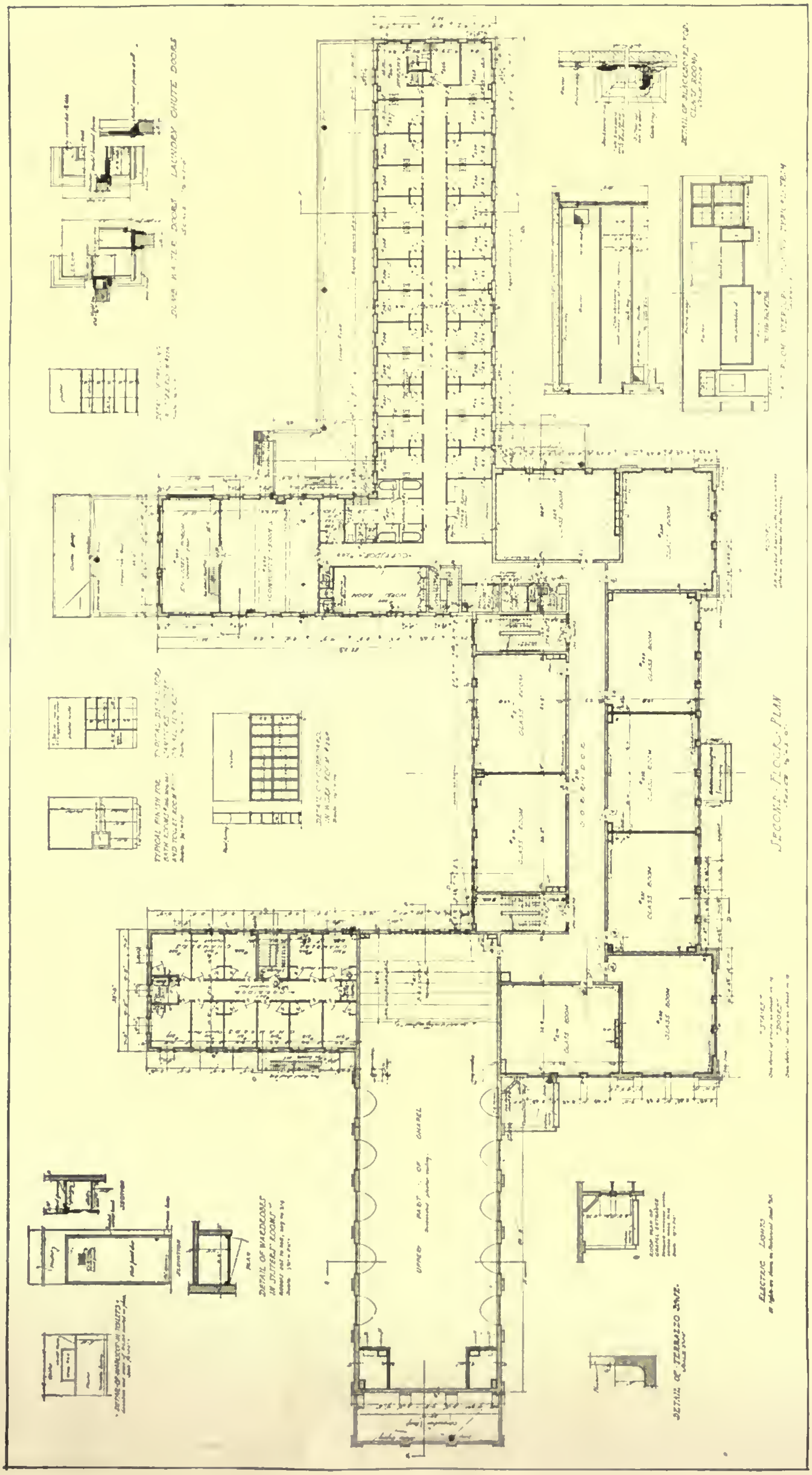
HOUSE OF LELAND H. ROSS, MADISON, N. J.

BEHR & SMITH, ARCHITECTS



ST. FRANCIS HOME FOR ORPHAN BOYS, DETROIT, MICH.

ALBERT KAHN, ARCHITECT



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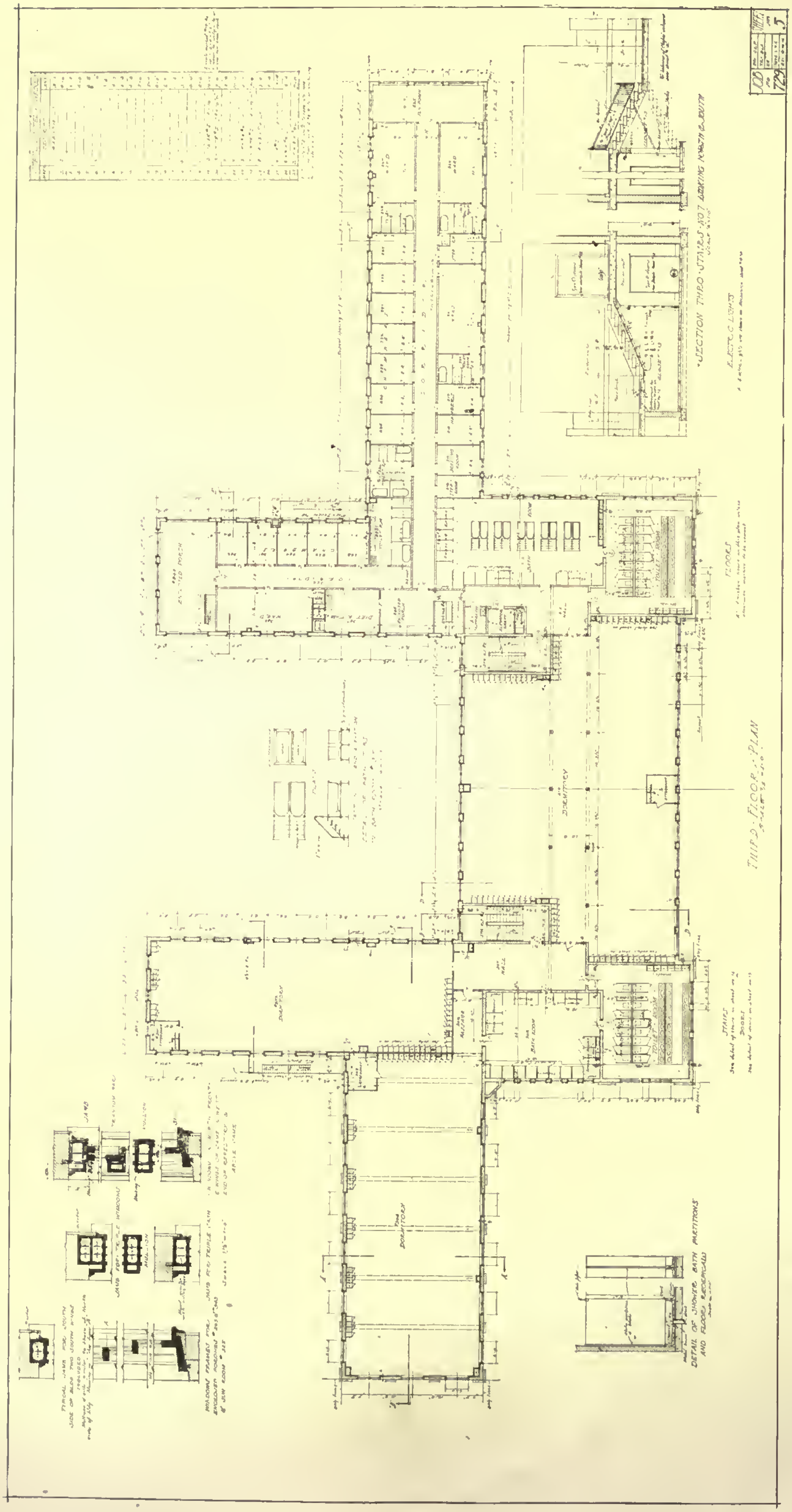

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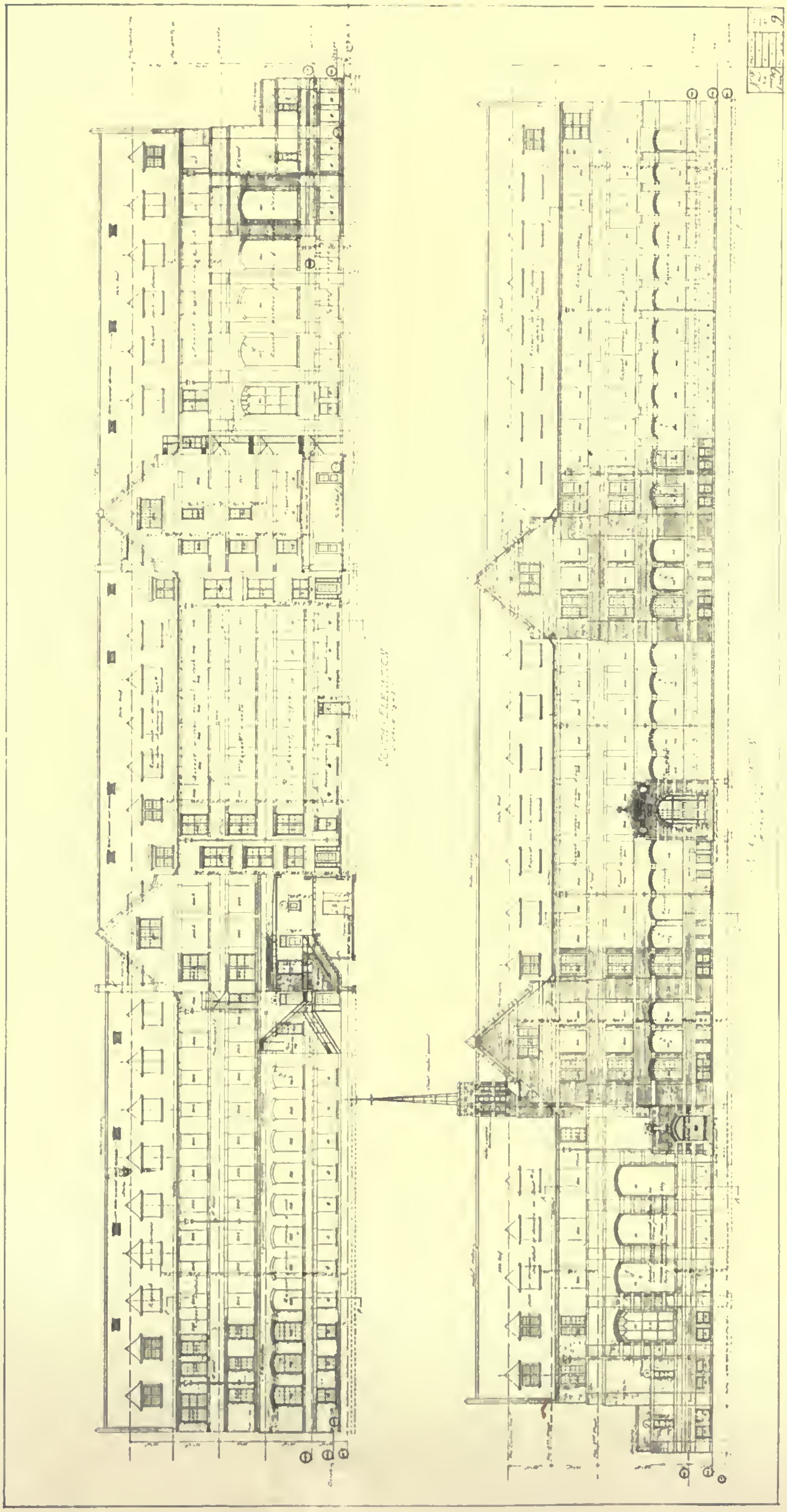

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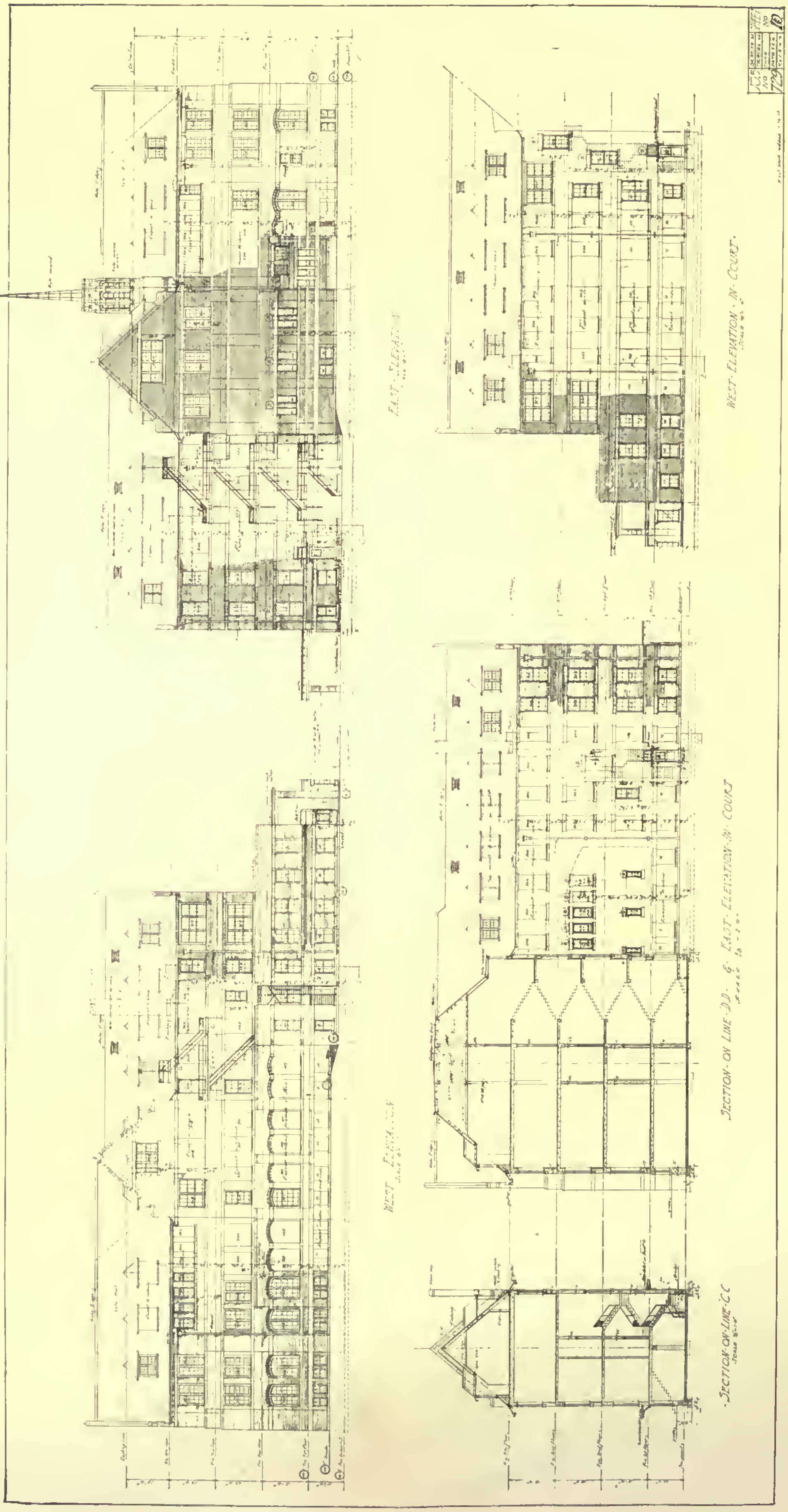


ST. FRANCIS HOME FOR ORPHAN BOYS, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

LEGAL DEPARTMENT

Conducted by

CLINTON H. BLAKE, Jr., of the New York Bar

IN recent years, there has been a marked tendency for architects to go beyond the limits of the services which they are called upon to perform for their clients under the strict letter of their contract, and take upon themselves a greater responsibility in many ways than they are legally called upon to take. It has become necessary for the modern lawyer, dealing with important corporate matters and the like, to extend the scope of his knowledge and activities beyond the old-time conception of the office lawyer, as one who merely gave advice on technical questions of law and interpretations of statutes, and become in many respects a business man acquainted with both the complexities and the practicalities of modern business. There has been an almost exactly similar development in the architectural profession. The old conception of the architect as one who, in the seclusion of his office, prepares plans and then superintends the erection of a building, in accordance with the plans, and nothing more, has, under modern building and commercial conditions, given way to the idea of the present day architect, who must, in many cases and in repeated instances, go beyond these fundamental and narrower limits of his activities, and give much of his time to problems involved in the present day building operation, such as labor disputes, disputes between the contractor and the owner and the like, with which, technically, as architect, he is not primarily concerned.

It was only but the other day, that I was called in consultation by an architect in behalf of his principal, the owner, in a case involving a dispute between the general contractor and a labor union. The matter was one which concerned, strictly speaking, the owner and did not, except indirectly, concern the architect. The latter, however, was the one who took the initiative in bringing about the proper solution of the situation and who represented the owner in dealing with the problems presented. This architect was merely giving to his client the service which the modern business man is coming to expect from his architect.

It is a sound business policy which prompts the architect to go beyond the strict limits of his employment, in protecting his client, and voluntarily to act as the latter's representative in handling issues and disputes arising in the course of the building operation. The larger architectural offices are more and more coming to appreciate the value of such an extended service to their clients, as a business asset, aside from any questions of professional duty, and to place at the disposal of their clients facilities and service which it would have been impossible for an architect of an earlier generation to offer, even had it occurred to him that it was necessary or advisable to do so.

It is important, however, for the modern architect in giving this added service to his client, in acting as the buffer between the client and the contractor, the contractor and the sub-contractor, or the client and the trade union of materialman, as the case may be, to realize that there is a certain danger in the assumption of an authority beyond that which naturally follows his employment as architect. The mere employment of the architect to superintend the work endows him with a certain well-recognized authority. This authority, broadly speaking, is to see that the work is performed in accordance with the plans and with the specifications. So long as he acts strictly within the bounds of this authority, he is on safe ground. As soon, however, as he goes beyond it and undertakes to speak for the owner or represent the owner in decisions outside of the limits of the preparation of the plans and specifications and the superintendence of the work, he is entering a danger zone.

If the architect undertakes, in an emergency or in the absence of the owner or otherwise, to authorize, for instance, additional extras or changes in the plans and specifications or to agree to concessions to the contractor or the materialman or to induce the contractor to settle labor disputes on the basis of some assurance of consideration from the owner or of additional compensation for the work, he should, in such event, before acting, secure the definite authority of the owner to represent the latter and to act for him on the point in question. This authority would be, in law, known as a special agency, as distinguished from the general agency powers of the architect under the original terms of his employment.

It is entirely natural that an architect, engrossed in the matter at hand and without an understanding of the legal principles involved, should act time and again as he believes in the interests of the owner, but without having secured from the latter any grant of authority for the action which he takes. Only too often, I have had presented to me cases where the architect, with the best intent, has taken action in behalf of the owner which the latter disowns or of which, when future disagreements arise, he attempts to take advantage.

There is however, no mystic formula or technical legal red tape involved in securing the necessary grant of authority to support any step which the architect takes outside of his ordinary routine services. Any consent on the part of the owner or acquiescence by him in the action of the architect is sufficient to protect the latter in the course which he follows. Of course, the more definite this consent and acquiescence are, the safer the architect will be. It is preferable, accordingly, in every case where such a course is possible, for the architect to secure the written approval of the owner. This may be a written approval of a particular act proposed, or an approval including authority on many different points. Many contracts, by their terms, require any such special authority to be in writing. Where this is the case, the architect should be careful to have the authority placed in this form. Where this is not necessary and it is not practical, for one reason or another, to secure written approval of a particular step which the architect desires to take, verbal approval by the owner should be secured in any event. If possible, it should take such form, that there may be no ambiguity about it and no difficulty in proving the fact that it has been given, if necessity to do so arises.

In sketching these general points of warning, I would not be understood as deprecating in any way the modern tendency of the profession to assume these general and broader responsibilities. On the contrary, I believe that the assumption of them is in the interests of the architectural profession and of the owner alike, and is, in fact, rendered necessary by modern business and commercial conditions. The point is, that, recognizing that this is so, the architect nevertheless should be diligent to take such ordinary precautions as may be necessary to protect himself from complications arising from an excess of zeal on his part or from the taking by him of any step for which he has not received authority from his client.

If there be the slightest doubt of the right of the architect to speak for the owner on a given point or to order changes or extras or to perform any act which he proposes to perform, the only safe course for him to pursue is to secure that authority before acting. If he does this, he can feel assured that there will be no "come-back" in the future and that he will not be penalized for having extended his activities beyond the limits of the authority granted to him.

RECENT LEGAL DECISIONS

THE architects sued to recover for services in the preparation of plans for alterations to defendant's house. The defendant had abandoned the alterations and the architects declined to deliver the drawings to him, on the ground that they were following the rule of the American Institute that "drawings and specifications, as instruments of service, are the property of the architect." It was held, that while it might be true that where both parties knew of this rule and contracted in contemplation of it, the drawings would remain the property of the architect, yet, in the case in question, it appearing that the defendant was ignorant of the rule and that no such agreement had been made, the drawings belonged to him and the architects could not recover without delivering the drawings.

Hill v. Sheffield 117 *N. Y. Supp.* 99.

THE testimony of architects that it is a general custom that the plans shall remain the property of the architect is not sufficient to show a custom binding on the community generally, and does not affect the rights of the owner in the plans, unless it is shown that both parties knew of the custom and contracted in contemplation of it.

Gibbon v. Pease and Moffatt v. Scott.
Tilly v. Cook County, 103 *U. S.* 155.

AS between themselves, an architect and his client may agree that the architect shall remain the owner of the plans and specifications and that the client shall not use them again, without making proper payment therefor.

McCoy v. Grant, 174 *Northwest Reporter* (*Minn.*) 728.

AS between the architect and builder, a general custom has been recognized, to the effect that the builder has a right to have the plans in his possession and to use them while the building is in course of construction, although the plans are to remain the property of the architect.

Lumsford v. Dietrich, 86 *Alabama* 250.

WHERE an architect agrees to furnish all necessary plans and to perform the usual and customary services of an architect and to receive as payment a percentage of the cost of the building, including the settling of disputes, he cannot recover for revised drawings necessitated by changes in the plans, nor for extra compensation for acting as arbitrator between the owner and the contractor.

Osterling v. Bank, (*Pennsylvania*) 105 *Atlantic* 633.

A PROVISION in a contract, whereby the architect is appointed the arbitrator of such disputes as may arise between the parties, is as binding as, and probably more binding than, an ordinary submission of a dispute to arbitrators for the reason that such a provision becomes a part of the original consideration for the contract.

Water Co. v. Fidelity, etc., Co., (*Indiana*) 123 *N. E. Rep.* 703.

DEPARTMENT OF SPECIFICATIONS

IN the Department of Specifications in the last issue of *The American Architect* the subject discussed was "Demolition of Existing Buildings." The next sequential subject is "Excavation" which will be discussed from the standpoint of two assumptions.

The first of these assumptions is that the excavation work will be the subject of a separate contract, and the second assumption is that the excavation will occur in almost any kind of soil; whatever special notations may be required with respect to the different soils will be given so as to cover the various kinds of operations that must be specified.

Wherever excavation work is to be made the subject of a separate contract it is customary to include therein only the main excavation, leaving the incidental trimming of banks, excavation of trenches and pits for footings, piers, etc., and other finished work for inclusion in the foundation construction specifications.

This Department will not attempt to enter into a discussion of the geological elements of soils and a detailed study of the use of explosives in excavation work in soils that cannot be removed by steam shovel. The study of soils from a geological standpoint should be made by every specification writer and he will find that there are available several authoritative books on engineering geology that can be read with considerable profit. The specification writer cannot anticipate what difficulties he will encounter in specifications for excavations unless he is thoroughly versed in the important phases of engineering geology. It is not necessary that the specification writer be as thoroughly familiar with the detailed nature of soils as is required for the writing of a book on the subject of engineering geology, but he most certainly should know the engineering description of rock, shale, clay and ordinary earth so that he can specify their removal intelligently.

Regarding the use of explosives, it is not within the province of this Department to discuss the use of explosives in text book fashion and the reader must bear in mind that the purpose of these discussions is to elucidate in some degree of clarity the methods of writing specifications that will result in a successful conclusion of the work, and throughout these articles it will be necessary to disregard some detailed studies of various operations with which the specification writer should be acquainted. As these points occur, efforts will be made to make clear just what the intention of this Department is with respect to the technical description and understanding of methods or materials that are necessarily precedent to the intelligent specification of desired results. It seems proper to emphasize these points at this time in order that the reader will not assume that attempts are being made to gloss over the lack of details that might be expected. Many pages could be written on the use of explosives in excavation work but such a discussion would be burdensome to our main subject, which is Specifications.

BEFORE writing specifications for excavation work it will be necessary to know the geological nature of the soil, whether or not there is water present that may interfere with open excavation without coffers or other water repelling devices, and how excavation work will affect adjoining street and walk pavements or buildings.

This Department in the issue of October 12 presented suggestions with respect to investigations that should be made by a competent engineer before the detailed designing of the building is commenced and if the suggestions given therein are followed, definite information relative to these phases of the work should be at hand.

As will be the case in all specifications, the specifications for this section, which will be numbered two in our series, should have as its first paragraph a reference to the "GENERAL CONDITIONS OF CONTRACT."

The second paragraph should be entitled "SCOPE OF CONTRACT" and should recite in detail the conditions obtaining and the work that is to be accomplished. The questions that must be determined by a reading of this paragraph are:

a—Extent of the work

b—The kind of soil that is to be expected and whether this information is based on the results shown by test borings or whether assumptions are based on known conditions obtaining in the immediate vicinity.

c—The disposal of all excavated material. If any material is to be retained on the work for back-filling or finished grading, that fact must be noted.

After reading this paragraph the estimator will have presented to him the fundamental bases that will govern the cost of the work.

If the site has been occupied by a building that has had excavated basement spaces it will be necessary to call attention to the existence of such spaces, and if the area and depth of these spaces are not indicated on a survey sheet that is a part of the drawings these dimensions should be given, approximately, in the specifications.

If it is known that the ground water level is pretty close to the existing grade level, this fact must be mentioned, as the existence or non-existence of ground water is a vital factor in the cost of the work.

It is quite often proper to require that contractors who propose to submit estimates under the specification should visit the site and become familiar with conditions as they may be presented to them by visual examination, but this requirement sometimes is superfluous, especially where those who are to submit estimates are not residents in the vicinity of the construction work and very probably would not make a special trip to the site unless the specifications explicitly stated that known existing conditions involved possibilities of such a great expense with respect to the accomplishment of the work that it would be advisable for all estimators to know exactly what conditions are.

We will then add paragraphs numbered three, four and five which will be respectively: "EXTENT OF EXISTING EXCAVATED SPACES" "GROUND WATER LEVEL," and "EXAMINATION OF SITE."

The sixth paragraph will be captioned "EXCAVATION" and should recite in detail the actual work of excavation as in writing this paragraph consideration must be given to the amount of soil that is to be removed.

In general the soils may be divided into the following classifications:

a—rock
b—shale
c—clay
d—earth
e—sand

At a casual glance it does not seem possible that there would be any misunderstanding of the nature of rock. This subject, however, has been given very earnest attention in some legal controversies and misinformation or ignorance of the nature of rock at times has caused a great deal of grief to the architect. The same comments may be made with respect to shale and it is often rather difficult to determine whether shale is rock or rock is shale. One would expect that rock could not be removed by the steam shovel or a drag line and most certainly not by the hand pick and shovel. Likewise, with respect to shale, persons who have lived in districts where shale is extremely hard and might possibly be named rock under strict geological description, may not understand that there are some shales that can be removed by the steam shovel and in some instances by the hand pick and shovel. With respect to clay, earth or sand there usually do not enter questions that are difficult of solution unless the clay is mixed with rock or shale or unless in either clay or earth there are pockets or strata of quicksand. If the specifications are to be written on an equitable basis—that is, equitable both for the contractor and the owner—and it seems possible that different kinds of soil will be encountered, separate prices should be requested on the excavation of each class of material.

LET us assume that the site is covered with about 12" of earth or ordinary soil under which there is an admixture of earth and sand three feet thick, followed by a gravel strata three feet thick, after which we find blue or yellow clay with perhaps some sand and gravel mixed with it for several additional feet, under which lies a thin strata of shale which finally turns into rock, and we will have conditions that frequently are encountered. In one corner of such a site it is possible that a pocket of quicksand will be found, with consequent water conditions that must be contended with. Let us suppose that separate figures are asked for excavation of shale or rock and for all materials other than shale or rock there would be three different prices governing payment for the work.

It may be that large boulders will be found mixed into the clay, the size of which will not preclude their being removed by the steam shovel or by the ordinary hand excavation methods. If this is so and there is a price governing the excavation of rock, an impecunious contractor might make a claim for the rock excavation price for the removal of such clay on the assertions that boulders are rock. Furthermore, he might contend that shale is rock and the architect probably would find it impossible successfully to combat this contention. Therefore, when writing specifications for excavation work where it is not known definitely whether shale or rock will be encountered but where there is a belief that these materials are present, there should be a definition of these materials. One definition that has proved successful in such cases is as follows:

> "All material that can be removed by the steam shovel, drag line or hand pick and shovel, shall be classed as ordinary earth, and all material that can be removed only by the use of explosives or by wedges in drilled holes shall be classed as shale or rock."

If this distinction is kept in mind, it will give sufficient warning to the specification writer and will act as a suggestion as to how the specification may be written.

An acquaintance with the various types of excavation machinery available is quite desirable in order that the specification writer will be able to anticipate, to a certain extent, the methods that the contractor will pursue. In small operations involving very low yardage of material it is not practical to use a steam shovel, but the high cost of hand labor is bringing the use of the steam shovel into excavations for ordinary buildings to a much greater degree as the years pass. Steam shovels will be able to remove certain classes of shales that could not be removed by the hand pick or shovel and if such a shale is known to exist, it should not be classed with rock with respect to the use of explosives or wedges for its removal.

As we have assumed that the excavation work will not include trimming of banks, etc., it will be understood that the natural angle of repose of the soils will not be disturbed unless sheet piling is to be placed by the excavation contractor to maintain the surface of surrounding pavements or properties in their original position. The removal of ground water, if the excavation is carried below the ordinary ground water line, may introduce complications that would result in damage to adjoining properties and unusual expense to the contractor and, of course, the owner. Extreme care must be given the specifications for sheet piling which properly should be made the subject of the seventh paragraph. It is usually adequate to require that the banks be left so that the surrounding soil will remain undisturbed and if there is any possible chance that heavy rains will erode the banks, plank protection should be required so that the falling water will be deflected into the floor of the excavation so that it may seep away or that it may be removed by mechanical means.

If there is an adjoining building, the foundations of which do not go down as deep as the excavation work is to go, suitable temporary shoring must be provided—if it has not been provided before by other contractors—so that such adjoining building will be kept in a stabile condition until the foundation contractor can provide his shores. If such conditions exist it is advisable to keep the banks a sufficient distance away from the footings so that the inclination of the bank is sufficient to provide ample support for existing foundations. This will be included in paragraph eight.

Inasmuch as the purpose of excavation under this specification is to remove the greater amount of soil at a minimum of cost, leaving the more expensive trimming and trench excavation for other contractors, the excavation contractor should not be permitted to remove the soil that should remain to provide natural support for surrounding structures or public improvements until adequate temporary support can be given them by a contractor skilled in the placing of such devices.

If quicksand is encountered certain devices must be resorted to, but ordinarily if the specifications mention that quicksand pockets or strata may be expected, the ingenuity of the contractor must be depended upon to conduct the work in a proper and acceptable manner. He is intensely interested in the proper prosecution of his part of the work in order that it may be most economically accomplished and it is not advisable to lay down requirements of too exact a nature that may not actually be necessary in the work.

The ninth paragraph should require that trees that are to be saved, existing walks or road pavements that are to be left in place, curbs, lawns, shrubbery or such items that are to remain, should be adequately protected by boards or planks or some sort of device that will not become displaced during the excavation work. It is not possible to enter into a detailed discussion of these protective precautions without having definite conditions in mind, and conditions may vary so much that the ingenuity of the specification writer must be depended upon to take care of each circumstance as it may exist.

We have then the following outline for the excavation work:

I. General Conditions
   a. A paragraph referring the reader to the General Conditions that will be made a part of the Contract and which should be read by all bidders

II. Scope of Contract
   a. Extent of the work
   b. Kind of soil and degree of accuracy of knowledge thereof
   c. Disposal of excavated material
   d. Possibility of shoring and sheet piling

III. Extent of Existing Excavations
   a. Describe existing excavated spaces
   b. If old foundations and footings are left by wrecker, state so
   c. If old first floor construction has been left in place to brace old foundation walls, state so
   d. State what is to be done with old water or sewage conduits or similar services if unearthed and ready for use

IV. Ground Water Level
   a. State depth below a certain established grade and whether this is definitely known or is only approximately estimated
   b. Disposal of seepage of ground water. This may be covered under subdivision No. Six

V. Examination of Site
   a. Caution bidders of necessity for making examination before submitting estimates in order that foreseen expenses may be included. But do not assume that unforeseen difficulties should be included

VI. Excavation
   a. Rock
      1. Blasting
      2. Precautions to be exercised during blasting operations
         a. Matresses
         b. Other protective devices to prevent flying material
         c. Storage of explosives

Excavation (Continued).

- b. Shale
  - 1. Same precautions as above for rock if blasting is required
  - 2. If Shale can be removed by wedges in drilled holes or by steam shovel of a certain power, state so
- c. Clay
- d. Sand
  - 1. Dry
  - 2. Quick
- e. Gravel
- f. Loam or common dirt
- g. Disposal of water in excavations

VII. Sheet Piling
- a. State purposes that are to be served
- b. Give requirements as to nature of piling probably required and how bracing is to be accomplished
- c. Requirements for quicksand
- d. Protection of banks against erosion

VIII. Shoring of Adjoining Structures
- a. State conditions and give requirements
- b. Notices to owners of adjoining properties

IX. Protection of Trees, Pavements, etc.
- a. Describe conditions and state requirements as to preservations.

STAIR HALL

HOUSE OF LELAND H. ROSS, MADISON, N. J.

BEHR & SMITH, ARCHITECTS

(For further illustration of this house see plate section)

DEPARTMENT OF ARCHITECTURAL ENGINEERING

THE DESIGN OF LIGHT WEIGHT FLOORS OF CONCRETE

By WM. H. GRAVELL, M. Am. Soc. C. E.*

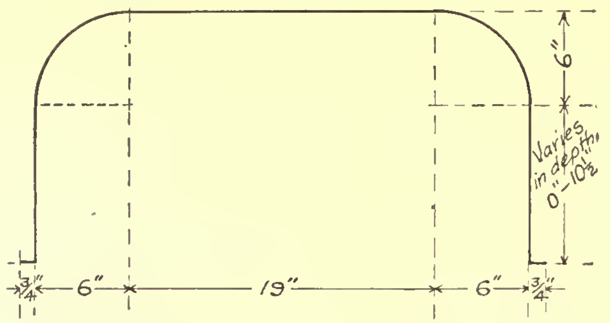
Webb Terminal Warehouse, Philadelphia, Pa., Wm. H. Gravell, Engineer. Unplastered ceilings, ribbed slab floors

THE late Ernest Ransome, one of the earlier pioneers in reinforced concrete construction, developed a light floor of ribbed members and published formulas to make the work of designers easy. In his day, however, all forms were made of wood and the expense of making and stripping them led to this type of floor being abandoned in favor of the combination concrete rib and hollow tile floor. This bit of history is introduced to show that the principle of the ribbed floor is neither new nor patentable and that difficulties with forms were the cause of its being forgotten for a time.

For ordinary spans and loads, a plain slab was often cheaper than a ribbed slab but the weight was a drawback and the use of the hollow tile fillers between ribs of concrete effected a tremendous saving in weight, the benefits being felt in sup-

*Of McClellan & Campion, Engineers, Philadelphia, Pa.

porting beams, girders, columns and foundations. Ordinary tile, being 12 in. wide, fixed the distance between ribs. Experiments with two tile side by side were not always successful although many slabs were built in this way with ribs 24 in. apart. One result, however, was the development of a decided sentiment in favor of a flat ceiling, the combination rib and tile slab affording a fine surface for plastering.

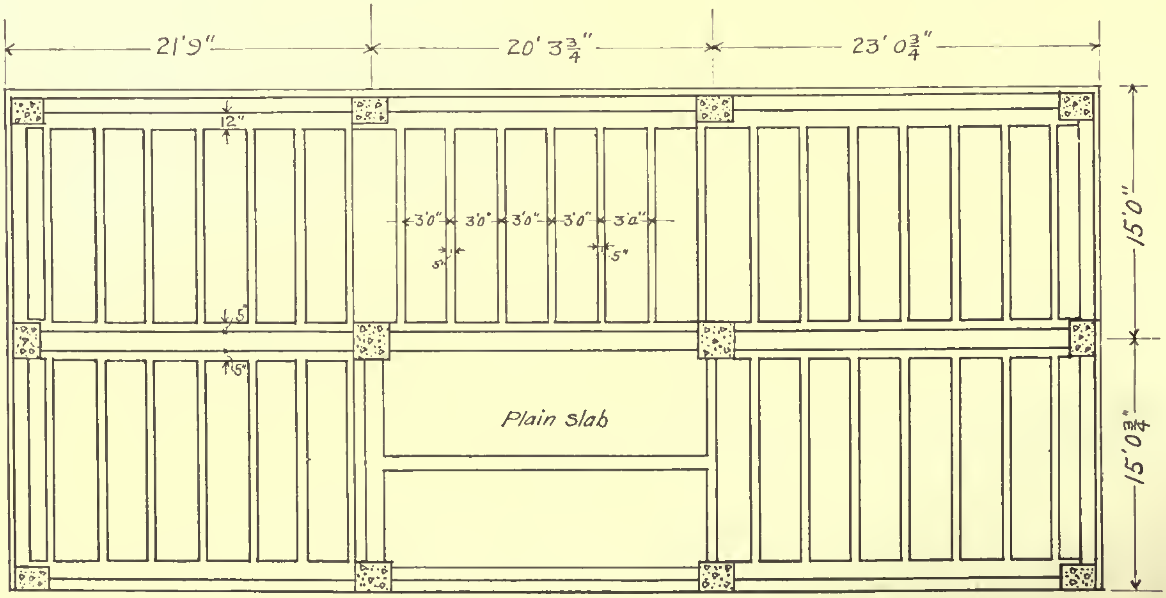


One form of metal centers. Other makes have sloping sides, with an angle of about seven degrees from the vertical

A few years ago a new metal center was introduced and several companies now make them so that contractors may buy or rent them and the ribbed floor is coming back. For those who prefer the flat ceiling a type of center may be used which is left in place and metal lath attached to the underside of the ribs for the plaster. It is

In the Otis Building, Philadelphia, erected in 1915, all the slabs were of the ribbed type, metal centers being used; and the addition completed during the present year contains the same type of slab. They are practically the same as used by the writer in 1910 for the Webb Terminal, Philadelphia. In the designs prepared in our office for two large dormitories for Princeton University ribbed slabs are provided. The accompanying photographs show that a properly constructed slab with exposed ribs is rather pleasing in appearance. The slab is designed exactly like any reinforced concrete slab, the only unique feature being the use of standardized metal centers.

The centers are usually made of No. 12 iron in sheets 60 in. wide bent as shown in the accompanying figure. The most convenient lengths are 5 ft., 8 ft. and 10 ft. They lap longitudinally and telescope so that depths may be varied from 6 in. to 15 in. and ribs may have any bottom width greater than 4 in. The ordinary bottom width of it is 5 in. giving a spacing of three feet. The ends are filled with wood. A slab thickness of 2½ in. is sufficient for most loads met with. A 2 in. plank 5 in. wide, properly shored, is used as a rib bottom form and left in place until the concrete is fully set. The metal center can readily be removed in warm weather in four days and, if properly handled, can be used in indefinite number of times. Those in the Otis Building Addition had



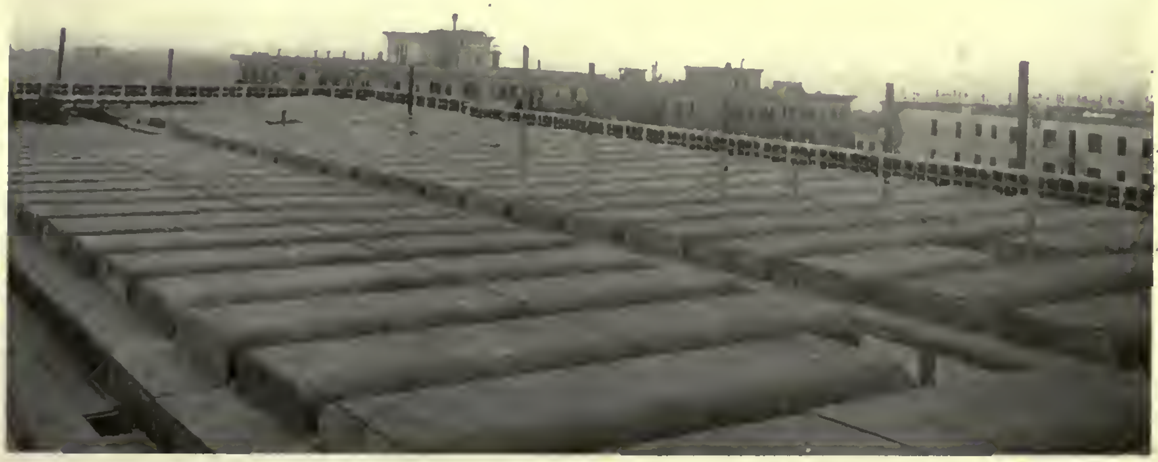
Typical floor—2nd to 12th—Otis Building Addition, Philadelphia, Pa., McClellan & Campion, Engineers. Showing arrangement of ribs in floor slabs

possible, however, to use smooth forms which may be taken out, the metal lath for the ceiling being attached to wires projecting from the ribs. Smooth forms have the advantage over forms of mesh in the possibility of their being reused.

been, it is learned, used eleven times previously.

The table of properties here presented is based on ribs 5 in. wide on 36 in. centers; maximum compressive fibre stress in concrete 650 lbs. per sq. in., tensile stress in the steel 16,000 lbs. per sq.

Showroom of Asam Brothers, Philadelphia, Pa., Wm. Steele & Sons Co., Architects. Ribbed Floor Slab with Plastered Ceiling



Metal centers in place. End fillers are made of wood. Flanges of T beams may occasionally be wider than required for strength in order to shorten spans of small ribs when shear is excessive

Maximum Properties of Metal Center Slabs

UNDER ECONOMIC CONDITIONS

Slab ins.	Conc. cu. ft.	Wt. lbs.	*L.* *ft.*	*jd.* *ins.*	*T=C* *lbs.*	*As* *sq. in.*	*V* *lbs.*	*M* *in.-lb.*
6" & 2½	.94	135	15	6.57	32,700	2.05	3,950	215,000
8 & "	1.02	145	18	8.32	39,000	2.45	5,000	325,000
10 & "	1.08	155	21	9.85	44,100	2.75	5,920	408,000
12 & "	1.15	165	24	11.40	47,500	2.95	6,850	540,000
14 & "	1.22	175	27	12.90	51,200	3.20	7,750	660,000
15 & "	1.26	180	30	13.60	52,700	3.30	8,160	718 000

in., $n=15$ and shear 120 lbs. per sq. in. The steel area given is for the maximum resisting moment, but it may be proportioned to the exact bending moment if desired whenever the bending moment falls between the resisting moments in the last column. The proper steel area is found by dividing the bending moment by the product of Jd and the steel fibre stress.

The simplicity of the wooden supports for metal centers is one of the cost reducing elements

Experience in our office shows a 20 per cent. difference in cost in favor of the exposed rib, or joist, slab when compared with combination rib and clay tile slabs. This is in the slab only and the saving in weight is carried to beams, girders, columns and footings. The smooth centers are readily taken out and make a very decent ceiling for an unplastered job.

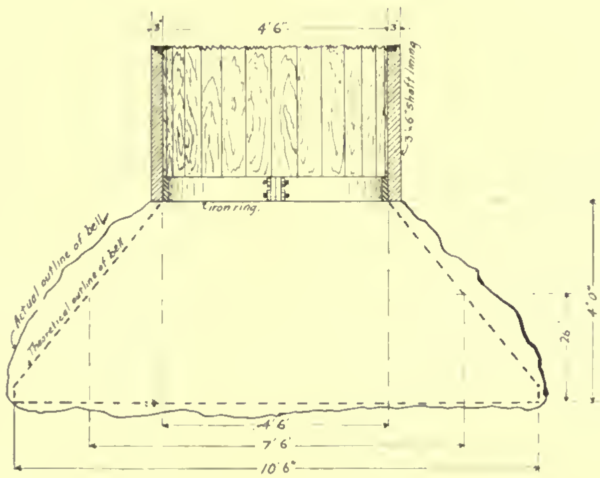
Metal centers in place for floor of Otis Building. Reinforcement supported on metal spacers to insure depth and spacing. Conduits for electric wires are embedded in the slab

THE DESIGN OF CONCRETE PIERS IN CLAY

THE design of foundations in clay is undertaken frequently without proper study. In such material the problem is to obtain sufficient bearing area. It is solved by assuming a certain allowable soil pressure per square foot, based on tests of the material on the site or, more frequently, based on personal judgment. The depth of the excavations usually plays a too important part and basement space is sacrificed; difficulties with adjoining owners not infrequently being encountered.

The use of columns instead of bearing walls results in many cases in the substitution of isolated square footings for wall footings but the area is still governed by the bearing capacity of the clay sub-soil. The sinking of shafts often reveals seams, or a seam, of hard material at a depth considerably lower than any which may be required for a basement and of a nature that will materially reduce the bearing area required for the load to be carried. A comparatively slender pier may be used by excavating a well and filling it with concrete. With this type of foundation it is possible to put in a deeper basement if required at any time in the future and the question of encroachment upon the property of adjoining owners does not arise. Considerations such as the above led to the use of "cylinder piers," in India for bridge foundations many generations ago. Cylinder piers were wells sunk by the open caisson method, the caisson being forced down by the weight of a thick masonry wall built up at a rate to correspond with the rate of sinking. When the metal shod ring on which the wall rested finally reached the pre-determined depth the interior was filled with concrete.

The use of a modified method came in with the skyscraper and it has received the name of "Chicago Caisson Foundation," because the first application is credited to Chicago. In that city rock is seldom found at a depth less than 90 feet and the upper layers of clay are quite soft. The earlier steel frame buildings were erected on spread foundations, sometimes, but not always, resting on piles. The sinking of concrete piers to rock was a natural development. The construction of a network of underground tunnels for a telephone company, which developed into an important freight carrying system is said to have caused streets to sink and buildings to settle because of the drainage of the sub-soil, so that today in the main business district it is the rule to found all buildings on concrete piers.



The shape of the "Bell" at the lower end of concrete pier sunk in clay by open caisson method

They are like all foundations in that, although a highly important part of the structure, there is a strong desire on the part of owners to spend on them no more money than is believed to be positively necessary, for they are buried in the earth out of sight. Not all go to bed rock, the usual depth being that which it is believed will carry the footing below future subways or sewers, the construction of which may result in draining the clay sub-soil and thus cause settlement of heavily loaded areas. Such piers are used today wherever modern frame structures are erected on an area covered with a clay sub-soil of considerable depth. The description, in the August 17 issue of THE AMERICAN ARCHITECT, of the piers on the site of the old Hotel Pontchartrain in Detroit led a reader to ask how such piers are designed, hence this article.

Assume that a column carries a load of 600,000 pounds and the pier must go to a depth of 90 feet below the basement floor to a layer of hard dry clay. Several layers of suitable clay were encountered in the exploratory borings but not at depths which insure against possible future disturbance. The first thing to determine is the diameter of the pier, a simple matter, for the smallest well in which men can excavate will have a diameter of four feet. Assuming a working stress on the concrete of 200 lbs. per sq. in., a pier 17 inches in diameter will carry the load, so it is evident that for a diameter of four feet a lean concrete may be used. It should be deposited fairly dry as the compression it receives will drive out much moisture and this will rob it of cement. If much water is encountered in sinking the shaft there should be less water in the concrete for it will ultimately receive a great deal by absorption. When the load is considerable a richer concrete is used and when the wooden lining is left in the shaft the concrete is often wet enough to flow freely. Notwithstanding the theoretically sufficient low strength a concrete leaner than 1-2-4 is seldom employed.

Tests have shown that bending phenomena are not manifest on concrete columns in which the length is less than 30 diameters so another criterion may be applied to the case under consideration by assuming a diameter not exceeding one-twentieth of the depth. This fixes the least diameter for a 90 foot pier at 4 ft. 6 in., and this diameter will be used. The shaft of concrete will weigh 214,650 pounds, the concrete being assumed to weigh 150 lb. per cubic foot, a reasonable assumption when we consider the compression to which it will be subjected before it receives a final set.

The total load at the bottom of the pier will be 600,000 plus 214,650 pounds, a total of 814,650 pounds. Assuming that the clay on which it will rest is good for 10,000 lbs. per square foot a bearing area will be required of 82 square feet. A circle 10 ft. 6 in. in diameter will give the required area so a chamber will be excavated at the bottom with this diameter, that is, to a radius extending three feet beyond the face of the shaft.

The depth of the footing is fixed by allowable punching shear on the circumference of the shaft, the value of which may be taken at 100 lbs. per sq. in. Dividing 815,000 by 16,900 (100 times inches of circumference) the depth at face of shaft is found to be 48 inches. The average diameter is 7 ft. 6 in., and a similar calculation, dividing 815,000 by 28,200 gives a required thickness at this point of 28 inches. To economize labor and excavate the chamber as quickly as possible it is given a bulbous form, care being exercised to secure nothing less than the computed depths. The projection is called a bell.

When a shaft passes through one or more seams of good clay it is not uncommon to form bells at such points in order to utilize the additional bearing area thus found. Provided they are all below possible future disturbance the total load will be divided by the number of bells, each of which is then designed to carry its share. This results in considerable economy in excavation. Theoretically the bearing power of the seams is not the same, owing to differences in depth but this is seldom given serious consideration if all are more than fifty feet below the surface.

Floor Live Loads in France

THE differences in allowable live loads for floors, noted in American building ordinances, find their counterpart in so small a country as France. The following recommended live loads are found in *"Constructions Civiles,"* by Barberet and *"La Construction Moderne—Pratique,"* by Guédy.

Mons. Barberet has the popularity in France enjoyed by Kidder in America and the loads recommended in his book are used more than those recommended by Mons. Guédy, who is a consulting architect and engineer for the city of Paris.

The loads are given in French in kilograms per square meter and are here translated into pounds per square foot for the convenience of our readers:

Building	Barberet	Guédy
	Lbs. per sq. ft.	
Residences	31	41
Dance Halls	83	103
Assembly Halls	83	123
Hay Lofts	84	93
Grain Warehouses	94	123
Salt Warehouses	125	164
General Merchandise	153	164
Paper Warehouses	206	308

Distribution of Forest Products

IN *The National Lumber Bulletin,* Mr. C. J. Hogue of the West Coast Forest Products Bureau presents the following opinion:

"The annual lumber consumption is about equally divided between industrial and structural uses.

"In the structural uses sash, doors, millwork, moulding manufacturers and planing mills consume about 25 per cent. of the total annual cut; boxing and crating about 15 per cent. and wood-using industries an equal amount.

"In structural uses about 20 per cent is required for structural timbers, of which about one-half is of the high-grade selected type, while in the other half the requirements are less rigid; railroad ties consume about 12½ per cent. and an equal amount goes into miscellaneous building uses.

"The railroads use about 20 per cent. of the annual lumber cut and farmers are said to use fully 50 per cent. About 60 to 80 per cent. of the annual production passes through the hands of wholesalers and about the same amount through retail yards."

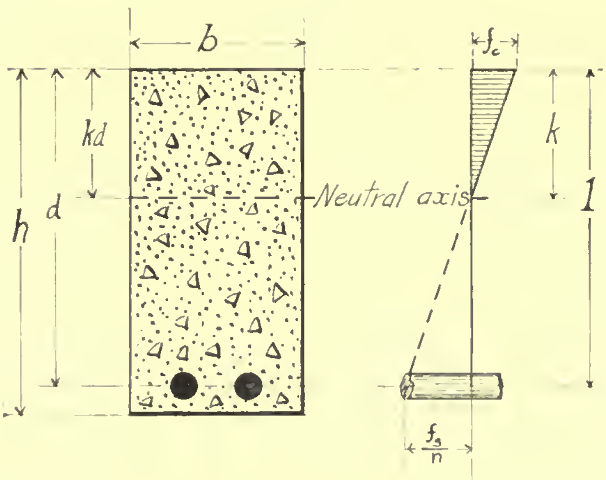
Wind Pressure on Chimneys

A JAPANESE professor, says *The Building News,* London, has been experimenting on the effect of strong winds on tall columns. In one case a chimney 550 ft. high in a wind of velocity 78 miles an hour oscillated at the top through 7¾ inches in the direction at right angles to the wind, and through less than an inch in the direction of the wind.

Reinforced Concrete Formulas

THE following collection of formulas to determine the position of the neutral axis and the steel ratio in beams of reinforced concrete is given in response to requests from readers:

- f_s = unit tensile fibre stress in steel
- f_c = unit compressive fibre stress in concrete
- n = ratio of deformation between steel and concrete
- m = ratio of stress between steel and concrete
- p = ratio of steel area to concrete area
- k = ratio of depth to neutral axis to depth to center of gravity of steel.



Ordinary straight-line formulas:

$$k = \sqrt{2pn + (pn)^2} - pn$$

$$p = \frac{\frac{1}{2}}{\frac{f_s}{f_c}\left(\frac{f_s}{nf_c} + 1\right)}$$

Formulas by Robert S. Beard in *The Engineering Record,* May 11, 1912:

$$k = \frac{nf_c}{(f_s + nf_c)}$$

$$p = \left(\frac{f_c}{2f_s}\right) k$$

Formulas by Ernest McCullough in *Practical Structural Design:*

$$k = \frac{n}{n+m}$$

$$p = \frac{k}{2m}$$

The following formulas were evolved by G. F. Dodge in 1909:

$$k = \frac{1}{1 + \frac{f_s}{nf_c}}$$

$$p = \frac{f_c k}{2f_s}$$

All the foregoing formulas are based on the beam being balanced, i.e., the concrete resisting moment being equal to the steel resisting moment.

The following expressions are useful when the ratio of steel is known and a closely approximate value of the depth to the neutral axis is wanted in order to compute the concrete resisting moment. The method gives a value of k correct to two significant figures when the steel ratio is less than 0.01:

$n = 8 \quad k = 0.15+18p$
$n = 10 \quad k = 0.18+18p$
$n = 12 \quad k = 0.20+18p$
$n = 15 \quad k = 0.23+18p$ (*Talbot*)
$n = 18 \quad k = 0.25+18p$
$n = 20 \quad k = 0.26+18p$

The economic stresses, that is the proper concrete stress economically to develop the assumed steel stress, or *vice versa*, may be closely approximated as follows:

$$f_c = \frac{f_s}{1.8n}$$

Floors and Floor Coverings

A NEW Farmers' Bulletin, Floors and Floor Coverings, gives practical information on various questions connected with the choice and care of materials for floors and their coverings, such as the best types of floors for various purposes, the proper finishes and good methods of cleaning. It was prepared by the office of Home Economics and is intended to help reduce the cost, the time, and the labor of keeping a house in order with regard to its floors. The bulletin may be had upon application to the Department of Agriculture, Washington, D. C., and should be in the library of every architect.

"Safety In Building Construction"

COPIES of the second edition of this book are now available for distribution and may be had upon application to the Home Office of The Travellers Insurance Company, Hartford, Connecticut. It contains 175 pages and 101 illustrations, as compared with 109 pages and 49 illustrations in the first edition. The subject matter has been re-arranged and expanded, and one entirely new section has been added.

Making Paint Hold

RECENT specifications for a good building showed that the specification writer was misinformed on the use of lead. Oil is essential and all coats should form one mass. Three thin coats containing considerable oil are better than two thick coats. Lack of sufficient oil causes lead to chalk.

Frame Houses of Pressed Steel or Metal Lumber

A Correction

IN an article entitled "Light Weight Structural Steel" in the issue of Sept. 28 it was stated that the first two-story house of this material was completed during 1921.

It appears that the statement was erroneous, proof having been given that similar houses were erected a number of years ago.

Telephones

CIRCULAR No. 112, Bureau of Standards, is a remarkably complete treatise on telephone service. It is well illustrated and written in non-technical language. It contains 214 pages and may be procured from the Supt. of Documents, Government Printing Office, Washington, D. C., at 65 cents per copy.

Safety Repairs on Elevators

THE Bureau of Buildings, of New York City, recently issued a general order requiring that in the future all worms and worm shafts on elevator equipment under its jurisdiction must be forged in one piece of sound steel or iron, free from welds. This action was taken because it transpired that some concerns had been welding new ends on worm shafts, when the key seats had become worn at the coupling ends of the shafts.

Coal Storage Data

THE following figures are stated to have been arrived at after thorough and carefully conducted tests, made for coal producers in New York, Pennsylvania and West Virginia:

Net Tons (2,000 lbs.) of the various sizes occupy cubic space as follows:

Broken coal	33 cubic feet
Egg coal	33.6 cubic feet
Stove coal	34.2 cubic feet
Nut coal	35 cubic feet
Bituminous coal	36 cubic feet

Gross Tons (2,240 lbs.) of the same sizes require:

Broken coal	37 cubic feet
Egg coal	37.6 cubic feet
Stove coal	38.2 cubic feet
Nut coal	39.2 cubic feet
Bituminous coal	40.2 cubic feet

The Peabody Coal Company, Chicago, Ill., as the result of careful weighing tests made the following data public in *Engineering and Contracting*, Nov. 10, 1920, for net tons:

Anthracite.	Pea	.33 cubic feet
	Chestnut	.34 cubic feet
	Range, Small Egg	.35 cubic feet
	Large Egg	.36 cubic feet
Pocahontas.	Slack	.35 cubic feet
	Lump and Egg	.35.5 cubic feet
	Mine Run and Nut	36 cubic feet
Quaker and New Era.	Lump	.38 cubic feet
Quaker.	Egg and Nut	.40 cubic feet
Acorn.	Lump	.40 cubic feet
Wasco.	Lump	.40 cubic feet
Screenings		.40 cubic feet
Indiana.	Lump	.41 cubic feet

Based on 40 cu. ft. per ton the following table of capacities is used for designing cylindrical coal pockets.

Depth of Coal Feet	Inside Diameter in Feet 12	16	20
	Capacity in Tons		
30	85	151	234
40	113	201	312
50	141	251	390
60	170	302	468

Bearing Pressures in Tons and Pounds

QUITE frequently, says *Construction Lime News*, building codes state that the safe load for walls shall be a certain number of tons per square foot. The following table gives the equivalent loading in pounds per square inch for the most commonly specified loadings:

Tons per square foot	Pounds per square inch	Tons per square foot	Pounds per square inch
18	250	8	111
15	208	7.2	100
12	166	7	97
11½	159	6	83
10.8	150	4	70
10	139	5	56

Removing Oil and Grease from Floors

ACCORDING to *National Safety News* a satisfactory method for cleaning greasy or oily floors is to use lime. Sprinkle air-slaked lime or hydrated lime over the floor in a layer about one-quarter inch thick. Leave it on for two or three hours, and then remove with a stiff brush. It will be found that the lime has absorbed the grease and oil, and the floor will present a surprisingly clean appearance. This has been used successfully on oily cement floors of machine shops which had resisted all other attempts to clean them.

THE AMERICAN SPECIFICATION INSTITUTE

127 North Dearborn Street, Chicago

ANNUAL FALL CONFERENCE

THE Board of Governors of The American Specification Institute extends to all those interested in the improvement of specifications for building or engineering structures and their equipment, a cordial invitation to attend the first "Annual Fall Conference" to be held at the Chicago Engineers' Club, 314 Federal Street, Chicago, on the evening of Friday, December 9, at 6:30 o'clock.

The purpose of the Annual Fall Conference is to crystallize the thoughts of architects and engineers and to learn what those who have to furnish materials or perform work under specifications must contend with in their endeavor to provide what is wanted and still do their work to the best of their ability and for the economic benefit of themselves as well as the owner.

The program for the evening will include a banquet, following which there will be forceful talks on specifications by men representing the legal profession, the building material and equipment industries, the superintendent of construction, and the estimator, which talks will be followed by a discussion in order that all those present may have an opportunity to present their views, and it is hoped, to contribute further to the future activities of the Institute. Inasmuch as the Board of Governors desires a frank discussion of specifications so that we all may know how specifications may be improved, each speaker has been requested to present a critique of specifications without devoting time to fulsome praise in order to make a favorable impression. It is with a strong realization that specifications cannot be improved without constructive criticism that the Board of Governors has made this request of each speaker and it is believed that the evening's discussions will prove to be extremely valuable.

BULLETINS

THE following letters have been received in answer to Bulletins No. 1 and 2 and are given here as they present criticisms of interest:

Bulletin No. 1—Letter A

"Your circular letter of June 20, with a general specification outline, has been received and reviewed with much interest. I found, however, that in using the outline as given, it is rather difficult to find any particular trade involved without a great deal of hunting through the outline.

"In my ten years' experience in the building business, it seems that the construction business should be outlined under very general headings, and each heading then subdivided into detail subjects. There is attached herewith an outline which I have made up on this basis, and which I submit for your consideration. In addition to the development of an outline or checking list and the arrangements of specifications so as to conform with the sequence of construction, there should be a comprehensive outline of all work involved in building operation such as is indicated on the attached sheet.

"If the Institute is to fill the greatest need of those interested in specifications, the material must be so arranged that it is easily found as well as being usable. It will, therefore, be necessary to arrange, alphabetically, all items which are included in the specifications prepared by the Institute. These suggestions are respectfully submitted for your consideration.

---

1. PRELIMINARY
   - Matters Preliminary to Contract
   - Preliminary Surveys, Sketches, Estimates
   - Inspection of Materials
   - Borings
   - Tests
2. CONTRACTS
   - Agreement
   - Contract Documents
3. SITE
   - Work preliminary to construction
   - Moving
   - Wrecking
   - Clearing
   - Sheeting
   - Protection of Trees
4. GENERAL
   - General conditions of The American Institute of Architects
   - Models

5. EXCAVATION
   - Excavation
   - Filling
   - Leveling
   - Pumping
   - Blasting

6. FOUNDATIONS
   - Soils
   - Piles
     - Wood
       - Plain
       - Creosoted
     - Concrete
       - Pre-cast
       - Cast in Place

7. MASONRY
   - Brick
   - Stone
   - Architectural Terra Cotta
   - Terra Cotta Floor Arches
   - Imitation Stone
   - Fireproofing
     - Tile
     - Concrete
     - Gypsum
     - Brick

8. CONCRETE
   - Structural
     - Mass
     - Reinforced
   - Finished Surface
     - Walls
     - Ceilings
     - Floors
   - Cast
     - Ornament
     - Blocks

9. CARPENTER WORK
   - Structural Framing
     - Walls
     - Roofs
     - Floors
   - Sheeting
     - Walls
     - Ceilings
     - Floors
   - Finish
     - Millwork
     - Cabinet work
   - Stripping
   - Furring
   - Grounds (wood)
   - Flooring
   - Siding
   - Ceiling
   - Forms

10. STEEL AND IRON (Structural)
   - Structural Steel
   - Cast Iron
   - Reinforcing Steel

11. BUILDER'S STEEL AND IRON
   - Sills
   - Guards
   - Anchors
   - Manholes
   - Gratings
   - Doors
   - Partitions

12. ORNAMENTAL IRON, ETC.
   - Ornamental Iron
     - Bronze
     - Brass
     - Copper
     - Cast Iron
     - Wrought Iron
     - Steel
   - Store Fronts
   - Elevator Enclosures
   - Stair Rails
   - Marquees
   - Fixtures

13. PLUMBING
   - Sewers
   - Drains
   - Plumbing
     - Rough
     - Finish
   - Gas
     - Coal
     - Acytelene
   - Water
     - Supply
     - Purification
     - Softening
     - Drinking

14. HEATING AND VENTILATION
   - Heating
     - Hot Air
     - Hot Water
     - Steam
       - High Pressure
       - Low Pressure
   - Ventilating
     - Fans
     - Ducts

15. ELECTRICAL
   - Light
     - Wiring
     - Fixtures
   - Heat
   - Power
   - Telephones
     - Outside
     - Inside
   - Call Systems
     - Fire
     - Express
     - Telegraph
     - General
   - Recording Systems
   - Signal Systems
   - Machinery and Equipment

16. POWER
   - Steam Power Plant and Equipment
   - Electric Power Plant
   - Water Power Plant

17. WATERPROOFING
   - Asphalt
   - Tars
   - Paints
   - Membrane
   - Integral
   - Papers
   - Fabric

18. INSULATION
   - Materials
     - Cork
     - Mineral Wool
     - Quilts
   - Cold Storage
   - Heat

19. ROOFING
   - Slate
   - Tile
     - Clay
     - Cement
   - Composition
   - Shingle
     - Wood
     - Metal
     - Cement
     - Asphalt
     - Asbestos
   - Metal
     - Tin
     - Copper
     - Lead
     - Corrugated Iron
   - Glass

20. SHEET METAL WORK
   - Materials
     - Copper
     - Lead
     - Tin
   - Flashings
   - Skylights
   - Cornices
   - Ceilings
   - Ventilators

21. METAL DOORS, WINDOWS, TRIM
   - Solid Steel Sash
   - Hollow Metal Trim
   - Kalamein Trim
   - Doors
     - Tin Clad
     - Kalamein
     - Hollow

22. MARBLE, MOSAIC, ETC.
   - Marble
   - Mosaic
   - Tile
     - Clay
     - Cement
     - Cohesive
     - Faience
   - Terrazzo

23. HARDWARE
   - Rough
   - Finish

24. LATH AND PLASTER
   - Furring, Metal
   - Lath
     - Wood
     - Metal
   - Plaster
     - Plain
     - Ornamental
     - Scagliola
   - Exterior Plaster

25. GLAZING
   - Glass
     - Plate
     - Sheet
     - Art
     - Mirrors
   - Glazing
   - Structural Glass

26. PAINTING AND DECORATION
   - Exterior Finishing
     - Paint
     - Varnish
   - Interior Finishing
     - Painting
     - Staining
     - Varnishing
     - Oiling
     - Calcimining
     - Cold Water paint
     - Paper Hanging
     - Fresco
     - Mural Paintings

27. FURNISHINGS
   - Draperies
   - Window Shades
   - Furniture
   - Fixtures
   - Sculpture
   - Paintings

28. CLEANING
   - Exterior
   - Interior
   - Windows
   - Premises

29. EQUIPMENT
   - Mail Chutes
   - Clocks
     - Master
     - Secondary
   - Sash Operating
   - Vault Doors
   - Sidewalk Lights
   - Window Cleaner's Outfit
   - Weather Strips

30. MECHANICAL INSTALLATIONS
    - Elevators
    - Elevator Signals
    - Dumb Waiters
    - Escalators
    - Pneumatic Tubes
    - Conveyors
    - Pumps
    - Ejectors
    - Refrigeration
    - Vacuum Cleaners
    - Compressors
    - Cash Tube Systems
31. FINISH FLOORS
    - Wood
    - Cork Tile
    - Composition
    - Mosaic
    - Marble
    - Ferrazzo
    - Tile
        - Rubber
        - Cement
        - Clay
32. MISCELLANEOUS
    - Accoustics
    - Window Screens
    - Smoke Stacks
    - Landscape
    - Sculpture
    - Roads
    - Pavements
33. ADJOINING PROPERTY
    - Sheeting
        - Wood
        - Steel
    - Shoring
    - Underpinning
    - Needling

Letter B

We believe that Bulletin No. 1 deals with the general subject that the first Bulletin issued by the Institute should deal with and that a carefully worked out standardization of specification subject headings will be of great benefit to specification writers.

"As a foundation skeleton we favor the use of main divisions by trades with subheadings under each trade rather than a continuous list of subjects such as the Bulletin gives. Take, for example, item 28, 'Furring' might be wood, or hollow tile, or skeleton iron, and would better be a subheading under carpentry, fire proofing, and lathing and plastering to be dealt with under whichever trade the particular case called for. The same scheme would place item 30 as a subheading under all trades where modeling is apt to be required. The same principle would also apply to many other of the 92 items given in the Bulletin. We enclose a rough draft only partly filled in, showing the idea. There is nothing particularly novel about this, the scheme having already been used more or less. We have found it practical and applicable to a wide range of work and adjustable to either a simple or an extensive specification.

"The page numbering of specifications will also bear some consideration. The ordinary method of numbering the pages in a straight sequence from the first to the last makes it necessary to complete the specifications before the page numbering can be established and any later alterations are apt to upset the numbering and make new numbering necessary. A method which overcomes many of the difficulties consists in using an index letter for each trade subdivision and numbering the pages of every separate trade with an independent series beginning at No. 1 in each case. That is, the first section, whatever it is, say 'General Conditions,' will run A1, A2, A3, A4, etc. The next section, say 'Preliminary Work,' will run B1, B2, B3, etc. The next section, say 'Excavation' will run C1, C2, C3, etc. By this system any trade can be written at any time independently of the other trades so far as paging is concerned. This is sometimes found desirable as when separate trade proposals are being asked for. Then too, when amendments are made in the specifications, requiring alterations, the paging of the particular section only that is affected would be altered."

Bulletin No. 2—Letter C

I PRESUME that practically everybody who writes specifications has prepared some sort of an outline for the more ready forwarding of the work, and that these outlines are used in various forms.

"In the office of———we use a master specification, which has been developed through the years, and which is always in a state of reconstruction as conditions develop. This master specification was formerly a card index, as mentioned in your late bulletin, but we have found it more desirable to condense it and place it in a loose leaf system in a book, any of the pages of which can be readily removed, retyped and replaced. I find this procedure is helpful in eliminating old stuff and material rarely used. We do not attempt to use the master specification verbatim, except in small part, but write or dictate, a new specification for every job.

"The practice of writing a specification by trying to adapt an old one is, in my opinion, bad practice, as it is inevitable that references creep in which are not applicable to the contemplated work, and items are forgotten which are important to include.

"We find that the constant reference to the master specification as a checking list is a much more satisfactory procedure as tending to produce a complete specification."

Letter D

AND now a word or two concerning these specifications and my method of preparing the same. I have for years written all my specifications on what might be called a loose card paragraph system; that is, I have a 5 x 8 filing system, each card in this system containing a separate clause in the specification, and of course each trade occupies a separate place in the filing system.

"This system as now developed contains every clause that I have ever written into any specification since the founding of this system some ten years ago and in writing any trade it therefore becomes necessary to review every clause I have previously written into this trade, making it practically impossible to overlook any situation which has ever occurred before. Of course it is the extraordinary situation occurring on a particular job which is always fresh in the mind and which is therefore difficult to overlook in the writing of specifications for this work.

"In writing the specification for any trade, I simply read every card under that trade and remove such cards as are pertinent to the specification in hand keeping them, of course, in their original order. These cards are then snapped together with a rubber band and turned over to the stenographers to write the trade. After the proofreading, which is done from the cards, they are returned to me and are placed back in the trades in their original positions, leaving the trade ready for the writing of the next specification.

"The cards in each trade are arranged as follows: First, general clauses; second, description of materials; third, then follows the actual steps performed in that trade as nearly in the order of their performance as is feasible.

"If you will read the trade 'Reinforced Concrete' in the specification sent you, I think you will appreciate this arrangement of clauses in each trade.

"Insofar as possible the clauses in each trade have been prepared to cover as general a condition as possible, but of course some slight additions have to be made to the cards, which are done in blanks left for this purpose on the cards, in pencil or by checking the different items listed in the cards in pencil, which pencil marks are, of course, erased upon the writing of the next specification if not pertinent.

"I have found this an excellent and very simple method of preparing a specification and I believe it is as quick a method as there is. The specification which I am sending you was completed in about eight hours working time.

"My painting specifications I write in a somewhat different manner from the ordinary, this idea having been worked out by me with two objects in view:

1. To make it visibly apparent just what processes are to be employed in each different part of the work; and
2. To make it possible for the superintendent of construction readily to check the work as it progresses.

"I do not know of anyone else who uses this method of writing painting specifications, with the exception of those architects to whom I have shown it and who have adopted it as their standard.

"If you are interested, I suggest that you read the painting trade in the enclosed specification.

"I should be glad to answer any questions which you may have concerning my method and the results obtained thereby and I am looking forward to the receipt of the questionnaire which should reach me shortly."

Letter E

YOUR letter of recent date containing suggestions from members with respect to card indexes for specification writing has been duly received. The writer has carefully read the letters 'A' and 'B' and is of the opinion that a card index system of some sort is the only logical method for the specification writer to use in dictating specifications for the various kinds of work.

"Like the writer of letter 'A', we have in the office under way a specification form developed from our past experience in writing specifications. The undersigned of this letter has had quite a bit of experience estimating in the office of a large contracting concern, as well as twenty-five years of drafting, and has spent a great deal of time in the last twelve years perfecting his specification for use in this office.

"While, in my opinion the general form of card indexing is the best method, I cannot but feel that unless the architect or specification writer understands the terms thoroughly, it is of no use to him. The mere fact of copying what some one else has written would be apt to develop complications. In following a card system, the specification writer must thoroughly understand materials and *workmanship* which is the real essence of a specification and which comes from long training and experience in observing and handling work. A knowledge of materials is obtained from the actual experience one has had in using them and a good catalog system where the specification writer may easily find the names, quality and kind of material he needs for a particular purpose as it is a well known fact in specification writing that one kind of material used in one job will be of no use in another.

"I feel that the form of specification which I am writing, while it is very simple in its construction and plain in its language, would necessitate an understanding of its terms, if one were to use it properly. I am not condemning such a form, for as I mentioned above, I think it a practical solution of the problem, *if* the user understands the terms, and is familiar with the name and the kind of material specified, and the proper workmanship required for the particular purpose.

"Referring to the catalog system, our office has spent considerable time and money in developing a catalog system which proves useful to us in specifying a material by its trade name, and thus eliminating the clause, 'a certain kind of goods or equal thereto' which is employed by so many architects."

Letter F

WITH reference to Bulletin No. 2, Serial No. P.2, Letter 'A':

"A text book on the writing of specifications will be most welcome. I have been planning such a book myself but pressure of other work has prevented me from getting much beyond the planning. I will welcome the new book if published and will be glad to lay aside my plans as I have other work I want to undertake.

"Personally I am in favor of a looseleaf system rather than a card system, having tried both to some extent. I could use a good text book with my classes to advantage, and I believe there are many architects operating small or modest offices who could use such an aid to specification writing to great advantage. Letter 'B'.

"The statement that I favor a looseleaf system applies to this also. Bulletin No. 3, Serial No. 10.

1. Matters Preliminary to Contract:

"Survey should show, or Investigations should determine: Location of sewer, storm sewer if any, gas main, electric light (and power) lines and telephone lines, for nearest connections. Many surveys show grades only. They should show trees and shrubbery, whether to be removed or preserved.

2. Agreement and Schedules of Conditions of Contract:

"The American Institute of Architects General Conditions are excellent, but voluminous for the smaller work. I believe it to be as impossible for one set of general conditions to be made to apply to all classes of work, from the $5,000 house to the $500,000 or several million dollar office building as it would be to write a text book on any subject that would be of equal interest to the beginner and the expert.

"I believe it to be important to have these general conditions modified to apply suitable to the smaller work. The matter of education in specification writing can best be approached from the bottom up, rather than from the top further up. It is not, to my mind, so important to aid the experienced specification writer to make his work more nearly perfect as it is to aid the average architect to improve his product, which is at present often very unsatisfactory.

"If the writer of letter 'A' should give any idea as to how soon he may be able to publish his text book it will help not only those teaching the subject but many practicing architects to decide whether or not to keep on with efforts to standardize their specifications. I should like to see the book produced in the same way in which the Handbook of Architectural Practice was produced by The American Institute of Architects. You may be familiar with the fact that Mr. Frank Miles Day put the matter into the hands of the Institute for publication. It was first printed in unbound form and submitted to a number of the members for comment before final publication. It would be a real 'boost' for The American Specification Institute to publish the book, and the author could still profit from a royalty on sales if desired."

LETTER G

THE bulletin, No. 2, Serial No. 0.2, was received and the enclosed letters were very interesting. The subject of proper filing of data to make it available when needed is a problem and one not to be easily solved.

"I do not find the card system with master paragraphs to be a satisfactory one for continuous use. The same holds good for the re-use of specifications drawn up for buildings previously erected which are of a similar character. The chief fault that I have found in such a system is that the work is estimated and carried out on the basis of the custom of the office, reflected in the specifications. I know this to be true. It is especially true when certain contracting firms continue to carry out the work of certain offices which is often the case.

"It was following one experience in my own work, where the use of the 'master paragraph' specification of that office brought extras into the work owing to the fact that the work was proven to have been estimated on the basis of the usual custom and not on the actual specification, that I revised my work so that the specification was a real description of the work to be done on that particular building.

"It was proven in my later work that I could give the information necessary to tie in with the drawings by making them a description of the building and together they made a complete picture of the work to be erected.

"Specification data should be filed and used and the card index arranged to show where to find that data quickly, and also indicating the catalogs of the firms supplying, as well as the materials best suited to the proposed work, gives the most satisfactory results. I do not believe the most thorough and complete specification can be written by handing numbered cards to a stenographer. The plan creates the thoughtless way of approving the data because the title looks right. It takes but a little more time to draw up a rough draft in a manner that requires the grouping of the paragraphs in proper sequence which, when read as a whole, shows that proper thought was behind it and that the pages mean something more than so many pages."

LETTER H

ALMOST everybody immediately interested in specification writing realizes some sort of a card system must be used as a skeleton. To produce such a system for building work in general would be a great achievement of The American Specification Institute, incorporating the experience of its several members, and later revising the cards.

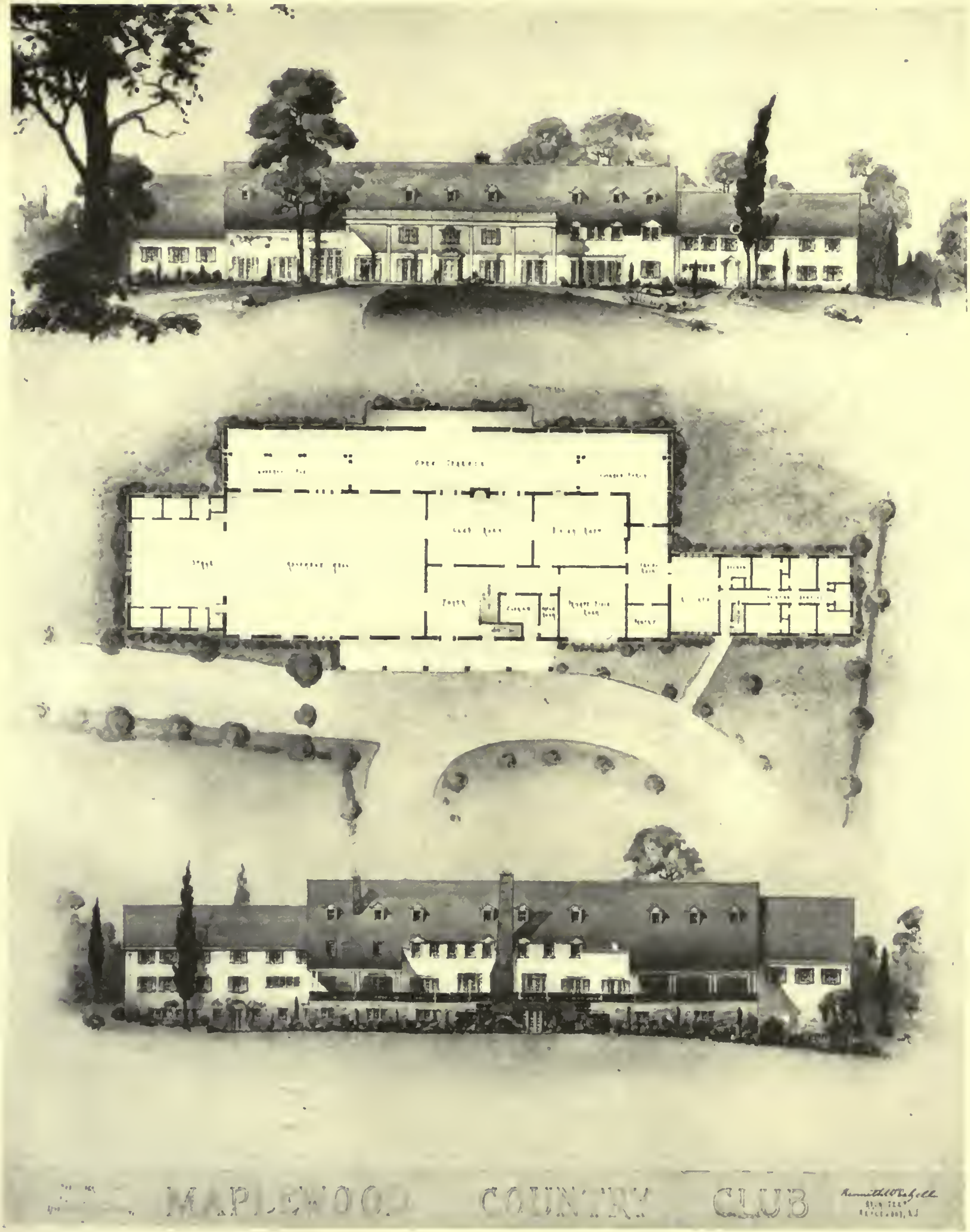
"Having had considerable experience in this field, I wish, however, to carry this card system further by giving clear, short, impartial and competent advice to the specification writer as to how and when to use each card. This has been done in this office under 'remarks' immediately after the card heading, resulting in suitable choice of materials for different kinds of work and proper technical instructions for use of different materials. By such a method the rigidity of stock specifications may be eliminated. Attention must also be paid to different grade of workmanship desired by clearly specifying what is wanted.

"With such data it will probably be found that card size is too small,—in this office we use the regular letter size, frequently filled up by any item and its 'remarks,' often with vacant space for future addition of new data. Typed on thin paper a selection of required pages (or items) is made from their index under any kind of contract work or trade and the blueprint copies used as stubs for the specification writer. It produces a complete, technically correct specification of suitable materials fitted to the kind or class of work for which it is intended.

"I should like to see The American Specification Institute undertake such a work for the building industry. Its extension into the fields of engineers and purchasing agents of materials can easily be done. Before it is started the standard form of type should be determined as well as a general classification of subjects.

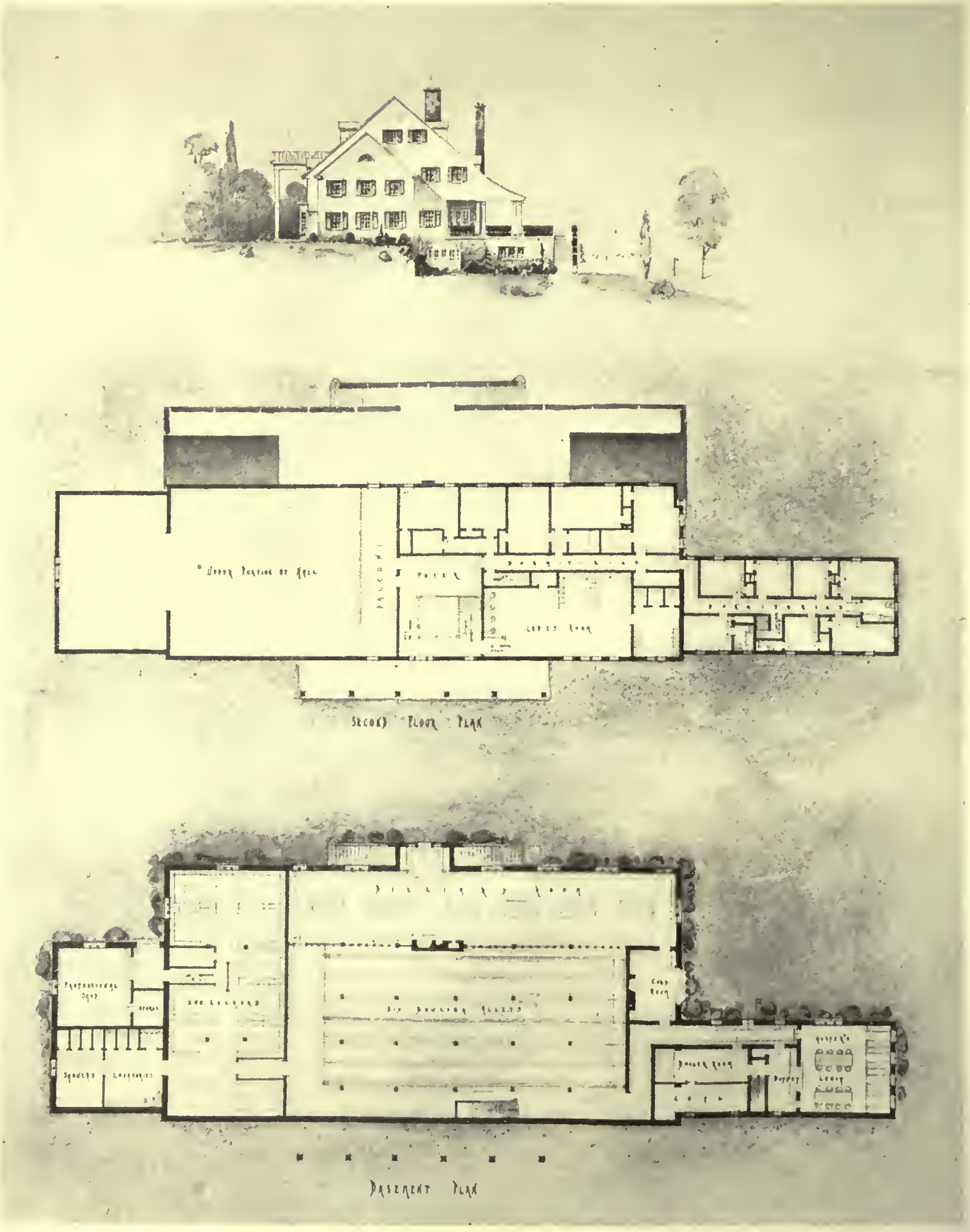
"In the very nature of the case it is impossible for your Institute to make any research work about all of this material—and your technical data must be furnished from societies directly interested—by your representation on their committees or sharing their heavy expenses."

Architecture as a harbinger of good will—The "Piaphong," erected by the Chinese at Chefoo, and dedicated to the people of the United States



COUNTRY CLUB, MAPLEWOOD, NEW JERSEY

KENNETH W. DALZELL, ARCHITECT



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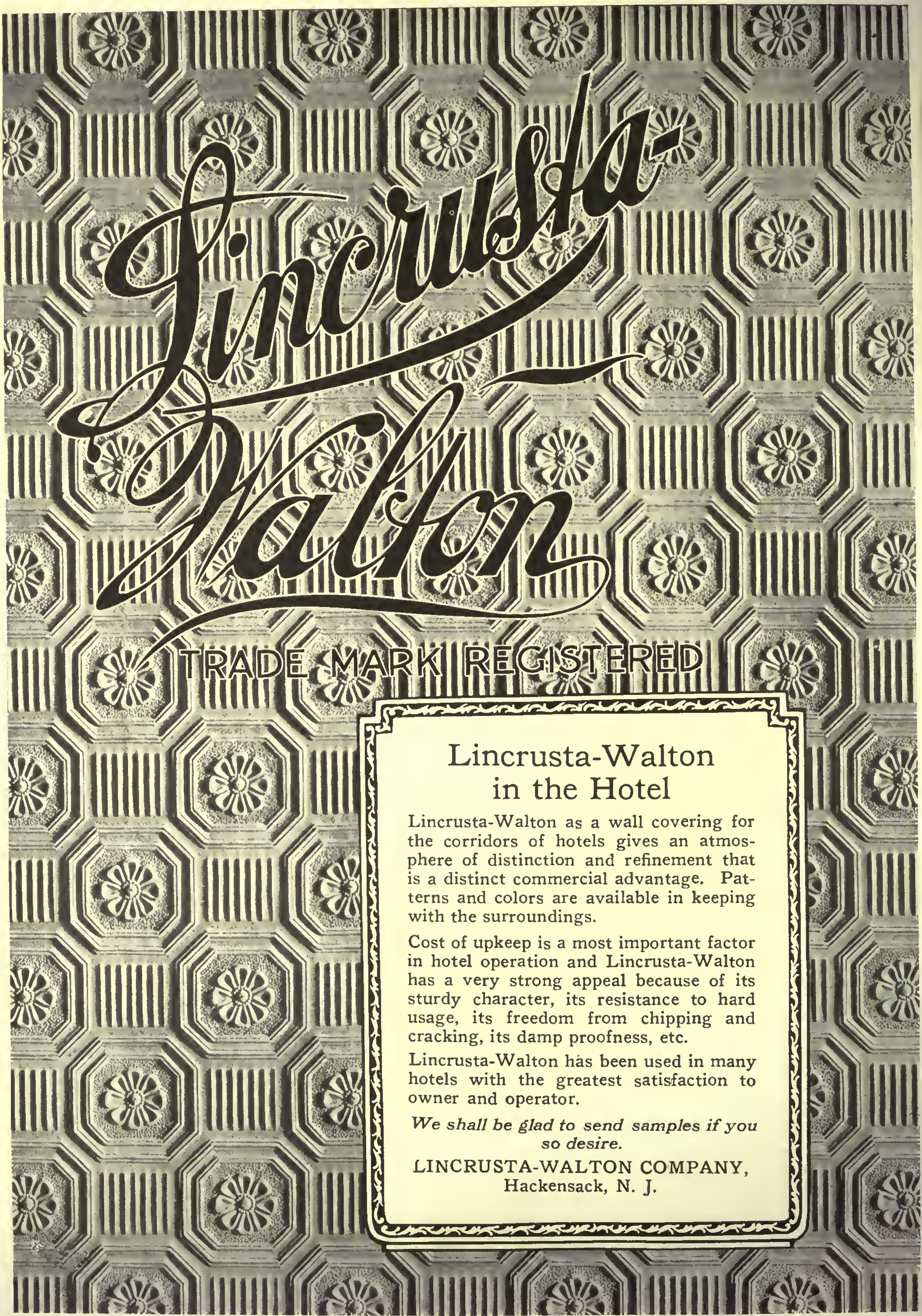
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THE AMERICAN ARCHITECT
THE ARCHITECTURAL REVIEW

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VOL. CXX DECEMBER 21, 1921 NUMBER 2383

Plates

OWNED AND PUBLISHED BY
THE ARCHITECTURAL AND BUILDING PRESS, INC.
PUBLICATION OFFICES: STAMFORD, CONN.
Editorial and Advertising Offices: 243 West Thirty-ninth Street, New York
E. J. ROSENCRANS, President and Treasurer FREDERICK S. SLY, Vice-President

WILLIAM H. CROCKER, Editor
ERNEST McCULLOUGH, C. E., Associate Editor

Western Office: First National Bank Building, Chicago, PAGE A. ROBINSON, Manager

Yearly Subscriptions in the United States and Possessions, Mexico and Cuba, Six Dollars. Canada, Seven Dollars. Other Countries, Eight Dollars, payable in New York Funds. Single Copies (Regular Issues) 35 cents.

PARAPET DETAIL (CHAPEL RAILING)—VI CENTURY—RAVENNA, ITALY

THE AMERICAN ARCHITECT
The ARCHITECTURAL REVIEW

VOL. CXX WEDNESDAY, DECEMBER 21, 1921 NUMBER 2383

West and North Elevation, House of E. A. Choate, Esq., Rye, N. Y.

MAKING THE HOUSE FIT ITS SITE

BY W. K. RAINSFORD, Architect

THE house of E. A. Choate, Esq., stands in the grounds of the Apawamis Club at Rye, and upon the edge of the Golf Course. The situation was beautiful, the topography very "accidenté," and in the planning and massing of the house, the problem was one of a close study of natural conditions, unhampered by preconceived and ill-digested convictions on the part of the clients.

The curve of a rocky ledge, trailing off into a fine grove of oak trees, seemed pre-eminently the proper site, and suggested that the backbone of the house should bend at an obtuse angle. The fact that the view lay to the N.N.W., suggested that the Living Room, to get both view and sun, should open through in both directions, and probably had better open in three. To get an East window in the Dining Room, and in some bedroom above it, another angle would have to be found, but the bend of the backbone would make this not difficult. The character of the ground suggested a style somewhat rugged, and in which beauty should be sought through the medium of color and texture rather than of detail. And lastly, to avoid too much theorizing, the fact that the house would be equally well seen from each of three directions, but always at some distance and through trees, and that the approach would encompass it in this way, suggested a strong featuring of the roof, and a massing of it for effect of climax. Actually, the roof line, more than anything else, determined the final silhouette of the plan.

The study of the ground plans was not difficult. In the use of a naturalesque style an architect must trust his own good taste and follow the line of least resistance. Changes of level were used wherever convenient, and some exterior grading was necessary. That the garage doors should be visible, though not conspicuous, from the front door was not considered a serious fault, more especially since the amount of grading necessary to have avoided this would have been large, and the more circuitous driveway would have very seriously damaged the intimate beauty of the oak grove. It was found practical to open the kitchen through in both directions—a fact which has enabled it to be kept cool throughout the hottest summer weather. Since the sleeping porch was, of necessity, to be placed above the sun parlor, their location was determined by that one of the two which was judged the more important, and the morning sun was sacrificed for sunset and view.

Fireplace in Stair Hall

Of the North and West elevations, the same may be said, as of the plans. When in the middle of the Nineteenth Century the informal Jardin Anglais was sweeping away the beautiful formal gardens of Europe, and conscious thought in design was considered original sin, a formula once offered by an expert for the laying out of a garden was ,*"Enivrez le jardinier, et suivez dans ses pas."*—(Get the gardener very drunk, and follow in his footsteps.) This is perhaps not a final solution, but the gist of it is a frank expression of impulse and of fact. Here a frank expression of plan was all that was necessary for a good elevation, the massing of the roof, as has been said, having already been closely considered in the proportioning of the somewhat complicated silhouette. The sleeping porch, which, though so necessary a feature in nearly all modern country residences, is so often an afterthought in design, and which does not so much confess its accidental origin as it does proclaim it from the house tops,—the sleeping porch was made the one dominant feature of the short West front. By allowing it slightly to overlap its supporting walls, and providing it with the only completed triangle in all the complex series of hipped roofs, it was rescued beyond peradventure from any accusation of the accidental.

Living Room

NORTH ELEVATION

HOUSE OF E. A. CHOATE, ESQ., RYE, N. Y.

W. K. RAINSFORD, ARCHITECT

The South front was decidedly more difficult. Here, beyond finding a sufficiently recessed angle for the little sunken garden, whose lily-pool should be on axis with the Living Room, and slightly featuring the chimney of the Hall fireplace which would dominate that garden, the central block of the building alone had to be considered.

Corner of Garden

But this central block was a problem. The Jardinier, instead of wandering amiably onward upon his inspired path, sat down and went to sleep. The block was profiled from ridge to foundation at either end; its lower floor, occupied by Dining Room and Hall, was in plan a composition of two-one from right to left, while the upper floor was two-one two-one. No frank treatment of such an aggregation could be found of sufficient dignity and simplicity to serve as dominating feature for that whole elevation, nor could the dis-symmetry of the plans be made to harmonize with the symmetrical roof; and yet the plans were entirely convenient, and the roof just what was wanted in the general effect. Obviously the Jardinier would have to be sobered up and compelled to think.

A continuous arcade across the lower story was found to be satisfactory, and the windows of the upper story were, without regard to their natural relations, grouped symmetrically if not formally, above them. The addition of buttresses, while not logical, nor in any way related to interior bearing-walls, was found to be very helpful to the effect. Sincerity in design is always desirable, but cannot, with success, be made a fetish, and here the suggestion of end-pavilions, obtained by the superposition of windows framed between practically meaningless buttresses, brought a solution which has seemed entirely satisfying.

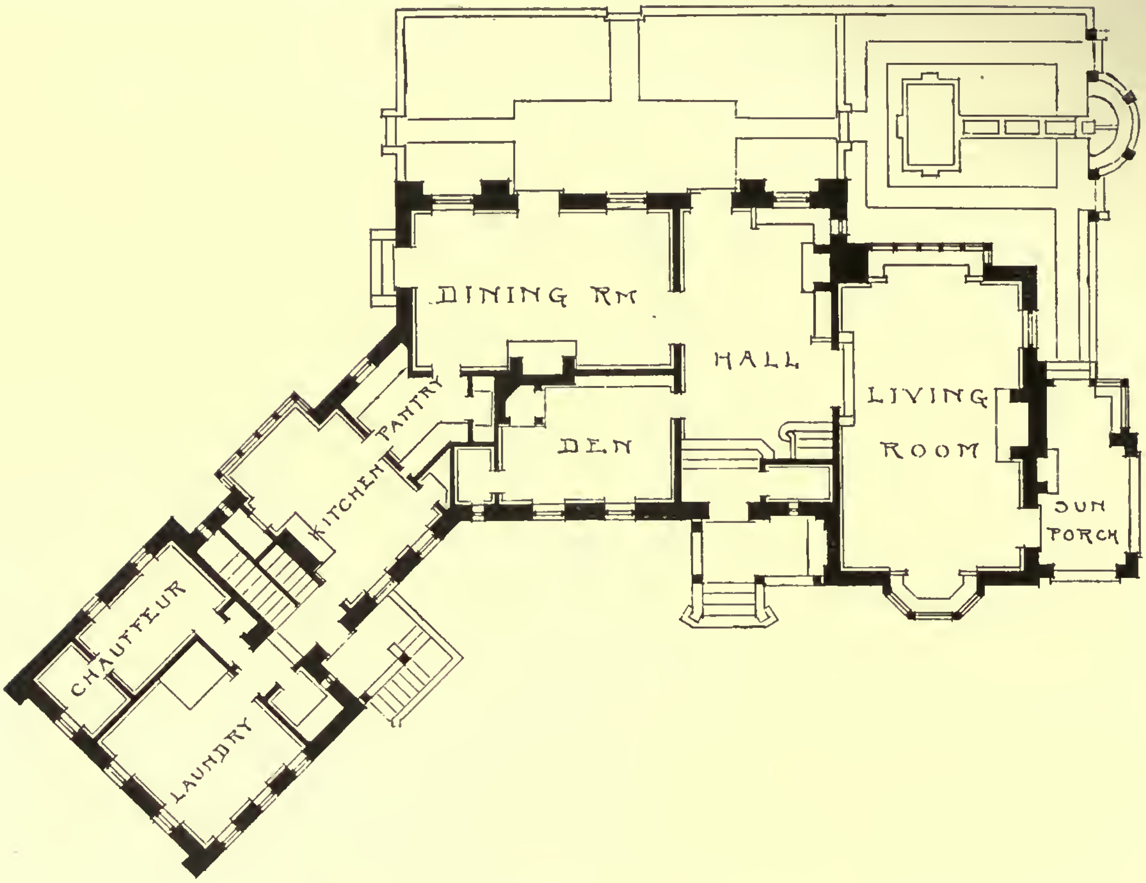
For the rest, the house, as has been said, depends for its exterior effect on texture and color. Rubble-stone walls mixed with brick, and drifting off above into stucco, through which the brick and stone still occasionally protrude, give that charm of premeditated spontaneity which Anthony Hope once attributed to his heroine's golden hair. The stone was carefully selected for flat surfaces and warm rust-colors, the brick is rich and varied, and the roof-slate is also largely yellows and browns. The treatment of the stucco is probably unique, being hand-colored with the infinite labor of love. It was originally intended to be buff and of varied texture, but during the enforced absence of the architect it hatched out blue-grey and smooth. So the architect bought him a variety of water-proof paints, some tin dishes to mix them in, a dozen or more sponges, a paint-brush or two, and borrowed extension-ladders and canvas overalls. Then during three weeks he labored,

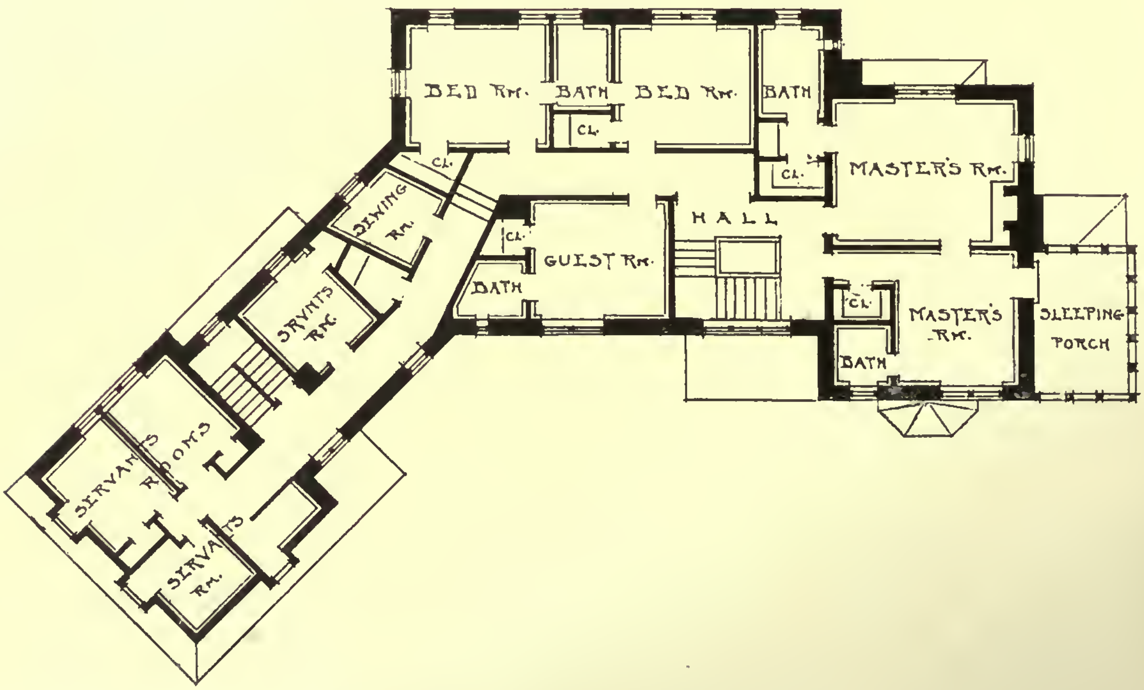
Stair Hall

SOUTH ELEVATION, MAIN PORTION

HOUSE OF E. A. CHOATE, ESQ., RYE, N. Y.

W. K. RAINSFORD, ARCHITECT





HOUSE OF E. A. CHOATE, ESQ., RYE, N. Y.

W. K. RAINSFORD, ARCHITECT

SERVICE WING, NORTH ELEVATION

SUNKEN GARDEN

HOUSE OF E. A. CHOATE, ESQ., RYE, N. Y.

W. K. RAINSFORD, ARCHITECT

DINING ROOM AND DEN FROM STAIR HALL

HOUSE OF E. A. CHOATE, ESQ.
RYE, NEW YORK

W. K. RAINSFORD, ARCHITECT

DINING ROOM FROM STAIR HALL

developing style and a technique in this unprobed field of art, and eventually felt proud of his work. The first panel, executed on the tree-covered East front of the garage, was christened "The Battle of the Marne," then came "The Ashes of Empire" and "The Gotterdamerung." But round the corner, on the more public North front came a well-ordered Turner sunset, and thereafter he settled into his stride. The final result is not glaring; it is not bizarre; it is only warm, and varied, and very personal. There are orange-browns drifting down into buffs, and brownish orange slightly shot with crimson, where the bricks give a red background, and the rough texture of the stucco would allow a dry brush to leave a delicate bloom of color on the tops of the roughness alone. For the most part, the work was done with a sponge, sometimes containing different colors on its opposite sides. Sometimes the sheer blue of the stucco could be coaxed into an olive-green, which might be carried off into cinnamon or partly overlaid with a thin cloud of old-gold; on the South front, where the stucco was already yellowish, much of it could be left to show through, and here, where the house is viewed at more intimate range, the coloring was kept very subdued. As an indication of the spirit in which the work was pursued one might note that the owner took two days from his business in the city to act as painter's-assistant, and color the stone-joints to match.

The care taken in the exact placing of the house, so as to fit it in between the well-grown oak trees, helped out by some successful planting of cedars and laurel about the front door, has been well repaid by a prevention of that feeling of rawness so commonly associated with the very new. The house seems to grow from the ground on which it stands and to have been there for decades. The interior will require both time and money for its proper furnishing, but here the owner must take up the work where the architect leaves off, and the labor of love may be leisurely continued for all time.

STAINED GLASS PANEL IN METROPOLITAN MUSEUM OF ART

GERMAN MIDDLE XVI CENTURY RENAISSANCE

SOME FUNDAMENTALS IN HOSPITAL PLANNING--PART II

BY HENRY C. WRIGHT, Hospital Consultant

Airing Balconies and Sun Porches

SUN and air are very important therapeutic agents. No hospital should be without an abundance of both. The open balcony is used for fresh air treatment. The porches with windows are heated. They are used most largely by convalescent patients. Patients, whether in a ward or private room, need a change, and an enclosed porch affords a place of diversion and assembly. Such balconies and porches, so far as possible, should not be so placed as to darken wards or patients' rooms. Some hospitals have provided a narrow balcony about five feet wide along private rooms, with a door from each room onto the balcony. The bed can be pushed part way out. These narrow balconies do not materially darken the rooms below. In practice, however, they do not seem satisfactory. For high class private rooms, a private balcony is highly desirable. This can be formed partly by a bow window and recess between two rooms, and accessible from both. In large hospitals a smoking room for ward patients is desirable.

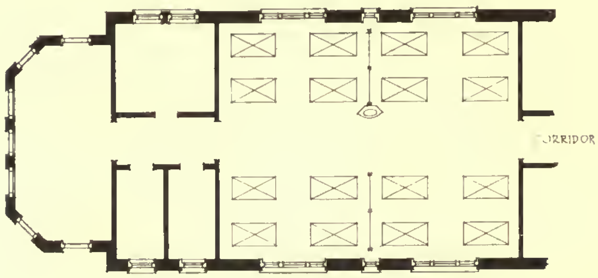


Fig. 3. A ward with beds parallel to the longitudinal axis. Plate glass screens separate the beds into groups of four. Wide windows permit adequate ventilation without a draft to any patient. Patients may be classified in groups of four. By this arrangement of beds, it is feasible to provide running water into the wards

Wards

A WARD is usually considered a room in which four or more beds are placed. Wards are usually used for patients who can pay little or nothing for care in the hospital. From the standpoint of the welfare of the patients, wards should contain few beds; from the standpoint of operating economy, as many beds should be in one room as can be readily supervised by one head nurse. The maximum should not exceed twenty-four. A desirable number is much less. In small hospitals the number of beds in a ward will be governed largely by the number of wards. In no case should there be fewer than three; one for females, one for males, one for babies. Preferably the males should be divided into surgical and medical. Again, it is desirable to provide a separate ward for maternity cases. Large hospitals will have additional classifications.

The objection to having a large number of beds in a ward may be minimized by grouping the beds and using glass partitions between the groups. See Fig. 3.

The arrangement of beds as shown in Fig. 3 has the additional advantage of abundant ventilation without a draught on any patient. Again, no patient faces the light. This arrangement of beds is used in the new Cumberland Street Hospital, Brooklyn, New York.

The width of wards should be not less than twenty-six feet and not more than twenty-eight, when the beds stand at right angles to the longitudinal axis. When they run parallel, as in the foregoing illustration, the width should be not less than thirty-two feet.

Private Rooms

PRIVATE rooms may be of great variety in size and facilities according to the finances of the hospital and the class of patients to be cared for. The simplest room may be eight by twelve feet, with no running water or closet. These dimensions require the bed to stand at right angles to the outer wall. It is preferable to have the bed parallel with the outer wall. With this arrangement the minimum width of room is about nine feet. Ten feet are preferable. Thirteen feet is a comfortable length for a room. A room eleven by thirteen feet is very convenient to work in, and more desirable for a patient. Rooms in higher class hospitals are frequently made twelve by fifteen feet. A semi-private room usually contains two or three beds, preferably separated by a curtain or a permanent partition of sheet metal and glass. For these beds, a width of seven feet is workable; eight feet are preferable.

All private rooms if possible should have running water. When finances will permit, it is desirable to have rooms in pairs with a toilet between assigned to either of the rooms. Where this arrangement is used the lavatory should not be placed in the toilet, but instead, one should be provided in each room. See Fig. 4. The following arrangement is desirable:

Private baths are little used by patients. Nevertheless it is desirable to provide some rooms with baths, since they are requested, and will bring proportionately larger returns to the hospital.

The doors to private rooms should be not less than three feet six inches; four feet are preferable. When finances will warrant, metal frames should be used. The doors should be so hung as to shield the bed when partly open.

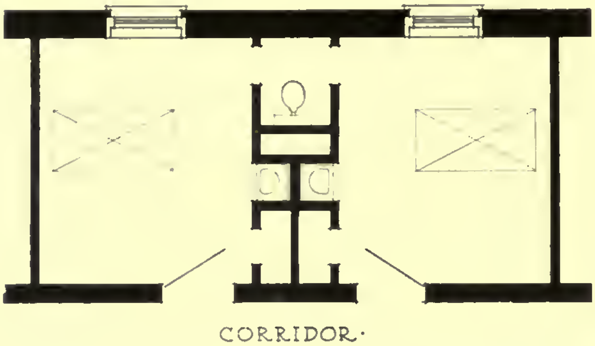


Fig. 4. Illustration of a toilet located between two private rooms, accessible from either, with a lavatory placed in each room so that running water will be available in the room not having the assignment of the toilet. Door from the corridor to the private room so hung as to screen the bed

Service and Auxiliary Rooms

In addition to the food service room heretofore mentioned, each ward or group of private rooms should have a utility room, nurses' station, bath and toilet, examining room, quiet rooms, place for clean linen and for soiled linen, stretchers and wheel chairs closets, and, for the surgical ward, a place for dressing carriages. When feasible, a case for flowers should be provided.

A utility room usually is equipped with a sink, laundry tray, bed pan hopper, utensil sterilizer, instrument sterilizer and gas plate. There should be floor space for a table and waste receptacle. In this room are frequently placed the dressing carriages and a case for solutions and supplies. In, or in the vicinity of this room should be a blanket warmer. It is desirable to have the nurses' toilet entered from this room. Herewith is presented an illustration of a utility room.

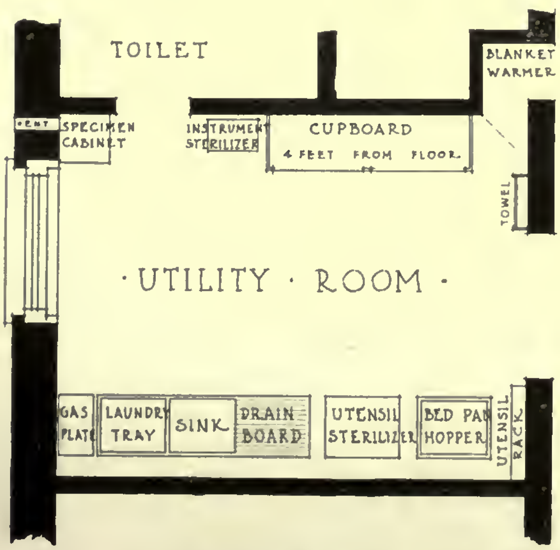


Fig. 5. Utility Room, showing necessary set fixtures. Blanket warmer so located that it can be used also as a utensil warmer

With wards, it is advisable to have the nurses' station adjoining, with a window overlooking the ward. In, or near this room or alcove should be the linen and medicine closet. This should have running water. In connection with private rooms, the nurses' station may be an open-front alcove in the rear of which is a linen room with shelves for linen, trays and other accessories.

Soiled linen may be placed in hampers or dropped down clothes chutes. There are objections to clothes chutes unless they are enclosed in a room and made accessible only to an employee assigned to the task of putting the soiled linen in the chute. Unless this arrangement be made, the inside of the chute is likely to become fouled by the carelessness of employees.

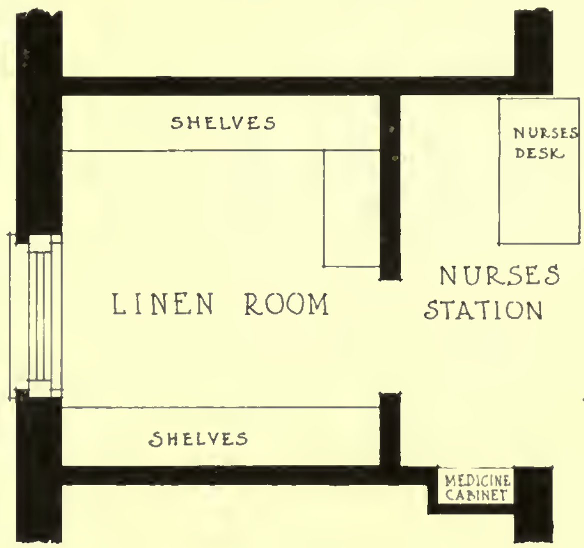


Fig. 6. A nurses' station and linen room so combined as to facilitate control of linen by the Charge Nurse

In arranging the accessory and auxiliary rooms, study should be made so to place them as to reduce to a minimum the travel of nurses. The room most frequently visited in ministering to the patient should be nearest the ward. Where possible, it is advisable to have the toilet and utility rooms at the outer end of the ward, so that visitors will not pass by them.

Operating Room

The minimum operating service is one operating room, a surgeon's dressing room and a room used jointly for sterilizing, nurses' work room. An anæsthetic room is desirable, but this function can be performed in the operating room if space for such a room is not available. The surgeon must have a room in which to dress. If this room be adjacent to the operating room, his final wash-up may also take place in this room. So far as possible the operating suite should be so located that visitors or employees do not pass by the rooms.

In larger hospitals the operating facilities will be adjusted to the amount of work to be done. In addition to one or more major operating rooms, there should be one or more minor operating rooms. In these rooms a large proportion of operating may be performed, thus reducing the labor

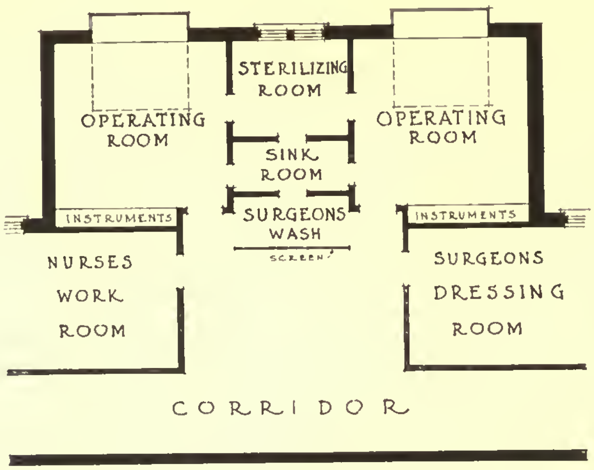


Fig. 7. A convenient layout for two operating rooms, with auxiliary rooms

of preparing and caring for the large operating rooms. Where possible set fixtures for washing instruments and for disposal should be in a room or space separate from the sterilizing room. If the nurses' work room be not adjoining the sterilizing room, it is advisable to have a dressing sterilizer in the nurses' work room. This room should also have a sink used in preparing saline solutions. The nurses' work room should have ample cupboards or cases in which to place material to be sterilized and having been sterilized.

The sterilizing room should have a water sterilizer, dressing sterilizer, if it be not in the nurses' work room, one or more instrument sterilizers, sink, and room for one or more tables. Adjacent should be a blanket warmer and saline closet. The blanket warmer may be used for this purpose.

The major operating room should be lighted from the North. It is advisable to place artificial lights above a glass ceiling, so that no pendant fixtures will be over the operating table. It is advisable to have no set fixtures in the operating room. A central floor drain is desirable, and electrical outlets on the walls needed. A hose connection for washing the room should be provided.

Delivery Room

A DELIVERY room should be provided separate from the operating room. Adjacent to this it is advisable to have one or more labor rooms. In the delivery room may be the wash-up for the obstetrician. There should also be an instrument sterilizer, a pack sink, and a disposal sink. Closets or cupboards for supplies should be ample. A blanket warmer is needed if the warmer connected with the operating room be not nearby.

Creche

A CRECHE or nursery for new born babies should be provided. This should be a well lighted room, and opening on it should be a babies' wash-up and a food preparation room. The creche need not be near the delivery room, but should be as near the maternity service as possible.

Floors

NO thoroughly satisfactory floor has as yet been devised. Tile is sanitary, easy to clean, has low upkeep, but is expensive and hard on the feet. Terrazzo is good, but will crack, and at times will roughen. Magnesite floors are easy to lay, cheap, but not durable. They will usually crack, and often peel up. Wood floors have cracks and require constant attention. Their daily care is expensive. Linoleum, if fully seasoned before laying, and then properly laid, is on the whole a very satisfactory floor for wards and rooms that do not have rough usage. For private rooms, wood or cork or a combination is very satisfactory. In corridors, cork, linoleum, rubber or terrazzo, are durable and acceptable. Kitchens and operating rooms should have tile floors.

Windows and Ventilation

ARTIFICIAL ventilation, except for operating rooms, kitchens and toilets, is a needless expense. Seldom are ventilating systems used, even though installed in private rooms and wards. It is better not to depend upon them. Window ventilation can be made satisfactory if the windows are properly designed.

Lighting Fixtures

NO ceiling fixtures should be used in wards or patients' rooms. It is difficult for a patient lying on his back to avoid the light from a ceiling fixture. Side fixtures are much preferable. At each bed should be a light-plug, for reading and to be used by physicians when examining patients.

Call Systems

IN small hospitals no call systems are needed. In a hospital of moderate size a call system for nurses is desirable, especially from private rooms. No call is needed for doctors. In large hospitals a doctors' call is necessary. Audible calls are disturbing to patients. Lights are preferable.

Stores and Storage

A STORE centralized and under the control of a storekeeper is advisable. Only daily supplies of food and materials should be issued, so no auxiliary store rooms should be provided. Storage space is very essential for broken furniture, mattresses, surplus beds, cots, and a great variety of things.

Laundry

IT is advisable for a hospital to have its own laundry. Much of its laundry is in such condition that a commercial laundry does not care to handle it. It is preferable to place the laundry in a building separate from the patients. The basement of the patients' building, however, is a feasible place, provided it be well ventilated. The equipment is very similar to that used in a commercial laundry. Separate washers for staff laundry are advisable.

Heat, Light and Ventilation

IF the hospital be not too large, hot water is preferable to steam, inasmuch as the radiators by that system are never hot enough to burn patients,—a factor which must be considered. When possible, it is advisable to place radiators under windows. A ventilating louvre through the outside wall, back of the radiator, necessitates enclosing the radiator. The enclosure harbors dirt. The enclosure may be obviated by bringing the window close to the floor.

In small hospitals it is advisable to place the heating plant in the basement. In large hospitals a separate building is preferable.

Light generated by a hospital plant is usually more reliable than that purchased from a commercial company. A breakdown generator is needed for safety.

The problem of refrigeration is complicated. What boxes should be refrigerated and what not; whether or not ice should be made, are questions for local determination. The size of the hospital and relative location of refrigerating machinery and boxes must be taken into consideration in deciding the question of manufacturing ice. Refrigeration of all boxes and the manufacture of ice are desirable if the cost is not too great.

Shops

AMPLE space should be set aside for shops, carpentry, painting, etc. Frequently too little attention is given to this phase of hospital operation.

Ambulances

SOME hospitals do and some do not operate ambulances. When ambulances are used, provision should be made for them as near the main building as feasible. Space for a shop and waiting room for the driver should be provided. Telephone connection will not be overlooked.

THE foregoing spaces and facilities are some of the most common and important in hospital planning. Spaces which are not common to all hospitals have not been discussed, such as the dispensary, Zander room, hydrotherapy, electrotherapy, cardiography, etc. Such spaces will be determined by a study of the local problem.

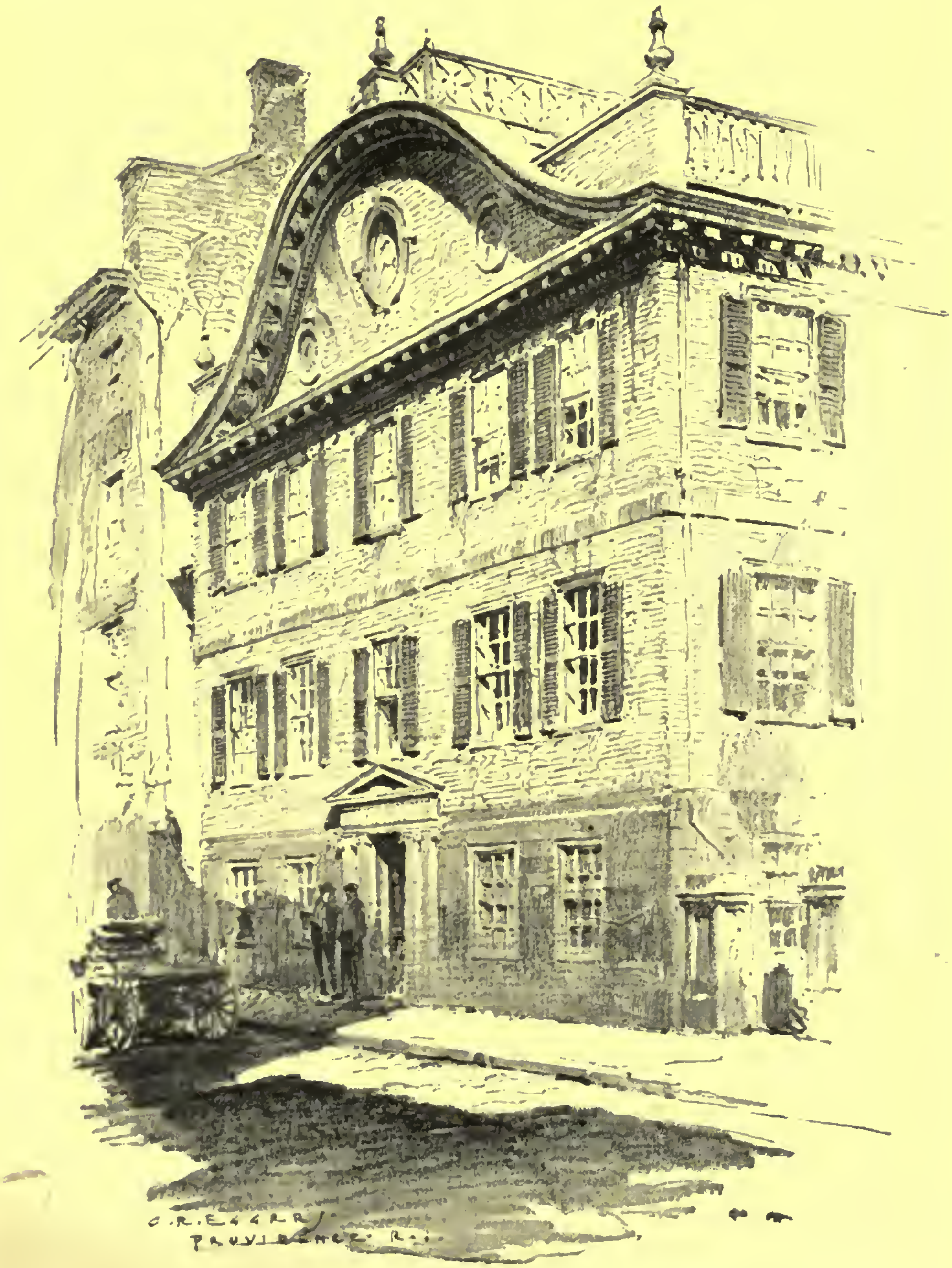
Old Providence National Bank

(See reproduction of original drawing by O. R. Eggers on opposite page)

THIS building was erected about 1775 by Joseph Brown, one of a number of competent "builder-architects" whose work may be found in all of the original states. Brown occupied it as a residence for a long period of years. It then became the banking house for the Providence National Bank.

This structure long stood as a symbol of the financial stability of the Government. It typified the various stages of the history of banking in this country from the time when the Continental Congress first gave aid to the banks organized under its authority through the many financial storms that culminated during our Civil War in the present National banking system.

Within and without, this building bears evidence of its having originally been designed for a residence. The many years of commercial occupancy did not rob it of its fine features of architectural detail.



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OLD PROVIDENCE NATIONAL BANK

THE AMERICAN ARCHITECT Series of Early American Architecture

[illegible]

GARDEN WALL AND APPROACH
ESTATE OF ARTHUR H. MARKS, ESQ., YORKTOWN HEIGHTS, N. Y.
ANDREWS, RANTOUL & JONES, ARCHITECTS

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VIEW IN GARDEN, ESTATE OF ARTHUR H. MARKS, ESQ., YORKTOWN HEIGHTS, N. Y.

ANDREWS, RANTOUL & JONES, ARCHITECTS

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GARDEN STEPS AND PERGOLA

HOUSE OF CHARLES A. STONE, ESQ., LOCUST VALLEY, L. I., N. Y.

WELLES BOSWORTH, ARCHITECT

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ENTRANCE DETAIL

HOUSE OF CHARLES A. STONE, ESQ., LOCUST VALLEY, L. I., N. Y.

WELLES BOSWORTH, ARCHITECT

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HOUSE OF A. E. BURR, ESQ., SCARSDALE, N. Y.

A. J. BODKER, ARCHITECT

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MAIN ENTRANCE DETAIL

HOUSE OF A. E. BURR, ESQ., SCARSDALE, N. Y.

A. J. BODKER, ARCHITECT

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ENTRANCE DETAIL
HOUSE OF A. E. BURR, ESQ., SCARSDALE, N. Y.
A. J. BODKER, ARCHITECT

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GARAGE OF A. E. BURR, ESQ., SCARSDALE, N. Y.

A. J. BODKER, ARCHITECT

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DETAIL, MAIN ENTRANCE

HOUSE OF W. D. PACKARD, CHAUTAUQUA, N. Y.

WARREN & WETMORE, ARCHITECTS

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THE PORTE COCHERE

HOUSE OF NICHOLAS BRADY, ESQ., MANHASSET, L. I., N. Y.

JOHN T. WINDRIM, ARCHITECT

476"

EXTERIOR DETAIL

HOUSE OF FRANCIS KEIL, ESQ., SCARSDALE, N. Y.

A. J. THOMAS, ARCHITECT

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EXTERIOR DETAIL

HOUSE OF FRANCIS KEIL, ESQ., SCARSDALE, N. Y.

A. J. THOMAS, ARCHITECT

HOUSE OF PHILIP W. HENRY, ESQ., SCARBORO, N. Y.
BERTRAM G. GOODHUE, ARCHITECT

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DETAIL ON TERRACE

HOUSE OF PHILIP W. HENRY, ESQ., SCARBORO, N. Y.

BERTRAM G. GOODHUE, ARCHITECT

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TERRACE VIEW

HOUSE OF PHILIP W. HENRY, ESQ., SCARBORO, N. Y.

BERTRAM G. GOODHUE, ARCHITECT

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HOUSE OF PHILIP W. HENRY, ESQ., SCARBORO, N. Y.
BERTRAM G. GOODHUE, ARCHITECT

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·EDITORIAL·COMMENT·

Bankers and Contractors

THE report that banks in Chicago will refuse to make building loans unless contractors agree to abide by the ruling of Judge Landis in the recent arbitration case between labor unions and the Employers' Association is a refreshing sign of sanity. The decision was widely acclaimed because it reduced rates of pay in the building trades. The more significant part, the elimination of practices calculated to enhance the cost of building by putting a premium on inefficiency and lack of speed of craftsmen and combinations in restraint of competition on the part of associations of employers, is now sharply emphasized by the reported action of the banks. The first reaction on many people is condemnation of the banks for what appears to be conspiracy. Sober second thought shows that the action is eminently proper. The refusal on the part of employers to abide by the decision is a confession of their unwillingness to conduct their affairs in a lawful manner.

To loan money to such men is contrary to public policy, for the lender in effect becomes party to a conspiracy in restraint of trade. Any citizen smarting under a sense of wrong or imbued with a crusading spirit in defense of public rights can stop work in progress and thus imperil the security on which the loan was made. The banks, we may be sure, are acting on good legal advice. Before the decision of Judge Landis was rendered no question could be raised, but a defiant attitude indicates a spirit of resistance to law and this spirit the banks cannot afford to recognize. Thus expediency and business morality march hand in hand, unless business morality is merely another name for expediency, a somewhat pessimistic opinion, it must be confessed, for one to hold.

New York Chapter Visits "Southern Cross"

THE visit of the New York Chapter, American Institute of Architects, to the Munson Line Steamship, Southern Cross, serves to direct attention to the rapid advancement of the architectural treatment of passenger-carrying ocean going steamships flying the American flag.

Up to the outbreak of the War, this country's proportion of passenger ocean ships was comparatively small. When the Shipping Board started out on its extensive program of ship building, they laid the keels of many ships, most of them for transport service. With wise forethought they planned for the conversion of a number of the larger ships to passenger service. When the Armistice was signed many of these were on the ways, not yet launched. The group of ships now operated under the American flag are of large tonnage, and their refitting to adapt them for passenger service was quickly and satisfactorily accomplished.

The Southern Cross is one of this group. Another ship, the Hawkeye State, of 20,800 tons' displacement, was fully described and illustrated in THE AMERICAN ARCHITECT, issue of April 13, 1921.

While the solution of the architectural problems presented in the conversion of these ships, has not, in every instance, been satisfactory, the great advance shown indicates the future possibilities.

If one is able to look back over a period of forty years, he will be convinced that much satisfactory work is being done in an effort to make these ships architecturally better.

Forty years ago, the ocean going passenger ship was, as to its equipment, a very unsatisfactory thing. The steamboats, plying on our large inland waters, were a most awful type of so-called architecture. Garish, overspread with jig-saw work and gilt, they suggested to the traveler afloat the usual ornate bar rooms of the period. The ocean going ships followed these undesirable models.

But a few years before the clipper packets, the shuttles that wove the fabric of our communication with Europe, were making their lumbering way across the Western Ocean. The cabin passenger of that period, as far as comfort and convenience were served, was not as well off as the steerage passenger of today. It is marvelous to note what has been accomplished in the perfection of our "floating hotels." There is, as has been heretofore pointed out, an interesting field of work for architects in the architectural treatment of passenger ships, and undoubtedly every member of the New York Chapter who was of the party on the Southern Cross realizes the opportunity for a new and decidedly good field of study.

Poseurs

ARTISTS, real artists, those whose pictures hang on the line at Academy exhibitions, and for whose canvases dealers compete, will soon have no place to lay their heads.

Ten years ago, when Greenwich Village was a real art center, an artist might have secured a whole floor for forty dollars a month, or a single room at a proportionate rate. "The Village" was a real art center, a worth while place for artists to live. But, when they were comfortably settled there, when they had set up their easels and gone to work, along came the newly rich, the "near artist" and all the bunch that affect the artistic pose. They elbowed the artists to one side, and offered unheard of prices for studios.

A lot of people who absolutely were devoid of artistic perception, who could not even draw a straight line with a ruler, and whose ideas of art were of the department store type, moved their rugs, their old pewter and all the junk they fondly believed to be artistic, into the Village. Then they set out on a round of "studio teas," and scoured the Village for an artist "lion" as a guest of honor. Their finely engraved visiting cards proclaimed their studio habitat. Meanwhile other equally inartistic "artists" bought and remodelled old houses, the speculative real estate agent cooperated, and rents began to soar. Now the real artists are moving out, and the Village once truly called the "Latin Quarter of New York," is but the neighborhood of dilettante and poseurs.

These things are occurring in other cities, and are making conditions so very bad as to create a real hardship for the city living artist. As soon as he makes known that he wants the place for a studio, the owner scenting a large profit, raises the rent.

The parasites of art cannot know the contempt in which they are held by artists. If they did, they would not continue to crowd them out of house and home by aping a pose that they are absolutely unable to make good.

The Voice of the People

WHILE the general public may know nothing about art, in Boston at least it knows what it likes, or doesn't like. Judging by the letters printed in the daily press of that city, the people do not like the new building of Federal Reserve Bank.

It does not "symbolize the federal power of which it is a local embodiment." "It violates a fundamental principle of architecture in being out of harmony with the site." These are some of the transgressions that are said to be a part of the general architectural scheme of the building. Possibly these criticisms are not well founded, and we suspect they are not, but what is worth while directing attention to is that the people of Boston are jealous of their architectural good name, and are quick to voice their criticisms of what they don't like. It's a good rule for other cities to follow. If the building is as objectionable as claimed, the government has learned that dwellers in cities have certain rights as to the character of federal architecture that it will be wise to acknowledge. And if the people are wrong, they may be "shown" and thus acquire some much needed education in the art of architecture.

Architecture and Atmosphere

THE ARCHITECT, of London, reviewing the exhibition of American architecture, held in the galleries of the Royal Institute of British Architects states,—"It is easy to forget that America has an atmosphere comparable to Southern Europe in its clearness, a factor which renders it natural that her architects should carry out work which is comparable in its fineness of detail to that of Italy, but which could be often like a partly legible page of print, seen in a poor light if erected here."—This statement as to atmospheric conditions in the United States is only true as to certain localities. Our climate is as varied here as it is in Europe. Another variation and the attendant atmospheric conditions are the outstanding things that prevent the development of what may we call a "national" type. We may have regional types and in fact we already have very distinctive buildings in different regional locations. What probably retards the development of regional types more than anything else, is the standardization of materials especially those molded elements that are introduced into the façades of buildings. Molded Terra Cotta, imitations of cut stone, wrought iron, all the many things that are available today, are very often selected and used without regard to the atmospheric conditions that prevail.

Manifestly any ornament that may be standardized cannot be successfully used in identical patterns in Pittsburgh, New York, Chicago or the cities along the Southern California coast. Each has its very marked atmospheric characteristics. The critical observer at the last exhibition of The American Institute of Architects held in Washington, where photographs of buildings were shown from every section, found that the ornament used on buildings has become so standardized that there is practically little difference in any of the locations mentioned above.

The successful designer will carefully study the effect of climate on the "weathering" of his work. Architects have exerted the very best influence on materials and the wise manufacturer has always lent a listening ear to their suggestions. The matter of design of decoratively molded material may well receive careful consideration, such consideration as will take into account the action of the atmosphere, and the location of the use of the material.

Successful manufacturers of commodities in general use, know that they must cater to regional taste. Novelties made for a large sale in one section, are found to be not readily saleable in another. If the architect will be as critical in his selection of elements of design to fit his particular locality, manufacturers, always keen to co-operate will join readily in meeting his needs.

DEPARTMENT OF SPECIFICATIONS

Foundations

THE discussion in our last issue assumed that the excavation contractor's work under a separate contract system would include only the rough excavation, leaving trimming of banks and finished excavation for footings, etc., for inclusion in the foundation contractor's work.

The next sequential step in this series is the subject of foundations which will include all finished foundation work, shoring and underpinning of adjoining buildings, sheet piling to hold banks of excavations and the construction of foundations up to the grade lines for exterior or retaining walls and to the bases of interior columns.

This discussion generally will treat of construction for which concrete is used. The use of rubble stone or brick foundation walls is becoming less common than formerly for the reason that concrete can be installed more cheaply and at the same time presents a much neater appearance and in certain cases provides a much better foundation for waterproofing against surface water or hydrostatic pressure.

It is some times customary to make certain assumptions with respect to the bearing power of soils that may not be proper when the exact nature of the soil is revealed by the excavation, and it is usually in those cases where the architect has not made previous examination of the soils that it is advisable to conduct tests on the bearing power of the soils and this work naturally will be done upon completion of the general excavation and will probably only be done under the direction of the foundation contractor because he will be able to furnish the material for loading such as cement or coarse aggregate.

If the soil is to be tested the tests should be made on a soil surface of more than one square foot. Up to recent years it has been customary to make the tests on one square foot of soil but it seems to be the general concensus of engineers that the test load should be brought to bear on three or four square feet in order to eliminate the punching action that a bearing one foot square provides. The test should be made on the soil at about the level of the bottom of the lowest footing and should be made in a pit that is approximately the size of the footing of the apparatus. This is to provide for resistance against upheaval of the soil under testing load, the importance of which can be readily understood. The method of erecting gauges for regarding settlement should be described carefully and there should be requirements for readings to be taken at intervals frequent enough to record settlements of one quarter inch.

The load should be applied gradually until the designed load has been placed, at which time the loading should cease and measurements taken for at least twenty-four hours. In some cases it is customary to apply an additional load equal to fifty per cent of the designed load from twenty-four to thirty-six hours after the original load has been placed. Readings under this loading should extend over a period of two or three days and it is advisable to allow the load to remain for at least one week in order to observe the action over this length of time. The application of loads and their removal within twenty-four or forty-eight hours do not always indicate correctly the actual supporting power of the soil. The specifications should require careful recording of all readings even though settlement does not occur.

It is often possible to reach definite conclusions as to the bearing power of the soil through a study of material brought up in holes of small diameter which have been bored down to a level of at least twenty feet below the level of the bottom of the lowest footing. It is not necessary for the specification writer to make requirements for borings other than to give locations or state about how many holes are to be bored. Quite often, if a hole is bored at each corner of the lot, observations possible to obtain from these borings will be sufficient to indicate the exact nature of the soil.

In a previous issue this department made a suggestion with respect to the obtaining of specific data by a competent engineer and if this data has been obtained it is of course rather unusual to require the making of test loads on the soil or of boring test holes, but as this work has had to be done on some operations after the general excavation has been completed, it is proper that the specification writer should have this as a reminder in his outline.

SEVERAL of the standard text books on engineering structures have complete discussions of the various methods of making soil tests and the specification writer should make it a point to understand thoroughly the discussion of this study in at least one of the books.

There are certain occasions where it is necessary to carry finished excavations up to the adjoining buildings with the bottom of the excavations below the bottom of the footings of adjoining building foundations. If this is necessary it will, of course, demand consideration of the support and maintenance of such adjoining buildings in a stable condition pending the installation of the new foundations and their bracing by means of floor systems. Such conditions undoubtedly will have been determined prior to the making of the drawings but it is only in rare cases that the drawings for a new structure indicate methods that are to be pursued in shoring or underpinning of adjoining structures especially where there are different owners. The specification writer should ascertain the conditions so that the contractor estimating on the contract will have a fairly clear understanding of the work that must be done in order to install the new construction work in an advantageous and economical manner.

As discussed heretofore a question of legal rights enters into the support of adjoining structures. If the law of the community requires that the owner of the new building provide underpinning for adjoining structures, these requirements will, of course, demand consideration. The specifications should require that adjoining structures be shored, needled if necessary, and underpinned in such a manner as not to interfere with the occupancy of the adjoining structure any more than is absolutely necessary and so that the building levels will be maintained in their original positions at all times. The specification writer should not attempt to lay down rules of procedure in respect to the kinds of shoring or needling media as long as he requires that the building be maintained in its original and in a stable condition. The contractor knows what results are to be accomplished and it will be his concern to accomplish them in the safest and, what is to him, the most economical manner. The above will cover practically all requirements that will be necessary in the usual operation but additional requirements may present themselves for consideration under unusual conditions. The specification writer then will have to consider what demands these unusual conditions make and arrive at some conclusion, possibly after consultation with contractors who are experienced in such work, and lay down a tentative course of procedure in outline form. Many valuable suggestions are given in engineering text-books and the information presented therein will, in practically all cases, provide the specification writer with sufficient information to handle his part of the work in a careful manner.

Cases will arise where sheet piling will be required, the driving of which must be done before the banks of the excavation are trimmed and possibly before the excavation work is commenced. Such requirements are usually the result of shifting soils such as quick sand or water saturated loam and sometimes clay on steep pitched hard pan, or gravel in similar stratification, will require the retaining of adjacent ground so that the foundations of buildings some distance away from the property line will not be endangered. It must be remembered that as a general rule where there is water present in the soils it must not be removed from the adjoining ground to such an extent as to endanger the stability of buildings nearby. This rule applies to all soils and is based on a general law that a property owner can excavate on his own property but he must not disturb the soil of adjoining property through his excavation work. In such cases restraining of soil must be accomplished by means of sheet piling. For a long time wood piles, that is planks, were used, but in recent years the economy and desirability of the use of steel sheet piles has given them a great deal of prominence in such work. Wood sheet piles are sufficient in soils that are not saturated with water or where excavations do not extend below adjoining foundations. In many buildings, especially where there are two stories below the grade line, the use of steel sheet piling becomes economical because of its strength. Shores must be erected to maintain the sheet piling in alignment and so as not to permit bulging under the natural pressure of the overlying soil. The piles should extend below the lowest trench excavation for the outside wall footings and should be placed so as not to interfere with the construction of the footings or foundation walls.

In practically all building construction a specification writer is concerned more with the proper construction of the foundation walls and with the prevention of slides that might add extra expense or cause damage to adjoining structures or street pavements. If the specification simply requires that sheet piling of wood or steel, as the case may be, shall be provided to hold the banks of excavations, and shall be braced by shoring in such a way as not to interfere with the bracing of foundation walls his purpose ordinarily will be accomplished. Other phases of sheet piling are more properly engineering phases with which the specification writer should be familiar but which need not be written into the specification.

The drainage of excavations must be provided for in the specifications even though local custom indicates that the contractor will take care of such drainage regardless of specific requirements. If the site has been occupied by a building it is very probable that a sewer line will be available into which the surface water may be discharged by pumps. Otherwise, it must be conveyed to the ground surface and distributed into gutters or disposed of by other means to preclude its return to the excavation. This is one of the matters that usually is considered a routine duty of the contractor but, as mentioned above, it should be specifically included in order that there will be no dispute as to whether rain water or seepage of rain water or other surface—or ground-water is to be disposed of by the contractor. There have been some disputes as to whether under the usual specification requiring the contractor to dispose of all water in excavations he is required to dispose of water resulting from excessively heavy rain-falls. The specification writer should bear this in mind and see that his clauses are so specific that there will be no question on this score.

In the specifications for finished excavation work it must be definitely stated whether or not the contractor will be permitted to trim the banks of enclosing walls and of trenches so that they may be used as forms for concrete. In many operations there is no reason why the concrete should not be laid against the banks, thus requiring forms for the inner wall surfaces only. In cases where membraneous waterproofing must be applied, this of course will not be possible and the specification then will require that excavations be carried to a point a sufficient distance outside the exterior foundation wall surface to permit the installation of such work. This will occur only in clay soils or soils of such homogeneity that they need no restraint such as that provided by sheet piles.

Much argument has been the result of this important point and it should be given consideration in every specification. There is usually no reason why the sides of trenches should not be used for concrete forms unless of course the soil is of such nature that such use cannot be made of it. If there is any doubt in the mind of the specification writer he should require that all excavations must extend far enough to permit erection of forms for the foundation walls and footings.

All excavated material must of course be removed from the excavation unless it will be of use in filling under raised portions of the basement floor. If the soil is not to be distributed over the surrounding ground for filling low spots or for general grading it must be removed to dumps and the specification must be clear on either phase of this question of disposal. All excavations must be carried down to the underside of the basement floor or to the underside of sand or cinder or other sub-grading that is to be provided under the basement floors. The specification writer should require that various levels be conformed to with as great accuracy as possible and be definite in stating that the excavations below such restricted grades will require the use of a certain kind of filling that must be placed at his expense.

If the site has been filled with rubbish, as is often the case, it will sometimes be found that good soil cannot be gained at the designed footing levels. In such cases the excavation work must be carried deeper and in order that the specification writer will provide all possible protection, he should include a clause calling for bids on the cost of excavation below the designed levels, these bids to be based on the cubic foot or cubic yard and to be computed from areas excavated and not from the amount of earth measured after it has been removed.

In illustration of these points the writer has in mind one operation that revealed conditions that could not have been determined except by means of the boring of test holes. In making drawings for a building occupying an interior lot, careful inquiry was made of the architects and contractors who erected buildings occupying adjoining lots and each person interviewed claimed that the soil at the foundation level was good and that no difficulty was encountered in excavating the basement. In view of these reports it did not seem necessary to make test borings as the footing loads were comparatively low. However, during excavation work it was discovered that the soil was of a most treacherous nature and it was necessary to excavate to approximately twice the depth before firm and substantial soil was encountered. This condition resulted in a very careful investigation when it was found that a slough at one time passed through this property exactly at right angles to the street and as its banks were practically vertical and at the property lines, the adjoining building owners did not discover the rubbish and waste fill that was placed in the slough years before. On this operation the specification did not call for bids on additional excavation and the architect was justified in believing that the contractor succumbed to the temptation to make all the money he possibly could under the unfortunate conditions obtaining.

In further illustration of these points, in another operation the contractor claimed that his contract called for excavation at so much a cubic yard and for hauling away at so much a cubic yard, the amount of excavation to be determined from the hole dug in the ground while the amount of material that was to be hauled away should be determined in the wagons. This meant that there was an excess of about forty per cent in yardage to be hauled and because of the inadequate specifications the extra expense had to be adjusted practically in accordance with the demands of the contractor.

The specification writer, in case there are doubts as to the exact nature of the soil, should call for bids on excavation in soil that it is believed is present and also for excavating and hauling away soil that he believes might possibly be present. As mentioned heretofore, great care must be taken in identifying the soils that are commonly included in rock classifications such as shales and hard pans, in addition to what is ordinarily called "rock."

(To Be Continued).

DEPARTMENT OF ARCHITECTURAL ENGINEERING

FUNDAMENTALS OF ECONOMICAL PLUMBING

Being Suggestions Made in June, 1921, to Secretary Hoover's National Building Code Committee in the Interest of the Betterment of the Housing Situation

BY WM. PAUL GERHARD, C. E., Dr. Eng.*

SUGGESTIONS tending to future economy in plumbing construction may be conveniently dealt with under the following headings:

I. Materials
II. Methods and Design
III. Workmanship
IV. Fixtures and Fittings
V. Control of Plumbing by Rules and Regulations

I. MATERIALS

(a) Cast Iron Pipe and Fittings

IN the construction of plumbing and house drainage systems by far the most common material used is cast iron soilpipe and fittings. At the present time manufacturers carry in stock, and plumbers use, three kinds and weights of pipe, namely light or so-called standard pipe, extra heavy cast iron soilpipe, and a medium grade of pipe. In most of the cities having plumbing regulations the use of light pipe is prohibited, and extra heavy pipe is specified to be used. A few cities, notably Philadelphia, permit the use of a medium grade of pipe. (4" soilpipe weighing 45 lbs. per 5-foot length.) In hundreds of smaller places having neither plumbing regulations nor inspections, plumbers still make use of the light weight pipe.

The standard or light weight iron pipe has been condemned for many years by sanitary engineering experts and by progressive plumbers as an entirely unsuitable material for the purpose.

It is obvious that if undesirable material such as this were eliminated entirely, manufacturers would have to carry a smaller variety of foundry patterns, as well as manufacture a smaller variety of pipes and fittings to be kept in stock. They would also benefit by a smaller demand for storage floor space in their warehouses. It is well known that there is a considerable loss by breakage of light pipe at the foundry, also loss from breakage during transportation, and finally loss due to breakage in delivery and handling on the job. All such losses could be done away with if the use of light pipe were prohibited altogether.

I favor formulating rules requiring the use of only *one* kind and weight of pipe and fittings. This pipe as well as the fittings to be somewhat lighter than the extra heavy pipe hitherto used. Such an amendment to existing rules could be effected without impairing the efficiency or durability of the constructed work. The medium-weight cast iron soilpipe used in the buildings of the United States Housing Corporation, at Bridgeport, Conn., seemed to be a well-made article; the pipe when cut was found to be uniform in thickness all along its circumference, and the joints of the pipe appeared to be well calked. They stood the water pressure test successfully.

There is no question that foundries and supply houses carry a larger variety of fittings than are required or desirable in use. Such a multiplicity of fittings appears to be quite unnecessary. The elimination of useless or seldom-used fittings would accomplish another economy. The War Industries Board reduced the number of available fittings from that shown in catalogs considerably, and with much success, and further improvement along this line could no doubt be effected.

All cast iron pipes and fittings should be delivered uncoated at the job. Coal tar or asphalt coating too often conceals foundry defects in the pipe. There would, however, be no objection to a red

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lead or other coating of the pipe system after same is installed in a building and tested.

I favor doing away with the so-called double-hub pipe, and making instead pipe in regular shorter lengths, beginning with one-foot pieces, two, three and four-foot pieces up to the standard length of five feet. This would effect some economy to the plumber on the work in not requiring the time-consuming cutting on the job of the 5-foot lengths of soilpipe.

(b) Welded Screw-Jointed Pipe and Fittings

STANDARD plumbing rules should recognize the fact that for large and particularly for tall buildings the screw-jointed drainage system has appreciable advantages. Hence both genuine wrought iron pipe and steel pipe should be permitted. Since galvanizing as a protection against corrosion in both kinds of pipes has been found to be of doubtful advantage, and certainly not of lasting quality, I favor, for house drainage purposes, the use of well asphalted pipe and fittings. The highest grade of welded scale-free steel pipe only should be specified, or else the somewhat more expensive, but apparently more durable, genuine wrought iron pipe. The use of the term "wrought pipe" should be discouraged or, better, prohibited as being a misnomer and misleading.

Fittings should be of cast iron, of proper weight, properly cast and tapped so as to constitute what is known as "recessed drainage" fittings, which insure a smooth interior to a pipe line.

For underground lines screw-jointed welded pipe should not be permitted, and only cast iron pipe of proper weight should be used. In certain cases it might be advantageous to use a heavier grade of pipe than that used for the vertical soil, waste and vent pipe system, such as, for instance, the cast iron pipe used for gas mains.

(c) Brass Pipe

PERMIT the use of brass pipe for drainage purposes, but only if the pipe is regular iron pipe size and semi-annealed. Owing to its high cost this pipe material will be but rarely called for, at least for the main soil, waste and vent stacks.

The use of hard brass pipe should not be permitted, and brass tubing, if used at all, should be restricted to the inlet side of fixtures and for flush pipes.

(d) Earthenware or So-called "Tile" Pipe

THE suggestion has been made time and again, and in fact, in some cities and towns permission has been given, to substitute tile pipe in place of iron pipe for the house drains *inside* of buildings. The controlling motive was stated to be increased economy.

Vitrified pipe has but two points of advantage over iron drain pipes: (1) the pipe in itself is cheaper; and (2) it resists corroding influences better than iron pipe. In the interest of a permanently safe house drainage system, however, these points should not receive much consideration.

As is well known, tile pipe is more fragile than iron pipe; it has less structural strength; it is more readily damaged. In designing a house drainage system the aim should always be to keep the house drain exposed as much as possible. This can be readily done with heavy iron drain pipe, which requires, when carried above the cellar floor, supports or hangers at intervals of about ten feet, whereas a tile drain should have continuous support. There is also the number of joints to be taken into account. In tile pipe there are on the average at least twice the number of joints that there are in iron pipe. Every joint in a drainage system being a danger point, the fewer joints there are, the safer will be the system.

In general, it is much more difficult to secure a good drainage layout with tile pipe. It should also be borne in mind that tile pipe is usually laid by masons or drain layers, rarely by plumbers; hence there would be two independent trades or craftsmen connected with the construction of a house drainage system, a thing obviously undesirable, because it introduces the question of divided responsibility for the work.

Again, it is well known that joints in tile pipe are more difficult to make tight; more precautions are required to prevent leakage of sewage from the joints. Such joints may be made tight by the aid of special "joint runners" and by the use of bituminous joint compounds, but all this would nullify the end desired, viz., economy in construction. When pressure tests are applied to tile pipes, joints found leaking are more difficult and expensive to make tight. To insure permanency, all tile pipes should be encased all around with at least four inches of concrete, all of which adds to the cost of tile pipe laying.

Summing up, my judgment is that tile pipe should never be used for house drainage *within* a building, and that if used with all the required precautions and with unusual care in workmanship, no economy whatever in construction would be attained.

Beginning at a point ten feet *outside* of the foundation walls of a building, tile pipe may be safely used, except that where there is danger of roots of trees growing into the pipe joints, or where the trench excavation is made in loose soil, and there is consequently danger of settlement, which would crack the pipe, or at least cause joints to open up, and also where a sewer line passes near to a well furnishing water for household use, it is preferable to use the safer, though more expensive iron piping.

II. PLUMBING METHODS AND DESIGN

(a) Backventing versus Circuit Venting

PROGRESSIVE engineers and sanitarians have of late recognized the fact that there is room for a vast improvement in plumbing design, by the introduction of *simplified* methods, while at the same time maintaining the safety of the work. This would result in an appreciable economy in the cost of plumbing work.

The old, standard system of backventing individual traps, which entails the introduction of numerous and expensive, yet largely useless, branch vent pipes, must go. The simpler a plumbing system can be made, consistent with absolute safety, the better it will be. There are at the present time quite a number of cities and towns which have adopted rules permitting the use of anti-siphon traps at fixtures, always providing the main stacks of soil and vent and waste pipes are carried up full size through the roof, or providing the loop or circuit system is used.

For nearly twenty years all Government buildings in charge of the Supervising Architect of the Treasury Department have been designed with this greater simplicity in view. For an even longer period of time I have so designed the house drainage systems placed under my charge and superintendence, except where building departments stubbornly required the old obsolete system. Each year sees more cities adopting the safer and more economical methods.

I am inclined to believe the time is ripe for a universal introduction of the loop or continuous or circuit vent system. A recent legislative investigation in New York City brought out the fact that master plumbers as well as journeymen were opposed to the system and refused to estimate on work where anti-siphon traps were specified. It is not for me to say how far they were warranted in their action. It may well be that the amendments to the old plumbing rules appeared to them to be framed largely, if not altogether, in favor of one special trap device, and that their combined action resulted purely from the objection to the singling out of a special device which was not altogether free from faulty design.

In this connection mention should be made of the fact that two years ago, when the U. S. Housing Corporation appointed a committee of expert engineers to investigate and report upon a simplified plumbing system introduced by the Corporation from motives of economy, it was found by actual tests that a backvented plumbing system, erected according to the old rules, stood the severe tests less well than the simplified system using anti-siphon traps. Attention was, however, drawn in the report to the fact that all anti-siphon traps are to a certain extent more liable to fouling than the ordinary P- or U-shaped bend trap. Positive knowledge on this phase of the subject is still lacking, and it seems quite possible that the objections raised against anti-siphon traps because of fouling in the interior when long in use, may have been somewhat exaggerated.

While it seems proper to require the use of only approved and tested non-siphoning traps, the tests applied before approval of a trap should not be too severe, nor should they be formulated in the interest of only one special patented device.

While the recommendations of the report of the Committee of engineers appointed by the U. S. Housing Corporation were confined to plumbing in two- and three-story houses and to soilpipe stacks not exceeding a stated definite height, personally I entertain no doubt that a properly designed continuous vent system can be successfully applied to buildings up to ten stories in height. In fact, in my own practice, it has been introduced in a number of buildings without any complaints as to siphoning of traps ever having been made.

Any buildings exceeding ten stories in height, and in particular all skyscrapers, should be subject to a special examination, and their system designed accordingly, especially with a view toward avoiding backpressure in the system; but, in proportion to the vast number of dwellings and apartment houses required owing to the present housing shortage, they may be said to be so few that for the purpose of promulgating generally beneficial rules, which would tend to economy, they might be disregarded.

Possibly the solution of the problem may be found in a classification of buildings where anti-siphon traps could be safely used, and those in which they could not be so used without special precautions being taken. Plumbing rules, if modified, should state definitely under what conditions the simplified and more economical system could be used. The decision in this matter should not be left entirely to the discretionary power of a plumbing inspector, or a plumbing board, or a commissioner of health.

(b) Main House Drain Trap and Fresh Air Inlet

WHEN plumbing was first made subject to official rules and regulations, an essential requirement was the main house drain trap. This was largely the outcome of the sewer gas theory, which claimed that the air in the street sewers is deleterious to health and should therefore be kept out of the house pipe system. The trap in turn required the installation of a fresh air inlet, the object of which was to cause a circulation of air in the house pipe system. I was myself for many years an advocate of this main drain trap.

In recent years, however, scientific investigations have demonstrated the fact that the air in a house drainage system is more impure than that of the sewers. To a certain extent the trap is an obstacle to the free flow of the house sewage and at times it causes stoppages. Moreover, the fresh air inlet became an objectionable feature because of the difficulty in finding for it a proper location. The weight of evidence appears to be against the continued use of both the trap and the fresh air inlet, and in the interest of economy it would be well to dispense with them hereafter, except in certain specific cases.

(c) Trapping Several Adjoining Fixtures by One Trap

IN the interest of economy, and to simplify a plumbing system it has frequently been suggested to use a single trap for several adjoining fixtures, such as a basin and a bathtub, a kitchen sink and a washtub, or even for a battery of lavatories. I do not favor such a layout, even when more economical, and believe in the interest of safety and efficiency separate individual traps should be required in all cases.

(d) Use of 3-inch Soilpipes

WORTHWHILE economy can be effected in two and three-story houses by permitting the use of 3-inch (instead of 4-inch) soilpipe stacks. Where modern siphon and siphon-jet closets are used, having a somewhat restricted outlet, it seems perfectly safe to make this reduction in the size of the soilpipe stack, but the rule should be limited to houses with plumbing on only one or two floors, and should not be applied to apartment and tenement houses of many stories.

(e) Use of Flushometer Valves

SOME economy can probably be effected by using flushometer valves in place of high flushing tanks for water closets and urinals. But to avoid frequent repairs costly to building owners, and also in the interest of water waste prevention, only tested and reliable devices should be permitted, and these are notoriously few.

III. WORKMANSHIP

AT the present day, when lead pipe which has to be largely worked by hand, is to a great extent eliminated from plumbing work in buildings, there is apparently no good reason why a more mechanical execution, not only of the pipe system, but of the entire plumbing system should not be striven for. Long ago I pointed out that it was desirable to do away with slipshod methods and to introduce mechanically correct workmanship.

To an interested observer it must be apparent that the manual work of the journeyman plumber has not kept pace with the many improvements in the design of fixtures and fittings. A more accurate and more mechanical workmanship is required. This should be taught in the plumbing trade schools, and should be emphasized and required in the plumbing shops by the employers of labor.

It would seem to be entirely feasible and practical to lay out a plumbing system and fit it together in a workshop in much the same way as machinists turn out their work in erecting shops. If after being so fitted, the several parts are again taken down, transported to the building, and there again assembled, a more rapid and more accurate putting together could be accomplished, and this would undoubtedly tend to greater economy in the cost of an installation. This applies also to manufacturers and will be again referred to. How far the plumbers' trade unions would favor such a suggestion and departure from methods commonly employed remains to be seen.

IV. PLUMBING FIXTURES AND FITTINGS

OURS is undoubtedly an age of great extravagance, and as in the case of many other commodities bought by the public, extravagance in plumbing has led to the manufacturers displaying in their showrooms, and illustrating in their catalogs, a vast selection of elaborate and sometimes very expensive fixtures. A too large variety of fixtures and fittings is manufactured for architects, builders and owners of houses to choose from.

Economy demands that the number of types of fixtures should be restricted. A beginning should be made by abolishing entirely all fixtures and fittings which are either not strictly sanitary, or are actually unsanitary or are mechanically imperfect. In this category belong unsanitary bubble fountains, the secret basin waste valves, the short hopper and washout waterclosets, and water closets with local vent attachments, not required where the bathroom or the water closet compartment are provided, as they always should be, with proper ventilation. In this way restrict the types of fixtures to a few from which to make a selection.

Unrestricted variety of fixtures and fittings has a tendency to increase prices unduly, because it compels manufacturers and supply houses to keep a large stock on hand, which in turn requires storage space, patterns, working capital, etc. Manufacturers must admit that reducing the present confusing multiplicity of styles and applying standardization to those parts of fixtures, which connect with the water and waste system, would tend to a lowering of prices of their products, because overhead expenses would be considerably reduced.

In this connection I may refer to the Standard Specifications for Plumbing Fixtures, prepared by the Board on Uniform Plumbing Specifications for the U. S. Treasury, War and Navy Departments.

Greater uniformity and a smaller variety of styles would simplify and cheapen the cost of plumbing installations. But I would go a step further. I contend that it should not be necessary hereafter, when buying finished products from manufacturers to have them assembled and fitted, at great additional cost to the owner, on the job. The fittings selected should be properly assembled with the selected fixture at the manufacturing establishment, so that even should it be considered necessary—for greater safety and convenience in shipping—to take down and disconnect the fittings, the entire fixture, as illustrated in a plumbing catalog, could be re-assembled by the journeyman plumber in a few minutes instead of requiring hours and hours to do this at the expense of the owner.

V. PLUMBING REGULATION BY OFFICIAL RULES

THE present rules—even the best of them—are burdened with non-essentials. These should be omitted in framing a standard set of rules. It ought to be possible to frame a compact set of rules, capable of universal application and providing for greater simplicity and safety, hence for economy. The rules should not permit of arbitrary interpretation on the part of the men appointed to enforce them.

There is some truth in the claim that present-day plumbing rules are responsible for the high cost of plumbing. But conditions like those referred to in preceding sections carry by far the greater responsibility. These have, without doubt, been seriously aggravated by trade and labor conditions as revealed in recent housing investigations.

NEW OIL FOR OLD

IN Fort Wayne, Ind., the Tarney Oil Company is a pioneer in a new industry, the reclaiming of crank case oil. The apparatus used is shown in the accompanying illustration. The company procures oil from garages, filling stations, repair shops, etc., and reclaims it for a certain charge per gallon. In cases where such an arrangement cannot be entered into the oil is bought outright, reclaimed and sold to dealers.


An oil reclaiming outfit for Garages

A business of this sort is of course local and may develop into public garage owners doing the work by regularly changing oil for motorists. The actual operating expense is barely five cents a gallon for the reclaimed product. Adding overhead and the slight loss in quantity there is still considerable economy in the use of reclaimed oil. The final saving is in the increased life of the motor, an important item.

Motor users can remember when manufacturers advised a change of motor oil every 600 to 1,200 miles and today, because of the heavy character of present fuel oil, it is deemed necessary to change oil every 300 to 800 miles. It is also true that most motor troubles arise from faulty lubrication due to the attempt of owners to keep down expense and change oil only when trouble develops. When it becomes possible for a motor driver to have a reasonable allowance made for used oil he will undoubtedly change oil oftener.

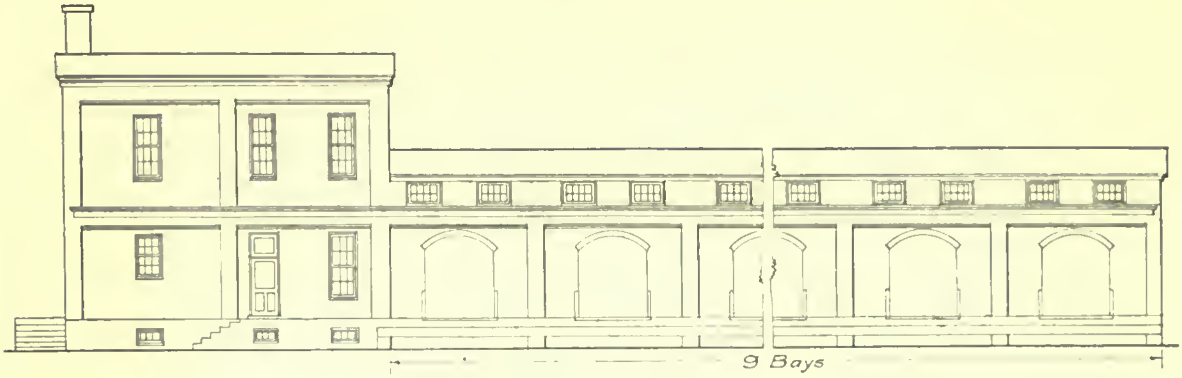
These reclaimers are new and designers of public garages, service stations and garages for taxicab companies, department stores, etc., might add "Oil Reclaimer" to specification reminders for garages. The outfits, we have been informed, are now standard for 50 and 100 gallon capacity per twenty-four hours and so may be installed in old as well as new garages. The 50 gallon outfit requires a floor space of 3 ft. 4 in. by 5 ft., with an over-all height of 6 ft. 11 in. The 100 gallon outfit requires a floor space of 4 ft. 6 in. by 6 ft., with an over-all height of 6 ft. 8 in. In addition a steam boiler is required if steam pressure is not available. Steam is used to rid the oil of gasoline, the principle being the same as a still. Other foreign matter is removed by precipitation, a coagulant being used to hasten the process.

MODERNIZING RAILWAY FREIGHT HOUSES

BY G. P. RICHARDSON

GOOD lighting in a freight station eliminates dark aisles and gloomy corners, thus increasing the amount of usable floor space. It also facilitates the handling of freight because the tags and markings can be easily read. Standard designs for freight stations seem to have been prepared on the assumption that the structure was merely a loading and discharging platform having shelter walls and roof. A freight station really has three functions, being the platform mentioned, serving as a sorting room for shippers and, incidentally, doing duty as a temporary storage warehouse.

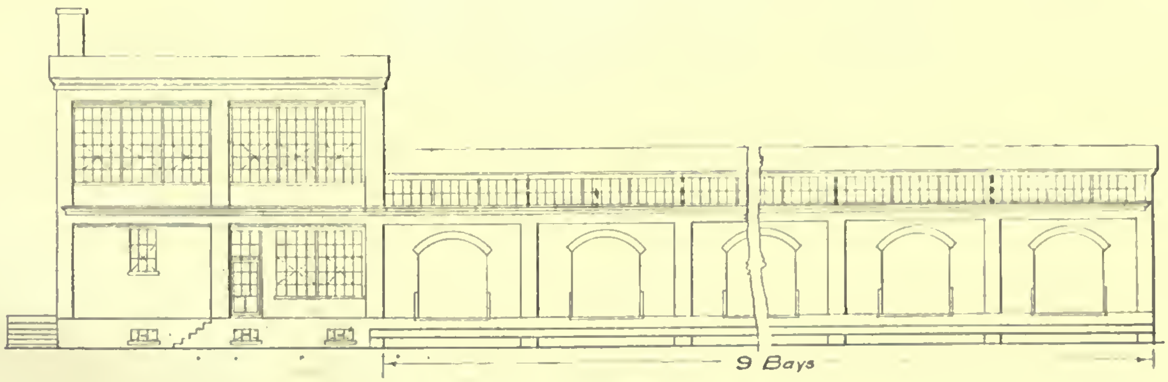
This modern conception of the freight station caused the engineers of a large railway company recently to make a careful investigation of their standard designs. The importance of good lighting and ventilation was appreciated but as the platform design was satisfactory the study involved merely the question of how to obtain better lighting and ventilation at the lowest cost.



The standard Freight House with wood sash

The standard plans had been used in the building of a number of freight stations. All windows had small lights and wood sash. The accompanying illustration brings to mind the average gloomy freight station with an all pervading aroma of perspiring humanity and many sorts of perishable commodities. In the offices the wall spaces were dark and uninviting and in the merchandise storage space were plenty of dark nooks. In the monitor the windows were single sash spaced about four feet apart with brick walls between. The window design provided 220 square feet of lighting area and 31 square feet of ventilating area on each side of the building.

The building was redesigned with large bays of steel sash in the office and a continuous run of steel sash windows in the monitor. The revised design provides 790 square feet of lighting area and 62 square feet of ventilating area on each side of the building. The difference is reported by the engineers as, "an increase of 260 per cent



The standard Freight House with steel sash in lighting area and 100 per cent in ventilating area."

The total cost was slightly reduced for the extra windows eliminated equal areas of brick wall, which cost more per square foot than the steel sash glazed. But one objection was raised and that was because the extra glass area may increase heating costs. The additional heating however will be required during only five months in the year and it is in these months that good lighting is essential. The better window lighting will reduce the expense of artificial lighting and also produce greater efficiency because of comfortable working conditions. One further improvement is under consideration, namely, the use of a light diffusing glass in the offices. The forward march of improvement is going to convert dreary freight houses and their offices into places where human beings may work with satisfaction, if not pleasure.

Specification for Spar Varnish

AN interdepartmental committee on standardization of paint specifications, United States Government prepared and recommended a specification for water-resisting spar varnish, which appears in Circular No. 103, of the Bureau of Standards.

In general the varnish shall be suitable for use on both outside and inside surfaces of vessels, buildings, etc., and must be resistant to air light and water. The manufacturer is given wide latitude in the selection of raw materials and processes of manufacture, so that he may produce a varnish of the highest quality. It must meet the following requirements:

APPEARANCE.—Clear and transparent.

COLOR.—Not darker than a solution of 3 g of potassium dichromate in 100 cc of pure sulphuric acid, specific gravity 1.84.

FLASH POINT (CLOSED-CUP).—Not below 30° C (85° F).

NONVOLATILE MATTER.—Not less than 40 per cent by weight.

SET TO TOUCH.—In not more than 5 hours.

DRY HARD AND TOUGH.—In not more than 24 hours.

WORKING PROPERTIES.—Varnish must have good brushing, flowing, covering, and leveling properties.

SAFETY OF WORKING.—Varnish must pass the draft test.

WATER RESISTANCE.—Dried film must withstand cold water for 18 hours and boiling water for 15 minutes without whitening or dulling.

TOUGHNESS.—Varnish must pass a 50 per cent Kauri reduction test at 24° C. (75° F.)

Detailed instructions for making the specified tests are given in the pamphlet which is sold by the Superintendent of Documents, Government Printing Office, Washington, D. C. at 5 cents per copy.

Entrances and Exits for Moving Picture Houses

IN a recent issue of *The Scientific American* appeared an illustrated description of a new device for assisting patrons to find seats in moving picture houses. Near the entrance a seating plan of the theatre is mounted on a stand, each seat being indicated by a round glass button. When a weight of not less than thirty pounds is upon any seat the glass button is illuminated. It becomes dark when the weight is removed. All that is necessary is for patrons entering the auditorium to look over the seating diagram for dark spots and then go directly to the seats thus indicated.

The recent fire in a moving picture house in New Haven, Conn., with attendant loss of life, has revived an idea worthy of attention. It is that every fifteenth row of seats be omitted, thus providing cross aisles in auditoriums. In the aisles going toward the curtain gates to be installed opening one way so the audience may go freely into the theatre but on going out will be checked and compelled to use the cross aisles. Fire exits to be opposite the cross aisles and to be open for use at all times. In this way the entrance will serve solely as an entrance, the only means of egress being by side doors, commonly known as fire exits.

Fire drills in schools, and other institutions where discipline is maintained, have proven their value. An alarm of fire sets certain formations automatically in motion so that panic may be, and generally is, avoided. A theatre fire however always causes a panic because the tendency of the audience lacking drill and discipline, is to escape by way of the entrance. The mind acting instinctively causes each person in a crowd to move towards the customary place of egress. Advantage should be taken of this mental reaction to train people to depart by the nearest exit, by making it difficult to use any other. Each moving picture house is a neighborhood center, the majority of the patrons being quite regular in attendance, consequently a short period of training will remove three-fourths of the danger of panic in case of fire. Such training will do away also with clogging of aisles and vestibules caused by people going in and out by the front entrance. The flow in and out should be in one general direction. Men who advocate such "routing" of theatre audiences believe it should be applied to all places of public assemblage, not excepting churches. That a structure is classed as "fire-proof," or "fire-resisting," is not in their opinion any reason for omitting the training for it is intended as a protection against danger of panic from any cause.

Architectural Engineering

Its True Meaning as Expressed by a Celebrated English Architect

DURING the course of an address on the Faults of Modern Architecture, delivered at a meeting of the Northern Architectural Association, at Newcastle, England, Professor A. E. Richardson, F.R.I.B.A., said, in part, as follows:

"I have reserved the subject of Architectural Engineering to the last not because I believe it to be the least important but by reason of the fact that it is largely out of architectural hands. This in itself is one of the most lamentable things I have to bring to your notice. Oddly enough, the giant conceptions produced by engineers during the past forty years have the merit of scale, due, of course, to the objects they express; they have the merits of proportion, but there the good qualities end. It is pathetic to come across an engineer's attempt to make a building or an erection, be it of steel, masonry or humble brick, a thing of character. What the engineer lacks the architect possesses; there you have the case in a nutshell. The pity of it is that the two seldom collaborate, and until this misunderstanding of the functions of each is overcome no real progress will be made. Some of the factories of the North of England, some of the power houses in the South, exhibit features that are distinctly pleasant, not, let it be understood, by reason of architectural embellishment, but on account of massed form which is in the main accidental. Artists, mostly futurists, look upon such works as typifying modern life, but even if such accidental things are passable they are far from the true meaning of architecture. As direct statements of fact they may be admirable, but we are as unlikely to advance the spirit of architecture from such concrete evidence as we are to obtain inspiration from the ruins of Karnak."

BOOK NOTES

The Writing of Specifications*

THERE is such a dearth of good books on specifications that when one receives a new book on this interesting subject it is welcomed with a hope that at last some one has produced a book that covers the subject, even though it be elementary.

"The Elements of Specification Writing" has thirteen chapters the subjects of which are: Introduction; Contract and Bond; Advertisement (or Notice To Contractors) and Information To Bidders; Proposal; The Composition of Specifications; General Clauses—Specifications and Plans; General Clauses—The Engineer During Construction; General Clauses—The Contractor and His Workmen; General Clauses—The Contractors Miscellaneous Responsibilities; General Clauses—Progress of Work; General Clauses—Terms of Payment; Specific Clauses; Outlines of Specific Clauses and an Appendix consisting of five pages.

The discussions of the assigned subjects are interesting and instructive, as far as they go, and should be of some assistance to students in molding their judgment on the legal provisions and entanglements of engineering work.

The few pages that are devoted to specific clauses, outlines and the appendix, as elements of specifications, contain material of value. The reference to the difficulties in correctly naming different soils is easily worth the price of the book and for this reason if for no other, should be read by all architects.

It is regrettable, however, that books on specifications devote from three-fourths to nine-tenths of their contents to discussions and instructions pertaining to general conditions of contracts and instructions to bidders and leave the impression that specifications for materials, methods of finishing and installation and for equipment are so inconsequential that they do not need elucidation.

An architect has at his disposal the Contract Documents of The American Institute of Architects and, until he is able to compose better general conditions, he should adopt them for his work. It is true that one should know something of contract law but, for the average architect, it will suffice if he writes his specifications so carefully that actions at law are not necessary to maintain the rights of the parties to the contract.

It is certain that an *architect* cannot learn very much about the elements of specification writing from this book and possibly he can learn a great deal more about legal entanglements from other books that are more comprehensively written.

One cannot help but sympathize with the student who, while in school, is given such inadequate instruction in the elements of writing specifications for all trades from excavation to interior decoration and lighting fixtures. For when he attempts to write his first document he will find he has been fed shells and not kernels.

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* *The Elements of Specification Writing. By Richard Shelton Kirby, C.E. New York, John Wiley & Sons, Inc.* 153 *pp.* 6x9 *in. Cloth.* $1.50.

THE AMERICAN SPECIFICATION INSTITUTE

127 North Dearborn Street, Chicago.

ANNUAL FALL CONFERENCE

THE first Annual Fall Conference was held at the Chicago Engineers' Club on the evening of December 9. The attendance was very gratifying, particularly as there was representation from practically all interests involved in building construction work. It was the concensus of those present that similar meetings should be held at least once every two months and in accordance with this wish the Board of Governors has determined to hold the first "Annual Winter Conference" in the first part of February, next year. At future conferences one particular subject will be discussed by several speakers from different viewpoints so that discussions may be prepared in advance.

After the dinner the meeting was conducted by Mr. Chester L. Post, in the absence of the Chairman of the Board of Governors, Mr. Ralph W. Yardley.

The following letter from Mr. Yardley was read:

"It is a great regret to me that I shall be unable to be present at the first Annual Fall Meeting of The American Specification Institute.

"Since leaving Chicago and during the extended tour of the west and south which has enabled me to be in many cities, I have interviewed many prominent engineers, architects, manufacturers and contractors, and I have yet to find the first who did not feel, as do those who formed the organization, the inefficiency of the average specification in use today for all classes of engineering and construction work, and the need of improvement.

"I feel that those who attend the Fall meeting are to be commended for their interest and activity in furthering the interests of the allied professions through their interest in improving specifications, and I feel sure that everyone who attends that meeting will leave it with a desire to interest other members of his profession because of the value to him of the work of the Institute.

"It has been my privilege to see the engineering, architectural and technical man from all angles. I have lived with him as a student in the university. I have taught with him as a teacher preparing others to enter a technical professional career. I have been the technical man in his office handling the affairs of his clients. I have advised municipalities in their selection of technical service and had the assistance of the technical man of nearly every profession during the World War. I have represented the interests of corporations where I was practically the client. And therefore I believe that I have the right to state that there is no commercial business, and few professions, which have the splendid aim to be constantly on the aggressive to seize and do those things which will advance the profession as the professions which comprise the various activities represented by the membership of the Institute. A famous physician once said that the medical profession was the only one which was striving to put itself out of existence. The architectural and engineering professions are the only ones which strive to improve constantly the work which they do, and which endeavor to protect and secure for their clients the best and most modern results for the least cost, to the detriment of the fees which they secure as the remuneration for their services.

"I realize that the view of remuneration for services of the technical man and the commercial man is based on two ideas, assuming we are referring to the money remuneration. To the professional man money is a reward. It furnishes a means of livelihood,—to be sure,—but to him his profession is first and all. The work of his profession is a fascination and a pleasure. The improvement of his professional work is the same as his physical, mental and moral growth, and the money which he receives is the incidental reward for his labors which will result in proportion as he grows in his profession and as he gets more and more interested in his profession. With the man engaged in pursuits other than those of a technical profession, the viewpoint is entirely different. Money is the tool by which he accomplishes and secures and wields power. The business he creates or handles cannot be shaped without it. It is the means to an end and not the result of a project.

"If we all did not have this love of our professions first and foremost and if our sole concern was the acquiring of money we would not be in our various professions today, for no man is or ever has been a success in his profession who went into it for purely mercenary motives.

"Therefore your presence here indicates a desire to improve the standard of your profession, to remedy a defect in your profession which has needed to be remedied for some time, but whose accomplishment seemed so great a task that no one had the courage to attempt it. And because it indicates this it is an evidence of your contribution to your profession rather than of any mere desire to meet your fellow members socially or to absorb a certain amount of data from the reports and papers which will be presented.

"I desire this talk to be brief and will not touch on matters which may be brought to your attention by others. As we are all interested in what we need to do, what we can do and what we will do in the coming year, there is no need of discussing the past or discussing at length the history of the Institute. Some years hence, when we are much older and when our year book is the standard handbook which lies at every specification writer's elbow, it may be amusing or interesting to the then youngsters of the Institute to have some of you tell of the inception of the organization, but we have not time for history now—there is too much work to be done.

"The need of the organization has been so thoroughly discussed and is so evident that I believe any time spent on such a subject would be a waste. As to the future, the Plan and Scope of the Institute, (which by the way, is about as brief, clear and definite a specification as has ever been written) is so comprehensive that it provides activities for a long time to come, and it is largely a matter of your selection of those things in the Plan and Scope which are the most important to you and which should be taken up first, which determine the most successful results for the coming year.

"In conclusion I want to mention two points which have been impressed on me most strongly since getting deeply into the work of the Institute. First, I desire to call your attention to the need of the professional man who is working practically alone in the smaller cities and towns remote from our great business centers. Those of us who have lived all of our lives in the great cities, who have belonged to the Engineers clubs, the chapters of the various Engineering, Architectural and other technical societies and who fraternize daily with others of our profession sometimes are inclined to make light of the man working in the smaller community, owing to the work of his hand not bearing the marks of the very latest technical and professional developments, as does the work of those in our great cities. But we should never forget that the improvement of the kind of work done in the profession, not only in the great cities, but throughout the entire country and the entire civilized world is of more importance to the profession and to each of us individually as a member of our profession than mere individual accomplishment, and that our contribution of our efforts and achievements to the profession at large is of greater individual benefit than any effort at or results from purely individual achievement.

"Second, we must try to realize the loneliness and isolation of the professional man working in the smaller and more remote communities. If you were to meet them as your Chairman has done, and hear them sincerely and earnestly explain their efforts to give their clients the best and latest developments of professional service, and hear them state their feeling that they were handicapped in so doing, owing to their working alone and apart from any professional contact, save the limited information obtainable through the technical press; if you were to hear their wish that the poorest part of professional service, the specifications, be developed so that they would at least approach the uniformly high standards which are set by drawings prepared in all offices everywhere, you would realize that the greatest service you can render to yourself and your profession is to give your fullest co-operation to the work of the Institute and to give it the advantage of everything you have learned and can in the future devise in connection with specification work.

"Your Board of Governors has earnestly and sincerely endeavored to give the best efforts they possess to make the work of the past year a success. The results have not been all it was desired they should be, altho they have probably been more than the members expected for the first year of as large a task as the Institute has attempted. They plan each year to endeavor to do more work than the preceding year, and they will spare no effort or hesitate at no sacrifice of personal time or personal convenience which may be necessary to make the work of the Institute a success.

"It is the desire of the Board of Governors that this Fall meeting be of such value that every member will be able to incorporate many of the items learned from the papers and discussion in his daily work, and it is desirable that everyone present take active part, not only in the meeting, but by correspondence with the secretary between meetings in order that the Institute may at all times be an active, working organization, daily assisting and helping the man whose work is that most complex and least understood of all technical arts—the writing of practical specifications."

Chairman Post: It is very unfortunate that Mr. Yardley cannot be with us this evening, but we are mighty glad to have a communication from him in his absence.

The next thing we will take up will be the question of materials. Mr. Arnold of the Barber Asphalt Paving Company has kindly consented to discuss this question for us.

Mr. Arnold: What I propose to say this evening covers the built-up roofing industry, or I might say, the materials going into built-up roofing construction. I don't think any one will dispute the fact that the built-up roofing industry, as an industry, is sadly in need of an airing and my object in the final analysis is to bring out the point that a few additions or slight changes in the average specification will enable architects and engineers to get the thing they want, regardless of what they might have decided to use.

I want to keep away from anything that might suggest that we want to bring out the relative merits of the materials available. I want to confine my remarks to the subject as a whole.

In the first place we have asked the question, "What is a built-up roof?" Now, regardless of where we may get the materials or who may sell them we are going to have to use two things—waterproofing and reinforcing factors. There are just three materials used that provide a waterproofing for a built-up roof: Trinidad Lake asphalt, a coal-tar residuum and a blown oil, so-called artificial oil residuum.

In the reinforcing field we have just three materials being used generally today. We have an all rag felt, which, by the way, is a cotton rag felt; we have a paper rag felt, containing various percentages of paper stock, and the asbestos compound felt.

Now, in the waterproofing group, taking one at a time, we have shown the derivation of the three materials. First we will take the artificial oil residuum. We get our crude oil in this country from six grand groups. It goes through the various pipe lines to the refiner. The refiners take out miscellaneous by-products such as benzine, gasoline, naphtha and so on, and when they get through with the material they have left what is a sludge; as a matter of fact, it is a fuel oil. That is placed in stills and under heat is blown or oxidized to make it of a proper penetration, or melting point, or consistency, for use in built-up roofing construction.

There is one other way that material can be used or compounded. It is possible to incorporate into the mixture a small percentage of gilsonite. That is done in some cases.

Briefly, that is the story of the oil residuum asphalt used in built-up roofing.

Now we will take the coal-tar group, and that, by the way, is a very interesting study. We get our coal-tar from the coke oven and gas plant. It goes to the refiners. They take out many by-products. When they get through with the material they have left a pitch or in some cases a coke. That in turn is fluxed back with dead oils to make a pitch used today for roofing purposes.

Now I might say there are two classes of pitch being furnished today for built-up roofing. A pitch as used in an ordinary, I will say in a less expensive, pitch and gravel roof, is of such consistency that it is necessary to flux the material with what is known as a refined tar, but, as a matter of fact, it is a flux and is absolutely necessary because, without its use, the pitch would be so brittle that it would be worthless on a roof.

Now the other type of pitch doesn't need the refined tar as a flux and, by the way, authorities claim that this flux, this refined tar, that is used in connection with pitch is a detriment rather than otherwise and tends to cause the pitch to disintegrate and go to pieces.

This happens to be the material that the Barber Asphalt Paving Company are interested in, the Trinidad Lake roofing asphalt. It comes from the Trinidad Lake in the British West Indies. It is brought to this country by boat where it is dehydrated and afterwards there is a small percentage of a liquid asphalt maltha added to make it of a proper consistency for use on a roof. There are no by-products taken from it, it goes to any producing company and directly to the roofing contractor.

The point I want to make, and I think this is the idea that is interesting the members, is that a classification of these materials is logical, regardless of what decision might be made as to which one of these materials would be used. If there is no other way in your minds, I would suggest that you classify the list as it stands. In other words, when a man wants to, or proposes to, furnish the Smith Co. or the Brown Co. roof, let's ask him what it is made out of. Maybe he has just the thing you want. That is the thought back of the idea of classification.

As I said before, there are just three reinforcing materials being used. We prepared a table showing the relative properties of those three reinforcing materials. We had to show relative properties because of the various weights. For example, the tensile, the Mullen strength and the percentage or limit in saturant of those materials would carry relatively. By the way, any of these materials are available from any number of sources; there isn't anything tied up with any particular organization.

All rag felt has the greatest tensile strength, next comes the paper felt and lastly the asbestos. The asbestos felt also carries the least in saturant.

Now briefly, that covers the subject of built-up roofing. That is all there is to it. Those are the

materials available. How simple this whole thing could be made if architect and engineers would consider the subject of classification and demand to know what might be furnished under various trade names.

Just to illustrate how important this subject is from the standpoint of the architect: I have been informed, and I am absolutely satisfied this is authentic, that ninety per cent. of the tarred felt sold in the city of Chicago is No. 3 tarred felt for use in pitch and gravel roofing, yet I guess ninety-nine per cent. of the specifications call for No. 2. Now I am satisfied that that is a fact. How can we eliminate such gross misrepresentation, and how can we get away from those things? If the architect and engineer will incorporate in their specifications that felts (I don't care whose felts they may be) delivered to a job, must bear manufacturers' labels, denoting the kind of and weight per one hundred square feet, and insist if the labels are not on the material that they be rejected, we are going to get somewhere; at least we will take a step forward and eventually may eliminate this situation.

The same thing is true of waterproofing materials. As a matter of fact, I know that roofs are purchased in the city of Chicago and that the waterproofing used in those roofs is sold all the way at from six to fifteen cents a pound for identically the same materials. Now we wouldn't have such a condition if we just analyzed the situation as it is and it is not complicated.

Just one other thought: It is a pretty hard matter, in fact it is impossible, for a man in business to tell how many pounds of waterproofing material are being mopped on a roof in a mopping. It can't be done. Certain minima are possible in various materials, but, for example, when a man is specifying a pitch and gravel roof that is to be mopped, perhaps half the width of a lap, using approximately 100 or 125 pounds of compound, how in the world are we going to know that we are getting that many pounds of material? How much more simple it would be if we said, "mopping the lap eleven inches," or whatever the case might be, rather than using 100 or 125 pounds. The inspector always has a rule in his pocket that he can lay down and get it right.

Here is another thought: The reason this condition is here, and it is the same thing all over the country, is because a few contractors, unscrupulous, are trying to, or are, beating the system, and what is the result? When four or five contractors out of perhaps thirty or thirty-five decide to do business along those lines, the fellow who prefers to do business legitimately is either forced to get in line or get out of business and there isn't a legitimate contractor or manufacturer dealing in these materials but what would welcome an opportunity to put labels on and to assist in work of this kind, because it certainly is time that the built-up roofing industry is placed on an engineering basis and anything you gentlemen can do to help the cause will help yourselves and every one else interested.

(To be Continued)

CURRENT NEWS

A New Competitor In the Field of Architecture

A Professor of Botany Designs a University Building

WE learn from a recent issue of *The Modern Hospital* that the foundations of the new university of Jerusalem, to which Jewish physicians in the United States are giving $1,000,000 to build the medical college, have been laid. The inside of this institution will be furnished in accordance with American standards, while the exterior will conform to the general plan of the university. An American surgeon will be at the head of the medical department; he will be assisted by an all-American staff. The plans for the building were drawn by Patrick Geddes, professor of botany at the University of Edinburgh.

Le Brun Travelling Scholarship Competition Year—1922

THE Executive Committee of New York Chapter of the American Institute of Architects, as Trustees of the Travelling Scholarship, founded by Pierre L. Le Brun, announces a competition for the selection of a beneficiary. The programme will be issued about January 1, 1922, calling for drawings to be delivered about March 1, 1922.

All those wishing to enter the competition should arrange at once for nomination by a member of the American Institute of Architects. Nomination blanks can be had of the Secretary of any Chapter, A. I. A., or of the Le Brun Scholarship Committee, 215 West 57th Street, New York. Nominations should be sent, so as to be received before January 1, 1922, to Le Brun Scholarship Committee, 215 West 57th Street, New York. Julian Clarence Levi, Chairman.

Creepers on Buildings

THE ARCHITECT of London, prints the following in a recent issue: "Sir Thomas Jackson, writing to the 'Times,' emphasizes the damage done to buildings by creepers, especially ivy and Virginia creeper, while such plans as wallflowers and pellitory will pull masonry to pieces. He adds that buildings need not be left bare, as roses, jessamine, wistaria, and hundreds of other climbing plants may be used without detriment to buildings. He does not sufficiently emphasize what we feel, that in a majority and not a minority of cases the covering of buildings with vegetation is not only harmful but disfiguring. It may on æsthetic grounds be justifiable if we wish to hide what is an eyesore, but nothing can be more unsightly than a good building metamorphosised with heavy growths of ivy or other plants, and it is only those who are completely insensitive to beauty in the form of structure who can defend such practices. Fortunately, there is in this respect a change of opinion, though at present it has been chiefly brought about by the emphasis laid on the damage done rather than from æsthetic dislike of the results produced."

Henry Bacon Elected Member American Academy of Arts and Letters

IN the election on November 18th, of Henry Bacon, Architect, to membership in the American Academy of Arts and Letters, the profession of Architecture has again received recognition from this dignified and select body.

Architects previously admitted to membership are Thomas Hastings, William Rutherford Mead and Cass Gilbert.

California Architects Form Organization

A SHORT time ago thirty-three leading southern California architects organized the Allied Architects Association of Los Angeles in an endeavor to assure careful planning, designing and construction of public buildings in Los Angeles and vicinity.

New Architectural Fraternity

IT is announced that a professional architectural fraternity, called Triglyph, has just been organized at the Massachusetts Institute of Technology. Its purposes are to promote the interests of architecture by encouraging individual achievement and to foster a spirit of helpfulness in the Institute's department of architecture.

Roosevelt Monument To Overlook Panama Canal

A MONUMENT commemorative of Theodore Roosevelt is to be erected on Ancon Hill, overlooking the Panama canal in the construction of which he took such a great part. The idea, has been approved by the authorities.

Saxon Foundations Unearthed at Canterbury

IN preparing a site for the Kent County War Memorial, within the precincts of the cathedral, the excavators have unearthed some interesting early foundations. It is believed that they are those of the Saxon church of St. Mary Queningate. A mediæval charter possessed by the Dean and Chapter is said to support this theory.

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ATLAS Portland Cement builds permanence into beautiful monuments. Its dependable uniform quality, consistently maintained, has led to its position as "the standard by which all other makes are measured."

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PERSONALS

John J. Klaber, architect, announces the removal of his office to 103 Park Avenue, New York City.

Frank V. Nickels, architect, has moved to his new office at 225 South Sydenham Street, Philadelphia, Pa.

Erich J. Patelski has moved his architectural office from 2550 West Jackson Boulevard to 1434 North Larrabee Street, Chicago, Ill.

George A. Griebel has resumed active practice of architecture and engineering with offices at 402 Ninth Garage Building, St. Clair and East Sixth Streets, Cleveland, Ohio.

Carl L. Baumann, architect, announces that he has opened an office for the practice of architecture at 901 Sixth street, Port Huron, Mich. Manufacturers' samples and catalogs are requested.

Edward J. Hancock, architect of Eau Claire, Wis., has moved his offices from the Laycock Building to newly remodeled quarters just across the street.

It is announced that B. William Markovitz and H. G. Votter, architects, have removed their offices from the Newman-Stern Building to Room 228 Union Building, Cleveland, Ohio.

Leslie A. Libby, architect, 178 Middle Street, Portland, Maine, is desirous of receiving manufacturers' catalogs and samples of building materials.

Walter Pleuthner, architect, has removed his office to 132 East Fortieth Street, New York City. Material and catalogs of late issue of interest to architects, decorative architects and landscape architects are requested.

J. L. Putnam, formerly of the firm of Somervell & Putnam, architects, Vancouver, B. C., has opened an office for the practice of architecture at 502 Dallas County State Bank Building, Dallas, Texas. Manufacturers' samples and catalogs are desired.

It is announced that R. A. Swartz, architect, has purchased the office of F. W. Hunt & Company, architects and engineers. Mr. Swartz is located at 513 Mining Exchange Building, Miami, Okla., and will be pleased to receive manufacturers' catalogs and samples.

Allan Burton and Marshall C. Crisp announce the formation of a partnership under the firm name of Burton & Crisp, architects, and the opening of an office for the general practice of architecture at 701 Linz Building, Dallas, Texas. Manufacturers' samples and catalogs are requested.

Announcement is made that Moise H. Goldstein, architect, and his associates, Thomas M. Harllee, Nathaniel Cortlandt Curtis, Frederick D. Parham and Nelvil C. Settoon have moved their offices and will now be located in the new Hibernia Building, Suite 1105-1108, New Orleans, La.

Robert Skrivan and Edward Crumley, associate architects, who were formerly connected with the firm of Dunnigan & Crumley, have announced their removal to more spacious quarters in the Harvey Building, 355 East One Hundred and Forty-ninth Street, New York City.

It is announced that R. O. Beattie & Company have opened offices for the practice of architecture in Rooms 1 and 2 of the Foutron Loan & Trust Company Building on North Sherman Street, Hutchinson, Kan. The services of R. J. Hamilton, who for several years was with W. E. Hulse & Company of Hutchinson, have been secured as office manager. Manufacturers' samples and catalogs are requested.

Van Horn and Ritterbush, architects of Bismarck, N. D., have opened a branch office at Grand Forks, N. D., in the rooms formerly occupied by W. J. Edwards, who recently passed away. Nellie R. Edwards will be connected with the office and Charles P. Edwards will be associated upon the completion of an architectural course. The firm name is Van Horn & Ritterbush, Successors to W. J. Edwards. The office in Grand Forks will be located at 7½ South Fourth Street.

The State Board of Architecture in California, Southern Division, has granted certificates for the practice of architecture to the following: W. Douglas Lee, formerly with John M. Cooper, architect; William J. Gage, 4239 Monroe Street; Ray J. Keiffer, 218 Wilshire Building, Sixth Street and Western Avenue; H. H. Whitely, 520 Southwestern Avenue; Harry T. Miller, formerly with R. C. Farrell, architect, and Lowell A. Lamoreaux, 1492 West Forty-sixth Street, all of Los Angeles, Cal.

REFERENCE LIST OF BUSINESS LITERATURE

A service arranged for the use of the Architect, Specification Writer, and Architectural Engineer.

This list of the more important business literature of manufacturers of building material and equipment is published each issue. Any of these publications may be had without charge, unless otherwise noted, by applying to The American Architect and The Architectural Review, 243 West 39th Street, New York, or obtained directly from the manufacturer. Either the titles or the numbers may be used in ordering.

ANCHORS—See Bolts

ARCHITECTURAL IRON WORK—see also Ornamental Metal Work

The Hughes-Keenan Company, Mansfield, Ohio.
230. *Catalog No. 5.* Contains descriptions of Pressed Steel Stairs, Ornamental Iron, Fire Escapes, Steel Door and Window Frames, Pressed Steel Toilet Partitions. 65 pp.

ASH HOISTS—See also Hoists

Gillis & Geoghegan, 545 West Broadway, New York, N. Y.
329. *General Catalogue.* Contains specifications in two forms, (1) using manufacturer's name, and (2) without using manufacturer's name. Detail in ¼ in. scale for each telescopic model and special material handling section. Fully illustrated with photographs of actual installations and descriptive matter of same. 20 pp., 2 colors. 8½ in. x 11 in.

ASH RECEIVERS

Sharp Rotary Ash Receiver Corporation, 396 Bridge St., Springfield, Mass.
205. *Catalogue E.* Booklet describing the Sharp Rotary Ash receiver with illustrations of houses in which the furnaces are equipped with this device. 24 pp. Ill. 6x9¼ in.
331. *Catalogue F* A booklet for architects and builders telling what the Sharp Rotary Ash Receiver is and what it does; together with tables of dimensions for installation. 8 pp. Ill. 6x9¼ in.

ASBESTOS—See also Lumber, -Roofing

Johns-Manville Co., New York, N. Y.
372. *Catalog No. 304.* A treatise on the manufacture and uses of Johns-Manville Building Materials made of asbestos and mastic for all places exposed to fire or corrosion. 100 pp. Ill. in colors. Board covers. 8½ x 11 in.

BAKERY EQUIPMENT

Rend Machinery Company, Inc., York, Pa.
275. *Three Speed Kitchen Machine.* A booklet describing a useful apparatus for mixing cake batches, fancy pastries, mashing potatoes, sieving soups, crushing fruita and vegetables and for general whipping, creaming, beating and mixing duties in hotel and restaurant kitchens.

BLUE PRINT MACHINES

Wickes Brothers, Saginaw, Michigan.
248. *The Wickes Continuous Electric Blue Printing Machine for Economy.* Describes a horizontal continuous type machine for paper 48 ins. wide with all necessary data for installation and operation. 20 pp. Ill. 3-1/2x6-1/2 in.

BOLTS

National Lead Company, 111 Broadway, New York, N. Y.
272. *Cinch Bolt Booklet.* An illustrated booklet of Cinch Bolt Specialties. 20 pp. 3-1/2x6-1/4 in.

BRICK

American Face Brick Association, 110 South Dearborn St., Chicago, Ill.
103. *The Story of Brick.* Contains the history of, and basic requirements of building brick, artistic, sanitary and economic reasons, comparative costs, and fire safety with photographs and drawings, and illustrates ancient and modern architectural works of note in brick. Size 7x9¼ in. 56 pp.
137. *A Manual of Face Brick Construction.* The history of brick making, types of face brick, showing details of construction for walls, chimneys and arches. Details of use of tile and brick construction and different types of bonds are given. A series of plans and elevations of small brick houses, descriptions, useful tables and suggestions are illustrated and described. Size 8½x11 in. 116 pp. Price $1.00.
155. *The Home of Beauty.* A booklet containing fifty prize designs for small brick houses submitted in national competition by architects. Texts by Aymar Embury II, Architect. Size 8x10 in. 72 pp. Price 50 cents.
371. *Architectural Details in Brickwork.* An indexed folder case to fit standard vertical letter file, containing thirty-two half tones in brown ink on fine quality paper. The collection is an inspiring aid to all designers.

BUILDING CONSTRUCTION—See also Garage Construction

Concrete Engineering Co., Omaha, Neb.
347. *Handbook of Fireproof Construction.* An illustrated treatise on the design and construction of reinforced concrete floors with, and without, suspended ceilings. The Meyer Steelform Construction is emphasized and tables are given of safe loads for ribbed concrete floors. 40 pp. Ill. 8½x11 in.

Truscon Steel Company, Youngstown, Ohio.
317. *Truscon Floortyle Construction. Form D-352.* Contains complete data and illustrations of Floortyle installations. 16 pp. Ill. 8½x11 pp.
318. *Truscon Standard Buildings. Form D-398.* Describes Truscon Standard Steel Buildings, with diagrams, illustrations of installations, descriptive matter and list of users. 48 pp. Ill. 8½x11 in.
319. *Truscon Building Products. Form D-376.* Contains a brief description of each of the Truscon Products. 112 pp. Ill. 8½x11 in.
320. *Modern School Construction. Form D-396.* Contains illustrations of schools, with typical elevations, showing advantages of Truscon Products for this construction. 16 pp. Ill. 8½x11 in.

The Youngstown Pressed Steel Company, Youngstown, Ohio.
F268. *Fireproofing Products.* A catalog of metal lath, corner bead, channels, crimped furring, expanded metal and furring. 22 pp. Ill. 4 x 8½ in.

BULLETIN BOARDS

R. W. Clark Mfg. Co., 1774 Wilson Ave., Chicago, Ill.
F271. *Own Your Directory* and *Bulletin Boards of Character and Service.* Two pamphlets describing the Clark Changeable Bulletin Boards and Directories for Hotels, Club Houses, Business Blocks, etc. Each 4 pp. Ill. 6¼x9½ in.

BUILDING HARDWARE—see Hardware

CASEMENTS—See Doors and Windows

CEMENT

Alpha Portland Cement Company, Easton, Pa.
F256. *Alpha Aids.* A publication appearing at intervals and containing many useful suggestions and ideas for the use of concrete. 16 pp. Ill. 9 x 12 in.

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.
281. *The Atlas Handbook on Concrete Construction.* A text book written for the average builder in concrete and from the practical rather than from the technical standpoint. Treats on both plain and reinforced concrete. 144 pp. 4-1/2x7 in. Cloth bound. Price $2.00.

Lehigh Portland Cement Company, Allentown, Pa.
F260. *Sand.* A description of methods of testing sand for use in concrete. The apparatus costs less than one dollar and the tests may be made in the field. 8 pp. Folding colored insert. 3½ x 6 in.

Portland Cement Association, Chicago, Ill.
F267. *The Concrete Builder.* A bi-monthly periodical devoted to the use of concrete for farm and home. 20 pp. Ill. 6 x 9 in.

The Sandusky Cement Co., Cleveland, Ohio.
123. *Medusa Waterproofed White Portland Cement.* Booklet. Advantages, methods and specifications for use under various conditions. Size 6x9 in. 18 pp.
124. *"Stainless." Booklet.* Description and illustrations of works in architecture and sculpture made with Medusa White non-staining cement. Specifications and directions for use under various conditions, tables of colors, aggregate, and test of its waterproofing character. Size 6x9 in. 48 pp.

CEILINGS, METAL

The Edwards Manufacturing Company, Cincinnati, O.
193. *Pamphlet* of 32 pages describing metal ceilings and wainscoting. Well illustrated, with list prices and rules for estimating. 7x10 in.

CHUTES—See also Laundry Equipment

Cutler Mail Chute Co., Rochester, N. Y.
294. *The Cutler Mail Chute. Model F.* Describes the Cutler Mail Chute in its standard form, known as Model F. Contains data for preparatory work to be done before installation. 16 pp. Ill. 4x9¼ in.

Edwin A. Jackson & Bro., Inc., 50 Beekman St., New York.
171. Booklet showing general construction and size of chutes to receive coal. Two types are built into the foundation wall with glass panel in place of cellar window; another type is placed flush with the ground, and is placed adjacent to wall, or can be placed near the street curb. Size 3½x6¼ in. 16 pp.

CLOCKS

Radio Time Service Incorporated, 161 Devonshire Street, Boston, Mass.
F264. *"The Safeguarded Time System."* A series of bulletins discussing and describing electrically controlled time systems from the master and secondary clocks to and including all auxiliary equipment. Each contains 4 pp. Ill. 8½ x 11 in.

Josam

MICHIGAN CITY, INDIANA

REFERENCE LIST OF BUSINESS LITERATURE—Continued

COLUMNS

Lally Column Co., of New York, Calyer & Russell Sts., Brooklyn, N. Y.

122. *Lally Columns. Handbook.* Detailed construction diagrams for various types of steel construction. The text describes advantages of endurance and economy of the column. Various tests, tables of sizes, dimensions, weight, capacities and price given. Size 4¾x6½ in. 64 pp.

CONVEYORS

Otis Elevator Co., 260 Eleventh Ave., New York, N. Y.

264. *Spiral Conveyors.* An illustrated catalog describing Otis Gravity Spiral Conveyors, with layouts of typical installations. 56 pp. 6x9 in.

DAMPPROOFING—See also Waterproofing

The Truscon Laboratories, Detroit, Mich.

239. *Dampproofing.* Booklet giving specifications on black dampproofings, including Plaster Bond (dampproofing for interiors). Foundation Coat (dampproofing under each filling) and Stone Backing (dampproofing unexposed sides of cut stone). 12 pp. Ill. 5-1/4x7-1/4 in.

DOORS AND WINDOWS

Crittall Casement Window Company, 2703 E. Atwater Street, Detroit, Mich.

247. *Catalog No. 18. Crittall Universal Casements.* Contains complete description of steel casement windows for banks, schools, residences, churches, hospitals, etc., with details showing construction when set direct in masonry or with auxiliary frames. Sample specification enclosed 56 pp. Ill. 9x12 in.

Dahlstrom Metallic Door Co., Buffalo and East 2nd St., Jamestown, N. Y.

201. *Architectural Portfolio.* A collection of various designs and types of Dahlstrom Doors, drawings and details of each style or type. Mailed free only to architectural offices. 30 pp. Ill. 14x18 in.

202. *Architectural Catalogue.* An illustrated catalogue showing standard styles and types of Dahlstrom hollow metal doors and interior trim. Various types of frames and other architectural shapes are also illustrated. 46 pp. 11 sections. 10x14 in.

The G. Drouve Co., Bridgeport, Conn.

F242. *Service Sheets.* A set of four sheets of details. 1-15 showing Anti-Pluvius Puttyless Skylights; 1-201 showing Drouve Straight Push sash operator; 2-201 showing Drouve Worm and Gear sash operator; 3-201 showing Drouve-Lovell sash operator.

Henry Hope & Sons, 103 Park Ave., New York.

65. *Hope's Casements and Leaded Glass.* Portfolio. Gives specifications, description and photo-engraving, of Hope Casements in English and American Architecture, full size details of outward and inward opening and pivoted casements, of residential and office types. Size 12¼x18½ in. 32 pp.

Irving Hamlin, 716 University Place, Evanston, Ill.

F268. *The Evanston Sound-Proof Door.* An illustrated catalog describing a door successfully used in schools of music and all buildings where it is important to prevent communication of sounds from one room to another. 8 pp. Ill. 8½x11 in.

The Kawneer Co., Niles, Mich.

142. *Kawneer, Simplex Window Fixtures.* Booklet illustrated. Drawings, photographs and text describes weightless, reversible window fixture, its ease of installation, ventilation and light control. Size 8½x10¾ in. 16 pp.

The Lunken Window Company, 4022 Cherry Street, Cincinnati, Ohio.

351. *Lunken Windows.* The Lunken Window allows a full 100% opening thus obtaining for a sash window all the merits, with none of the glaring demerits, of French windows. This booklet tells how this is done. 12 pp. Ill. 4 x 9½ in.

352. *Baby Book of Details for Lunken Windows.* One for heavy construction and one for light construction. Each book contains 20 pages of line drawings of details for use of draftsmen. Convenient pocket size. 3 x 5¼ in.

Morgan Woodwork Organizations, Oshkosh, Wis.

286. *Building with Assurance.* A complete treatise on standardized doors and woodwork for houses. It contains also articles by experts on Lighting, Heating, Plumbing, Interior Decorating, etc. Profusely illustrated with many plates in color. 436 pp. Flexible leatherette covers. 9x11 in.

Monarch Metal Products Co., 5020-26 Penrose St., St. Louis, Mo.

288. *Monarch Control Locks.* An illustrated pamphlet describing a control lock for outswinging casement windows. It does not mar the woodwork and does not interfere with screens nor disarrange the drapes. Holds windows firmly open at any angle. 4 pp. 8½x11 in.

S. H. Pomeroy Company, 30 East 42nd Street, New York, N. Y.

293. *Underwriters' Laboratory Fire Retardant Windows.* A valuable book containing the Underwriters' specifications for fire retardant windows: at the same time being a complete catalog of windows built to meet the specifications. 67 pp. Ill. 6-1/4x8-1/2 in.

Reliance Fireproof Door Co., West & Milton Streets & Greenpoint Ave., Brooklyn, N. Y.

269. *Reliance Fireproof Doors.* An illustrated book showing types of doors and windows, mouldings, etc., with working drawings. 44 pp. 6-1/4x9-1/4 in.

Roddis Lumber & Veneer Co., Marshfield, Wis.

146. *Roddis Flush Veneered Doors.* An illustrated booklet of buildings in which Roddis doors have been used, and a treatise on Roddis Standard Construction, showing sections and diagrams of doors, as well as photographs of many types of inlaid veneered doors in color. Technical information relative to staining and finishing of doors. Size 6x9¼. 100 pp.

Samson Cordage Works, Boston, Mass.

34. *Samson Spot Sash Cord.* Booklet accompanied by samples of Samson Sash Cord, plain and with wire center.

Truscon Steel Company, Youngstown, Ohio.

348. *Truscon Steel Sash.* This handbook has been prepared for detailers and specification writers. The descriptions are clear and the details are complete. 80 pp. Ill. 8½ x 11 in.

315. *Truscon Steel Sash.* A catalog containing designing data, tables and views of Stock Sash installations. 6 pp. Ill. 8½x11 in.

Standard Comfort Window Corporation, 426 Broome Street, New York, N. Y.

F243. A book describing a combination sliding and swinging sash which may be applied to new and old double hung windows, maximum ventilation; maximum comfort; takes all danger out of window washing. 12 pp. Ill. 6x9 in.

DRAFTING MATERIALS

American Lead Pencil Co., 220 Fifth Ave., New York, N. Y.

268. *Booklet C-20. Venus Pencil in Mechanical Drafting.* An interesting illustrated booklet showing the possibilities of the Venus Drawing Pencil for drafting. 6x9 in.

Joseph Dixon Crucible Company, Pencil Department, Jersey City, N. J.

325. *Finding Your Pencil.* A book explaining the various degrees of hardness of the Eldorado pencil and the grade most suitable for every man who uses a pencil be he business or professional man, clerk or draftsman. Accompanied by a color chart of Dixon Colored Crayons. 16 pp and 4 pp. in color chart. Ill. in colors. 3¼x6 in.

DRAINS—see also Plumbing Equipment

Josam Mfg. Co., Michigan City, Ind.

252. *Catalog No. 5.* Contains complete illustrated descriptions of the full line of "Josam Double Drainage Drains" for floors, roofs, etc. 28 pp. Ill. 6x9 in.

253. *Book of Roughing-in Measurements for all Josam Traps and Drains.* A book containing useful data for architectural draftsmen. 20 pp. Ill. 3-1/2x6 in.

Josam Mfg. Co., Michigan City, Ind.

254. *Evolution in Roof Drains.* A pamphlet describing Josam Double Drainage Drains for roofs of wood and of concrete. 6 pp. Ill. 3-1/4x6-1/4 in.

255. *Evolution in Floor Drains.* A pamphlet describing Josam Double Drainage Drains for floors: some with and some without traps. 6 pp. Ill. 3-1/4x6-1/4 in.

DRAINS, FLOOR

Crampton Farley Brass Co., 221 Main Street, Kansas City, Mo.

194. Several pamphlets describing various types of floor and area-way drains. 3½x6¼ in.

DUMBWAITERS—See also Elevators

Sedgwick Machine Works, 144 West 15th Street, New York.

60. *Dumbwaiters and Elevators in Modern Architectural Construction.* Illustrated catalogue. 4¼x8¼ in. 80 pp.

ELECTRICAL EQUIPMENT—see also Lighting

Frank Adam Electric Co., St. Louis, Mo.

296. *Catalog No. 25.* A catalog and price list of knife switches, switch boards, panel boards, steel cabinets, switch board material. 83 pp. Ill. 8x10½ in.

Harvey Hubbell, Inc., Bridgeport, Conn.

297. *Electrical Specialties. Catalog No. 17, 1921.* This catalog contains descriptions with prices of the thousand and one items connected with electric light, electrical alarm and small electrical appliances installations in modern buildings. 104 pp. Ill. 8x10½ in.

ELEVATORS—See also Dumbwaiters and Hoists

A. B. See Electric Elevator Co., 220 Broadway, New York.

169. Photographs and description in detail of elevator equipment manufactured by the A. B. See Electric Elevator Co. Size 6x8 in.

Otis Elevator Co., 260 Eleventh Ave., New York, N. Y.

261. *Electric Traction Elevators.* An illustrated catalog describing gearless traction elevators. 28 pages. 8½x11 in.; and an illustrated catalog describing worm gear traction elevators 24 pp. 6x9 in.

REFERENCE LIST OF BUSINESS LITERATURE—Continued

ELEVATORS

Otis Elevator Co., 260 Eleventh Ave., New York.

262. *Self-Leveling Elevators.* A series of photographs showing gearless and worm gear self-leveling elevators. The adjustment with this type of elevator automatically levels the floor of the elevator with the floor level of the building.

Elevator Locks Co., 119 No. Washington St., Peoria, Ill.

338. *A Sign of Safety.* Describes devices for mechanically locking power and automatically locking gates of elevators, and control landing. Contains also list of users of this equipment. 26 pp. Ill. 4x9½ in.

Kimball Brothers Company, Council Bluffs, Iowa.

330. *Kimball Elevators.* An illustrated catalog of hand power, sidewalk, and garage elevators and dumbwaiters and electric passenger, freight and push button elevators. 32 pp. Ill. 7¾x10½ in.

ELEVATORS—See also Dumbwaiters and Hoists

Richards-Wilcox Mfg. Co., Aurora, Ill.

335. *"Ideal" Elevator Door Equipment.* Catalog showing elevator door hangers for one, two and three speed doors, also doors in pairs and combination swing and slide doors. Door closers and checks. 24 pp. Ill. 8½x11 in.

ELEVATOR EQUIPMENT

American Elevator & Machine Co., Louisville, Ky.

196. *Illustrated Catalogue* showing elevator equipment for various uses. 32 pp. 8½x9½ in.

ESCALATORS

Otis Elevator Co., 260 Eleventh Ave., New York, N. Y.

263. *Escalators.* An illustrated catalog describing escalators, with layouts of typical installations. 36 pp. 6x9 in.

FINANCING OF ENTERPRISES

The Hockenbury System, Incorporated, Penn-Harris Trust Building, Harrisburg, Pa.

313. *Your Hospital and Its Financing.* An educational work on how to finance a new hospital project and obtain funds for needed extensions to existing institutions. Illustrations are given of six institutions in five states financed by the methods, and through the work of the Hockenbury specialists. 20 pp. Ill. 4¼x8½ in.

314. *Financing Your City's New Hotel.* A plan is here offered to the enterprising architect whereby his ideas for a new hotel for his home city may be realized. Hotels financed through the work of the Hockenbury specialists are shown, together with testimonials from local business men. 20 pp. Ill. 4¼x8½ in.

FIREPLACES AND MANTELS

Chattanooga Roofing and Foundry Co., Chattanooga, Tenn.

143. *The Magic Hearth.* Leaflets. With instructions to build an open fireplace, section drawings, illustrations of fireplace equipment grates, firebacks, cranes, andirons, etc. Size 8½x11 in. 10 pp.

H. W. Covert Co., 137 East 46th St., New York.

79. *Hints on Fireplace Construction.* Diagrams of construction, and installation of Covert "Improved" and "Old Style" dampers and smoke-chambers, and other fireplace accessories. Size 5⅝x8½ in. 12 pp.

Colonial Fireplace Company, 4611 West Roosevelt Road, Chicago, Ill.

365. *Fireplace Equipment Catalog*— A valuable catalog of dampers, grates, andirons, hoods, fire sets, screens, fenders, cranes, etc. 16 pp. Ill. 8½x11 in.

Edwin A. Jackson & Bro., Inc., 50 Beekman St., New York.

91. *The Jackson Ventilating Grates.* Illustrated booklet. Plans, sections and photographs of fireplace grates that heat on two floors. Size 7x10 in. 8 pp.

92. *Dampers, Chutes, Doors and Dumps.* Illustrated catalog. Equipment and appurtenances of various types, construction and installation, data, dimensions and prices.

100. *Franklin Stoves.* Pamphlet illustrated. Four patterns of this colonial stove, suitable for use in a fireplace, with dimensions of parts and cost. Size 6x7 in. 4 pp.

FIRE PROTECTION EQUIPMENT

Foamite Firefoam Co., 200 Fifth Avenue, New York.

141. *Automobile Sprinkler System.* A booklet illustrated with diagrams in color showing the typical Firefoam Automatic Sprinkler and its installation of high state of efficiency for quickly extinguishing fires by Firefoam. Size 8¾x11 in. 8 pp.

153. *Allweather, Non-Freezing Fire Extinguisher.* A leaflet Explains the problem of the search for a non-freezing fire extinguisher and its satisfactory solution with the development of the Allweather. The tests, use, and illustrations of the extinguisher and parts are given. Size 8⅝x11 in. 4 pp.

Jiffy Fire Hose Rack Co., 133 West 52nd Street, New York, N. Y.

266. *Stand Pipe Equipment.* An illustrated catalog showing complete installations of stand pipe equipment. 31 pp. 7x9 in.

FIRE EXITS

Vonnegut Hardware Co., Indianapolis, Ind.

309. *Von Duprin Self-Releasing Fire Exit Devices.* A catalog and educational work on panic-proof, burglar-proof self releasing exit devices for doors and windows of buildings of any kind of occupancy. 41 pp. Ill. 8x11 in.

310. *Prince Self-Releasing Fire Exit Devices. Supplement to Von Duprin Catalog No. 12.* Contains valuable information for architects on the selection, detailing, etc., of Prince devices for doors and windows to insure safety against fire panic. 32 pp. Ill. 8x11 in.

FLOORING

Armstrong Cork Co. Linoleum Department, Lancaster, Pa.

222. *Business Floors.* A handy reference on floors for public and semi-public buildings, containing specimen specifications, directions for laying and other helpful data. Illustrated in color. 6x9 in.

American Magnesia Products Co., 5730 Roosevelt Road, Chicago, Ill.

285. *Velvetile Floorings: Its uses and Application.* Describes Velvetile Magnesia Flooring and tells how it is applied, with information as to its durability. 12 pp. 4x9 in.

The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.

204. *The Perfect Floor.* Tells how to lay, finish and care for Oak Flooring. 16 pp. 14 Illus. 5⅛x7⅝ in.

Franklyn R. Muller Co., Waukegan, Wis.

242. *Asbestone Flooring Composition.* A book describing uses of and giving specifications and directions for Composition Flooring, Base, Wainscoting, etc. 8-1/2x11 in. Ill.

The Marbleloid Co., 461 Eighth Ave., New York.

61. *The Universal Flooring for Modern Buildings.* Illustrated booklet. Describes uses and contains specifications for Marbleloid flooring, base, wainscoting, etc. Size 6¾x9¾ in. 32 pp.

FLOORS—See Building Construction

FOUNTAINS

Manufacturing Equipment and Engineering Company, Framingham, Mass.

186. *Sanitary Bubbling Fountains—Ice Cooled.* Pamphlets illustrating various types of sanitary drinking fountains. Sizes 6x9 in. and 9x12 in.

FURNACES—See HEATING

GARAGE CONSTRUCTION—See also Building Construction

GARBAGE DESTROYERS

E. C. Stearns & Co., 224 Oneida Street, Syracuse, N. Y.

224. *Cut Out the Garbage Can.* Pamphlet describing "The Incinerite," a garbage destroyer using natural, manufactured or gasolene gas. Made in wall type for new houses and portable type for buildings already erected. Contains table of details of all sizes with prices. 8 pp. Ill. 3x6 in.

GARBAGE RECEIVERS

Edwin A. Jackson & Bro., Inc., 50 Beekman St., New York.

170. Booklet showing general construction and sizes of garbage receivers to be placed underground for suburban use; also types to be built into the wall of city homes and apartments: also types for suburban wall with opening on inside for the maid and outside for the garbage man. Size 3½x6¼ in. 16 pp.

GLASS CONSTRUCTIONS

Frederick L. Keppler, 1799 First Avenue, New York, N. Y.

368. *Bulletin No. 207.* Describes Keppler Rooflights and tells why they are permanent, how to install them, etc., together with all necessary data for designers. 4 pp. Ill. 8½x11 in.

GREEN HOUSES—See GLASS CONSTRUCTIONS

GUTTERS AND DOWNSPOUTS

The New Jersey Zinc Co., 160 Front Street, New York, N. Y.

226. *Zinc Spouting.* Describes leaders, gutters, etc., "Made from Horse Head Zinc," giving information concerning their economy and durability. 8 pp. Ill. 6x9 ins.

HARDWARE

Franz Manufacturing Company, Sterling, Ill.

350. *Complete Hardware Catalog.* A catalog of hardware for garages, stables, outside doors, windows, coal chutes, chimney caps, flues, coal holes, cisterns, etc., 128 pp. Ill. 7 x 10 in.

Richards-Wilcox Mfg. Co., Aurora, Ill.

336. *Modern Hardware for Your Home.* Catalog of hangers for vanishing French doors; "Air-Way" multifold hardware for sun parlors and sleeping porches; "Slidetite" garage door hardware. 24 pp Ill. 8½x11 in.

REFERENCE LIST OF BUSINESS LITERATURE—Continued

HARDWARE

The Stanley Works, New Britain, Conn.

11. *Wrought Hardware. New 1921 Catalog.* This new catalog describes additions to the Stanley line of Wrought Hardware, as well as the older well known specialties and various styles of butts, hinges, bolts, etc. 376 pp. Ill. 6½x9½ in.

12. *Garage Hardware.* Booklet, illustrated. Garages and their equipment, such as hinges, hasps, door holders, latch sets, chain and hand bolts, showing illustrations and text with dimensions of garages, describing the Stanley Works product. Size 6x9 in. 24 pp.

13. *Eight Garages and Their Stanley Hardware.* Booklet. Plans, drawings and complete hardware specifications. Size 5x7 in. 32 pp.

127. *The Stanley Works Ball Bearing Butts.* Booklet, illustrated. Description, with full size illustrations of many typed butts and their parts, dimensions and finish. Size 5x7½ in. 32 pp.

George Lester Wilkins, 1775 Lunt Ave., Chicago, Ill.

97. *Wilkins Casement Adjuster.* Leaflets, illustrated. Jamb and sill section details of windows, equipped with the casement adjuster and specifications for installation. Size 8½x11 in. 4 pp.

Wagner Manufacturing Company, Cedar Falls, Iowa.

295. *Catalog and Price List No. 14.* This is a catalog on general house hardware specialties such as door hangers and track, sash holders, coal chutes, etc. Elevator door hardware is described in another book. 80 pp. Ill. 6x9 in.

HEATING

Alberger Heater Company, Buffalo, N. Y.

307. *Heating and Cooling Equipment. Catalog No. 3.* A useful manual for architects in addition to serving as a catalogue of heating and cooling equipment. Explains fully the advantages of spirally corrugated heater tubing. 48 pp. Ill. with line cuts and half tones. 7¾x10¾ in.

Crane Company, 836 So. Michigan Ave., Chicago, Ill.

241. *Steam Catalogue.* A book containing full descriptions of the complete line of Crane valves, fittings, etc., 800 pp. Ill. 6x9 in.

C. A. Dunham Co., 230 East Ohio St., Chicago, Ill.

15. *Dunham Heating Service.* Technical Bulletins describing Dunham products for home heating, return and vacuum systems. Size 8½x11 in.

166. *The Dunham Hand Book.* Booklet No. 114, containing heating data for the practical man. Pocket size. 144 pp.

The Farquhar Furnace Company, Wilmington, Ohio.

355. *Healthful Helpful Hints.* A discussion of furnace and chimney design and capacity for hot air heating and ventilation. 16 pp. Ill. 4¾x9¼ in.

356. *A Plain Presentation to Dealers.* A book of selling talk for dealers in Farquhar Furnaces. Four model heating layouts are shown and there is a page of useful "Do and Don't" advice. 24 pp. Ill. 8½x11 in.

Hess Warming & Ventilating Co., 1209 Tacoma Bldg., Chicago, Ill.

178. *Modern Furnace Heating.* An illustrated book on the Hess Welded Steel Furnaces, Pipe and Pipeless, notes for installation, sectional views, showing parts and operation, dimensions, register designs, pipes and fittings. Size 6x9½ in. 48 pp.

Jenkins Bros., 80 White Street, New York, N. Y.

235. *Catalog No. 21.* This catalog contains descriptions of all the valves, packing, etc., manufactured by Jenkins Bros. Includes also dimensions and price lists of valves and parts. 271 pp. Ill. 4x6-3/4 in. Stiff paper cover.

Jenkins Bros., 80 White Street, New York, N. Y.

237. *The Valve Behind a Good Heating System.* This booklet describes Jenkins Radiator Valves, Automatic Air Valves and other valves used in connection with steam and hot water heating. 16 pp. Ill. 4-1/2x7-1/4 in. Stiff paper cover.

Monash-Younker Co., 121 West 42nd St., New York N. Y.

321. *Valves, Syphons and Traps.* A series of pamphlets to enclose in envelopes, describing the well known Thermostatic Return Line Valves and other heating equipment specialties made by this company.

Richardson & Boynton Co., New York, N. Y., Chicago, Ill., Philadelphia, Pa., Providence, R. I., Boston, Mass.

290. *The Richardson Vapor-Vacuum-Pressure Heating System.* An interesting book which presents in clear non-technical language the principles of Vapor-Vacuum-Pressure heating; the economy over ordinary steam heating; steam and hot-water systems may be altered to use this principle with views of buildings where the V-V-P system is installed. 14 pp. Ill. 8x11 in.

291. *Perfect Warm Air Furnaces. No. 203.* Contains a full description of various types of warm air furnaces and parts, with dimensions and necessary data. 24 pp. Ill. 8x10-1/2 in.

292. *Perfect Cooking Ranges.* Description and dimensions of the complete line of the new high enamel finish Richardson Perfect ranges, with charts and information regarding combination coal and gas cooking ranges. 40 pp. Ill. 8-1/2x11 in.

HEATING AND VENTILATION

American Blower Co., Detroit, Mich.

361. *Sirocco Service.* A monthly publication containing descriptions of heating and ventilating systems installed by the American Blower Company, together with useful data for architects and engineers. 16 pp. Ill. 8½x11 in.

362. *General Catalog "ABC" Products.* A book full of useful data for all men who have to deal with heating and ventilating problems. 132 pp. Ill. 8½x11 in.

Buffalo Forge Co., 490 Broadway, Buffalo, N. Y.

215. *Buffalo Fan System of Heating, Ventilating and Humidifying.* Catalog 700. This contains a general discussion of heating and ventilating under four heads: Part 1. Public Buildings. Part 2. Industrial Plants. Part 3. Buffalo Apparatus. Part 4. Fan Engineering.

HEAT REGULATORS

Minneapolis Heat Regulator Co., Minneapolis, Minn.

134. *The Heart of the Heating Plant.* An illustrated catalog, describing the Minneapolis Heat Regulator, its construction, application and operation for the automatic control of temperature where coal, gas, fuel oil or street steam is used. Complete catalog and list prices. Size 6x9 in. 20 pp.

HOISTS—See Elevators and Ash Hoists

INSULATION

United States Mineral Wool Co., 280 Madison Ave., New York.

83. *The Uses of Mineral Wool in Architecture.* Illustrated booklet. Properties of insulation against heat, frost, sound, and as a fire-proofing, with section drawings and specifications for use. It gives rule for estimate and cost. Size 5¼x6⅝ in. 24 pp.

IRON AND STEEL—See also Metals

The American Rolling Mill Co., Middletown, Ohio.

233. *Armo in Picture and Fact.* A booklet describing the manufacture of pure iron in sheets and giving useful tables of sheet sizes and weights. 247 pp. Ill. 6x9 in.

234. *Why Steel and Iron Rust.* A booklet full of interesting data. 16 pp. Ill. 3-1.4x6-1/4 in.

Mitchell-Tappen Company, 15 John Street, New York, New York.

257. *Booklet 14 on Standardized Metal Caging.* Description of various ways of reinforcing the concrete fireproofing on structural steel work, with particular reference to Standardized Metal Caging.

KITCHEN EQUIPMENT

Bramhall, Deane Co., 261-A West 36th St., New York.

59. *The Heart of the Home.* Booklet, illustrated. Deane's French Rangers (all fuels), cook's tables and plate warmers. Size 6x9 in. 32 pp.

The Prometheus Electric Co., 513 West 42nd St., New York.

145. *Prometheus Electric Plate Warmers.* Leaflets illustrating the plate warmer, describing its construction, utility and types, adaptable for residences and hotels, according to specifications. Sizes and dimensions. Size 5⅝x9 in.

LATH, METAL

American Steel & Wire Co., Chicago, Ill.

228. *Stucco Houses Reinforced With Triangle Mesh Fabric.* A pamphlet containing valuable data on stucco work with tables of quantities of materials and many illustrations of houses covered with stucco applied on Triangle Mesh Fabric 24 pp. Ill. 6x9 in.

Concrete Engineering Co., Omaha, Neb.

346. *How to Use Ceco Lathing Materials.* An illustrated treatise on the use of expanded metal lath. Contains construction details and complete specifications, with sample piece of lath in pocket on cover of book. 16 pp. Ill. 8½x11 in.

Truscon Steel Company, Youngstown, Ohio.

316. *Hy-Rib and Metal Lath.* Tables, general data and illustrations of Hy-rib and metal lath construction. 6 pp. Ill. 8½x11 in.

LAUNDRY EQUIPMENT

The American Laundry Machinery Co., Advertising Dept., Cincinnati, Ohio.

84. *Catalog.* Illustrated. Washing machines, accessories, extractors, clothes tumblers, drying and ironing machines, etc., showing various types and electrical controls with specifications and dimensions for the installation and use of laundry machinery in laundries, institutions, hotels; also for mill and community laundries. Size 12½x9½ in. 218 pp.

Chicago Dryer Co., 2210 N. Crawford Ave., Chicago, Ill.

66. *Laundry Appliances.* Illustrated catalog. Descriptions of Laundry Dryers, Electric Washing Machines and Ironing Machines, especially adapted for use in residences, apartment buildings and small institutions. Size 8½x11 in. 48 pp.

REFERENCE LIST OF BUSINESS LITERATURE—Continued

LAUNDRY EQUIPMENT

The Pfaudler Co., Rochester, N. Y.

322. *Pfaudler Chutes for Economy.* Folder showing illustrations, drawings and description of the Pfaudler Laundry Chute giving dimensions for installations. Size 3⅞x8⅞ in. 8 pp.

LIGHTING—see also Electrical Equipment

I. P. Frink, Inc., 24th St. and 10th Ave., New York.

149. *Modern Church and Cathedral Illumination.* An illustrated booklet on lighting systems for various conditions of indirect, direct-indirect lighting reflecting electroliers and lighting from concealed sources. Photographs of interiors, typical sections of cove lighting and data sheet for chancel lighting and list prices are given. Size 7x10 in. 56 pp.

150. *Lighting Service for Hospitals.* A booklet illustrated with photographs and drawings, showing the types of lights for use in hospitals, as operating table reflectors, linolite and multilite concentrators, ward reflectors, bed lights and microscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses. Size 7x10 in. 12 pp.

218. *Picture Lighting. Booklet 422.* A pamphlet describing Frink Reflectors for lighting pictures, art galleries, decorated ceilings, cove lighting, the lighting of stained glass, etc., and containing a list of private and public galleries using Frink Reflectors. 24 pp. Ill. 5-1/4x7 in.

219. *Frink Reflectors and Lighting Specialties for Stores. Catalog No. 424.* A catalog containing a description of the Frink Lighting System for Stores; the Synthetic System of Window Illumination; and a number of appliances to produce the most effective lighting of displayed objects. 20 pp. Ill. 8x11 in.

220. *Frink Lighting Service for Banks and Insurance Companies. Reflectors. Catalog No. 425.* A very interesting treatise on the lighting of offices; with details of illustrations and description of lamps and reflectors. Contains a list covering several pages, of banks using Frink Desk and Screen Fixtures. 80 pp. Ill. 8-1/4x11 in.

Luminous Unit Co., St. Louis, Mo.

216. *"Brascolite Bulletin" No. 1.* Architectural Series on Hospitals, showing illustratons of various hospitals equipped with Brascolites, Aglites, and other Luminous Unit Co. products. 28 pp. Ill. 8x10½ in.

217. *Regular "Brascolite" Catalogue No. 8.* This catalogue contains descriptions with illustrations of Brascolites, Aglites, Elites, Industrolites, and Lumovitro for all classes of buildings. 28 pp. Ill. 8x10½ in.

National X-Ray Reflector Co., Chicago, Ill.

93. *Lighting from Concealed Sources.* A treatise, bound in buckram. The history, explanation of the laws of light reflection, giving types of lamps, reflectors, showing charts, tables, sections, photographs and lighting plans for dwellings, public buildings in which it has been used. Size 8½x11 in. 32 pp. 246 pp.

The Reflectolyte Co., 914 J Pine Street, St. Louis, Mo.

244. *"Reflectolyte" Catalog No. 4.* Description, Engineering Data, descriptions and prices of the well known type of reflector and suspended bowl lighting fixtures. 32 pp. Ill. 7-1/4x10-1/4 in.

Rush Porcelain Co., 1924 Archer Ave., Chicago, Ill.

337. *Catalog No. 7 of July, 1921.* Twenty-three pages illustrating white solid porcelain and china lighting fixtures for bath rooms, utility rooms, kitchens and wherever a white sanitary effect is desired.

Mitchell Vance Co., Inc., 503-511 West 24th St., New York, N. Y.

369. *Catalog No. 25.* A descriptive catalog, with prices, of the "T. R. B." Lighting Unit, for perfect distribution of light without glare and without shadows. 24 pp. Ill. 8x10 in.

LINOLEUM—see also Flooring

Armstrong Cork Co., Linoleum Department, Lancaster, Pa.

223. *Armstrong's Linoleum Floors.* A handbook for architects, published in the file form of (8-1/2x11 in.) recommended by the American Institute of Architects. A technical treatise on Linoleum containing general information, tables of grades, gauges and weights, specimen specifications, and detailed directions for laying linoleum. Profusely illustrated in colors.

LOCKERS, STEEL

The Edwards Mfg. Co., Cincinnati, Ohio.

19. *Edwards' Steel Equipment.* Illustrated catalog. Showing steel lockers and shelving for factories, offices, stores, schools and hospitals, together with illustrations and description of "Edmanco" steel office furniture and filing cabinets. Size 8x11 in. 32 pp.

LUMBER

The Long-Bell Lumber Co., R. A. Long Building, Kansas City, Mo.

203. *From Tree to Trade.* This book tells the story of the manufacture of lumber. Gives an idea of the scope of the business and the care and attention given to the manufacture and grading of Long-Bell trade-marked products. 100 illustrations. 48 pp. 8½x11 in.

The Pacific Lumber Company of Illinois, 2060 McCormick Bldg., Chicago, Ill.

363. *Construction Digest*— The use of California Redwood in residential and industrial construction. Contains illustrations, grading rules, specifications and other technical data for architects and builders. 16 pp. Ill. 8½x11 in.

364. *Engineering Digest*— The use of California Redwood in industrial construction and equipment for factories, railroads, mines and engineering projects. 16 pp. Ill. 8½x11 in.

LUMBER, ASBESTOS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

54. *Ambler Asbestos Building Lumber.* Catalog illustrated. Describes uses of this fireproof product for both exteriors and interiors. Tables of sizes and illustrations of various types of buildings in which it has been used. Size 8½x11 in. 32 pp.

MANTELS

Edwin A. Jackson & Bro., Inc., 50 Beekman St., New York.

90. *Wood Mantels.* Portfolio. Wood mantel designs of various types and openings, giving dimensions, projections and showing fireplace grate designs. Size 9x6¼ in. 32 pp.

MASONRY

Louisville Cement Company, Inc., Louisville, Ky.

311. *Brixment, the Perfect Mortar.* The reading of this little book gives one a feeling that definite valuable information has been acquired about one of the oldest building materials. Modern science has given the mason a strong water-resisting mortar with the desirable "feel" of the best rich lime mortar. 16 pp. Ill. in colors. 5½x7¾ in.

MEMORIALS

Harrison Granite Co., 200 Fifth Ave., New York.

151. *Memorials.* Booklet showing photographic illustrations and text of monumental pieces and memorials, of granite, ranging from monuments of public interest to simple private tributes. Size 4x9 in. 24 pp.

METALS—See also Iron and Steel

American Brass Co., Main Office, Waterbury, Conn.

138. *Price List and Data Book.* Illustrated. Loose-leaf Catalog. Covers entire line of Sheets, Wire Rods, Tubes, etc., in various metals. Useful tables. Size 3⅞x7 in. 168 pp.

139. *Illustrated Pamphlets.* Describes the use and adaptability of Extruded Architectural Shapes, Benedict Nickel, Die Pressed Metals Condenser Tubes and Commutator Copper. Size 8½x11 in.

The Cincinnati Mfg. Co., Cincinnati, Ohio.

349. *Ornamental Iron and Bronze.* A catalog of metal work for banks, mausoleum bronze and tablets, hollow metal and kalamein doors, elevator cars and enclosures, builders' iron and wire work. 164 pp. Ill. 7½x10¾ in.

MILLWORK—See also Lumber—Building Construction—Doors and Windows

MOULDINGS, METAL

National Metal Molding Co., 25 Fulton Bldg., Pittsburgh, Pa.

85. *Bulletins.* Bound in a standard correspondence folder suitably indexed for convenient filing, describes complete line of metal moldings.

152. *Hand-book for the Man on the Job.* An illustrated book of fittings and methods with description and instructions for installing National Metal Molding under all conditions; a book meant to be conveniently carried and used on the job. Size 4⅜x6 in. 102 pp.

ORNAMENTS, GARDEN

Howard Studios, Inc., 5 and 7 West 47th St., New York.

5. *Garden Ornaments.* Illustrated catalog. Garden ornaments and mantels. Size 8x11 in. 40 pp. Price fifty cents.

ORNAMENTAL METAL WORK—See also Architectural Iron Work—Metals

PAINTS, STAINS, VARNISHES

Breinig Brothers, Inc., Third and Grand Sts., Hoboken, N. J.

210. *Color Cards;* contains suggestions for color combinations and painting in general; with descriptions for use and illustrations of the following paints; house paint, metal protective paint, shingle stain, enamel tints, floor and deck paint, "Wallsheen" (flat wall paint), barn and silo paint, screen paint.

211. *Cartons;* contains panels illustrating various effects obtained on woods by the use of Breinig Brothers Wood Finishes.

Hammar Brothers White Lead Co., 2119 Railway Exchange Bldg., St. Louis, Mo.

F269. *What Makes Lead Chalk?* The reply, and it is one of remarkable common sense, is contained in a pamphlet with the above title. 22 pp. 3½ x 6 in.

Master Clock
Style A6OT

REFERENCE LIST OF BUSINESS LITERATURE—Continued

PAINTS, STAINS, VARNISHES

Samuel Cabot, Inc., 141 Milk Street, Boston, Mass.

341. *Cabot's Old Virginia White and Tints.* Describes a specially prepared "flat" white which architects say gives "the whitewash white effect." Also describes tints perfectly flat in tone giving the "pastel effect." Used on wood, brick, stone, and stucco. 16 pp. Ill. 4x8½ in.

Carter White Lead Co., 12,042 South Peoria St., Chicago, Ill.

270. *The Carter Paint Calculator.* A valuable book containing answers and salutations to common paint problems; gives sample estimates; data useful to both architect and master painter. Black Fabricoid cover. Vest pocket size 2-1/2x4-1/2 in., 70 pages. Sent postpaid anywhere on request.

Joseph Dixon Crucible Co., Jersey City, N. J.

324. *Dixon's Silica-Graphite Paint.* A pamphlet describing the physical properties of silica-graphite paint and especially the wide difference between it and other protective paints. Contains also sample color card with specifications. 20 pp. and 6 pp. in color card. Ill. 3¼x6¼ in.

Samuel H. French & Co., Philadelphia, Pa.

312. *French's Paints and Varnishes.* A catalog and price list of paints, stains, varnishes, mortar colors, cement colors and materials for plasterers, with instructions for selection of colors, etc. 44 pp. Ill. 4x8 in.

A. C. Horn Company, New York, N. Y.

300. *Color Card and Brief Description of various Horn Painting Specialties.* Koncrex, Protective Floor Coating; Aclac, Service Paint; Symentrin, Flat Wall Finish; Symentrex (Liquid Concrete, a Complete Finish for Concrete or Brick; Horns House Paints (Gov't Specification).

National Lead Co., 111 Broadway, New York, N. Y.

273. *Handy Book on Painting.* Instructions for painting metals, woods, plaster, cement, etc. Formulas for mixing paints. 100 pp. 3-1/4x5-1/2 in.

274. *Red Lead in Paste Form.* Instructions for using red-lead. 18 pp. Ill. 3-1/2x6-1/4 in.

Parker, Preston & Co., Inc., Norwich, Conn.

357. *Art in Shingle Stains.* Description of waterproof, odorless shingle stains and waterproof coatings for walls and floors; with covering capacities and directions for use. 27 pp. 3x4½ in.

The Ripolin Co., Cleveland, Ohio.

120. *Ripolin Specifications.* Booklet containing 21 carefully prepared specifications for different types of work. Complete index of uses for Ripolin. General instructions. 8x10½ in. 12 pp.

The Sherwin-Williams Co., 601 Canal Road, Cleveland, Ohio.

278. *Painting and Varnishing Specifications.* A complete specification text book on the painting and finishing of architectural surfaces. 30 pp. 8-1/2x11 in.

279. *Portfolio of Flat-Tone Multi-Color Effects.* Containing samples and complete specifications for securing the latest and most beautiful effects in interior wall decoration. 2-1/4x6 in.

The New Jersey Zinc Co., 160 Front Street, New York, N. Y.

227. *Painting Specifications.* A booklet full of useful information concerning paint mixtures for application on various surfaces.

PAPER

A. P. W. Paper Co., Albany, N. Y.

326. *Toilet Cabinets.* A specification card for letter file containing complete descriptions with dimensions, capacity, etc., of Onliwon Cabinets for toilet paper. Illustrated.

PILES, CONCRETE

Raymond Concrete Pile Co., 140 Cedar St., New York.

156. *Raymond Concrete Piles—Special Concrete Work.* A booklet with data concerning the scope of the Raymond Concrete Pile Co., for special concrete work. It classifies piles, showing by illustration, text and drawings, the relative value of special shape and manufacture of piles. It gives formulae for working loads, and relative economy. Size 8½x11⅛ in. 60 pp.

MacArthur Concrete Pile and Foundation Co., 12 John St., New York, N. Y.

323. *Concrete Pile Standards.* This treatise gives standard details for pile caps with standard specifications for concrete piles and has a valuable chapter entitled, "How a Pile Supports Its Load." Useful tables are presented with worked examples of computations for typical and unusual conditions. 54 pp. Ill. 9x12 in.

PIPE

The Duriron Company, Dayton, Ohio.

256. *Acid Proof Drain Pipe and Sanitary Fittings. A Message to Owner, Architect and Sanitary Engineer. Bulletin 126.* This bulletin explains the advantages of Duriron Pipe to resist the corrosive action of acids and alkalis. Contains drawings, tables of dimensions and full instructions for installation. 8 pp. Ill. 8x10-1/2 in.

PLASTIC ORNAMENT

The National Plastic Relief Co., 328-330 Main St., Cincinnati, Ohio.

308. *Catalogue No. 1, 1921.* A list, with prices, of Fiber Olitic Products such as lighting fixtures, floor and table lamps, candle sticks, torches, etc., with notice of special fixtures and ornaments made from blue prints. 48 pp. Ill. 3x6 in.

PLUMBING EQUIPMENT—See also Drains

The Cahill Iron Works, Chattanooga, Tenn.

243. *Catalog "H."* Illustrates the complete line of Cahill enameled iron bath tubs, lavatories, kitchen sinks, etc., 240 pp. Ill. 8-1/4x11 in.

Crane Company, 836 So. Michigan Ave., Chicago, Ill.

240. *General Plumbing Catalogue.* A very complete and well illustrated booklet describing the complete line of Crane plumbing goods. 800 pp. Ill. 8-1/2x11 in.

The Imperial Brass Co., 1200 W. Harrison St., Chicago, Ill.

95. *Catalog C.* Loose-leaf catalog. Illustrated. Describes Watrous equipment; drinking fountains, lavatories, sinks, flushing valves, urinals, seats and all other necessary equipment of the best types of plumbing fixtures. Size 8½x10¾ in. 62 pp.

98. *Watrous Gravity Liquid Soap System.* Loose-leaf Catalog. Giving photographs of all details of equipment with description of their use. Size 8½x10¾ in. 5 pp.

Jenkins Bros., 80 White Street, New York, N. Y.

230. *Jenkins Valves for Plumbing Service.* This booklet contains all necessary information about Jenkins Valves commonly used in plumbing work. 16 pp. Ill. 4-1/4x7-1/4 in. Stiff paper cover.

Kohler Company, Kohler, Wisconsin.

209. *"Kohler of Kohler."* A booklet on enameled plumbing ware describing processes of manufacture and cataloging staple baths, lavatories, kitchen sinks, slop sinks, laundry trays, closet combinations. 48 pp. Ill. 5⅛x8 in. Roughing-in Measurement Sheets 5x8 in.

Thomas Maddock's Sons, Trenton, N. J.

259. *General Catalog.* Contains complete description of the full line of fixtures styled the "Highest Grade Standardized Plumbing Fixtures for Every Need." 94 pp. Ill. 5x7-1/2 in.

260. *Specifications for Plumbing Fixtures.* Contains tables of specifications for industrial buildings, schools, apartments, hotels, etc. 8 pp. Ill. 9x12 in.

The Vulcan Brass Manufacturing Co., Cleveland, Ohio.

214. *Paragon Ball Bearing Self Closing Faucets, Bibbs and Stops—Catalog B.* Illustrated book, showing sectional drawings, illustrations and text describing "Paragon" self-closing work, high pressure ball cocks, parts and valves.

REFRIGERATION

The Automatic Refrigerating Company, Hartford, Conn.

298. *The Mechanics of Automatic Refrigeration* and *Automatic Refrigeration for Hospitals and Sanatoriums.* Two essential booklets for the library of designers and specification writers. 24 and 28 pp. Ill. 8½x11 in.

370. *Automatic Refrigeration for Retail Markets.* A valuable treatise on the subject matter mentioned in the title. 80 pp. Ill. 8½x11 in.

Brunswick Refrigerating Company, Brunswick, N. J.

221. *The Brunswick Method of Mechanical Refrigeration.* An illustrated booklet describing the Brunswick method of mechanical refrigeration for residences, clubs, hospitals, hotels, office buildings, restaurants and all buildings requiring refrigerating, ice making or water cooling equipment. 32 pp. Ill. 5-3/8x7-3/4 in.

The Jewett Refrigerator Company, 27 Chandler Street, Buffalo, N. Y.

231. *Refrigeration and Health. Vital Facts You Ought to Know.* A booklet outlining the basic requirements of a good refrigerator and explaining how to use a refrigerator to secure best results. 16 pp. Ill. 4-3/4x7-3/4 in.

Northey Manufacturing Co., Waterloo, Iowa.

F240. *General Catalog of Full Line.* Contains an interesting and valuable discussion of cold dry air refrigeration of every kind for all purposes, side or overhead and natural and artificial systems. 72 pp. Ill. 7½x11 in.

ROOFING—See also Slate

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

52. *Specifications and Price List.* Descriptive booklet. Details of Ambler Asbestos Cement Roofing Slates, "Century" Asbestos Shingles and Asbestos Corrugated Sheathings. Tables and drawings. Size 6x9 in. 44 pp.

53. *Ambler Asbestos Corrugated Roofing.* Catalog gives complete data for specifying, drawings, methods of application, tables, etc. Size 8½x11 in. 20 pp.

John Boyle & Co. Inc., 112-114 Duane Street, New York, N. Y.

212. *Boyle's Bayonne Roof and Deck Cloth.* List B 93. A prepared roofing canvas guaranteed waterproof for decks and the roofs and floors of piazzas, sun-parlors, sleeping porches, etc.

REFERENCE LIST OF BUSINESS LITERATURE—Continued

ROOFING—See also Slate

Creo-Dipt Co., North Tonawanda, N. Y.

55. *Creo-Dipt Stained Shingle Homes.* Portfolio, illustrated. Forty-seven attractive homes where Creo-Dipt stained shingles have been used. Size 6x9 in. Forty-seven sheets.

The John D. Emack Co., 112 So. 16th St., Philadelphia, Pa.

251. *Old Stonefield Roofs.* An envelope portfolio containing two plates in color and 20 views of houses having Stonesfield roofs. The accompanying 8 pages of text describe the manufacture and laying of Old Stonesfield slate roofs 5-1/2x6-3/8 in.

Ludowici-Celadon Co., Chicago, Ill.

154. *The Roof Beautiful.* Booklet. Well illustrated with photographs and drawings, giving history and origin of roofing tile, and advantages over other forms of roofing. Types shown by detailed illustrations. Size 8x10¼ in. 32 pp.

Mohawk Asbestos Slate Co., Inc., 1147-1151 Mohawk St., Utica, N. Y.

343. *For Roofs of Lasting Beauty.* A description with prices and directions for laying, of Mohawk Tapered Asbestos Shingles which make a low first cost everlasting roof covering. 4 pp. Ill. 8¾x11½ in.

Porete Mfg. Co., 26 Verona Ave., Newark, N. J.

258. *Porete Roof-decks.* An illustrated circular describing Porete (a new light-weight concrete) for use in fireproof roofs for all buildings. 4 pp.

Vendor Slate Co., Inc., Easton, Pa.

333. Occasional brochures on architecturally pertinent phases of roofing slate sent on request. See also listing under Slate.

ROOF-LIGHTS—See Glass Constructions

SCREENS

American Wire Fabrics Company, 208 So. La Salle St., Chicago, Illinois.

305. *Catalog of Screen Wire Cloth.* A catalog and price list of screen wire cloth, black enamelled, galvanized, aluminoid, copper bronze. 30 pp. Ill. 3½x6¼ in.

The Higgin Manufacturing Co., 5th and Washington Ave., Newport, Ky.

353. *Screen Your Home in the Higgin Way.* A description of Higgin door and window screens with practical data. 16 pp. Ill. 8½x11½ in.

SCREW HOLES

The Stine Screw Holes Co., Waterbury, Conn.

213. *The Only Screw Holes in the World.* A leaflet 8½x11 in. to fit in vertical file describing metal screw holes which are driven into any material with a hammer. When the driving head is removed a permanent screw hole is left.

SHEATHING

The Hydrex Asphalt Products Corp., 170 Broadway, New York.

63. *Sheathing and Insulating Paper—Waterproof.* Illustrated pamphlet. Describes Hydrex "Novento" and gives specifications for use under floors, in walls, and under roofs.

SKYLIGHTS—See Glass Constructions

H. H. Robertson Company, 1st National Bank Bldg., Pittsburgh, Pa.

87. *Robertson Glazing Construction.* Booklet, illustrated. Types of construction used in industrial, commercial and educational buildings, residences and hospitals, giving description, diagrams, tables of sizes and details of construction. Size 8x10½ in. 40 pp.

SLATE—See also Roofing

Vendor Slate Co., Inc., Easton, Pa.

332. *The Vendor Book of Roofing Slate for Architects.* Contains original information on slate in various architectural uses; history, geology, sundry practical matters; complete descriptive classification; extended treatise on architectural roof design and specifications. 24 pp. Ill. 8½x11 in.

STAINS—See also Paints, Stains, Varnishes

STONE

Indiana Limestone Quarrymen's Ass'n., P. O. Box 603, Bedford, Indiana.

37. *Indiana Limestone.* Illustrated booklet, Vol. I, of the Limestone Library. Size 6x9 in. 36 pp.

147. *Designs for Houses of Indiana Limestone.* A booklet of the best designs submitted in a competition for a detached residence faced with Indiana Limestone. Size 8½x11 in. 32 pp.

265. *Folders: Series D.* Structural detail and data sheets showing methods of detailing cut stone work in connection with modern building construction. 4 pp. each. 8-1/2x-11 in.

366. *Standard Specifications for Cut Indiana Limestone Work.* This is Vol. III, Series "A-3." Service publications on Indiana Limestone, containing Specifications and Supplementary Data relating to best methods of specifying and using this stone for all building purposes. 56 pp. Ill. 8½ x 11 in.

STORE FRONTS

Brasco Mfg. Co., Chicago, Ill.

56. *Brasco System of Hollow Metal Store Front Design.* Folio of Detail Sheets. Full size detail sheets 1, 2, 3 and 4. Corner bar, division bar, reverse bar and three-way bar, head transom, sill and jamb sections. Sheets 18x22½ in.

57. *Hester System Store Front Construction and Design.* Folio of Details Sheets. Full size detail sheets, a, b, c and d, of hollow metal store front construction, giving full size sections of head, transom, sill and jamb with moulding profiles and bar cover to house awning construction. Sheets 18x22½ in.

Detroit Show Case Co., Detroit, Mich.

77. *Designs.* A booklet. Store fronts and display window designs, giving plans and elevations, and descriptions. Size 9¼x 12 in. 16 pp.

78. *Details.* Sheets of full size details of "Desco" awning transom bar covers, sill covers, side, head and jamb covers, ventilated hollow metal sash and profile of members. Size 16x21½ in. 3 sheets.

Kawneer Mfg. Co., Niles, Mich.

40. *Kawneer Store Fronts.* Illustrated catalog. Drawings and details of construction. Size 8½x11 in. 32 pp.

41. *Full Size Details Kawneer Construction.* Blue prints. Size 30x30 in.

42. *A Collection of Successful Designs.* Portfolio. Shows 24 typical store fronts with elevations. Size 9x12 in. 32 pp.

STUCCO—See also Cement

American Magnesia Products Company, 5730 Roosevelt Road, Chicago, Ill.

284. *The Stucco Beautiful.* A booklet describing Kragstone Stucco with pictures of buildings on which it has been used. 12 pp. Ill. 4x9 in.

The Atlas Portland Cement Co., 25 Broadway, New York, N. Y.

280. *The Stucco House.* Contains many beautiful illustrations of houses finished with stucco and selected particularly for their architectural value. Detailed illustrations of stucco surface textures and drawings showing wall construction with revised specifications covering application of stucco. 96 pp. 8-1/2x11 in. Price 50 cents.

National Kellastone Company, 155 East Superior St., Chicago, Ill.

302. *Specifications for Stucco Work.* A booklet containing complete specifications in detail for the use of Kellastone stucco for new buildings as well as the "overcoating" of old buildings. 13 sheets of text, 2 sheets of illustrations. 8x11 in.

303. *The Story of Kellastone Imperishable Stucco.* In this most interesting book the merits of Kellastone are set forth in a convincing manner. Every page contains pictures of beautiful houses stuccoed with Kellastone and there are two pages in color. 22 pp. Ill. 8½x12 in.

TELEPHONES

Federal Telephone & Telegraph Co., Buffalo, N. Y.

344. *Federal Apartment House Telephones.* A short illustrated description of four classes of telephone equipment for apartment houses; Vestibules, the Suites, Rear Entrance, and the Janitor's Headquarters. 6 pp. Ill. in colors. 4x8 in.

345. *Interior Telephone Systems. Bulletin No. 610.* A detailed description of Selective Talking and Ringing Systems and Multiple Talking Systems of telephones for all kinds of establishments, from the most simple to those working on exchange trunks and central stations. 22 pp. Ill. 8¼x10 in.

Stromberg-Carlson Telephone Mfg. Co., Rochester, New York.

304. *Inter-Communicating Telephone Systems. Bulletin No. 1017.* A pamphlet giving just the information required for the installation of intercommunicating systems from 2 to 32 stations capacity. 15 pp. Ill. 7¾x10 in.

TERRA COTTA

National Terra Cotta Society, One Madison Ave., New York.

148. *The Garage.* An illustrated brochure of the garage finished with architectural terra cotta, with notes on the color of tiles used. Size 10½ x 13¼ in. 36 pp.

157. *Terra Cotta Defined. Brochure Series, Vol. VI.* Illustrated brochure with photographic illustrations of architectural terra cotta, details of terra cotta ornament in office-building, theatre, bank, school, store, and public building. Its adaptability and lasting qualities are given and the process of manufacture and history is briefly outlined. Size 8½x11 in. 32 pp.

158. *The Theatre. Brochure Series, Vol. II.* Theatres and moving picture houses, showing ornamental details in architectural terra cotta. Size 10½ x 14 in. 36 pp.

159. *The Store. Brochure Series, Vol. III.* Large and small store buildings are treated in this volume, of work built in various parts of the country, using architectural terra cotta. Size 10½ x 14 in. 36 pp.

REFERENCE LIST OF BUSINESS LITERATURE—Continued

TERRA COTTA

The Northwestern Terra Cotta Co., 2525 Clybourn Ave., Chicago, Ill.

96. *Architectural Terra Cotta.* A collected set of advertisements in a book, giving examples of architectural terra cotta, ornamental designs and illustrations of examples of facades, of moving picture houses, office buildings, shops, vestibules and corridors in which Northwestern Terra Cotta was used. Size 8½x 11 in. 78 pp.

TILE—Ornamental

The Associated Tile Manufacturers, Beaver Falls, Pa.

358. *Home Suggestions.* A new book in colors describing and illustrating the use of tiles in floors, walls, ceilings, fireplaces, garages, for exterior embellishment, etc. Full of suggestions. Sent to architects on request. 6 x 9 in.

359. *Basic Information on Tiles.* Book giving practical information on ingredients, processes, gradings, sizes, shapes, colors, finishes and nomenclature. Sent to architects on request. 7½ x 10½ in.

The Associated Tile Manufacturers, Beaver Falls, Pa.

374. *Basic Specification for Tilework and Related Documents. No. K-300.* This specification is prepared in a very systematic manner for the use of architects and builders. It is printed on one side of a sheet with facing page blank to receive memoranda. Various colored sheets make reference easy and simplify greatly the work of a specification writer in specifying tilework. 38 pp. 8½x11 in.

375. *"Work Sheets" for Specification Writers.* To be used in connection with "Basic Specification for Tilework and Related Documents." 16 sheets. 8½x11 in.

TRIM—see also Doors and Windows

VACUUM CLEANERS

Landers, Frary & Clark, Connersville, Ind.

299. *General Catalogue.* This book describes and illustrates Connersville vacuum cleaners, stationary and portable, dry and centrifugal separating units, sizes of machines, uses and typical installations. 24 pp. Ill. 5¾x9 in.

VARNISH—See Paints

VENTILATORS

The Burt Manufacturing Co., Akron, Ohio.

207. *General Catalogue* covering entire line of Ventilators, Exhaust Heads and Filters. Separate leaflets on each type of ventilator, vent and damper.

Monsoon Cooling System, Inc., 70 West 45th St., New York, N. Y.

367. *A Better Summer Business.* A book on theatre ventilation explaining how moving air in contact with the body produces comfort; explains principles and illustrates installation of Monsoon Cooling Systems. 32 pp. Ill. 6½ x 8¾ in.

The V-W Ventilator Co., 101 North High Street, Columbus, Ohio.

232. *Ventilators for Buildings.* An 8 page illustrated pamphlet describing ventilators for doors, windows, transoms, store fronts and sash rails. 3-1/2x6-1/4 in.

VENTILATION—See Heating and Ventilation

Ozone Pure Airifier Co., 1401 Jackson Blvd., Chicago, Ill.

F274. *Ozone Pure-Airifier. Bulletin No. I.* A treatise on how recirculated, ozonized air in ventilating systems is saving fuel. Contains also paper on air conditioning in school rooms. Shows two typical installations. 8 pp. Ill. 8¾x11½ in.

WALL COVERING

Standard Textile Products Co., 320 Broadway, New York

111. *Sanitas, Modern Wall Covering.* Folio. Plates of color renderings of various interiors, with suggestions for the library, living room, dining room, boudoir, kitchen and church wall covering, using Sanitas. Size 11½x6 in. 15 plates.

112. *Sanitas and Its Uses.* Booklet. Text and color illustrations of Sanitas as a wall covering, with tables for wall and ceiling measurements. Notes on sanitary character, cleanliness and durability of Sanitas. Size 5x7 in. 28 pp. 6 color plates and 2 sample sheets.

113. *Sanalining Sanitas Lining and Prepared Lining.* Folder. Notes on durability and cleanly character of the above three products. Size 3¾x6 in.

114. *Hints to Decorators.* Booklet. Instructions and specifications for the application of Sanitas, with notes on finishes and material. Size 5x6¾ in. 20 pp.

WATER HEATER

Humphrey Company, Kalamazoo, Michigan.

50. *Humphrey Gas Water Heaters.* Catalog and handbook. Diagrams, tables and complete data for specifying gas water heaters of all types and sizes. Size 6x9 in. 36 pp.

WATERPROOFING—See also Dampproofing

Samuel Cabot, Inc., 141 Milk Street, Boston, Mass.

340. *Cabot's Waterproofing Specialties.* Describes Dampproofing, Clear Brick Waterproofing, and Clear Cement Waterproofing with specifications and covering data. 12 pp. Ill. 4x9 in.

A. C. Horn Company, New York, N. Y.

301. *Architect's Set.* A file folder, ready labelled for inclusion in the files, containing a full set of literature on all Horn Waterproofings, Dampproofing and Technical Paints. Descriptive Chart giving covering capacities, etc., printed on inside of folder.

The Hydrex Asphalt Products Corp., 170 Broadway, New York.

62. *Dampproofing Walls, Above and Below Grade.* Illustrated booklet. Uses and specifications of Hydrex Paint, Hydrex (Bitumen). Compound and Hydrex Waterproof Primer for walls above and below grade, stainproofing cut stone, acidproofing floors, etc., described. Size 8½x11 in. 8 pp.

Minwax Company, Inc., 18 East 41st Street, New York, N. Y.

327. *Sub-level Waterproofing. Bulletin* 21. Contains a discussion of waterproofing methods as applied to sub-level and bridge deck work. Information is given on the MINWAX System with specifications. 24 pp. Ill. 8½x11 in.

328. *Waterproofing Exposed Walls.* Discussion of wall protection methods. Full information on MINWAX Clear Waterproofing; Minwax Brick and Cement Coating; MINWAX No. 300 Dampproofing. 12 pp. 8½x11 in.

The Sandusky Cement Co., Cleveland, Ohio.

125. *Catalog.* Examples of building tanks and concrete products manufactured using Medusa integral waterproofing, and reasons for and methods for use, described. Tables of cement and aggregates in booklet, accompanying.

The Truscon Laboratories, Detroit, Mich.

238. *Architects' Specification Hand-Book.* Contains specifications on waterproofing methods, damp-proofing, concrete floor hardeners, wood floor preservatives, technical paints and enamels. 33 sheets. Ill. 8-1/2x11 in.

Wadsworth Howland & Co., Inc., Boston, Mass.

306. *Bay State Waterproofings.* Contains descriptions of and specifications for use of brick and cement coating, crack filler, below grade waterproofing, steel protective coating, cement floor filler and coating, clear waterproofing. 16 pp. Ill. 8x10½ in.

WATER PURIFICATION

United States Ozone Co., Scottdale, Pa.

245. *Bulletin 37. Ozone Water Sterilizers.* Contains description of principles and mechanical design, results obtained and specifications covering construction. Complete outline of operation. Capacities from 100 to 1,000 gallons per hour.

United States Ozone Co., Scottdale, Pa.

246. *Bulletin 39. Swimming Pools.* Description and application of Ozone apparatus to Swimming Pools. This Bulletin completely covers the purification of swimming pool water and gives unique designs of swimming pool circulating systems.

WATER SOFTENERS

The Permutit Company, 440 Fourth Ave., New York.

105. *Permutit (Water Rectification Systems.)* Illustrated booklet. Describes all methods of softening water, including the original Zeolite process. For homes, hotels, apartment houses, swimming pools, laundries and industrial plants. Size 8½x11 in. 32 pp.

WEATHER STRIPS

The Higgin Manufacturing Co., 5th and Washington Ave., Newport, Ky.

354. *Higgin All Metal Weather Strips.* A booklet of considerable value to architects and builders on the use of weather strips. Ask also for the companion book on "The Reason Why." Each booklet 12 pp. Ill. 6x9 inch.

Monarch Metal Products Co., 5020-26 Penrose St., St. Louis, Mo.

289. *Cause and Effect.* A series of pamphlets describing Monarch Metal Weather Strips which are made of bronze, brass and zinc. They differ from all other strips in that they are applied in spaces around doors and windows as elastic fillers and not over the space as covers. Each 4 pp. 8½x11 in.

WINDOWS—see Doors and Windows

WINDOW LEAD

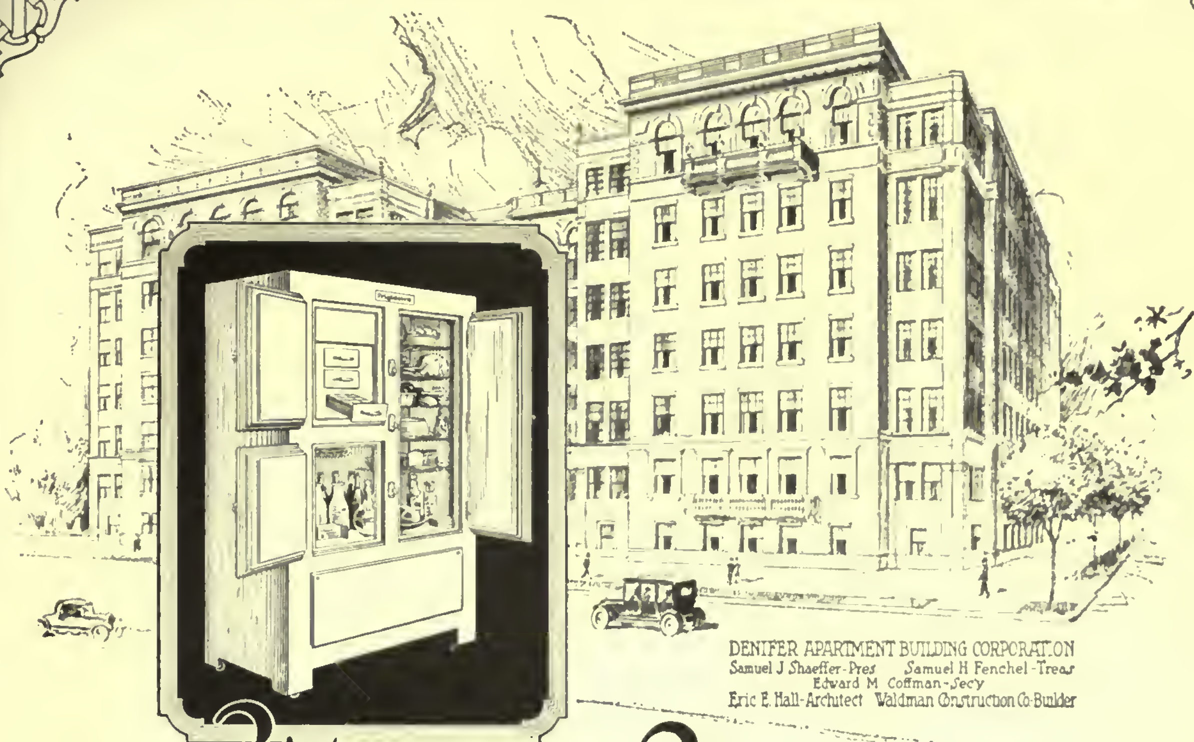
National Lead Company, 111 Broadway, New York, N. Y.

271. *Lead Came Booklet.* A booklet illustrating various sizes of lead cames. 12 pp. 6x8-1/2 in.

WOODWORK

Hartmann-Sanders Company, 6 East 39th St., New York, N. Y.

334. *Catalog No. 47.* Illustrating Koll's Patent Lock Joint wood stave columns for exterior and interior use. 48 pp. Ill. 7½x10 in.



37 Kitchens—37 Frigidaires

The Denifer Apartment, now under construction at Balmoral and Kenmore Avenues, Chicago, is installing thirty-seven Frigidaires—one for each of its thirty-seven kitchens.

Frigidaire's clean, dry, electrical refrigeration makes it ideal for use in apartments and many of its features provide unusual convenience.

With Frigidaire the uncertainty, bother and muss of the ice man are removed and you are independent of an outside ice supply.

Meats, vegetables, fruits or dairy products retain their freshness and flavor in the dry, constant temperature of Frigidaire—for it is at least ten degrees colder than is possible with ice.

A special compartment provides the means to freeze drinking water into small cubes. Here also, salads and desserts can be quickly chilled for table use.

Frigidaire is being demonstrated in all principal cities by our branch offices or Delco-Light distributors. They will gladly explain its numerous features—or a descriptive booklet will be mailed on request.

DELCO-LIGHT COMPANY
DAYTON, OHIO

The price of Frigidaire has recently been reduced from $775 to $595 f. o. b. Dayton

A PRODUCT OF GENERAL MOTORS CORPORATION

Frigidaire

CLEAN DRY ELECTRICAL REFRIGERATION

SARGENT
HARDWARE

John Crerar Library Building
Chicago, Ill.

Holabird & Roche,
Architects

THE practical side of the architect's work is equally as important as the artistic and in considering this phase of the work special attention is given to the selection of materials that are best adapted to the practical needs of each structure.

Here is a building, occupying a prominent corner in Chicago, that combines under one roof business and literature, the lower floors being devoted to commercial purposes and the upper floors to a notable library of engineering works. Certain hardware problems were solved by the use of

SARGENT

LOCKS AND HARDWARE

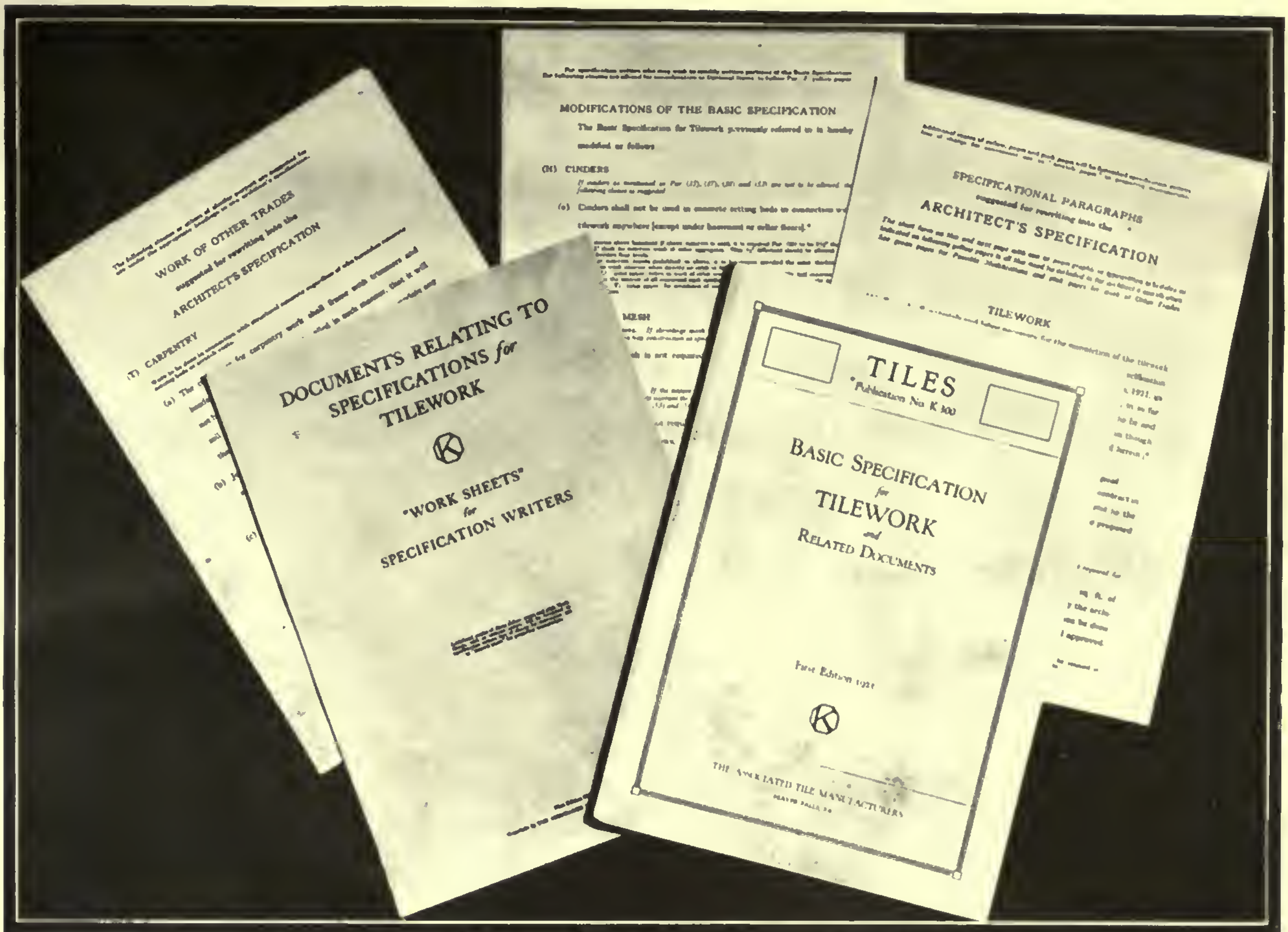
which are now giving satisfactory service in the building.

SARGENT & COMPANY

Manufacturers

NEW HAVEN, CONN.

New York Chicago



"BASIC SPECIFICATIONS"

and Related Documents

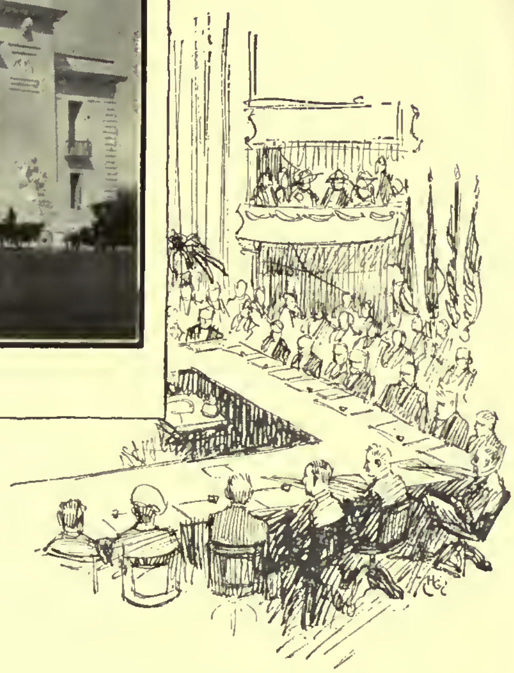
Our publication K 300 is a basic document designed to serve as a record to which architects may refer in preparing specifications for Tile.

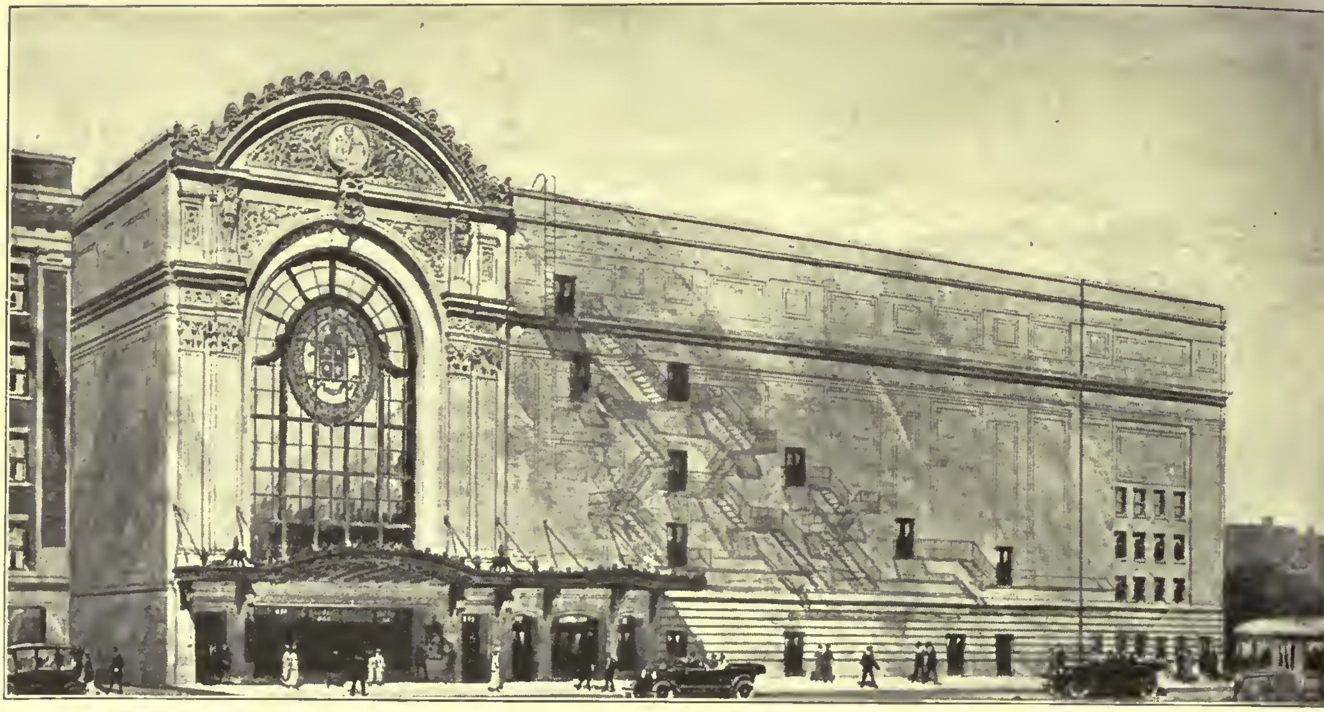
Documents relating to this publication, all available to the architect, include:

Modifications of the Basic Specification, paragraphs relating to Tile details that must be taken care of for the work of other trades, and specificational paragraphs for re-writing in the architect's own specifications.

Copies of these documents will be sent to architects on request.

The Associated Tile Manufacturers,
BEAVER FALLS, PA.





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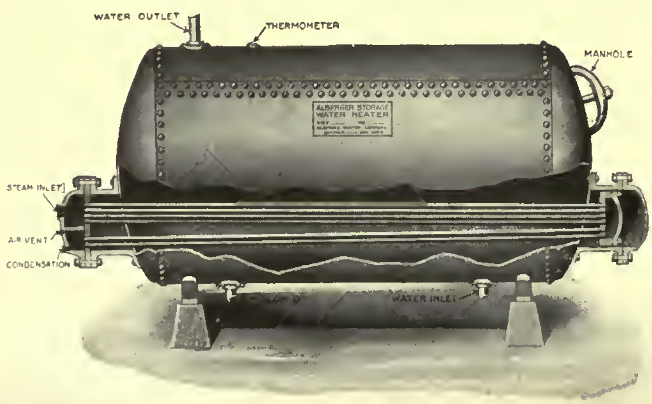

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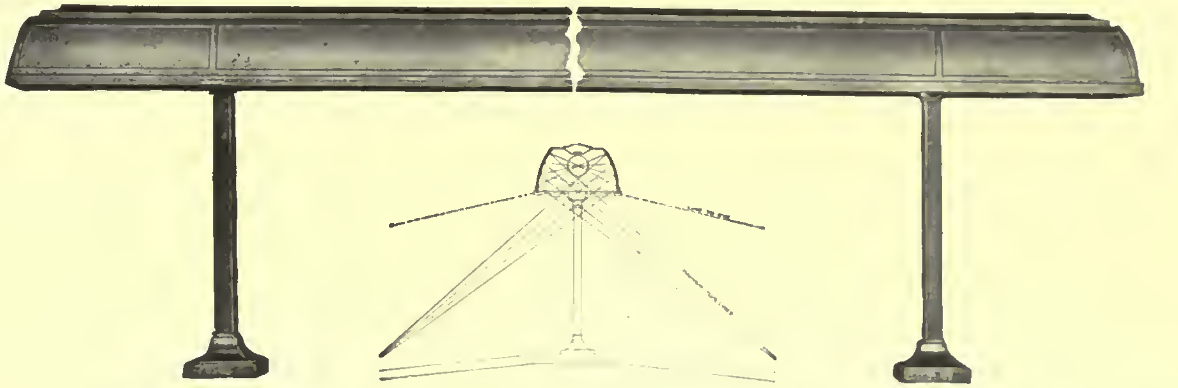

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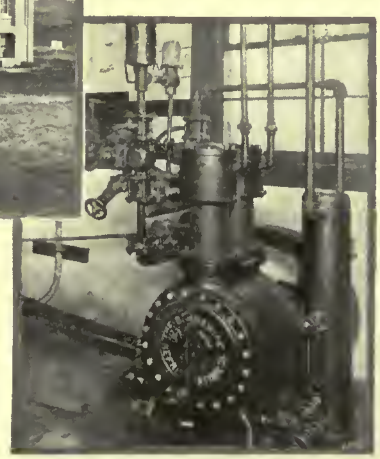

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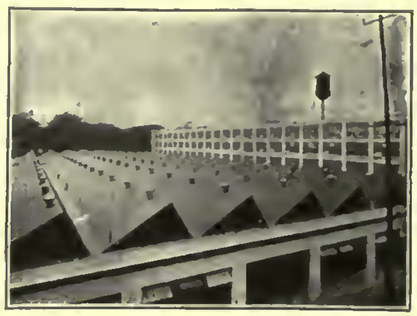

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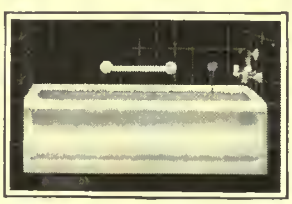

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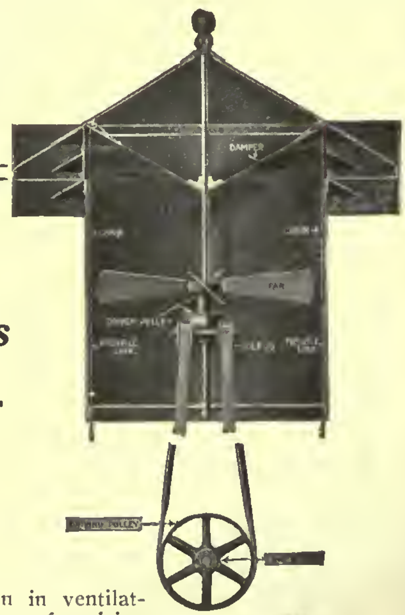

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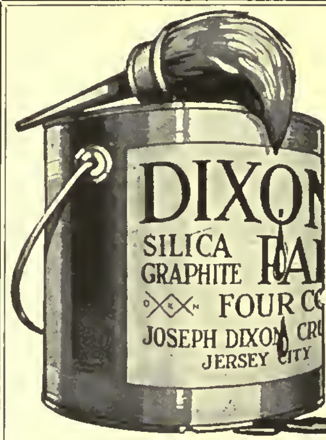

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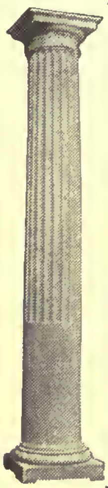

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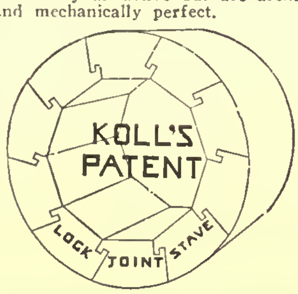

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