THE AMERICAN ARCHITECT
The ARCHITECTURAL REVIEW

VOL. CXXIII WEDNESDAY, MARCH 28, 1923 NUMBER 2416

NEW ENGLAND CHURCHES OF ARCHITECTURAL AND HISTORICAL INTEREST

BY CHARLES LYMAN SMITH

STANDING in the crypt, beneath the crossing of St. Paul's Cathedral, London, one is surrounded by memorials to many of the men,—soldiers, sailors, artists, architects and musicians who have written in large letters glowing pages of England's history. In this shrine where rest the illustrious dead, a plain black marble slab is conspicuous, bearing the well known inscription:—*"Lector, si monumentum requiris circumspici."* This marks the grave of Sir Christopher Wren, who was born in 1632 and died in 1723. He was the architect of the noble church which so appropriately bears testimony to his genius.

Baptist Meeting House at Providence, R. I. Built 1775. Often called "Baptist Cathedral of America"

In 1664 London was turned into a city of mourning by the ravages of the Great Plague, by which more than one hundred thousand citizens lost their lives. Following closely this fearful calamity came another, the Great Fire of September, 1666, which destroyed besides thousands of houses, the old cathedral of St. Paul's and more than eighty parochial churches.

This disaster proved Wren's great opportunity, for although his excellent plans for the restoration of the city were never fully realized, he had his own way in building St. Paul's and some fifty odd churches. His towers and spires were his greatest glory and they often attained rare architectural beauty. They are grouped about the splendid dome of St. Paul's with variety and skill, but this harmonious scheme has long since become obscured by many buildings, and the only panorama of Wren's achievement may be obtained either from Blackfriar's Bridge or from the tower of St. Savior's, Southwark. "In architecture as in poetry, not only the whole, but the principal members and every part of them should be great, and this group of dome, spires and towers bears unquestionable magnificence which does honor to the English nation." This unique work is the more marvellous when one considers that Wren was not a trained architect, and he is never known to have travelled further than Paris. Wren was absolutely incapable of trumpeting his own fame—but this modest man virtually rebuilt a city—and although dismissed by the Commission who employed him, posterity has already pronounced that his name belongs with the great men of two centuries ago.

By the time of the Great Fire of 1666 the Pointed arch had died out and the Renaissance style, borrowed from Italy, had taken the place of Gothic architecture. "About two hundred years ago," we are told in Wren's memoirs, "when ingenious Men began to reform the Roman language to the Purity which they assigned and fixed to the Time of Augustus and of that Century, the Architects also, ashamed of the modern Barbarity of Building, began to examine carefully the Ruins of old Rome and Italy; to search into the Orders and Proportions, and to establish them by inviolable Rule; so to their Labor and Industry we owe in a great degree the Restoration of Architecture." Wren naturally fell in with the fashion of his own time, and after a careful study of Salisbury and other Gothic piles he was confirmed in his faith in the Italian Renaissance. It is amusing to quote from some of his letters in which he tells us that "there is scarce any Gothick Cathedral that I have seen, at home or abroad, that is not overloaded with carving and tracery—and the Pillars yield and bend inwards from the Weight of the Vault of Aile. * * * For this Reason this Form of Churches has been rejected by modern Architects who use the better and Roman Art of Architecture." Any place of worship was in his eyes badly constructed in which the preacher's voice could not travel so as to be distinctly heard. Wren estimated that a preacher of average voice might be heard fifty feet in front, twenty behind and thirty on either side, provided he did not drop his voice at the end of the sentence.

"Old North" Church at Newburyport, Mass. Built 1756

He contended that the French preachers were heard further than the English because they raised their voices at the end of the sentence, just where the words often needed particular emphasis to express the meaning.

This article would appear to have digressed into a biographical sketch of Sir Christopher Wren, but in the light of the development of our New England church architecture of the eighteenth and early nineteenth centuries, we must acknowledge Wren's series of London churches as the inspiration of builders and architects. Today many of the finest examples of the Colonial period, scattered throughout our towns and villages, are pointed to with pride as "Wren towers" or "spires."

As in the case of Colonial houses after the log cabin period, the church was simple in construction, hardly removed from the farmhouse in appearance, with little to distinguish it as a place of public worship. Of these early buildings fortunately we have preserved for us in the quaint little town of Hingham, Mass., a meeting house, known as the "Old Ship," which has stood for more than two centuries substantially as when first erected in 1681. All the original timbers are still there, sound as when first hewn from the solid oak by the strokes of the broad-axe, the marks of which may

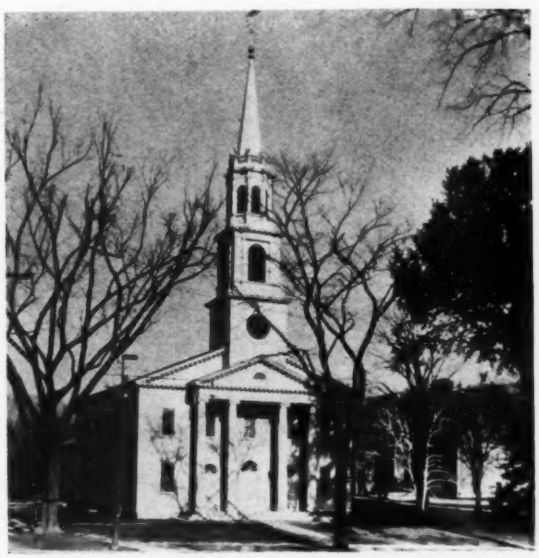
Meeting House, Hingham, Mass. Built 1681. Called "Old Ship." The oldest church in U. S. still used for purposes for which it was built

Church at Wayland, Mass.
Built 1816
Charles Bulfinch, Architect

Church at Deerfield, Mass.
Built 1824

Meeting House Hill Church, Dorchester, Mass. Replica of Church built on this site in 1816

"Second Church," Roxbury, Mass.
Built 1804



Church at Williamstown, Mass. Built 1914. A faithful copy of the church at Old Lyme, Conn.

be plainly seen. Exhaustive research establishes this ancient house as the oldest building for public worship in the United States which stands upon its original site, and continues to be used for the purpose for which it was erected.

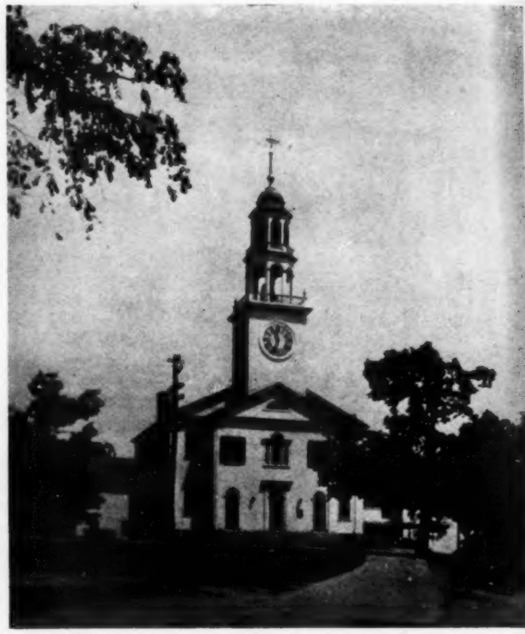
There is some doubt about the general appearance of the early New England meeting houses; but from woodcuts of buildings not now standing it is fair to suppose that the type used in the old house of worship in Hingham was more common than any other.

It is a square, box-like structure with a pyramidal roof surmounted by a belfry. There is a projecting porch, two regular rows of windows with diamond panes of leaded glass, with a pair of windows at a different level which mark the position of the high pulpit. About 1750, square pews with "banister" top were introduced. Up to that time there was no ceiling, but all open rafters. Through a small circular aperture in the roof the bell rope was lowered to the floor of the house, and later the opening was covered with glass, through which the sexton, while ringing the bell from the attic floor, could see when the minister had taken his place in the pulpit, which was a signal to cease ringing.

Church at Concord, Mass. Replica of a church built on this site prior to 1774. The Provisional Congress sat in the original church which was destroyed by fire in 1900

It seems incredible that our ancestors could have sat through tedious services in a New England climate with no heat other than that obtained from foot warmers or other portable appliances, but stoves were not introduced until the early part of the nineteenth century. There was no adequate provision for lighting, and time was marked by the hourglass which stood upon the pulpit.

In an article necessarily limited, it is impossible to describe in detail either the architectural beauty of design or the historical significance of each

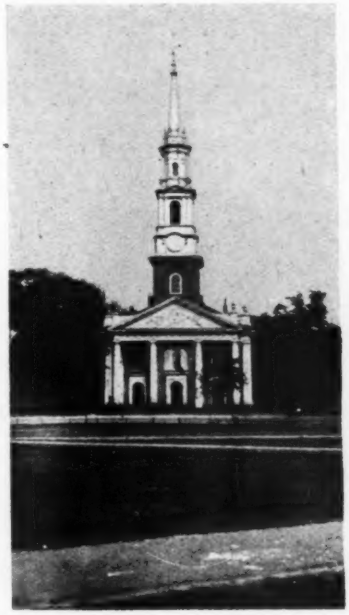


Church at Reading, Mass. Replica of Church built on this site in 1815

church, yet the subject is so fascinating that the temptation to elaborate upon it is great. It reminds one of the men at a banquet who consume so much time in response to the various toasts that the speaker of the occasion often finds he has been given scant opportunity to deliver his carefully prepared address, and must content himself with a few remarks.

When prosperity and peace finally spread throughout the colony, the people naturally desired to give their places of worship a degree of

"First Church," Dorchester, Mass. Built 1806 beauty hitherto unknown. The classic revival, or Georgian, being at its height in the Mother country, the colonists adapted that style to their needs. Builders of one hundred and fifty years ago knew quite a bit about the orders, and in a simple manner applied them to the ornamentation of their churches. The study of the early orders and their use by such men as Wren, Gibbs and Vaughan only add to their authority and make them indispensable as a means of expression. These classic forms appealed to our Puritan ancestors and seemed best to express their national spirit and religious beliefs. Thus, like the architects of old, the early builders of New England have become historians of their day—although their material being of wood or brick we cannot hope for the imperishable imprint of its influence as seen in many forms on every hand in the massive masonry of the Old World. These venerable churches take the form of Greek and Roman basilicas of three aisles with pulpit or rostrum at one end. Among the Romans this oblong public hall attained its greatest importance, and each provincial town had its basilica. In our village churches we find a double row of windows along the sides, in place of the peristyle of columns of the classic temples. The front is dignified by a projecting gabled porch of two stories pierced by three portals giving access to the aisles, the central one being enriched by pilasters supporting a pointed or arched pediment. Above, three windows balance the doorways, the one over the main entrance, usually of Palladian design, lights the organ loft or gallery, while at the pulpit end of the church a window of similar pattern lights the recess of the chancel.



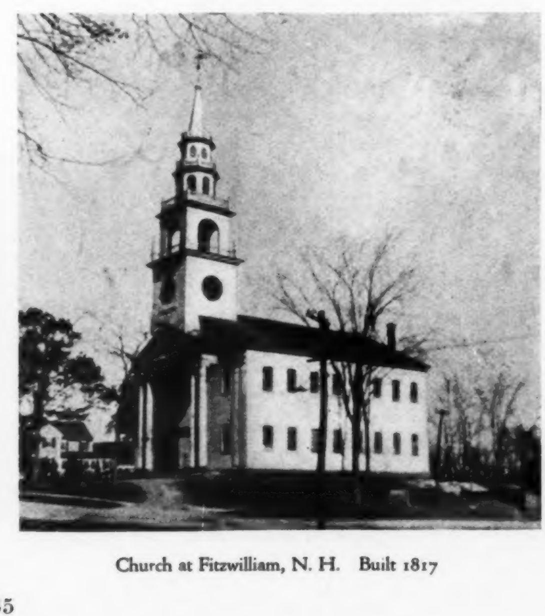
Church at New Haven, Conn. Built 1814

In some instances we find a more elaborate development, with Grecian portico of Doric or Ionic columns supporting a simple pediment from which rises the square tower which forms the base of lantern or spire.

These towers are frequently ornamented with a low balustrade with urns crowning the posts at the corners. From them rise successive and receding stories, sometimes in four sided gradations and again the octagonal and circular forms are used. These stories are embellished with column, arch, and pilaster of the various orders forming an ornate base for the pointed spire or lantern which is modeled along the lines of the fine Wren prototypes in London.

Thus nothing new and original has been devised as a substitute, and men are coming to realize that purity of design is more to be desired than novelty. The simple white church facing the village green and framed amid the interlacing branches of noble elms, though lacking in grandeur and ambition

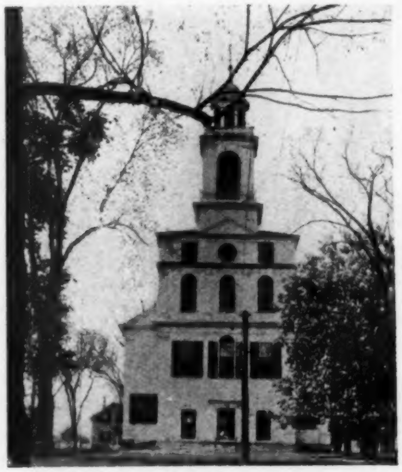
Church at Kennebunk, Me. Built 1773



Church at Fitzwilliam, N. H. Built 1817

of design, fills one with a sense of the beauty of holiness and peace in the serene dignity of its setting.

Boston with pride sets her old churches out to be seen of all in the heart of her busiest section. Great business blocks threaten to engulf them and the dead sleep in their shadow. Iconoclasts have failed to dislodge these relics of a bygone day and hundreds of thousands of dollars have been eagerly subscribed to save them from destruction. Fire and tempest have laid low many a spire and church, but Phoenix-like they have risen proudly from their ashes, reproduced in exact detail to perpetuate the lofty traditions for which they stand.



Church at Bedford, Mass. Built 1816

Many of these old churches have witnessed the birth of the nation, and from their ancient pulpits the stirring words of the Declaration of Independence and the Constitution of the infant Republic have resounded. Their bells have been cast in England to peal for the British Empire in North America, and from their towers have flashed the prearranged signals of alarm to warn the inhabitants against the dreaded invasion of the country by British troops. Gen. Gage, Sir William Howe, Gen. Warren, George Washington, Samuel Adams and John Hancock, to mention but a few, are illustrious men who have bowed in prayer or risen in protest against oppression within these sacred portals.

Some of the pulpits date from 1717, if not even from 1688, and organs are still in use that were sent from England in 1756 and said to have been tested by the great Handel himself.

These old churches have been desecrated by the ribaldry of British soldiers, they have been honored by the ringing speeches of inspired patriots, sanctified by the solemn funeral ceremonies for illustrious dead and consecrated through years of worthy service to God. The architects have produced buildings not alone pleasing to the eye, but they satisfy the requirements of convenience and stability, and they stand the test of time. May their towers and spires of sunny grace long rear their slender beauty as a symbol of all that is best in the foundation of character, history, art and religion.

Church at Dedham, Mass.
Built 1763

Church at Boston, Mass. Built 1914
Ralph Adams Cram, Architect

Main Dining Room, as restored

FITTINGS OF A FAMOUS ENGLISH HOUSE

The Interior of Hogarth House in London Now Reassembled in This Country

THE house at Number 75 Dean Street in London was notable for two reasons. It was, to quote *The Architectural Review* of London, "a comely and deeply interesting memorial of old London," and it was also, for a long period the home of William Hogarth, painter, "the best man in his own satiric field of any time." This house has, therefore, a twofold interest to architects. The house in its exterior was of red brick and stone, severely simple and classically correct in its proportions. It had an Ionic doorway with a curved pediment. The interior, the matter of present interest, was remarkable, as perhaps the finest example of its period of interior woodwork.

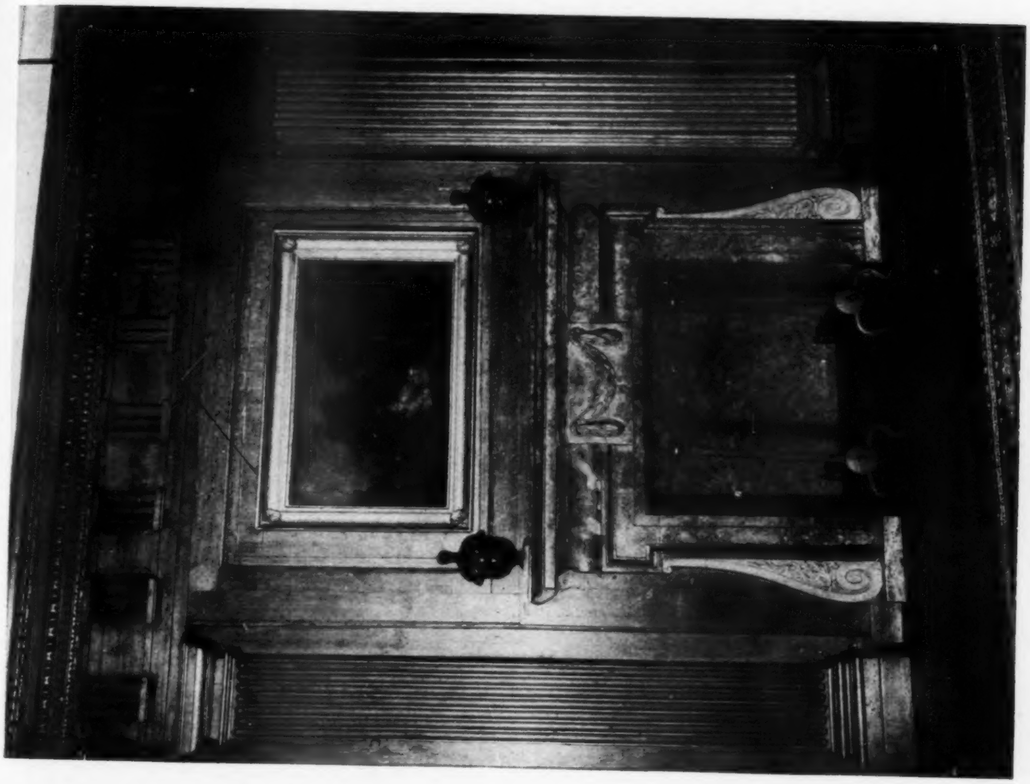
Richard and Samuel Redgrave, English artists, in a volume published by them in 1866, "A Century of the Painters of the English School," describe 75 Dean Street as follows:

"Entering this house from the front door, now closed, you are opposite the bottom of a flight of stairs occupying three sides of the hall, the fourth side, on the first floor, forming a passage or gallery leading past the front room to two apartments lighted from the back of the house. Up to the height of the gallery the lower floor has been painted to imitate channelled stonework, terminating on the first floor level with a richly ornamented stone stringing; above that level, on the wall opposite the gallery, is a painted representation of a colonnaded corridor, having two arched openings between coupled columns with an ornamented balustrade, and a third arched opening between columns opposite the windows. The other side of the corridor is represented as open to the sky; above the entablature which the columns support is a covered ceiling, and in the center an oval perspective of a balustrade, opening

Main Doorway

A Bedroom Mantel

Interior Views, Hogarth House, 75 Dean Street, London



Double Dining room Mantel

Entrance Hall and Main Staircase

Interior Views, Hogarth House, 75 Dean Street, London

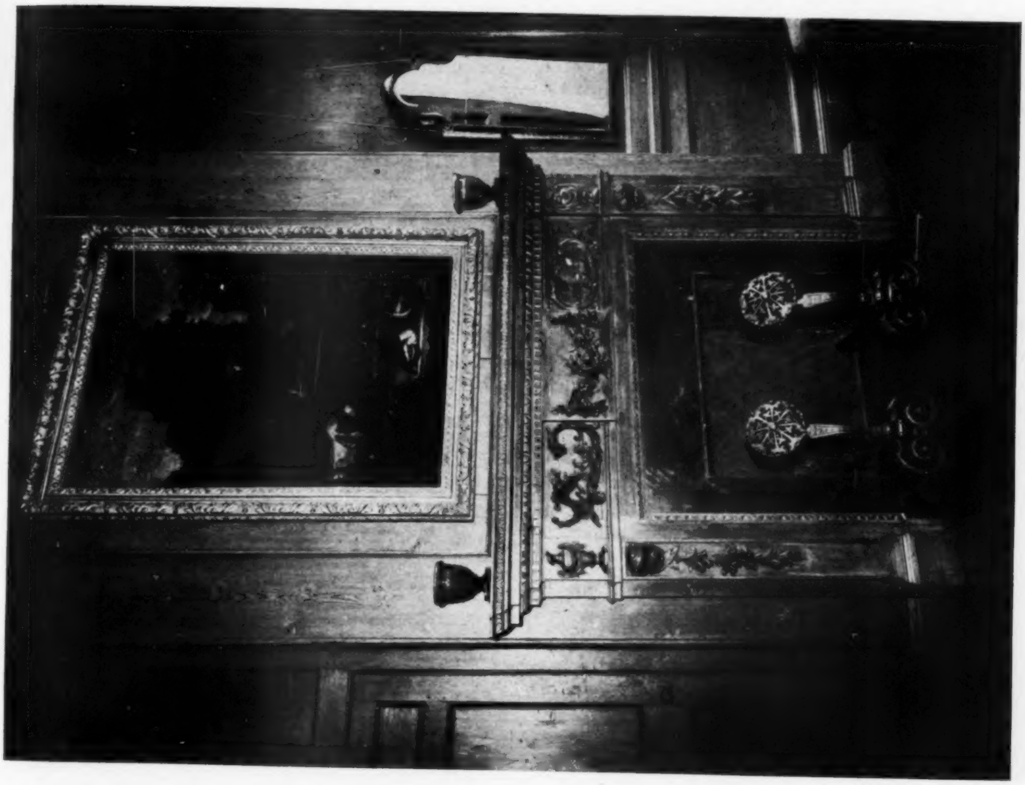
Rear Staircase

also to the sky, with figures looking over it toward the spectator. But the principal interest in the work is concentrated on groups of figures looking out from the arched openings below, of small life size, painted with a free hand and much skill, and of the Thornhill period. They call to mind some of the figures in Hogarth's pictures; one lady especially may have been Lady Thornhill, from the likeness to Mrs. Hogarth, and all have, more or less, the appearance of portraits, while they are very unlike, in treatment and execution, the works by Thornhill's hand at Greenwich and at Hampton Court. One of the figures is a black servant with a turban, such as we see in the Marriage à la Mode. Mrs. S. C. Hall also describes these pictures in 'Pilgrimages to English Shrines.'"

What now accents interest in this house and its interior fittings is the fact that its entire contents have been acquired by W. & J. Sloane, of New York, transported to this country and set up with accurate fidelity to its original placing. No undertaking seems to be too large to discourage the American collector. No price too great to exceed his ability to pay. For many years the governments of Europe have tried to stem the flow of art treasures to this country. Rare pictures, old armor, porcelains, and from time to time the fittings of rooms have reached these shores. Many an American house has had placed within it the finest example of panelled walls, taken from stately and often historically famous houses in Europe. We believe the transportation of the fittings of 75 Dean Street is the first instance where an entire house has been taken carefully apart, shipped to this country and so carefully reassembled as to create the identical atmosphere of its first erection.

The Hogarth house is especially rich in historic

A Bedroom



Small Drawing room Mantel

Small Dining room Mantel

Interior Views, Hogarth House, 75 Dean Street, London

Main Dining room

associations. It was designed and built in 1702 in Soho, then the fashionable residential section of London. It was built by Sir James Thornhill, Sergeant-Painter to George I, the leading decorative and historical painter of that period. He was the originator and organizer of the first British Academy of Art and later conducted the school where Hogarth studied. Hogarth's early efforts were as an engraver and maker of satiric sketches. Later, as a painter, the author of the series of paintings that so keenly pictured the social conditions of fashionable life of his day, he achieved an undying fame. Indisputably the greatest genius of his age, he practically set the "high water mark of European taste and elegance." An elopement with Sir James' daughter, for a while retarded the upward flight of Hogarth's genius. But his talent might not be denied, even by an irate father-in-law so that later we find that Hogarth and Sir James were on intimate terms of artistic association. It is a tradition that Hogarth and his father-in-law, Sir James Thornhill, collaborated on the series of painted decorations for which this house was famous. It is historically a fact that 75 Dean Street later passed to the possession of Hogarth.

Another view in Main Dining room

·EDITORIAL·COMMENT·

THE ANNOUNCEMENT recently made by the National Sculpture Society that it will hold an in and out-of-doors exhibition in New York in April is one of considerable importance in art circles. While this dignified national organization is always represented at National Academy exhibitions, it is a number of years since it has held a showing of work in a special exhibit.

In the field of art in this country's architecture, the easel picture and the mural painting or decoration have by their strong appeal of color, held the attention of the people. Sculpture, the pure embodiment of form, is not so widely seen nor is it even half appreciated.

For more than a quarter of a century, the National Sculpture Society has been quietly but forcefully working to promote the progress of the sculptor's art and better appreciation of it by the general public. Such exhibitions as from time to time have been held, have aroused great interest. The general public has yet to divest itself of the impression that sculpture is a mortuary art. It has its place in our daily lives in exactly the same measure as the work of the artist painter. The public will have to be taught the value of form in sculpture and what will be more difficult, the fact that it represents color in its most subtle development.

The forthcoming exhibition of the National Sculpture Society will be undoubtedly very much worth while and one that will justify the fullest co-operation on the part of every man and woman that claims a friendly interest in our advancement in the Fine Arts.

* * *

IN THE VERY WIDE reference to the work of Sir Christopher Wren, recently appearing in the architectural press in this country and in England, the one writer who has summed up more correctly than all others, the basic elements of Wren's greatness is Charles Marriott. In an article in the February issue of *Architecture* of London, Mr. Marriott in a critical analysis of the Work of Wren from its Decorative Aspect, directs attention to the craftsmen that Wren gathered about him. Great men seek association with men equally great, in the field of work allied to their own. It is the small man who, not sure of himself and fearful that he might be eclipsed by some talented associate, surrounds himself with incompetent assistants.

There was none of this littleness of character in Wren's personality. Grinling Gibbons, whose fame as a wood carver was world wide, Tijou, the master craftsman in wrought iron of his age, Strong, the master mason, Jennings, the master carpenter and Cibber Gibbons, the master sculptor, were all associated with Wren in his greatest works. Nor did Wren seek to dim the value of such association by arrogantly suppressing knowledge of their aid. He shared with them the glory of his successes.

Commenting on Grinling Gibbons' work on Wren's buildings, Mr. Marriott writes:—

"The fortunate results are to be seen on such things as the magnificent choir stalls and organ case at St. Paul's, the organ loft and case at St. Lawrence Jewry, the reredos at St. Mary Abchurch and the swags over the end arches in the Orangery in Kensington Gardens, to name only a few examples that come to mind. It is impossible to imagine a craftsman who could have come more pat to Wren's purpose than Grinling Gibbons—and the architect was equally fortunate in Tijou, the Frenchman, who did the ironwork in St. Paul's. * * * How far Gibbons worked under Wren's immediate direction is not clear, but it seems likely that, within the main architectural outlines Wren allowed a free hand to his grace of design, tact in spacing and perfection of workmanship."

Undoubtedly the masterly results of this collaboration between a great architect and a great craftsman were due to the fact that "Wren allowed a free hand" to Gibbons. Apparently there was no disposition to hamper the craftsman by an insistent set of designs, accurately drawn to scale, cramping the artistic fancy of the craftsman and reducing him to the common level of all the vast throng of labor that worked on the edifice. Space was allotted to certain decorative treatment and that space turned over to a competent craftsman who proceeded to work out his ideas, always, of course, under the eye of the architect.

Gibbons knew the artistic possibilities of every wood he worked on. He knew whether it would yield best results in a decoration of bold design in large masses or in fine detail. Tijou in like manner knew every possibility of the iron he forged. These men, with their fine artistic training combined with their extremely practical knowledge of their materials, were able to work with architects as one artist with another.

It is that sort of craftsmen we should seek to develop today. Firms engaged in supplying decorative elements to architects are striving to reach the same great ideals that Wren achieved in his work with his craftsmen. But, today the authorship is always attributed to the firm that furnishes it, while the man who designed it, who worked it out with his own brain and his own hands, is obscured. It is this failure to give credit to the craftsman who actually creates that hampers the advance of good craftsmanship. The artist needs inspiration and approval. He needs to be told how good his work is, not by those who give him his pay envelope, but by that great mass of people who find it good and are glad to acknowledge it.

The Architectural League of New York is at this time doing more to foster the development of a better type of craftsmanship in this country than any other organization. But it will get further ahead if it can make it possible for the actual craftsman to sign his work as artist, as well as the firm or corporation that developed or produced it.

Wren's work has lived for two hundred years. The fame of Gibbons, Tijou and other master craftsmen who worked with him, is, by reason of Wren's unselfish attitude, relatively as great.

* * *

BUILDING CODES are a necessity as a protection against ignorance and cupidity. Since they are restrictive in character it is increasingly necessary that they be based on truth. Unfortunately codes are usually based on precedent for the reason that officials who formulate them often selfishly "play safe" at the expense of the public. "Playing safe" with knowledge is necessary but "playing safe" through ignorance and fear is cowardly and unjust. The costly and unscientific condition of our codes results apparently from our method of producing them. New and better means must be devised for their preparation, enactment and enforcement.

Unsatisfactory codes are not characteristic of this country and the reasons for them are common to other countries as the following quotation shows. Mr. Percy J. Waldram, a prominent British architect, writes to *The Architects' Journal,* London, of February 14, 1923, concerning a criticism of certain building regulations of the London County Council.

> I would suggest that we probably have the building regulations which we deserve. Architects of experience are, of course, fully aware that theoretical loadings, like 70 lbs. per sq. ft. in bedrooms and 100 lbs. in ordinary offices, are wildly improbable, except under the most exceptional circumstances, for which generous factors of safety are always provided.
>
> But, however flagrant the absurdity may be, who can afford to protest publicly, with any hope of professional backing? The merest suspicion of heresy against that blessed term "established practice," the very mildest plea for a little common sense, generally suffices to arouse the vociferous ire of somebody who hides his practical ignorance under an unctuous reverence for "sound and safe building." After all, we know that when imprisoned within our textbooks we are safe, and we generally play for safety all the time and hug our chains.
>
> And we shall continue to do so until we can educate professional opinion through a new generation of young architects whose training has been more practical. It is futile to abuse the officials of local authorities or of Government departments, who can scarcely be expected to adopt standards less conservative than those which are indicated by published professional opinion. Equally useless is it to deride textbooks. They are too firmly established; and their authors have generally copied older textbooks, generation by generation, back to the time when fat commissions might be expected to result from writing a pseudo-scientific book of rules and dedicating it by permission to some Right Honorable architectural amateur.

We can attribute some of the wasteful requirements of American codes to the same reasons that apparently obtain in England. One of the most important wastes is due to the unreasonable live floor loads imposed on the designer. A survey of American codes discloses a wide variance in this one feature. If an article weighs the same in one city as in another there is no reason whatever for requiring a differently designed floor to support it.

In this issue of THE AMERICAN ARCHITECT is printed some data which Secretary Hoover's Building Code Committee has acquired. This committee is in great need of more information on this subject. It is the manifest duty of architects and engineers to lend their assistance wherever possible. The subject is worthy of the attention of technical organizations which might be better able to secure the information than individuals. If these organizations will allocate to themselves certain phases of the subject, overlapping of effort will be avoided and their action will aid this movement for economical, safe and sound building regulations based on facts.

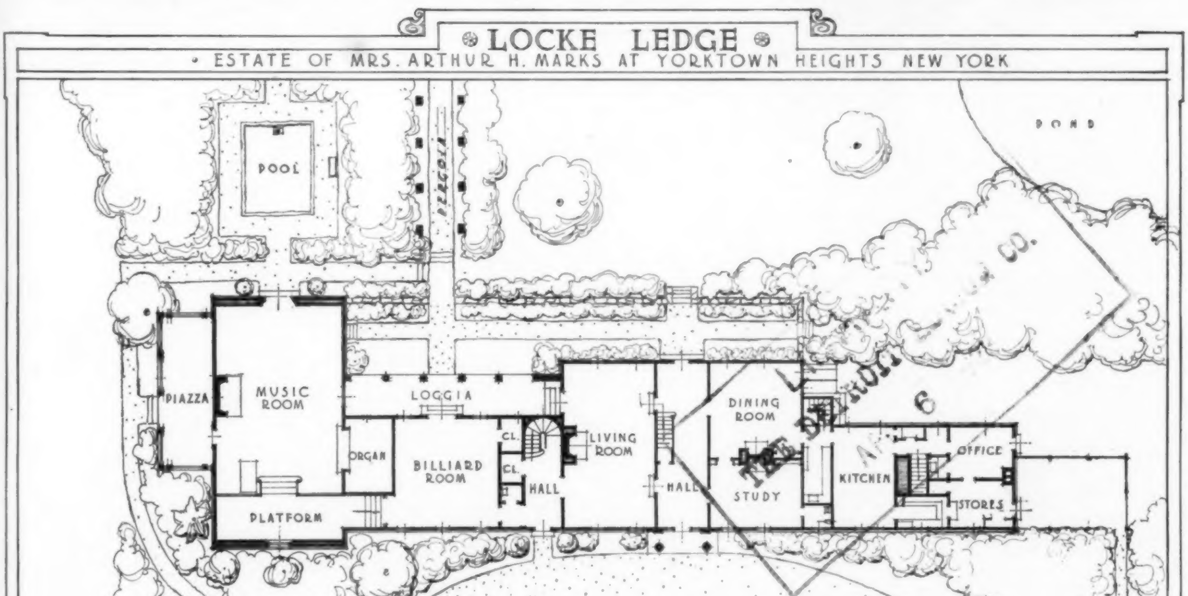
MARCH 28, 1923 THE AMERICAN ARCHITECT—THE ARCHITECTURAL REVIEW VOL. CXXIII, NO. 2416

ENTRANCE FRONT

ALTERATIONS TO A HOUSE ON ESTATE OF ARTHUR H. MARKS, ESQ., YORKTOWN HEIGHTS, N. Y.

ANDREWS, RANTOUL & JONES, ARCHITECTS

J. ROY WEST, LANDSCAPE ARCHITECT



ALTERATIONS TO A HOUSE ON ESTATE OF ARTHUR H. MARKS, ESQ., YORKTOWN HEIGHTS, N. Y.

ANDREWS, RANTOUL & JONES, ARCHITECTS

A. ROY WEST, LANDSCAPE ARCHITECT

HOUSE FROM THE POND

ALTERATIONS TO A HOUSE ON ESTATE OF ARTHUR H. MARKS, ESQ., YORKTOWN HEIGHTS, N. Y.

ANDREWS, RANTOUL & JONES, ARCHITECTS

J. ROY WEST, LANDSCAPE ARCHITECT

HOUSE FROM THE POOL

ALTERATIONS TO A HOUSE ON ESTATE OF ARTHUR H. MARKS, ESQ., YORKTOWN HEIGHTS, N. Y.

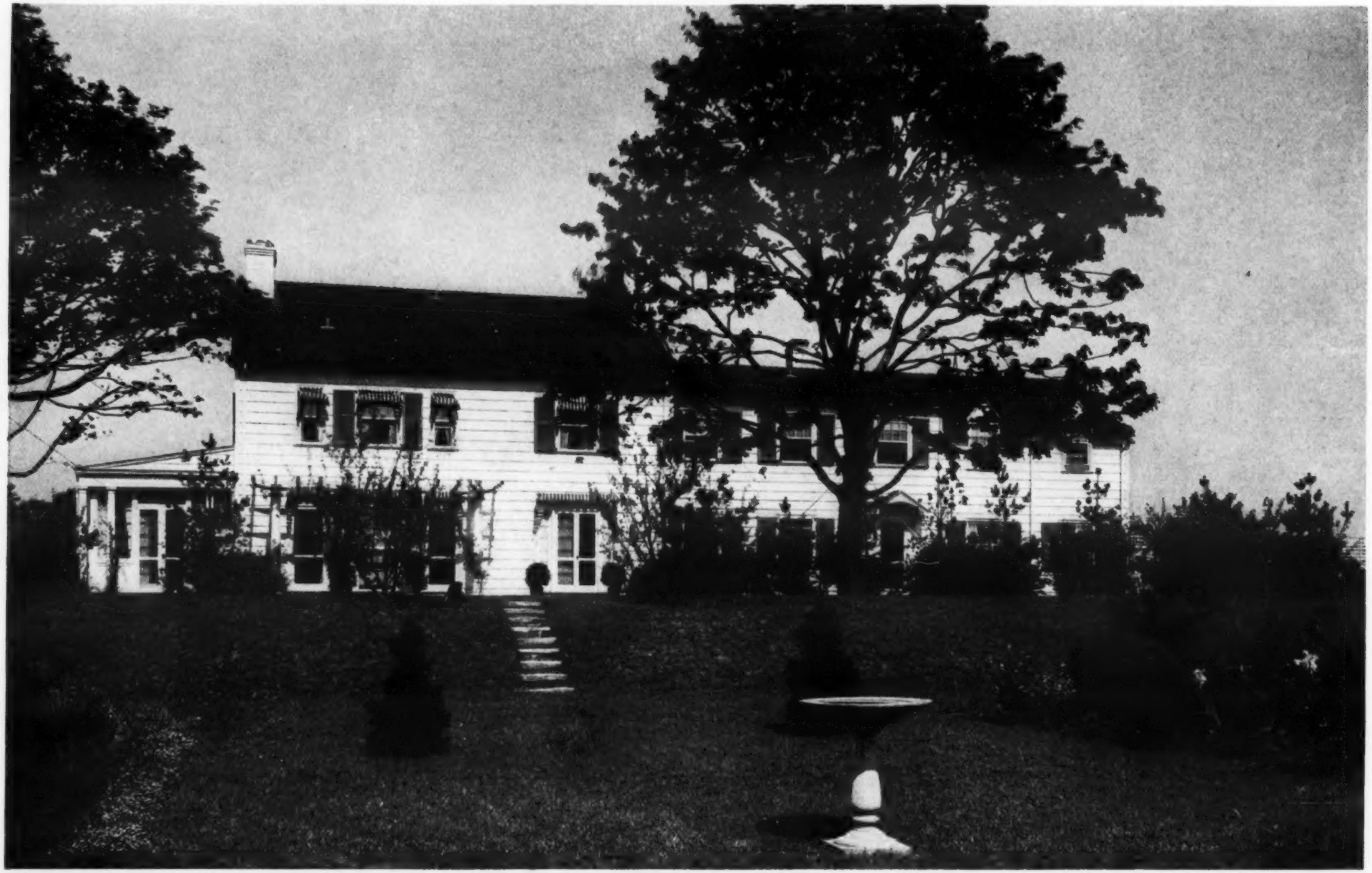
ANDREWS, RANTOUL & JONES, ARCHITECTS

BILLIARD ROOM LOGGIA

ALTERATIONS TO A HOUSE ON ESTATE OF ARTHUR H. MARKS, ESQ., YORKTOWN HEIGHTS, N. Y.

ANDREWS, RANTOUL & JONES, ARCHITECTS

J. ROY WEST, LANDSCAPE ARCHITECT



GARDEN FRONT

HOUSE OF MALCOLM STEVENSON, ESQ., WESTBURY, L. I., N. Y.

DWIGHT JAMES BAUM, ARCHITECT

ENTRANCE FRONT

HOUSE OF MALCOLM STEVENSON, ESQ., WESTBURY, L. I., N. Y.

DWIGHT JAMES BAUM, ARCHITECT

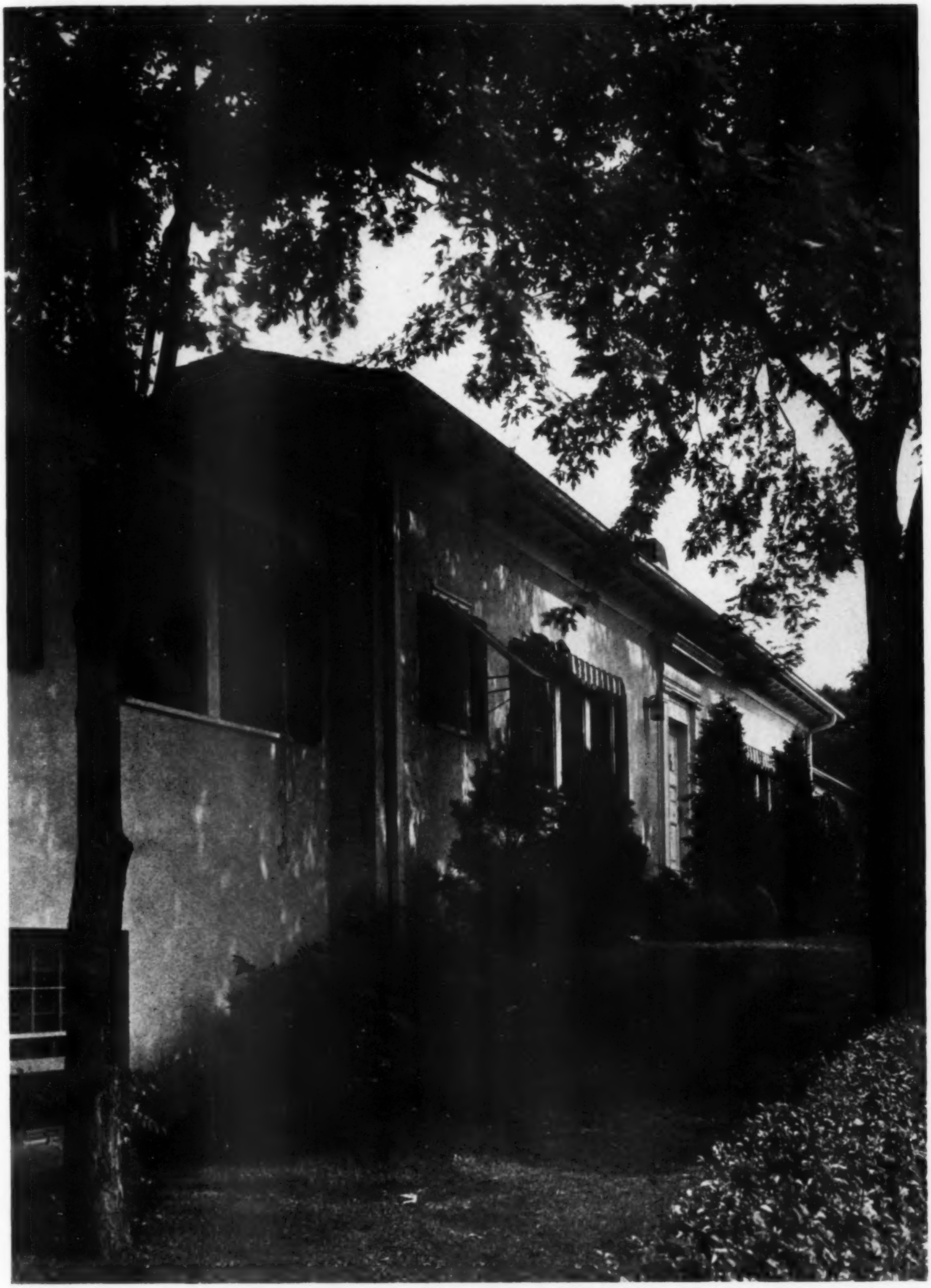
DETAIL OF MAIN ENTRANCE

HOUSE OF MALCOLM STEVENSON, ESQ., WESTBURY, L. I., N. Y.

DWIGHT JAMES BAUM, ARCHITECT

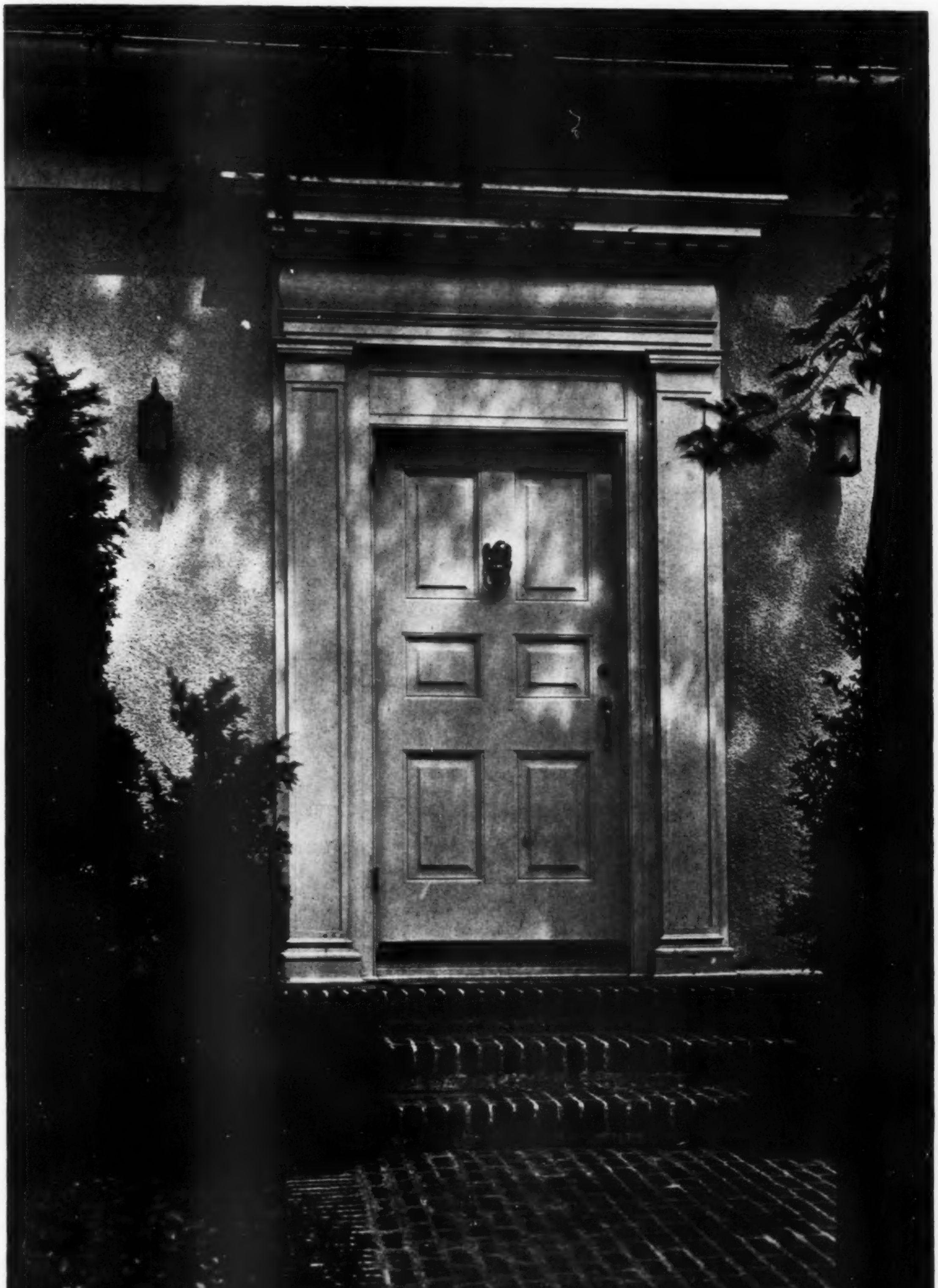
HOUSE ON ESTATE OF THOMAS NICKOLS, ESQ., LOS ANGELES, CAL.

PIERPONT & WALTER S. DAVIS, ARCHITECTS



HOUSE OF BERNARD BLACK, ESQ., GREAT NECK, L. I., N. Y.

THE PATTERSON-KING CORPORATION, ARCHITECTS



HOUSE OF BERNARD BLACK, ESQ., GREAT NECK, L. I., N. Y.

THE PATTERSON-KING CORPORATION, ARCHITECTS

GENERAL VIEW AND DETAIL OF ENTRANCE HALL OF A HOUSE IN DENVER, COL.

J. B. BENEDICT, ARCHITECT

BEAUX-ARTS INSTITUTE OF DESIGN

CLASS "A"—III PROJET
"A STEAMSHIP TERMINAL"

To facilitate the speediest communication between Europe and America, the steamship lines propose to build one great pier at the first possible point of disembarkation on this continent which will serve as does Cherbourg for Europe.

This pier should not exceed 1500 feet in length from the shore line to the tip nor 400 feet in width. It may have several levels, but there should be one main level for the passengers and customs inspection. The pier will permit two of the greatest liners to land passengers at once, one on each side. (The longest liner is the Majestic, 950'-0".) At tip will be a space for tugs and official boats to land. At the shore end will be an office building for administration and large portals controlling the entrance. The steamship stops just long enough to discharge passengers, mail and express. The passengers are deposited on the pier at approximately 40'-0" above water level, going directly to the space reserved for customs inspection. This space is divided alphabetically, their baggage is brought to their letter where it is inspected and then immediately taken to the train or motor. The mail, express and baggage are deposited at a lower level and delivered to the train, truck or customs inspection.

The pier is conceived in levels suitable for facilitating these movements. The trains are brought on to the pier. There is a broad roadway or roadways for motors or trucks. The continental aeroplane station on the mainland is not part of the program, and can be reached by motor bus or moving platform from the pier.

The services are to be placed on several floors in the office building and should consist of offices for the Consolidated Steamship Company, the administration of the pier, the customs officials, government officials and waiting rooms for passengers. On the end of the pier toward the ocean where tugs, yachts and small boats may land will be a large waiting room with a restaurant.

The speed of the transfer from the steamer to the next conveyance is of the utmost importance. Therefore every advantage should be taken of the facilities given by the various levels, providing ample stairs, ramps, elevators, etc.

When the pier is used for embarkation the problem is simplified by the elimination of the customs inspection and the only control will be at the portals and at the steamer gangplank. It is probable that the main portion of the requirements can be united under a single, immense roof, but it is not necessary that this cover the entire pier.

JURY OF AWARDS:—H. O. Milliken, F. A. Godley, J. H. Freedlander, W. E. Shepherd, Jr., P. L. Goodwin, H. R. Sedgwick, E. S. Hewitt, W. D. Blair, H. A. Jacobs, L. S. Butler, P. P. Cret, F. C. Hirons, H. Sternfeld, D. J. Baum, J. V. Van Pelt, O. Faelton, L. P. Burnham and J. L. Holst, Pier expert.

NUMBER OF DRAWINGS SUBMITTED:—88.

AWARDS:—

FIRST MEDAL:—F. J. Woodbridge, Columbia Univ., N. Y. C.; F. L. Hutchins, Univ. of Pennsylvania, Phila.; W. Douglas and P. E. Isbell, Yale Univ., New Haven.

SECOND MEDAL:—P. C. Smith, Columbia Univ., New York City; J. Todd, Carnegie Inst. of Tech., Pittsburgh; A. L. Hawes, C. V. Rueger and R. Ruhnka, Univ. of Pennsylvania, Phila.; V. M. Reynal and A. G. Clay, Yale Univ., New Haven.

FIRST MENTION:—W. L. Suter and E. Fuhrer, Chicago Sch. of Architecture, Chicago; S. L. Rockower, A. M. Dick, W. Conley, A. Marshall, C. Leonardi, P. G. Lee and W. Platt, Columbia Univ., New York City; R. Patterson, J. Franklin, J. J. Keil, C. E. Landefeld, J. C. Topnick, H. C. Kriesle and D. D. McGervey, Carnegie Inst. of Tech., Pittsburgh; S. H. von Storch, I. L. Scott and G. Matsuda, Cornell Univ., Ithaca; R. L. Linder, Atelier Denver, Denver; A. F. Euston, Atelier Hirons, New York City; D. E. Marquis, Los Angeles Archtl. Club, Los Angeles; W. P. Crabtree, Syracuse Univ., Syracuse; C. W. Pollitt and G. P. Turner, "T" Square Club, Phila.; H. J. Toombs, F. M. Baldwin, S. Chao, A. E. Poor and W. E. Willner, Univ. of Pennsylvania, Phila.; W. W. Lund, Univ. of Washington, Seattle; E. A. Lehti and S. W. Orr, Yale Univ., New Haven.

SECOND MENTION:—P. McFarlane, E. A. Johnson, C. F. Pope, Jr., F. E. Sloan, O. F. Cerny and A. Clark, Chicago Sch. of Architecture, Chicago; S. Blair, E. M. Griesser, F. B. Smith, P. C. Reed, V. H. Stromquist, J. H. Delo, and L. C. McLean, Carnegie Inst. of Tech., Pittsburgh; E. Kaw, J. S. McGraw, E. D. James, J. D. Lorenz, T. Hendryx, and J. A. Douglas, Cornell Univ., Ithaca; P. Goodman, Atelier Licht, New York City; L. E. McAllister and D. R. Shotwell, "T" Square Club, Phila.

H. C.:—V. H. Proetz and S. Brenwasser, Chicago Sch. of Architecture, Chicago; H. C. Brockman, G. A. Brink and W. M. Harris, Carnegie Inst. of Tech., Pittsburgh.

CLASS "A"—III ESQUISSE-ESQUISSE
"A RECREATION PIER"

A municipality situated on the shores of a large lake proposes to erect a Recreation Pier, which, besides serving for the amusement and entertainment of the people, will at the same time, be a feature of esthetic value to the city.

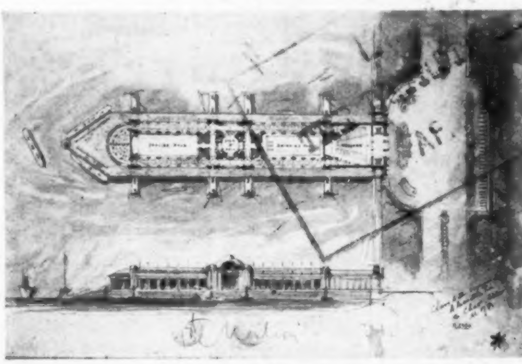
There are to be provided the following: A dancing pavilion with stage for amateur theatricals; a restaurant; a moving picture theatre and an indoor swimming pool.

These may all be under one roof or in separate buildings or group of buildings. Around the two sides of the pier is to be a promenade 20 ft. wide with landing stages for small boats, arranged at intervals, and across the front a space 50 ft. wide with landing stage for steamers.

The roofs of the building or buildings are to be arranged as roof gardens with ample stairway facilities.

Access to the pier from the shore is obtained by means of suitable approaches from a wide boulevard which skirts the shore of the lake about 100 ft. from it.

The dimensions of the pier itself measured from the shore line are not to exceed 600 ft. by 100 ft.



S. CHAO — **FIRST MENTION** — UNIV. OF PA.

CLASS "A"-III ESQUISSE-ESQUISSE
A RECREATION PIER

JURY OF AWARDS:—H. O. Milliken, B. W. Morris, P. L. Goodwin, D. J. Baum, P. P. Cret and H. Sternfeld.

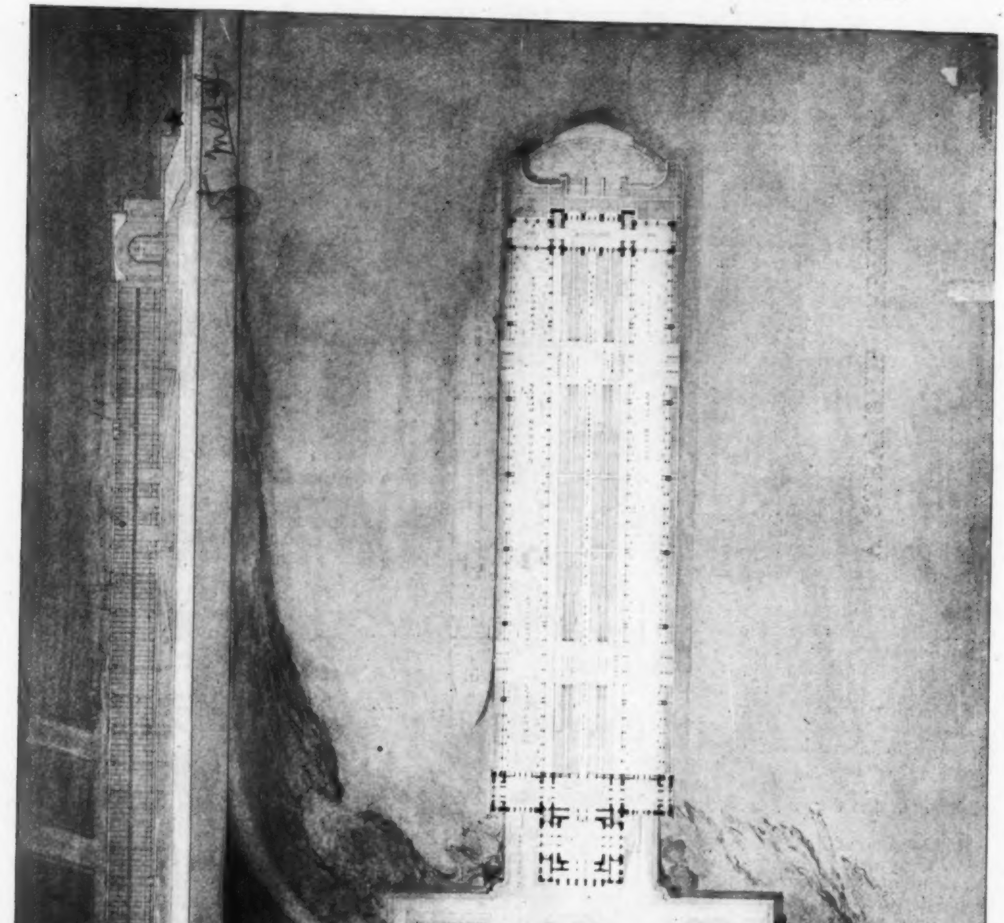
NUMBER OF DRAWINGS SUBMITTED:—48.

AWARDS:—

FIRST MENTION:—J. J. Keil, Carnegie Inst. of Tech., Pittsburgh; S. Chao and A. L. Hawes, Univ. of Pennsylvania, Phila.

SECOND MENTION:—D. M. Campbell, Columbia Univ., New York City; H. K. Bieg, E. A. Johnson, W.

(*Concluded on page 279*)



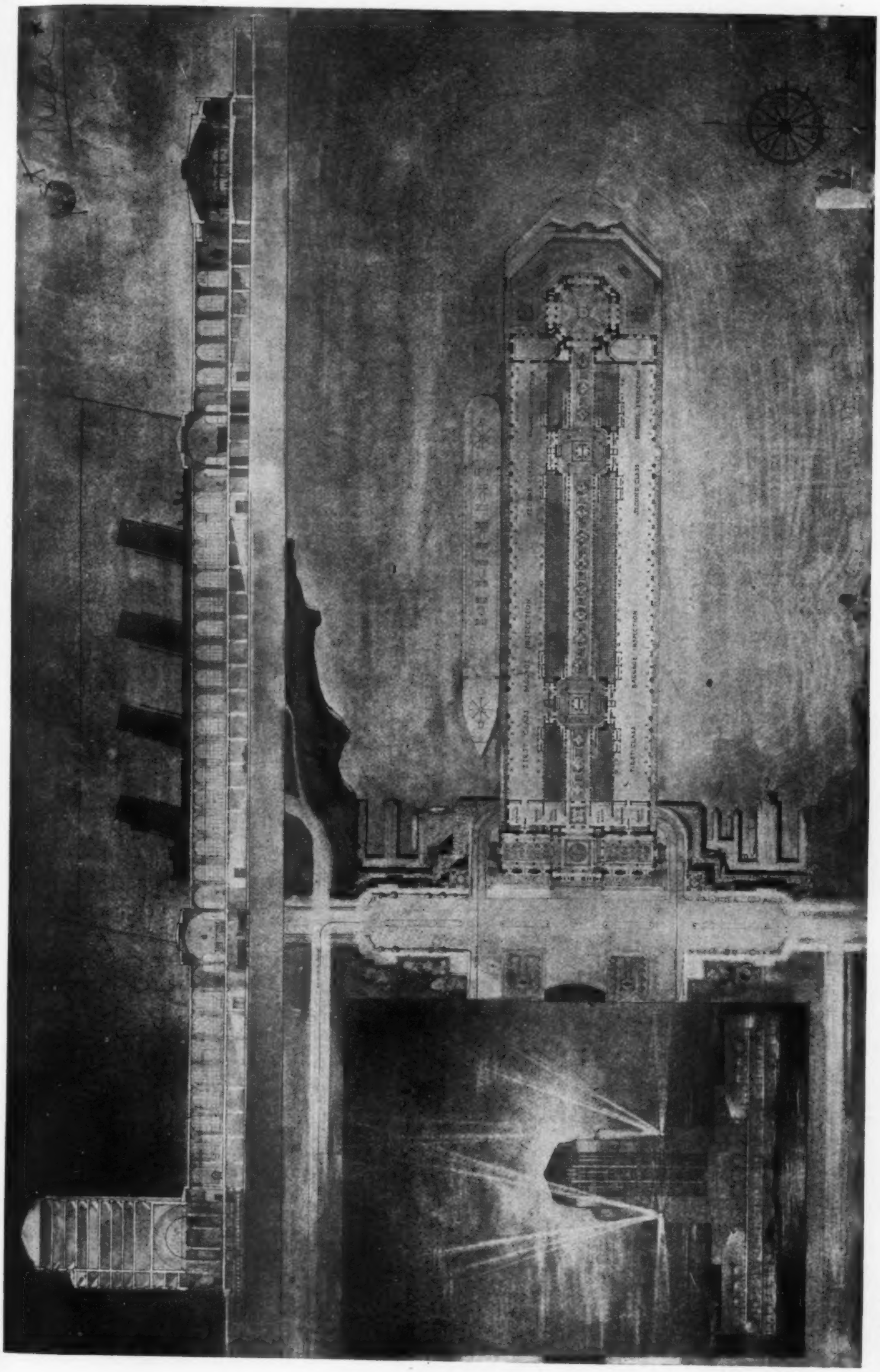
P. E. ISBELL

YALE UNIVERSITY

FIRST MEDAL

CLASS "A"-III PROJET—A STEAMSHIP TERMINAL

STUDENT WORK, SOCIETY OF BEAUX-ARTS ARCHITECTS



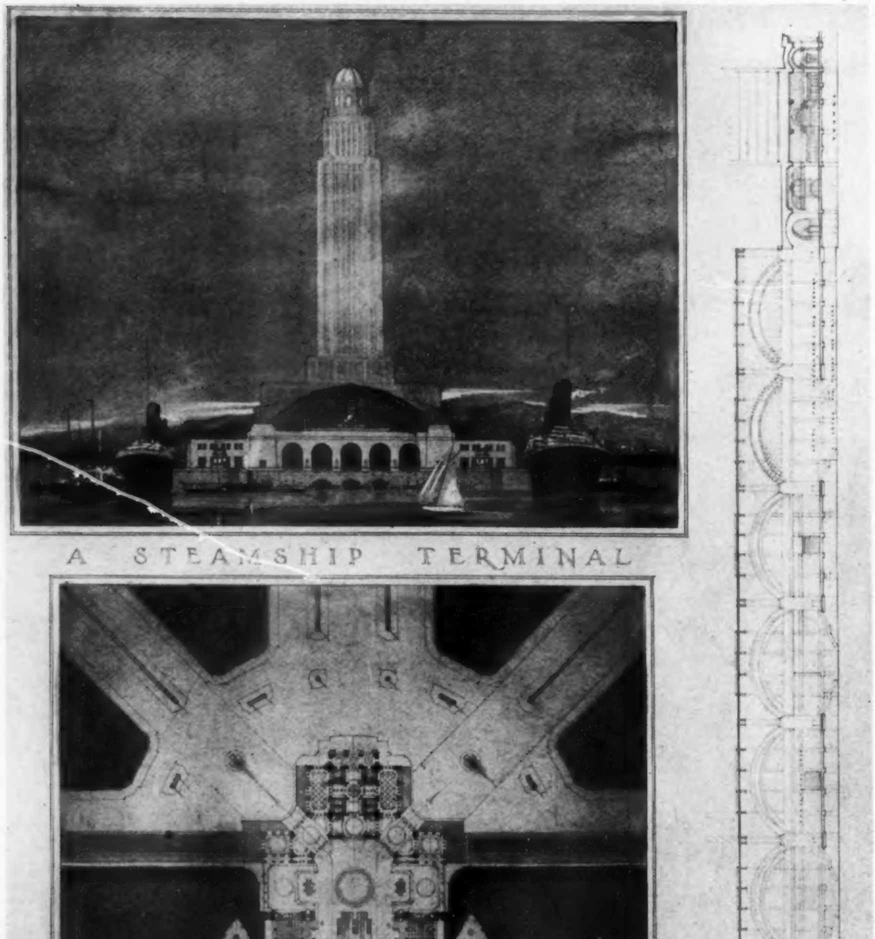
W. DOUGLAS

YALE UNIVERSITY

FIRST MEDAL

CLASS "A"-III PROJET—A STEAMSHIP TERMINAL

STUDENT WORK, SOCIETY OF BEAUX-ARTS ARCHITECTS



F. J. WOODBRIDGE FIRST MEDAL COLUMBIA UNIVERSITY

CLASS "A"-III PROJET—A STEAMSHIP TERMINAL

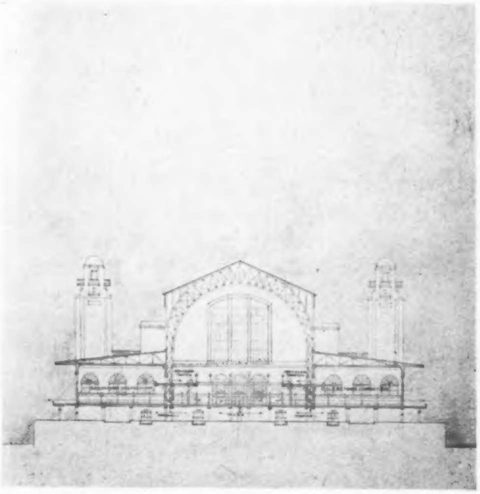
STUDENT WORK, SOCIETY OF BEAUX-ARTS ARCHITECTS

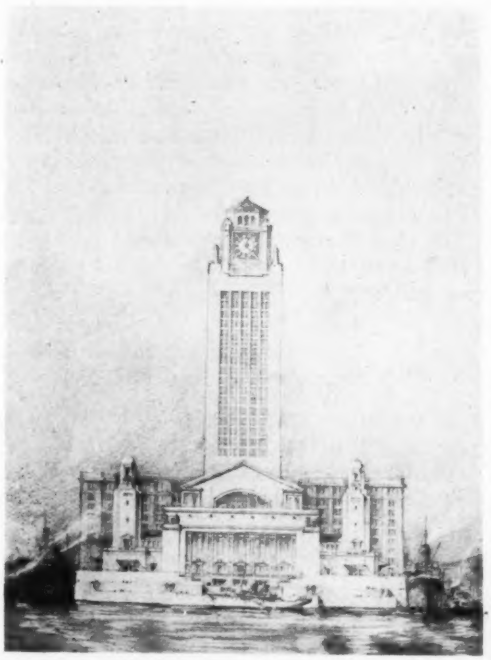
(*Continued from Page 275*)

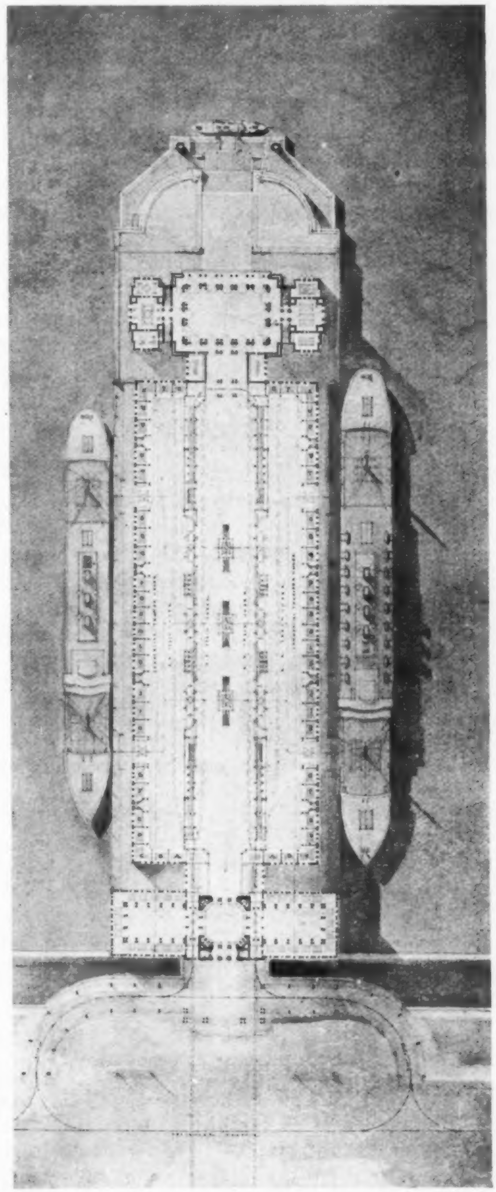
L. Suter and C. F. Pope, Jr., Chicago Sch. of Architecture, Chicago; R. L. Linder, Atelier Denver, Denver; P. Goodman, Atelier Licht, New York City; L. F. Fuller, Los Angeles Architectural Club, Los Angeles; R. B. Thomas, 101 Park Avenue, New York City; H. J. Toombs and F. L. Hutchins, Univ. of Pennsylvania, Phila.; A. G. Clay and E. A. Lehti, Yale Univ., New Haven.

CORRECTION:—In THE AMERICAN ARCHITECT, issue of January 31, 1923, in the listing of the Mention awards for the Class "A" and "B" Archaeology-II Projet, the name "W. W. Heath" appears as of "Syracuse University," whereas it should have been as of "University of Texas."

NOTE:—In the issue of April 11, 1923, there will appear the text and illustrations for the remainder of the Judgment of February 20, 1923.







F. L. HUTCHINS — FIRST MEDAL — UNIVERSITY OF PENNSYLVANIA

CLASS "A"-III PROJET—A STEAMSHIP TERMINAL

STUDENT WORK, SOCIETY OF BEAUX-ARTS ARCHITECTS

Travelling Studentship Competition

ALFRED C. BOSSOM, architect, of New York, who was born in England and studied there, is offering silver and gold medals and travelling studentship to English architectural students, which will give opportunities for greater success in architectural education. The plan is as follows:—

All large architectural schools in Great Britain are invited to compete. The Royal Institute of British Architects will annually arrange a problem of some definite practical existing condition that will have to be met, and designs submitted in each of the competing schools.

This problem will be the designing of a commercial structure such as an office building, hotel, apartment house, warehouse, for which the student will have to submit not only the design, but also the most accurate approximate statement of costs and a financial statement as to the probable revenue, upkeep, costs and depreciation.

The Judges will be an architect, a builder and a business man.

A silver medal will be awarded to the best design submitted in each school. The winners of these medals will send their drawings to London where the Royal Institute of British Architects will judge them and select the best one, which will receive a gold medal. The winner will also have a trip to America where he will study for six months. On his return to England he will be required to write a report on his findings, and copies of this report will be distributed among all the schools that have submitted designs in the competition.

This plan has been submitted to the Royal Institute of British Architects, and has been given to all of the larger schools and prominent architects in England.

The interesting feature of this competition is that England will send her students to America to study modern commercial architecture. Undoubtedly many students will prefer to study conditions here rather than on the Continent as in former years.

Rotch Scholarship Examinations

THE preliminary examinations for the Rotch Travelling Scholarship will be held at the office of the Secretary, C. H. Blackall, 20 Beacon Street, Boston, on Monday and Tuesday, April 9 and 10, 1923, at 9 A. M., to be followed by the sketch for Competition in Design on Saturday, April 14. The successful candidate will receive annually for two years an amount which it is hoped will not be less than $1,400 per year, and may be more, depending upon the funds, this amount to be expended in foreign travel and study during two years.

Candidates must be citizens of the United States, be under thirty years of age and must have been engaged in professional work during two years in the employ of a practicing architect resident in Massachusetts. Holders of a degree from a recognized architectural school may present their certificates in lieu of the preliminary examinations.

Candidates are requested to register at the office of the Secretary as long before the examinations as practicable.

Spring Exhibition, National Sculpture Society

THE National Sculpture Society of New York will hold an indoor and outdoor exhibition of American sculpture this Spring in the galleries and on the terraces and grounds of the Museums located at 156th Street and Broadway. The exhibition will include the works of the most distinguished contemporary American sculptors. About two hundred artists in all have had their works accepted by the Jury. The works, which number about eight hundred, range from large monuments to small sculpture and medals. Elaborate landscape decorations are being planned which will give a most artistic setting as a background for the sculpture shown out-of-doors.

A catalog containing two hundred illustrations and complete biographical data is being issued. A small volume with illustrations, entitled The Spirit of American Sculpture, has been written for this exhibition by Mrs. Herbert Adams. There will be a special press view on April 12, and a private view for which cards are issued will be held on April 12 and 13. On April 14 the exhibition will be opened free to the public, and will remain open until August 1.

This Year's Royal Gold Medallist

THE nomination of Sir John Burnet as this year's recipient of the Royal Gold Medal of the Royal Institute of British Architects, receives general approval in the English architectural press. *The Architects' Journal* of London, commenting on this selection, states:

"Sir John Burnet is one of the most predominant and pervasive architects of his time. By example he has done probably more than any of his contemporaries to reestablish a sane tradition of British architecture. He possesses in a rare degree the power of expressing modern structure in truly significant architectural form—an ability that is probably traceable to the fact that while at the Ecole des Beaux-Arts he studied engineering as well as architecture."

DEPARTMENT OF ARCHITECTURAL ENGINEERING

LIVE LOADS IN OFFICE BUILDINGS

DURING the latter part of 1922, a detailed investigation was made of live loads on several floors of the Equitable Building in New York City. This structure is well known as perhaps the largest office building in the world, and the varied nature of its occupancy made observations possible which should be very useful in the design of future office buildings and proper regulation of those already in use. The study was instigated by the Department of Commerce Building Code Committee, which is investigating the possibilities of greater economy in structural design, and the objects were to determine the maximum, minimum and average floor loads existing in actual office practice; the nature and distribution of such loads; and the relations which they should bear to the assumptions for design of floor slabs, floor beams and columns as governed by prevailing building code practice. With this in mind it was necessary to determine the actual weights of office furniture and merchandise, also their location with reference to partitions and floor beams. In order to cover a wide range of usual office building occupancies, three floors were selected, representing light, medium and heavy classes of occupancy, and the entire area of these three floors was surveyed. Several other offices on various floors, representing what appeared to be unusually heavy occupancy, were also investigated. The whole survey covered over 200 rooms.

The investigation was planned and supervised by C. T. Coley, M. E., manager of the building. A force of five men equipped with platform scales and field book spent several days weighing and

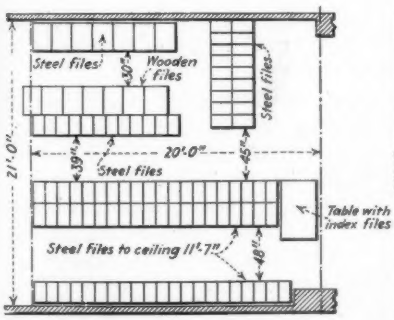


Fig. 1. File Room of Bonding Company

Summary of Loads

	Floor covering, Linoleum	630 lbs.
2178	File drawers, 10 lbs. each	21,780 lbs.
	Racks for same	4,300 lbs.
2	Card cabinets, 100 and 300 lbs.	400 lbs.
6	Card cabinets, 50 lbs. each	300 lbs.
1	Flat top desk	200 lbs.
7	Steel file cabinets, 340 lbs. each	2,380 lbs.
7	Steel file cabinets, 200 lbs. each	1,400 lbs.
5	Wooden file cabinets, 250 lbs. each	1,250 lbs.
5	Step ladders, 50 lbs. each	250 lbs.
		32,890 lbs. Total

Total floor area—420 sq. ft.
Load per sq. ft.—78.3 lbs.

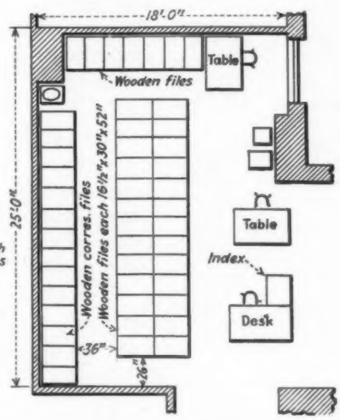


Fig. 2. File Room of Electric Company

Summary of Loads

	Floor covering, Linoleum	675 lbs.
47	File cabinets, 300 lbs. each	14,100 lbs.
2	Tables @ 150 and 100 lbs.	250 lbs.
1	Desk	200 lbs.
1	Stand	25 lbs.
1	Water Cooler	90 lbs.
2	Chairs @ 35 lbs. each	70 lbs.
3	Persons @ 150 lbs. each	450 lbs.
		15,860 lbs. Total

Total floor area—450 sq. ft.
Load per sq. ft.—35.2 lbs.

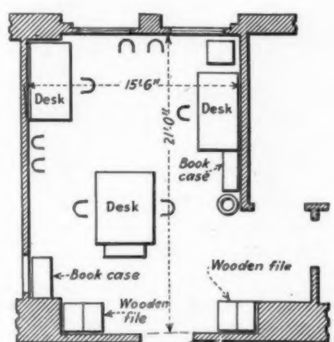


Fig. 3. Office of Electric Company

Summary of Loads

	Floor covering, Linoleum	488 lbs.
3	Flat top desks @ 400 lbs. each	1,200 lbs.
8	Chairs, 3 swivel @ 35 lbs. 5 arm @ 25 lbs.	230 lbs.
2	Bookcases @ 440 lbs. each	880 lbs.
4	File cases @ 273 lbs. each	1,092 lbs.
2	Stands @ 25 lbs. each	50 lbs.
1	Hat tree @ 18 lbs., cuspidors and baskets 30 lbs.	48 lbs.
7	Persons @ 150 lbs. each	1,050 lbs.
1	Water Cooler	90 lbs.
		5,128 lbs. Total

Total floor area—325 sq. ft.
Load per sq. ft.—15.5 lbs.

tabulating every article of furniture within the areas mentioned. Sketches were prepared for each office, showing the location and weights of all articles of furniture, so that the distribution of loads could be quite closely determined. Figures 1, 2 and 3 are typical examples of these sketches.

The results form a most interesting and valuable collection of data and are believed to be of much significance both to the designers of office buildings and for the purpose of determining proper building code requirements.

Following is a brief tabulation showing the outstanding features of the report on this study; Figure 4 also summarizes the observations graphically. It will be noted that little difference exists between the average loading of the floor selected as the heaviest in the building and that which appeared at first glance the lightest.

MAXIMUM, MINIMUM AND AVERAGE LIVE LOADS IN EQUITABLE BUILDING

	No. of Offices	Maximum lbs. sq. ft.	Minimum lbs. sq. ft.	Average lbs. sq. ft.
Light occupancy floor (20th)	67	55.4	.87	10.26
Medium occupancy floor (37th)	64	30.73	3.27	10.67
Heavy occupancy floor (11th)	62	33.84	5.00	13.96
Total and Average	193			11.6
Selected heavy occupancies throughout building	14	78.3	21.4	42.4

The weights given do not include the radiators, which averaged 200 lbs. each, with two to each bay, located under the windows. These would add approximately 1 lb. per square foot for all exterior bays.

The weight of the partitions was not included in the calculations. These in general are 3 inch hollow tile plastered each side, and a careful weighing of one which was being removed showed a weight of 30 lbs. per square foot, or approximately 350 lbs. per running foot.

The weight of occupants, taken at 150 lbs. per person, is probably high, as a considerable portion of such occupants is females, and some studies indicate that an average weight of same would not exceed 120 lbs.

DISCUSSION OF RESULTS

The careful sketches of load arrangement made it possible to throw some light on the prevailing method of assuming uniformly distributed live loads as a basis for floor design, and help to indicate what relation such assumptions should bear to actual total loads. Examination of bays for which the live load was more than 25 lbs. per square foot, showed wide variation in the distribution of such loads. The larger proportion was found, as might be expected, within a zone approximately 3 feet wide around the walls, the remainder being distributed variously in the centers of the rooms. In one or two cases, however, the major proportion of all the load was situated away from the walls and this condition must be provided for by designers. There is also the probability that practically all furniture may be collected in the central portion of a floor area when occupants are moving, or when painting or cleaning is in progress.

The sketches show that the heavier loads, such as library shelves and double filing cabinets, are likely to be located away from walls and partitions. This is obviously for ease of access, and the same consideration demands that when the concentrated loads per square foot are excessive, generous unloaded floor areas should be provided adjacent to the concentrations so as to assure a safe distribution.

Among the heaviest occupancies found is the stack room of a large law library. The entire floor area is covered with rows of steel stacks placed back to back with 32 inch aisle space between rows, and extending from floor to ceiling, the story height being 11 feet 7 inches. There is a main aisle 4 feet wide crossing the middle of the room at right angles to the stack rows. The total weight was taken as found and consisted of the following:

556 shelves of books @ 75 lbs.	41,700 lbs.
114 empty shelves @ 25 lbs.	2,850 lbs.
Books on floor	500 lbs.
7 ladders	100 lbs.
2 persons @ 150 lbs.	300 lbs.
	45,450 lbs.

Area 588 square feet
Load per square foot 77.3 lbs.

It is evident that the possibility of all shelves being filled should be considered, and, if this were assumed, the average loading would be increased to 87 lbs. per square foot.

Examination of all the floor sketches shows but eight articles of furniture (safes) over 2,000 lbs. in weight. A number of sectional filing cases and bookcases with contents weighed much more, but these weights were distributed over such a large area they could not be regarded as concentrated. Of 36 safes and safe cabinets, 23 weighed less than 1,000 lbs., 5 between 1,000 and 2,000 lbs., 2 weighed 2,200 lbs.; 2, 2,360 lbs.; 1, 2,800 lbs.; 1, 3,000 lbs.; 1, 3,500 lbs.; and 1, 4,250 lbs.

This seems to indicate that if care in regulation of occupancies were exercised, considerable economies might be possible in providing for concentrated loads. To what extent such regulation is practical is a matter for deliberation.

As would naturally be expected, the live loads were found lighter next the outside walls. Single row filing cases, cabinets, safes, bookcases and bins are usually located against blank interior walls. Whether by accident or otherwise, the further reductions in loads assumed for column design could be made with safety. The building was designed for a live load of 100 lbs. per square foot on the first floor and 75 lbs. on all others.

A less exhaustive but nevertheless interesting investigation of office floor loading was recently made for the Committee by Captain M. W. McIntyre, manager of the Union Central Life Insurance Company's Building in Cincinnati. This study included several large sections of different

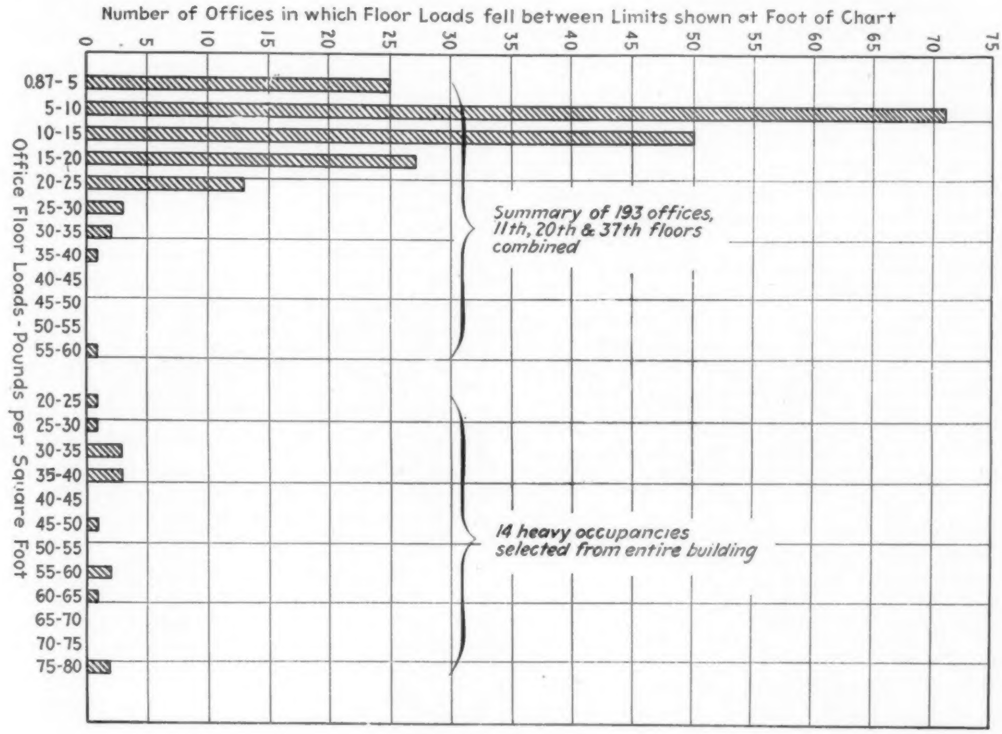


Fig. 4

heavier loads were not found where partitions cut up the floor space into small rooms, indicating that allowance may not be necessary both for removable partitions and heavy floor loads.

Several instances were found where two adjacent floor bays supported average loads of 25 lbs. or more, but in no case were two adjacent bays found in excess of an average of 40 lbs. per square foot.

There are but two or three instances in the floor plans discussed where three offices or store rooms meet at the same column and it is probable that this condition will be found but rarely in buildings designed for a sufficiency of light and ventilation. In view of this and of the surprisingly light average floor loads discovered, it becomes an interesting question whether in a building of this type stories devoted to clerical and filing purposes. Each individual piece of furniture was not weighed, but the average weight of representative articles was carefully ascertained and this result applied to furnishings of four floors.

All files, desks, etc., were considered as being 100% full or furnished with all necessary accessories. Following are tabulated the results of Captain McIntyre's investigations:

	No. Square Feet	No. pieces of Furniture	Total Wgt. of Furniture	Weight of Furniture per sq. ft.
Section A	10339	635	104478 lbs.	10.05 lbs.
Section B	9303	637	27085 lbs.	2.91 lbs.
Section C	7348	273	36306 lbs.	4.92 lbs.
Section D	10339	702	121388 lbs.	11.74 lbs.
Average	9332	561.5	72314 lbs.	7.405 lbs.

Weight of employees computed at the rate of 150 lbs. each, added from .9 to 1.75 lbs. per square foot of floor area.

Seven individual offices similarly surveyed showed an average weight of furniture of 7.66 lbs. per square foot. This building incidentally was designed to carry a live load as follows:

Basement and first floor	100 lbs. per square foot
Stairways and corridors	75 lbs. per square foot
Other floors	50 lbs. per square foot

The Committee has investigated the live loading in a reference room of a New York insurance company equipped with heavy steel filing cases for large Sanborn insurance map books. This was considered to represent unusually heavy occupancy. The cases were placed back to back and occupied a floor space approximately 5 ft. x 22 ft. and were 55 inches high. It was found that the case with its aisles for access occupied a space of 247 square feet and weighed with contents 10,620 lbs. Observation showed it liable to use by no more than 12 men simultaneously. The total load thus occasioned amounted to 50.3 lbs. per square foot.

Mr. C. H. Blackall, a prominent architect of Boston, Mass., and Mr. Arthur G. Everett of the Boston Building Department, published in The American Architect and Building News for April 15, 1893, the results of their investigation of three then prominent office buildings of that city.

The buildings were examined very carefully and copious notes taken of room dimensions, occupancy and details of contents. Average weights were assumed, based on averages for the various articles of furniture. The human occupancy was taken as the greatest known to have occurred in each of the offices investigated. The nature of occupancy was sufficiently diverse to be representative. Following is a resume of the results obtained:

Building	No. of Offices	Total Area in. sq. ft.	Total Weight	Av. Wgt. per sq. ft.
Rogers Bldg.	41	18,127	294,984 lbs.	16.8 lbs.
Ames Bldg.	70	32,151	544,419 lbs.	15.6 lbs.
Adams Bldg.	99	26,183	425,109 lbs.	16.7 lbs.
			Average	16.3 lbs.

The 10 heaviest loadings in each building averaged 25.9, 29.8 and 29.0 lbs. per square foot respectively. The highest load found was 40.2 lbs. per square foot, and in only 12.4% of the offices was the floor load in excess of 25 lbs. per square foot, and in only 26% did it exceed 20 lbs.

Mr. Blackall recently conducted a similar investigation of live loads in the Little Building of Boston, which is reported in The American Architect and Architectural Review, January 3, 1923.

Sixty-four offices were surveyed, the results indicating live loads even less than those discovered in his earlier investigations. The maximum floor load was 14.7 lbs. per square foot and but four offices had loadings over 10 lbs. per square foot. The minimum loading discovered was 1.3 lbs.

A full interpretation of the data described discloses many significant facts which space does not permit of presenting here. A detailed report on floor loads in office buildings and other occupancies will be prepared by the Committee as soon as sufficient information is obtained, and recommendations for minimum floor load requirements will be made.

Mr. Blackall's data of 1893 was the only important source of information on this subject until the investigations recently completed. A few isolated observations on school floor loads have been published and the Building Code Committee has been able to obtain from private sources some additional information on other occupancies. The total is lamentably small, however, and all who can and are willing to supply reliable information of this sort are strongly urged to report it to the Committee's office at the Department of Commerce in Washington, D. C.

Indiana Registration Report

THE Indiana State Board of Registration for Professional Engineers and Land Surveyors has made its first annual report (1921-22). The enactment instituting this Board makes no specific mention of architects. The law states that "in order to safeguard life, health and property, any person practicing or offering to practice professional engineering or land surveying in this state shall hereafter be required to submit evidence that he or she is qualified * * * and shall be registered * * * ."

As safeguarding life, health and property is well within the province of architectural practice, architects are compelled to register as professional engineers. Indiana is a member state in the Council of State Boards of Engineering Examiners and sustains reciprocal relations with the other member states.

The registrations enumerated in the report are as follows:

Architectural	119
Chemical	13
Civil	523
Electrical	91
Heating and Ventilating	22
Mechanical	110
Mining	70
Structural	180
Land Surveyors	50

There are many registrations from states other than Indiana. The offices of the Board are located in Indianapolis.

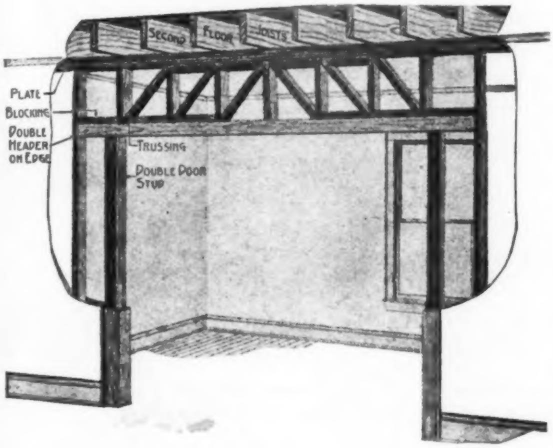
SMALL DWELLING CONSTRUCTION

Minimum Requirements Recommended by the U. S. Department of Commerce*

THE balance of the Recommended Minimum Requirements for Small Dwelling Construction is here given and includes those parts pertaining to frame construction, foundations, miscellaneous data for weights of material, fibre stresses, fire protective construction and garages incorporated in dwellings.

Frame Construction

Exterior Walls. Wood studding shall be not less than 2 x 4 in. and spaced not to exceed 16 in. on centers†; sheathing on walls more than one story high shall be not less than three-fourths in. actual thickness, laid tight and nailed with two 8 d. nails; where sheathing is omitted or not laid diagonally, all corners must be diagonally braced; sheathing may be omitted when other types of construction are used that are proven of adequate strength and stability by tests conducted by recognized authorities; ledger boards not less than 1 x 4 in. shall be gained into studs and nailed with not less than two 12 d. nails at each stud.



The plate, header and door studs are doubled, and the header turned on edge to afford greater strength. The short diagonal and horizontal members form a truss which provides rigid support for joists over the opening

Masonry Veneer on Frame Construction. Masonry veneer shall rest directly on masonry foundation and be not less than 3¾ in. thick; flashings shall be used to prevent moisture from penetrating behind the wall; veneer shall be attached to the framework not farther apart than 16 in. vertically and 24 in. horizontally; a sheathing shall be securely attached to the framework back of the masonry veneer.

Stucco on Frame Construction. Flashing shall be used to keep moisture from behind the stucco; back plastering shall be required where sheathing is omitted and shall extend back at least ¾ in. between the studs; expanded metal lath shall weigh not less than 3.4 lbs. per sq. yd. and wire lath shall not be less than No. 19 gauge; sheathing shall not be less than 1 x 6 in. securely nailed to the studding; stucco shall be kept at least 8 in. above the ground surface.

Wood Framing

Stresses due to combined live and dead loads shall not exceed those given in table. When wind loads are included the allowed stress can be one and one-half times the tabular load. Stress in compression across the grain may be increased 50 per cent in case of joists supported on ribbon board and spiked to the studding.

Allowable stresses permissible for structural timbers in small dwellings[1]

Species	Grade[2]	Allowable stresses in— Bending: In extreme fibre	Bending: Horizontal shear	Compression: Parallel to grain "short columns"	Compression: Perpendicular to grain	Modulus of elasticity
		Lbs. /in.²	*Lbs. /in.²*	*Lbs. /in.²*	*Lbs. /in.²*	*1,000 Lbs. /in.²*
Cedar, Western red	1	900	80	700	200	1,000
	2	600	53	467	200	
Cedar, Northern white	1	750	70	550	175	800
	2	500	47	384	175	
Chestnut	1	950	90	800	300	1,000
	2	633	60	533	300	
Cypress	1	1,300	100	1,100	350	1,400
	2	867	67	733	350	
Douglas fir[3]	1	1,500	90	1,100	325	1,600
	2	1,000	60	750	300	
Douglas fir (Rocky Mountain region).	1	1,100	85	800	275	1,200
	2	767	57	533	275	
Fir, balsam	1	900	70	700	150	1,000
	2	600	47	467	150	
Gum, red	1	1,100	100	800	300	1,200
	2	767	67	533	300	
Hemlock, Western	1	1,300	75	900	300	1,400
	2	867	50	600	300	
Hemlock, Eastern	1	1,000	70	700	300	1,100
	2	667	47	467	300	
Larch, Western	1	1,200	100	1,100	325	1,300
	2	800	67	733	325	
Maple, sugar or hard	1	1,500	150	1,200	500	1,600
	2	1,000	100	800	500	
Maple, silver or soft	1	1,000	100	800	350	1,100
	2	667	67	533	350	
Oak, white or red	1	1,400	125	1,000	500	1,500
	2	933	83	667	500	
Pine, Southern yellow[2]	1	1,500	110	1,100	325	1,600
	2	1,000	70	750	300	
Pine, Eastern white, Western white and Western yellow	1	900	85	750	250	1,000
	2	600	57	500	250	
Pine, Norway	1	1,100	85	800	300	1,200
	2	733	57	533	300	
Spruce, red, white, and Sitka	1	1,100	85	800	250	1,200
	2	733	57	533	250	
Spruce, Engelmann	1	750	70	600	175	800
	2	500	47	400	175	
Tamarack, Eastern	1	1,200	95	1,000	300	1,300
	2	800	63	667	300	

[1]Data furnished by the Forest Products Laboratory, Forest Service, U. S. Department of Agriculture, Aug. 1, 1922.

[2]Grade 1 shall have the defects limited as in the rules for select structural grade, adopted by the Southern Pine Association. Grade 2 may have defects of double the size, or defects which have double the effect, of those allowed in grade 1.

[3]Douglas fir and Southern yellow pine which conform to the A. S. T. M. standards for "dense" will be allowed an additional extreme fibre stress of 250 pounds per square inch.

*Continued from page 249, THE AMERICAN ARCHITECT, March 14, 1923.

†*Minimum sizes specified shall be understood as referring to the nominal sizes unless otherwise stated.*

Beams, Joists, Girders and Rafters. Each tier of floor to be anchored to masonry walls not more than 6 ft. apart; ends of lapped joists spiked together, butt end joints connected with steel straps or pads; joists parallel to walls to have anchor once in span and engaging three joists; girders anchored at wall ends and to each other with steel straps; joists entering wood frame walls to be securely spiked to wall construction; wall plate anchors to be at least 2 ft. down into wall, not over 6 ft. apart; every timber supported by masonry to have at least 3 in. bearing and have beveled end for release in case of fire; double joists under nonbearing partitions running in same direction; joists supporting nonbearing partitions crossing near center to be figured for normal loading with span 2 ft. greater than actual span; rafters to be vertically supported near ridge when the slope is less than 6 in. per foot and all rafters shall be thus supported unless their feet are securely fastened at plate; bridge all floor and flat-roof joists at intervals not exceeding 8 feet; wooden beams shall not enter 8 in. brick party or division walls unless recesses for timbers on both sides are provided at the time the wall is built, otherwise a 12 in. wall is required; in all masonry walls the beams on opposite sides shall be so placed as to provide at least 4 in. of solid masonry between them.

Basement Columns. Metal or concrete bases for wooden columns shall extend at least 3 in. above the cellar floor; wrought iron or steel columns shall be filled with concrete and all metal columns to have metal top and bottom plates, cast iron columns not to be filled with concrete.

Bearing and Nonbearing Partitions. All top and sole plates shall be of same width as the studs; double top plates except where studs are directly below joists when single plate can be used; if properly fire-stopped, studs may run through floor and rest on girders or partition plates; partitions unsupported by walls shall be supported on girders or double joists or on sole plates if placed at an angle to supporting joists. Nonbearing partitions shall have at least one 2 in. plate at top and bottom or be otherwise fire-stopped at floor lines.

PARTY AND DIVISION WALLS AND PARTITIONS

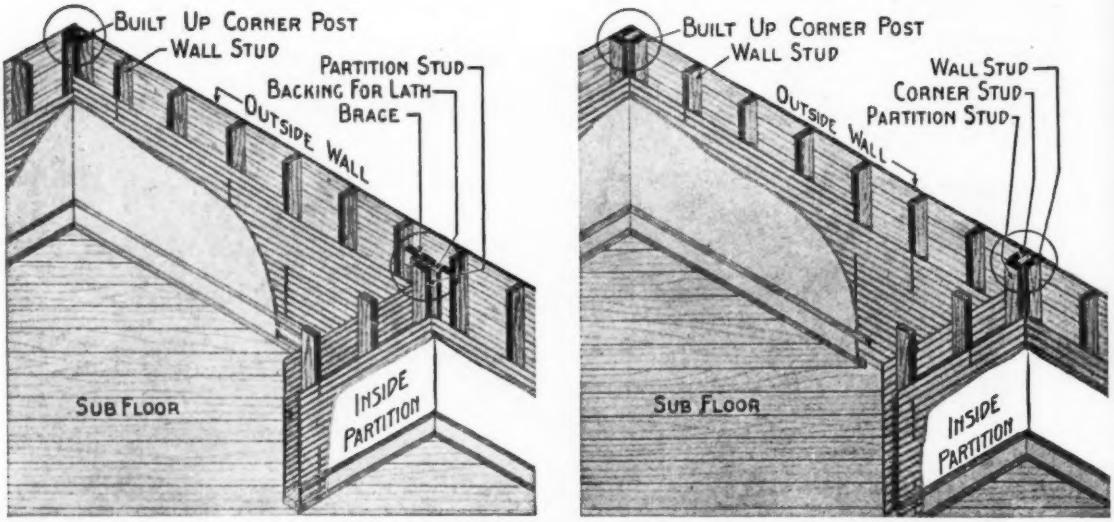
Party or division walls between dwellings occupied by not more than two families each may be constructed of wooden studs covered on both sides with metal lath and plaster; when thus constructed, fire-stops shall extend full depth of the joists and at least 4 in. above the level of each floor; such walls shall be supported below the first floor by a masonry wall not less than 8 in. thick; not more than four families shall be permitted in attached dwellings without a party wall of masonry; party or division walls of solid brick masonry shall be at least 8 in. thick for the upper 20 ft. of height and shall be at least 12 in. for the remaining lower portion; party or division walls of hollow building tile, hollow concrete block or hollow wall construction shall be not less than 12 in. thick and shall not be broken into for the insertion of building members; concrete party and division walls shall be solid and not less than 8 in. thick.

Parapet Walls. All masonry party and division walls in house built in rows shall project through combustible roofs at least 12 in., shall have full thickness of the top story and be coped. No parapet wall shall exceed in height four times its thickness.

Interior Partitions. Four inch brick, tile or concrete block partitions can be used in cellars or basements. Gypsum block may be used for nonbearing partitions where not exposed continuously to dampness.

FOUNDATIONS

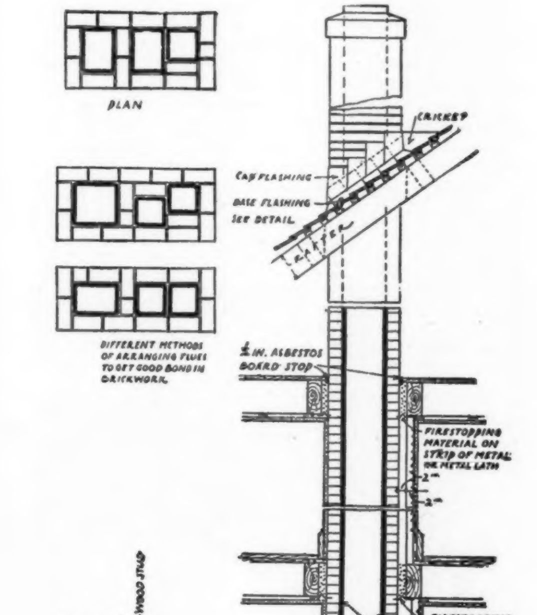
Solid foundation walls of brick, concrete block or coursed stone shall be at least 12 in. thick where they serve as basement walls, but may be 8 in. thick when the enclosure is not excavated, in which case such foundation walls shall be included in the allowable height of 8 in. walls; when of concrete cast in place they shall be as thick as the walls they support and never less than 8 in. Rubble stone walls shall be not less than 16 in. thick. Foundations for walls of hollow building tile, hollow concrete blocks, hollow walls of brick and for frame construction may be built of brick, concrete, concrete blocks, salt glazed tile or vitrified fire-clay tile with special thick walls and low degree of



Proper methods of securing backing for lath where partitions meet outside walls at or between wall studs. By such means firm backing is afforded for the ends of the lath and no lath extends through from room to room

absorption. Tile foundation walls shall not be less than 12 in. thick. Foundation walls for frame construction shall extend at least 8 in. above the adjacent ground surface. Quality of materials for foundation walls shall be the same as required for exterior walls except that ordinary hollow building tile shall not be used.

Footings. All foundation walls shall extend below the frost line and suitable provision made at bottom to keep load distribution within carrying capacity of the soil.



Section of an interior independent chimney showing recommended construction

Ventilation. Cross ventilation shall be provided for the space enclosed by foundation walls, whether it be excavated or not.

Miscellaneous Requirements

The weights of construction materials used in calculating dead loads shall be assumed as follows:

	Pounds per cubic foot
Solid brickwork, ordinary	120
Concrete—stone and gravel	150
Plaster and mortar	96
Oak	48
Yellow pine	48
Douglas fir and cypress	36
Spruce and hemlock	30
Maple and birch	48
Hollow gypsum block	48
Hollow tile partition block	60

Wooden stud partitions with three coats of plaster on each side, 99 lbs. per sq. yd.; with gypsum wallboard surfaces, 45 lbs. per sq. yd.; with fibre wallboard surfaces, 30 lbs. per sq. yd. Hollow walls of brick, 8 in., 72 to 90 lbs. per sq. ft.

Floor Loads. Floors shall be designed to support their own weight, the dead loads they are to carry and a live load of 40 lbs. per sq. ft., except that for floors of monolithic type or solid or ribbed slabs the live load may be taken as 30 lbs. per sq. ft.; girders or other members supporting an area not exceeding 100 sq. ft. shall be designed to carry a uniformly distributed live load of 40 lbs. per sq. ft.; when the area exceeds 100 sq. ft. and not over 200 sq. ft., the live load may be reduced to 35 lbs. per sq. ft.; when the area exceeds 200 sq. ft. the load may be reduced to 30 lbs. per sq. ft.

Roof Loads. Roofs having a rise of 4 in. or less per foot shall be designed for a vertical live load of 30 lbs. per sq. ft. of horizontal projection; with a rise of more than 4 in. and less than 12 in. per foot, for a vertical live load of 20 lbs, per sq. ft.; with a rise exceeding 12 in. per foot, for a wind load of 15 lbs. per sq. ft. of sloping surface and acting normal to the surface.

Timber in Walls. No timber, except inside lintels hereinbefore mentioned and wood nailing blocks 8 in. long horizontally or nearer together than 2 ft., shall be built into a masonry wall.

Chimneys. All chimneys must be built upon concrete or masonry foundations properly proportioned to carry the weight imposed without settlement.

All chimneys built of brick, stone, concrete block or hollow building tile, except chimneys having 8 in. or more solid brick walls, shall be lined throughout with fire-clay flue lining; linings shall be not less than ¾ in. thick and shall be made to withstand high temperatures; adjoining flue linings shall break joints at least 7 in.; flue sections shall be set in rich cement mortar with joints struck on inside; masonry shall be built around each section as it is placed and all spaces between masonry and linings completely filled with mortar; linings shall start below the bottom of smoke intakes or from throats of fireplaces and shall be continuous the entire height of the flue.

Walls of brick buildings may form a part of a chimney but the walls of the chimney shall be securely bonded into the walls of the building and the flue shall be lined the same as an independent chimney; no wall less than 12 in. thick shall be used to support a corbeled chimney, corbeling shall not project more than 6 in. from the face of the wall and consist of at least five courses of brick; chimneys shall extend at least 3 ft. above flat roofs and 2 ft. above ridges of roofs, capped with stone, terra cotta, concrete, cast iron or other approved material and no capping shall decrease the flue area; chimneys in party walls shall not extend beyond the center of the wall and their location shall be permanently indicated on the exposed surface of the wall.

Concrete chimneys cast in place shall flow easily, be well rodded and reinforced vertically and horizontally; the walls shall be not less than 3¾ in. thick and shall be lined with fire-clay flue lining or the linings may be omitted provided the concrete walls of the chimney be not less than 6 in. thick. Concrete blocks used in chimney construction shall not be less than 3¾ in. thick, blocks enclosing more than one flue shall have suitable reinforcement completely encircling the blocks and embedded in them. Stone chimneys, unless built of dressed stone in courses bonded at corners and tied with metal anchors, shall have walls at least 8 in. thick.

Hollow building tile shall not be used for isolated chimneys, but may be used in connection with exterior hollow tile walls, chimney walls to be not less than 8 in. thick. The walls may be of two thicknesses of 4 in. tile with broken joints or 4 in. of solid brickwork. Walls to be securely bonded to the exterior wall. No chimney shall be corbeled from a hollow tile wall.

The inside area of flue linings shall be not less than 75 sq. in. for a furnace or fireplace; 49 sq. in. for stoves and ranges using coal, coke, wood or oil fuel and for heating-furnace boiler or automatic hot-water heater using gas fuel; 10 sq. in. for vent flues for other gas burning domestic appliances; vent flues shall be made of fire-clay with walls not less than 1 in. thick with permanently sealed joints, in which case surrounding masonry may be omitted. Metal vent flues are not permitted.

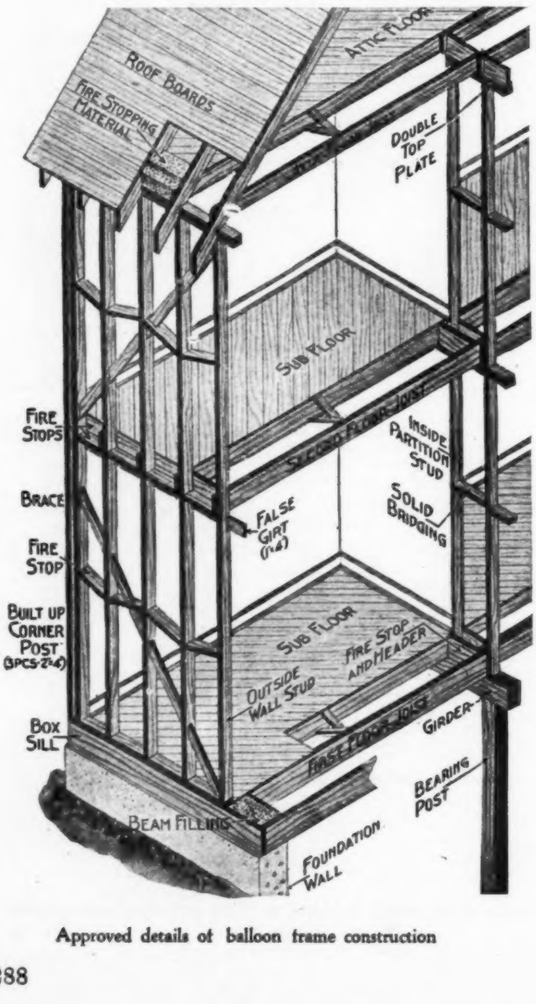
No change in exterior dimensions of chimneys shall be made within 12 in. above or below roof rafters or joists; smokepipe intakes to flues shall always enter the chimney through the side and shall consist of fire-clay or metal or cast of concrete; such openings shall be at least 18 in. below wooden lath and plaster, open joists or other combustible ceilings unless surface above the pipe is protected with incombustible material. No woodwork shall be placed within 6 in. of thimble; project brickwork for a space of 6 in. to face of furred lathing or surrounding 6 in. space to be covered with metal lath or an open space of 6 in. provided on all sides.

Woodwork around Chimneys. No woodwork shall be placed within 2 in. of the outside face of chimneys or within 4 in. of the back wall of any fireplace; all space between chimneys and wooden joists shall be filled with loose cinders, mortar refuse, gypsum block or other porous incombustible material to form a fire-stop; incombustible material to be supported on sheet metal attached to the joists with inner edge close to chimney wall; wood grounds to support wood base or other trim shall be insulated with asbestos paper at least ⅛ in. thick and metal wall plugs.

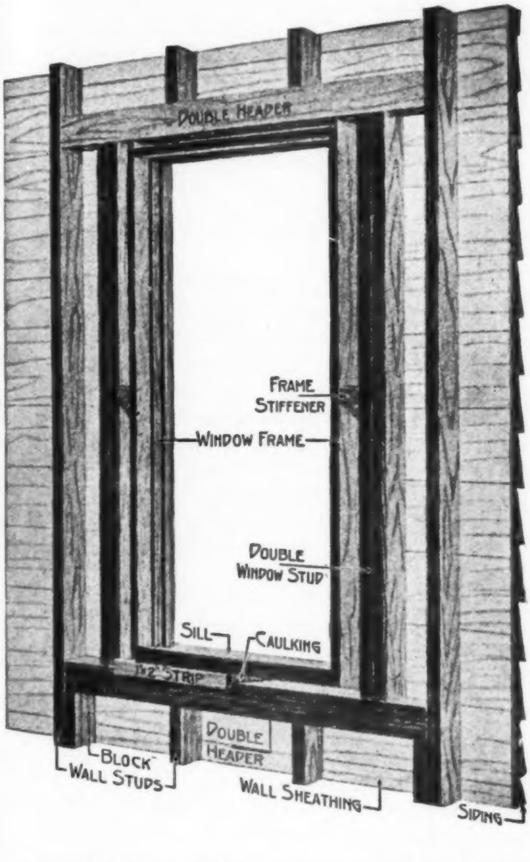
Walls of fireplaces shall never be less than 8 in. thick and if of stone not less than 12 in. thick; hearths and supporting arches shall project at least 20 in. from face of chimney breast and be 24 in. longer than fireplace opening; supporting arches shall be of brick, stone, hollow tile or reinforced concrete not less than 4 in. thick; suitable supports shall be provided for arches or slabs; no woodwork shall be placed within 8 in. of the side or top of any fireplace opening; no coal burning heater shall be placed in a fireplace that does not comply with these requirements.

Fire-stopping. Fire-stopping shall be arranged to cut off all concealed draft openings and form an effectual horizontal fire barrier between stories and roof spaces; in wood furred walls project the masonry between the joists their full height and the full thickness of the furring; the studded off space between the inside face of the wall and the studding at the floor level shall be fire-stopped with incombustible material; where stud partitions rest on or pass through floor construction, the space between studs and joists shall be filled with incombustible material at least 4 in. above each floor level; walls behind eaves or cornices shall be fire-stopped to prevent fire from entering attic space from within or without the building; wooden cornices or cornices having wooden frames, when on rows of dwellings, shall be completely fire-stopped or separated between each building; space between stair carriages or stringers shall be fire-stopped with a header beam at top and bottom; when stair is not all in one room or has closet underneath, an intermediate fire-stop shall be placed to cut off communication between different rooms or between closet and room in which it is placed, such stops best made of plank; if the stairs are the only separation between two stories, the underside or soffit of stairs shall be covered with metal lath or one-half inch plaster board and plastered to a total thickness of ¾ in.; where warm air pipes and registers are in the floor space, the space between the pipes or boxes and the wooden floor construction shall be filled with incombustible material supported on sheet metal; when a register box is protected in this way the space between it and the adjacent wood may be reduced to 2 in., otherwise it shall be 4 in.

Private Garages Combined with Dwellings. When a garage is beneath or attached to a dwelling, the floor and ceiling construction above the garage or the roof of an attached garage shall be unpierced



Approved details of balloon frame construction and have a fire resistance of one hour based on the standard specifications for fire tests of materials and construction; walls and partitions shall be of such construction as will meet the requirements of the same test; when located beneath a dwelling all doors and windows with their frames shall be of standard fireproof construction glazed with wire glass; openings from dwelling to garage shall be restricted to one doorway equipped with a standard, swinging, self-closing fire door, frame and hardware with no glass in the door; when a doorway



The double headers and window studs are as strong and rigid as continuous studs, and with the stiffeners at the sides help to prevent windows from binding and rattling. The caulking and rabbeted strip beneath the sill exclude air, which otherwise enters freely

connects directly with a cellar or basement on the same or lower level in which there is a heating device or gas fixture, the door sill shall be raised at least 1 ft. above the garage floor level or the doorway shall lead into a vestibule from which a second door connects with the cellar or basement; garage floors shall be of concrete or equally fire-resistive and impervious material.

The integrity of frame construction depends largely on workmanship of which the proper fitting of the parts and secure nailing are the most important elements. No code can describe or compel the exercise of good workmanship as it depends entirely on knowledge and intention on the part of the contractor or inspection on the part of the architect or officials. Unfortunately a large proportion of dwelling houses are constructed without architectural supervision and a considerable proportion of them are speculative buildings whose constructors have no interest in them beyond their sale at a profit. A wide distribution of this code will aid materially in securing a better quality of dwelling house construction as the appendix contains very complete explanations and suggestions which cannot be incorporated in a code. It becomes in effect a condensed textbook on the subject.

It is unfortunate that the fibre stresses for wood framing are based on several grades of material. The loads and attendant stresses in this class of work are not great and they are fairly uniform. One grade of material should be sufficient and the grade recommended should be one commonly found in every lumber yard. A too difficult lumber grade requirement will result in an ignoring of such matters entirely. It might have been more effective to have specified sizes of joists for span and spacing rather than fibre stresses. Calculations are seldom made for this class of construction and the sizes are generally dictated by common local practice.

The tacit agreement to the elimination of wood sheathing on exterior walls to have stucco finish and the substitution of back plastered metal lath applied directly to the studding, will be questioned by many architects, engineers and practical builders. A diligent search fails to reveal any reliable data to justify such a recommendation and such a radical departure from well established methods should be taken only after disinterested and properly designed tests have been made. The proposed elimination of the wood sheathing greatly decreases the insulation of the building with no adequate substitution. Insulation does not come within the scope of code regulations but it is a matter of utmost importance to the owner.

The completeness of the recommendations pertaining to chimney construction and fire-stopping is to be commended. While it is true that the vast majority of fires originate through carelessness of the occupants, a very considerable proportion originate in improperly constructed chimneys. The fire-stop aims to retard the spread of fire of whatever origin. The great expansion of confined air which results from a fire causes it to escape wherever possible. In a joist and stud constructed building the spaces between the joists and studs are in effect flues through which the hot air and gases escape to be followed by fire. Anything which will stop the flow of these hot gases will serve as a fire-stop. The use of mortar and concrete for this purpose has a limited effectiveness because when used in connection with wood there can be no intimate contact. The recommendation of the use of sand, fine cinders and ashes is a good one because these materials will settle into an intimate contact. Gypsum blocks can be cut in such a way that when forced into place, a close contact can be made and maintained. Wooden fire-stops can be cut, fitted and nailed in such a way that a tight contact is assured. They are entirely adequate as long as they fit close enough to prevent the passage of air. Wooden fire-stops present some advantages from the construction standpoint because they can be placed by carpenters as the framing proceeds and without the delays and trouble caused by using fire-stops requiring other mechanics and materials for a small volume of work.

It will be very difficult to enforce the requirements for proper fire-stopping. It might be done in several ways: to require a certificate from a building inspector before use is permitted as is usual with electrical or plumbing installations, practicable in towns where such inspection is available; by insurance companies imposing a heavy premium penalty whenever evidence of proper fire-stopping is lacking.

This code should be carefully studied and every effort be made to secure its adoption and enforcement. If adopted by states, it will then become applicable to communities where there are no building departments and can be enforced by fire marshals or other available officials. Existing codes can well be revised to conform to its principal recommendations.

Effect of Integral Waterproofing Compounds on the Strength of Concrete

By Duff A. Abrams*

AT the recent meeting of the American Concrete Institute, considerable interest was shown in a discussion of the function of integral waterproofing compounds in concrete. We have recently made a series of tests to determine the effect of these compounds on the *strength* of concrete. The tests formed a part of a series of laboratory and field researches on concrete exposed to sulphate soils and waters.

Compression tests were made on 6 by 12 in. concrete cylinders, in which 11 different integral waterproofing compounds were used in 1/3, 1/4 and 1/5 concrete mixtures, with aggregate graded up to 1 1/2 in. In a number of instances, 2 or 3 percentages of the compounds were used. The tests were made at the age of 28 days after curing the concrete in a moist room.

Without exception, the compressive strength of the concrete was reduced by these compounds. "Normal" concrete, that is without integral compounds, gave the following strengths: 1/5, 3010; 1/4, 3460; and 1/3, 4230 lb. per sq. in.

A soap solution of 1/4 lb. per gallon of mixing water gave a concrete strength 57% of normal; 5% crude oil, (both asphaltic and paraffin base) gave concrete strengths 73% of normal.

Four different proprietary waterproofing compounds, used in the percentages recommended by the manufacturers, gave concrete strengths 74 to 87% of normal; average about 80%. A so-called alkali-proofing compound (patented) gave concrete strength 16% of normal.

Little difference was found in the relative effect of integral compounds due to the quantity of cement within the range of the mixes used in these tests.

We have made no tests on the value of these compounds for waterproofing, and at this time no conclusions can be given with reference to their effect in concrete exposed to sulphates; however, users of such compounds should consider that the strength and probably the resistance of the concrete to destructive agencies may be seriously reduced thereby.

The Progress Report of the Joint Committee on Standard Specifications for Concrete and Reinforced Concrete, treated this phase of waterproofing concrete very briefly by saying that "Integral compounds shall not be used." This committee is composed of five representatives from each of five of the leading American engineering organizations which are interested in this field. Their report was published in 1921 by the American Society of Civil Engineers and by the American Society for Testing Materials.

Professor in Charge, Structural Materials Research Laboratory, Lewis Institute, Chicago.

PLANNING FOR OCCUPATIONAL THERAPY

With Special Reference to Curative Workshops and Recreation in Hospitals and Sanatoria

BY T. B. KIDNER, Institutional Secretary, National Tuberculosis Association

As new ideas develop new methods, changed demands on the architect are characteristic of all types of buildings, but in no field of planning is this more marked than in hospital design. Ten years ago, outside of hospitals for mental and nervous diseases and some half dozen sanatoria for tuberculosis, institutions for the care and treatment of the sick made no provision for a form of treatment which has assumed exceeding importance in the past three or four years, namely, Occupational Therapy. Today, the relief and cure of suffering by means of an appropriate occupation forms a part of the treatment in almost all kinds of institutions devoted to the care of sick and disabled persons.

As far as hospitals for mental and nervous diseases are concerned, this form of treatment has been applied for many years, and is well recog-

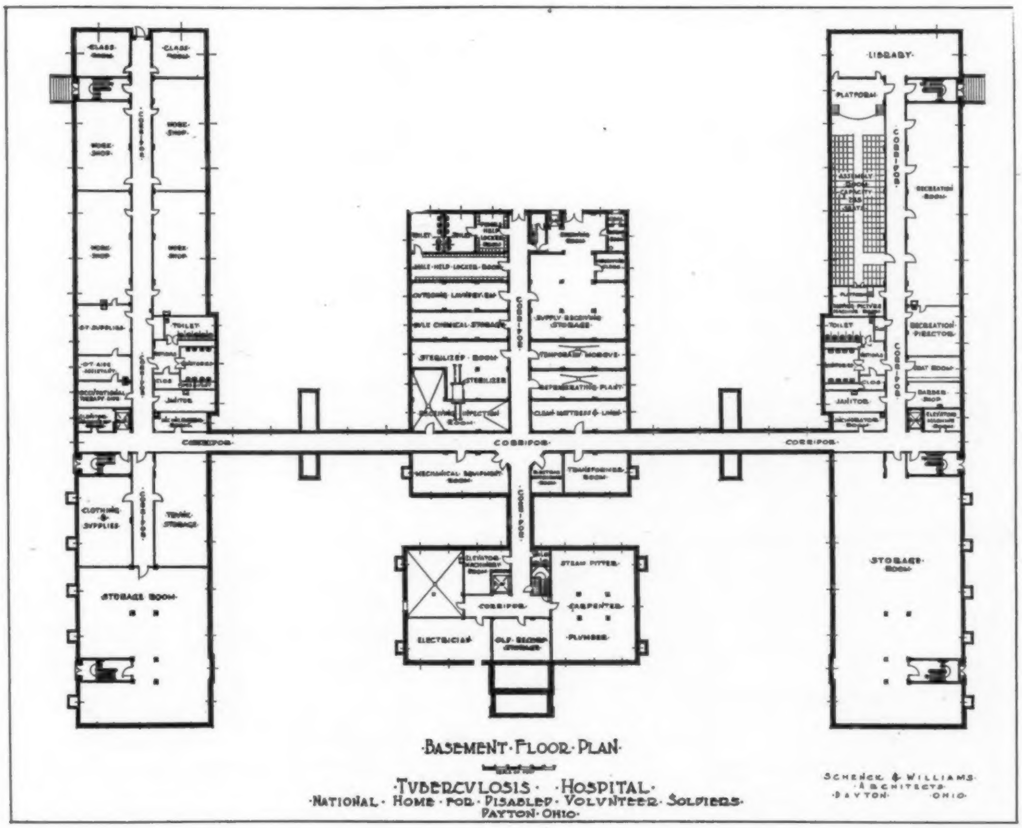


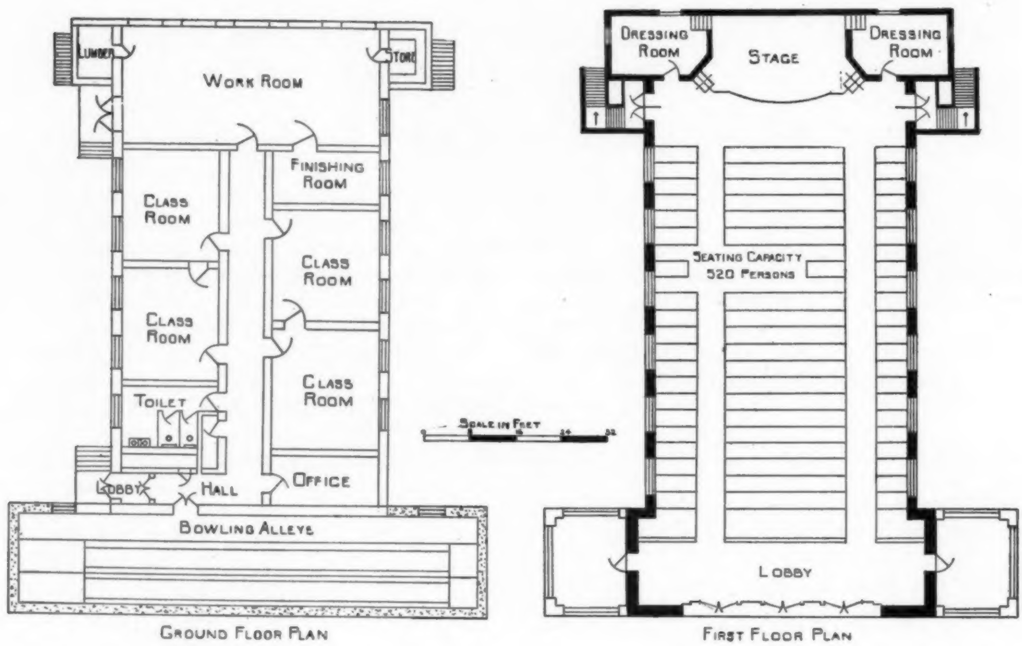
Fig. I. A reproduction of the basement floor plan of a 250-bed tuberculosis hospital at the National Soldiers' Home at Dayton, Ohio. The building consists of an administration building with a service unit at its rear and two wings for patients. Although it is termed a basement, the rooms for recreation, also the workshops and classrooms, are wholly out of the ground.

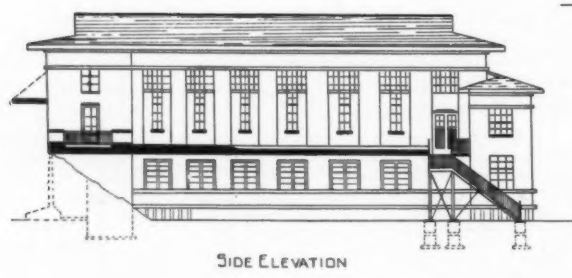
It will be noted that four well lighted workshops and two classrooms have been provided, together with a supply room and an office for the Director of Occupations.

The provision for recreation includes the patients' library, which is important, as library work is becoming a definite feature of the care of hospital patients.

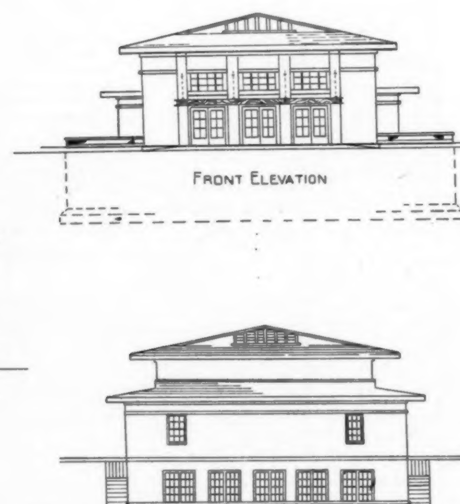
It will be noted that the accommodation includes an Assembly Room with a seating capacity of 235. It is estimated that this will provide accommodation for all patients able to leave their rooms or wards, and for the staff and attendants.

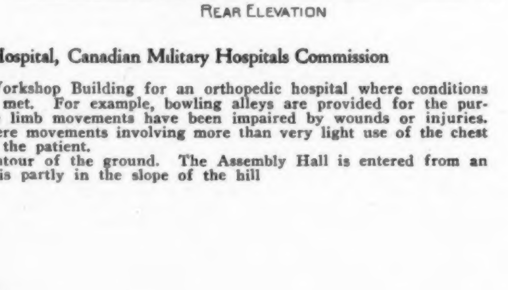
The Recreation Room is for quiet games. The usual provision for toilets and lavatories is included, and the institutional barber shop is also in this section. The Director of Recreation has an office, conveniently situated near the recreation and other rooms, and is responsible for the various features of that side of the work





Recreation Hall and Workshops





Figs. 2 and 3. North Toronto Military Orthopedic Hospital, Canadian Military Hospitals Commission

Figs. 2 and 3 represent the combined Recreation Hall and Workshop Building for an orthopedic hospital where conditions differing somewhat from those of a tuberculosis hospital must be met. For example, bowling alleys are provided for the purpose of giving opportunity for bodily exercise for cases whose limb movements have been impaired by wounds or injuries. Such violent exercise is forbidden in a tuberculosis hospital, where movements involving more than very light use of the chest muscles cannot be undertaken, because of the possible danger to the patient.

It will be noted that the architect took advantage of the contour of the ground. The Assembly Hall is entered from an upper level and the Bowling Alley is partly in the slope of the hill nized as a necessary part of the regimen of such institutions. In point of fact, one of the leading psychiatrists of the country, Dr. T. W. Salmon, who had charge of neuro-psychiatric work in the American Expeditionary Force, has said that:

"Occupational Therapy will some day rank with anæsthetics in taking the suffering out of sickness and with antitoxins in shortening its duration. The greater part of the distress in chronic diseases is mental, and Occupational Therapy is, thus far, our only means of dealing with this factor."

The general adoption of modern methods of rehabilitation in the World War Hospitals, particularly in the United States and Canada, has led to an enormous development of the work, and from every type of hospital in the country today demands are coming in for trained workers and for advice on equipment and buildings.

It is believed that a statement of the scope of Occupational Therapy and of the methods of its application will be of service to architects who may be called upon in hospital planning to provide for this new form of treatment.

Side by side with the increased use made of occupations in the treatment of the sick, has come an increased recognition of the value and, indeed, the absolute necessity, of making adequate provision for the recreation and amusement of the patients. This is, of course, particularly true in the case of hospitals for mental and nervous diseases. It is true, also, of tuberculosis sanatoria,

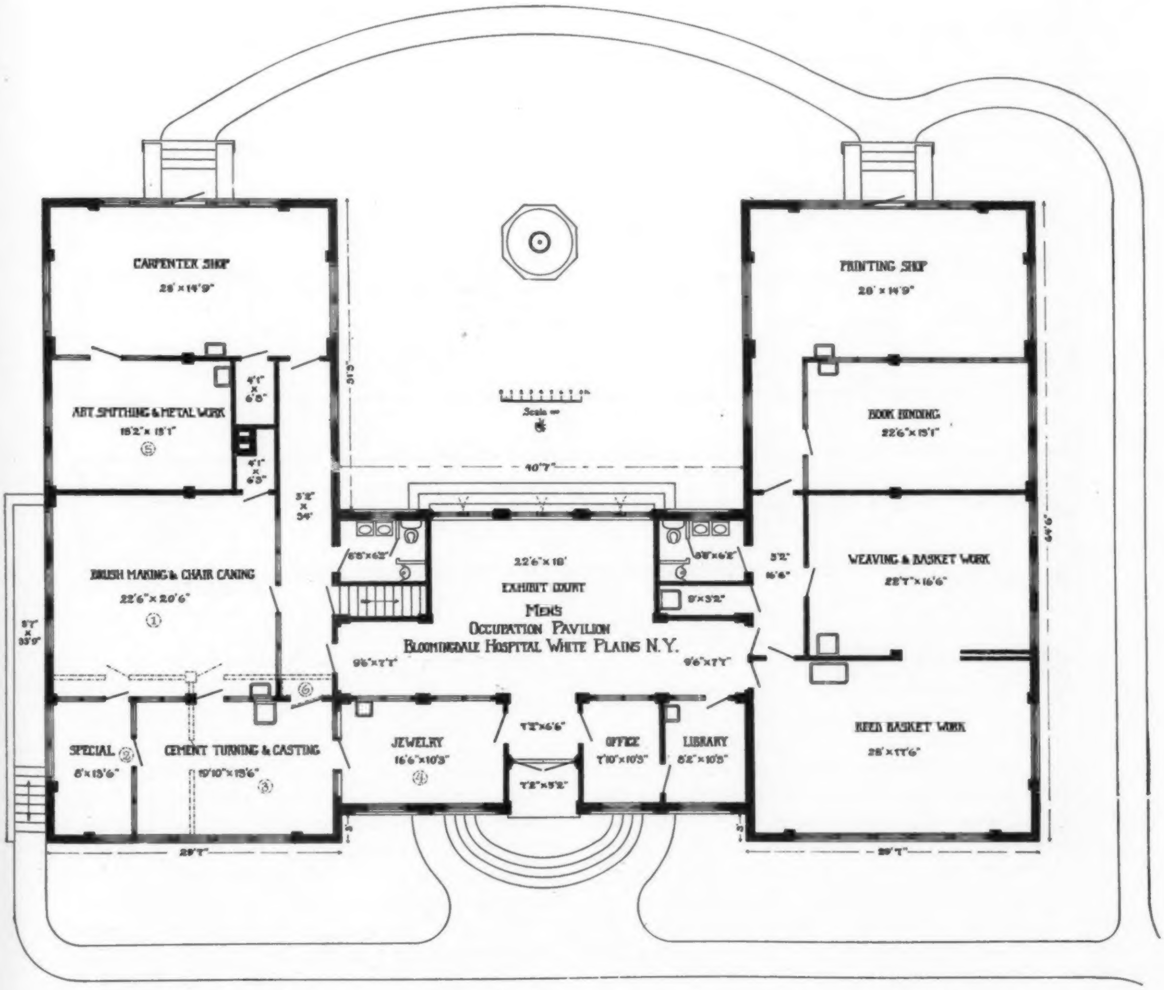


Fig. 4. One of the finest examples of the application of Occupational Therapy in hospitals for mental and nervous diseases is at the Bloomingdale Hospital, White Plains.

The above shows the floor plan of the pavilion provided for the occupational therapy work of men patients. It will be noted that various arts and crafts are provided for; very little provision for academic work being made in this type of hospital. The building has an excavated basement under one-third of it, which contains a dye room and storage rooms for supplies where the treatment is long and tedious in its nature and the good morale and contentment of the patients are of great importance.

Occupational Therapy has been defined as follows:—

"Any activity, mental or physical, definitely prescribed and guided for the distinct purpose of contributing to and hastening recovery from disease or injury."

on two sides, should be sufficient to care for from forty to fifty patients in a general hospital, or in the infirmary unit of a tuberculosis sanatorium.

When a patient has progressed toward recovery so that he is able to take exercise, (the so-called "ambulant" stage in tuberculosis) a wide field of work opens in which the hospital architect is directly interested.

Curative occupations for convalescent patients

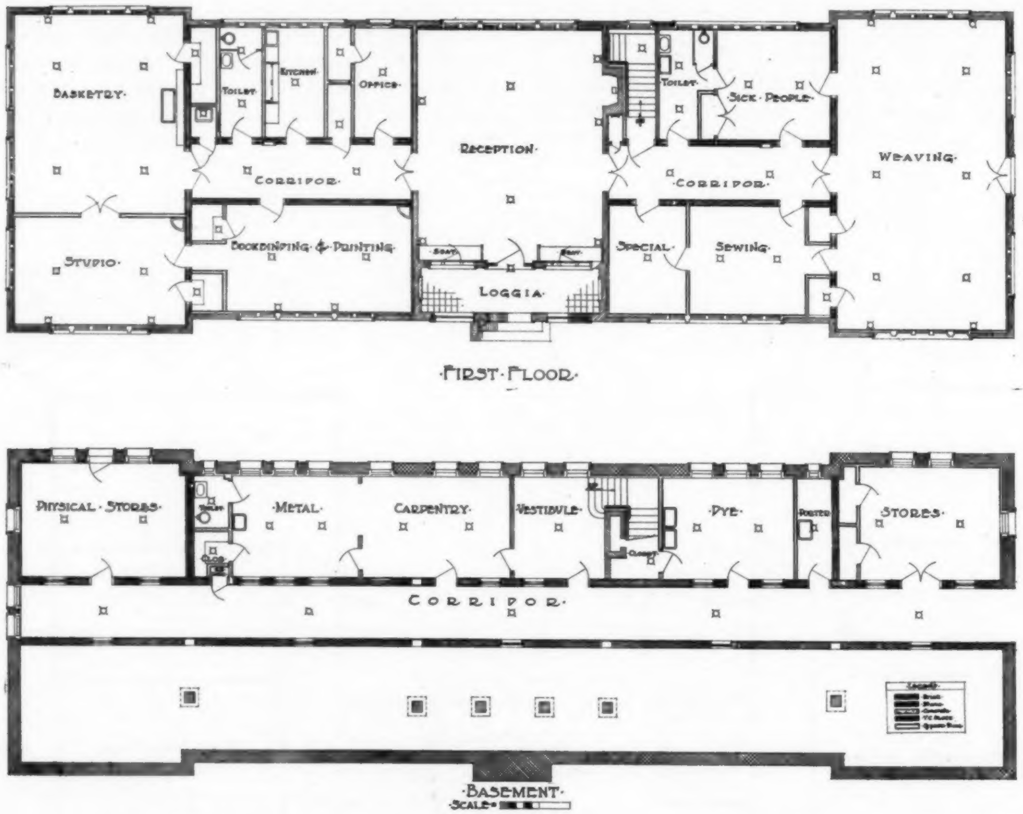


Fig. 5. Floor plans of the Women's Occupational Therapy Building, Bloomingdale Hospital, White Plains, N. Y., which is, in the author's opinion, the best example of such a building anywhere to be found. Not only are the internal arrangements excellent, but the color scheme of the interior and the design of the exterior are alike calculated to have an excellent effect upon the patients

For present purposes, Occupational Therapy may be grouped broadly under two heads:—(a) Ward Occupations; (b) Curative Workshops.

Ward occupations include work which is given to patients in bed, often termed "Bedside Work." The term "Ward Occupations" also includes work given in a hospital solarium, or on a "cure porch" in a tuberculosis sanatorium, to patients who are sufficiently recovered to leave their beds for a shorter or longer period daily. Very little special equipment is necessary in this stage and the only provision the architect need make is a small room for the storage of the equipment and the material. A room ten by twelve feet, fitted with open shelves

may consist of work given solely because of its restorative value, mental or physical or both, or it may be given for the dual purpose of assisting in the patient's restoration to health and of helping him to earn his living after he is discharged from the hospital.

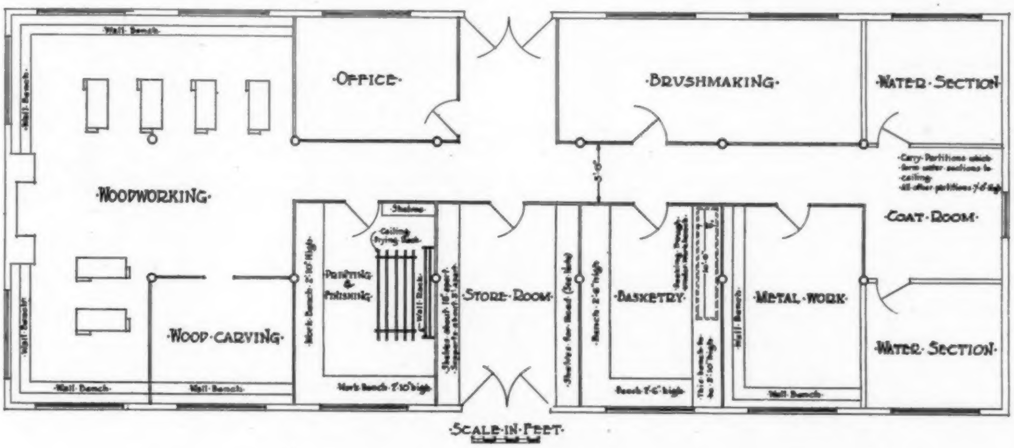
This latter aspect of curative work was, of course, the principal motive in the rehabilitation work in the War hospitals. The World War caused a great change in the attitude of the various countries concerned toward the problem of the disabled soldier. In previous wars, a nation usually considered that by the provision of pensions and medals, and in some cases "Old

Soldiers' Homes," the duty of the nation toward those disabled in its wars had been fulfilled. In the World War, however, for the first time the nations realized that pensions and medals were not sufficient, and that it was the duty of the nation to supplement these by providing opportunities for its war-disabled men to become once more self-supporting and, therefore, self-respecting and contented citizens. A realization of this led to the provision of vocational training courses in which a soldier permanently disabled by wounds or disease could be trained in some occupation appropriate to his condition and thereby be enabled to engage efficiently in some gainful occupation, in spite of the handicap of his disability. The resulting program of vocational rehabilitation for disabled soldiers and sailors was followed in the United States by a similar program for persons disabled in industry.

In June, 1920, Congress passed an Act, known as the "Industrial Rehabilitation Act," the object of which is "the promotion of vocational rehabilitation for persons disabled in industry, or otherwise, and their return to civil employment."

The importance of this measure may be appreciated when it is realized that it has been estimated that the number of persons disabled annually in the United States by industrial and other accidents is equal to the number of those who would be disabled from an army of 1,500,000 men in active service in the field. If to that number be added the number of those disabled by industrial illness, it is said that the total would be equal to the number of disabled from an army of 2,000,000 men in active service.

This Act involves co-operation between the Federal Government and the States on the "dollar for dollar" basis; that is to say, for each dollar contributed by the Federal Government a dollar must be contributed from the State funds. The offer of co-operation and assistance from the Federal Government brought an immediate response from some States which had already realized the need of rehabilitation. Other States followed and, in all, some thirty-eight States to date have joined with the Federal Government in this important scheme and are actually at work.



Occupational Therapy Building, Collins, N. Y. State Hospital—A remodelled building

Fig. 6. The architect has not in all cases the opportunity which was afforded at Bloomingdale Hospital to design a complete building throughout. Quite often an existing building has to be remodelled. The above is an example of this; being the Occupational Therapy Pavilion at the New York State Hospital at Collins, N. Y. Desiring to provide adequate accommodation for the occupational therapy work in this institution, the State Hospital Commission remodelled an old building which was formerly used for recreation in wet weather. It will be observed that the plan makes provision for crafts work in several lines and includes an office for the Director of the work. Two water sections are provided, as both sexes attend for instruction. These water sections were already in place; otherwise, of course, they would have been separated by being placed at opposite ends of the building

The effect of this upon hospital practice has already been felt. It has become an axiom that the sooner the vocational rehabilitation of a disabled person can be commenced, the more likely is it to succeed. The application of this beneficent Act is, therefore, resulting in the provision of facilities for Occupational Therapy and Pre-Vocational Training in many hospitals where such work would otherwise probably not have been introduced for many years to come.

For physical disabilities, the curative workshop forms the principal method of applying the work cure. Hospital architects have long been familiar with the many special machines for the correction of physical disabilities, and have provided space for them in hospital planning. The curative workshop is, however, largely superseding mechanical apparatus, the use of which has

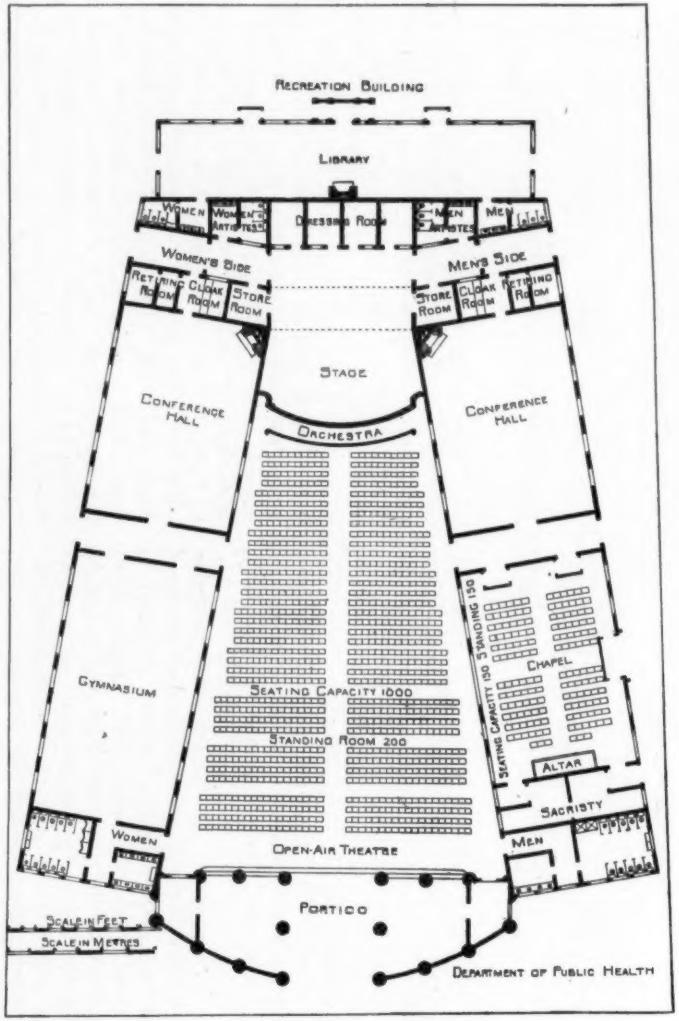


Fig. 10

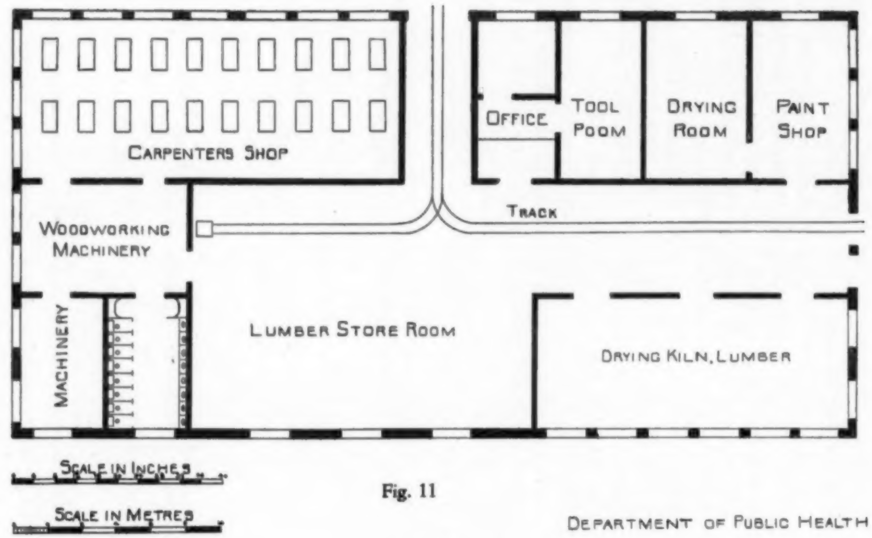


Fig. 11

Department of Public Health

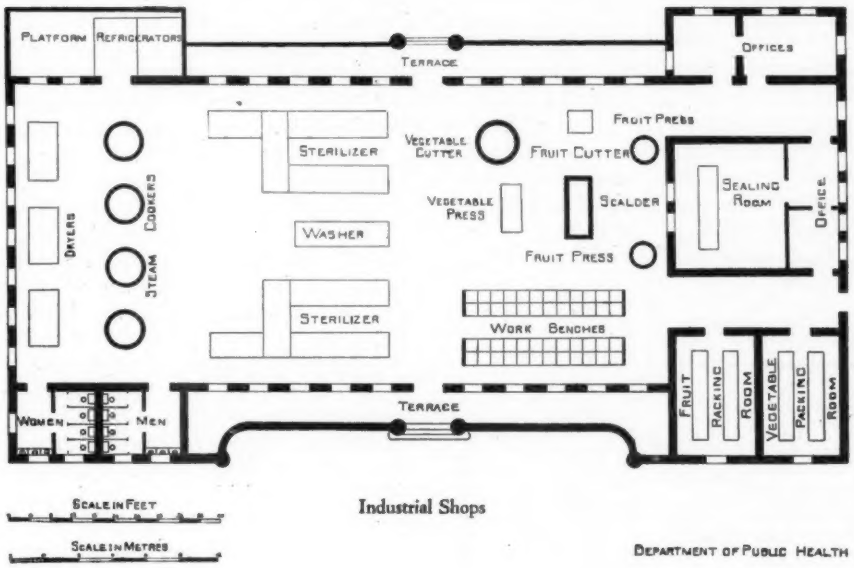
Industrial Shops

Figs. 10, 11, 12 and 13 are given by permission of the Inspector-General of the Department of Public Health of Mexico, which is about to erect a national sanatorium for tuberculosis, with a capacity of one thousand beds, within a few miles of Mexico City.

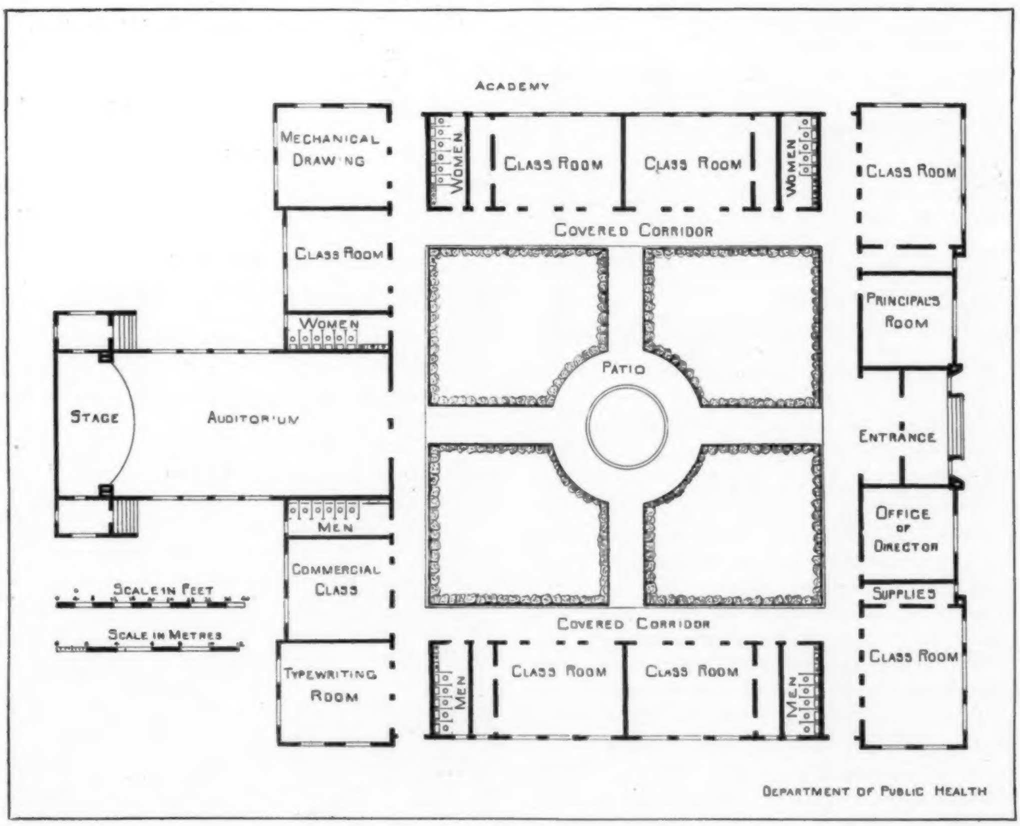
The plan of the Recreation Hall is interesting, as it includes a commodious open air theatre. Provision is made for carpentry and painting in one workshop unit, and academic subjects are provided for in an attractive building of quadrangle form, with an open patio in the center. The industrial shops for fruit and vegetable preserving are unique, but it is estimated that many of the patients may be usefully employed in such work

National Sanatorium for Tuberculosis, Mexico

Planning for Occupational Therapy



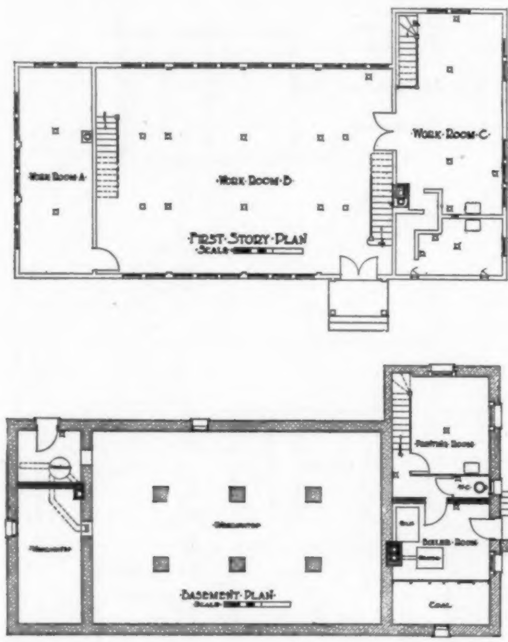
Industrial Shops



Figs. 12 and 13

National Sanatorium for Tuberculosis, Mexico practically no psychic value and can only have an indirect and problematical subsequent vocational value.

Side by side with the curative workshop, which will be described later, provision is also made for training in certain academic subjects. This is especially true where the work provided because of its therapeutic value has also a direct bearing upon the patient's subsequent occupation. Broadly speaking, therefore, the occupational therapy department of a hospital, if properly organized, forms in effect a small vocational high school.



Figs. 7 and 8

The above Figs. 7 and 8 will be of interest as representing one of the earliest examples of a building for occupational therapy in a tuberculosis hospital. The illustrations show the basement and first story plan of the workshop built many years ago at the famous Trudeau Sanatorium at Saranac Lake, N. Y.

In considering the accommodation necessary, it should be noted that the classroom subjects will vary scarcely at all in different parts of the country. Certain standard subjects have also been generally adopted in shopwork, but local industrial conditions will probably have some influence upon the hospital shopwork in different parts of the country. In some few places it has been found possible to supplement shopwork by gardening and agricultural work, where climatic and other conditions permit. Where this is done, the demand for space indoors is, of course, greatly reduced. This is particularly true of many of the larger hospitals for the insane throughout the country where an enormous amount of space would be required for patients' occupations, were it not for the fact that a large proportion of them are usefully and happily employed in work on the land.

It must be confessed that at present it is not possible to lay down very definite standards for the number of rooms and the amount of space required for occupational therapy work for a given number of patients. As far as tuberculosis hospitals are concerned, however, the writer made an attempt to do this in a memorandum to the U. S. Public Health Service, written in his capacity of Consultant on Sanatorium Planning to the Service. The following is an extract from the memorandum, which has been published as Reprint No. 667, U. S. Public Health Reports*:

"The exact number of rooms to be planned will depend upon the size of the hospital, but provision should be made so that at least 75 per cent of the ambulant patients can be accommodated, either in classrooms or shops, at one time. It may be considered that this is high, but it must be remembered that the hours of 'exercise' are limited; also that semi-ambulant patients nearing the stage of full exercise are often directed by the physician to take periods in the classes or shops.

Suggestions for rooms.—Administration:

(*a*) An office for the chief aide (therapist); say, 10 by 12 feet

(*b*) A storeroom for materials; say, 10 by 12 feet

(*c*) A room for finishing (assembling, varnishing, dyeing, enameling, etc.); say, 12 by 18 feet

(*d*) An office for the vocational director; say, 10 by 12 feet

(*e*) A storeroom for stationery, books, and other supplies for academic classes; say, 6 by 12 feet

(*f*) A storeroom for shopwork supplies; say, 10 by 25 feet

(*g*) Toilet rooms for male and female instructors

(*h*) Toilet rooms for students

Classrooms.—Because of the individual nature of the instruction, classes should not exceed 16 students. The floor space should provide not less than 35 square feet per student; thus a room 20 by 28 feet would accommodate 16 students. The room should be lighted on one of the long sides, with windows of the side-pivoted type preferably, the light to come from the left of the students. The radiation should be installed below the windows, and a foul-air vent arranged either in the ceiling or high up in the opposite wall. Standard blackboards of slate (or, in temporary construction, of hyloplate) should be installed on the wall at the rear of the teacher's desk and on the wall facing the window. A sink for washing blue prints should be installed in the drafting room; size, about 18 by 30 inches.

Government Printing Office, 10 cents.

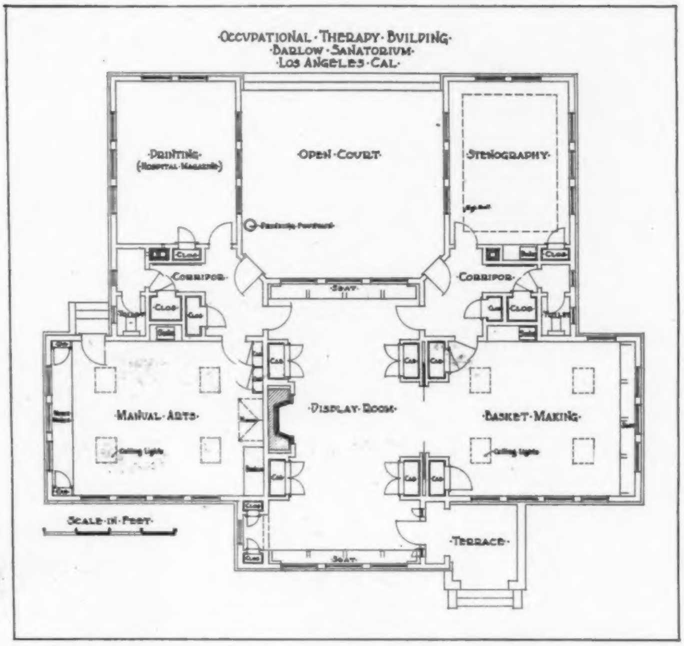
Generally, four branches of study should be provided for:

(*a*) Academic
(*b*) Typewriting
(*c*) General commercial
(*d*) Mechanical drafting

Provided that properly deadened floors are installed, the classroom may be in the upper story of the building in which the shops form the ground floor.

Shops and laboratories.—While suggestions will be made as to sizes of units, it is well to arrange that the interior partitions be of light construction and installed in such a manner that they may easily be moved should changes be necessary.

Factory-type windows are desirable and they should extend to the ceiling. At least 50 per cent of the sashes should be capable of being opened, preferably horizontally, on side pivots. Light on two adjacent sides of the room is desirable and the window-glass area should be not less than one-fourth the area of the floor space.



Occupational Therapy Building, Barlow Sanatorium, Los Angeles, Cal.

Fig. 9. The floor plan of an excellent building recently provided for Occupational Therapy

Each unit should accommodate from 10 to 12 students and should provide not less than 150 square feet of floor space for each student. The floors should be of heavy groove-and-tongue batten or wood block. Ceiling should be not less than 13 feet high.

The following are typical of the subjects often given in shops in a sanatorium for tuberculous ex-service men:

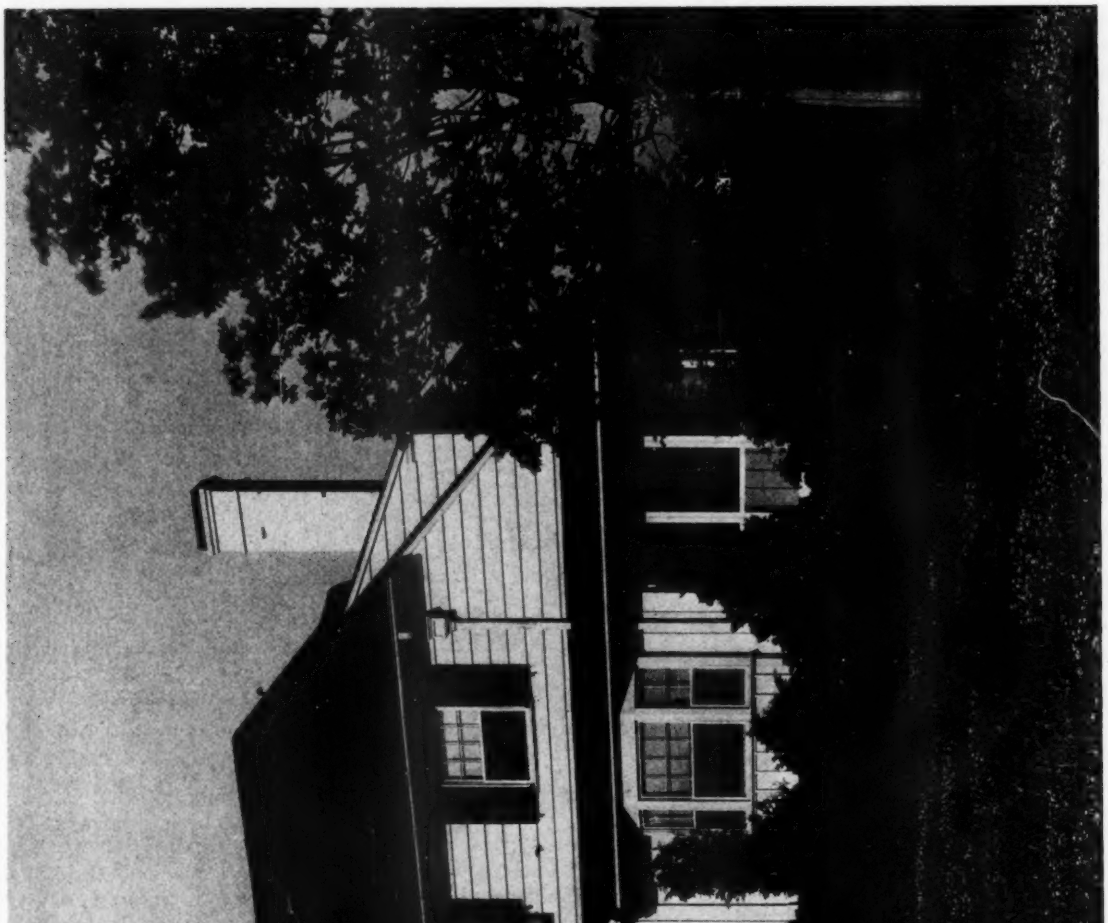
(*a*) Watchmaking, jewelry, engraving, etc.
(*b*) Tailoring
(*c*) Shoemaking (provide for a 5-horsepower electric motor)
(*d*) Commercial art
(*e*) General technical shop or laboratory, used for arts and crafts work of more advanced type than is possible in bedside and ward occupations; also for 'try-out' work in cases where the indications as to a student's capacity, inclinations, etc., are not clear. (Provide for a 10-horsepower electric motor)

In sanatoria in which gardening, agriculture, and other outdoor work form a part of the active features of the vocational classes, it is probable that shoemaking or tailoring or both would be omitted. Instead, a laboratory for science related to the outdoor studies would probably be installed.

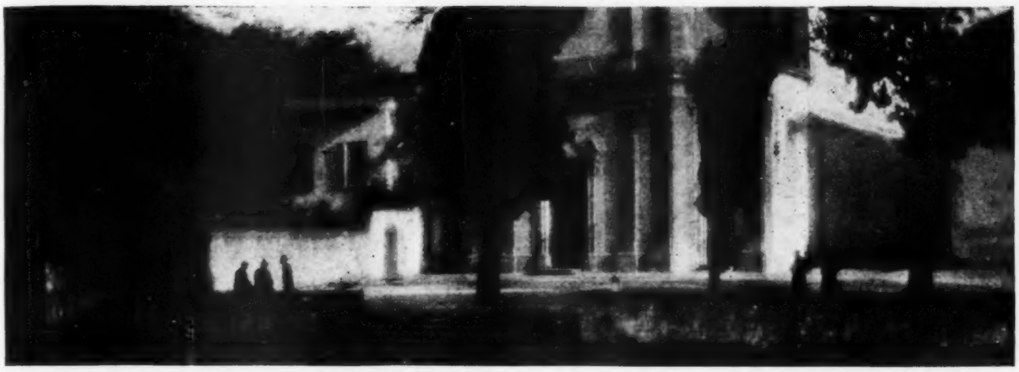
In each workshop water should be laid on and a kitchen or other working sink installed."

It is believed that the several plans used to illustrate this article will prove of interest to architects and others interested in hospital planning. Undoubtedly, more and more attention will be paid to Occupational Therapy and Pre-Vocational Training in hospitals. No subject connected with the care and treatment of the sick is receiving more attention in this and other countries than that of the after-care of hospital patients. This is bound up with hospital care, particularly with the field dealt with in this article, and it is certain that hospital planners must be ready to meet the demands which will be made upon them in this connection.

Note: The foregoing article was contributed by Mr. T. B. Kidner, who is the officer in charge of the Advisory Service on Institutional Planning maintained by the National Tuberculosis Association. Mr. Kidner is also the President of the American Occupational Therapy Association and has had a long experience in rehabilitation work. He is, therefore, qualified to speak with authority on the particular subject with which this article has dealt.



HOUSE OF MRS. C. E. DANCEY, LYNBROOK, L. I., N. Y.
DWIGHT JAMES BAUM, ARCHITECT



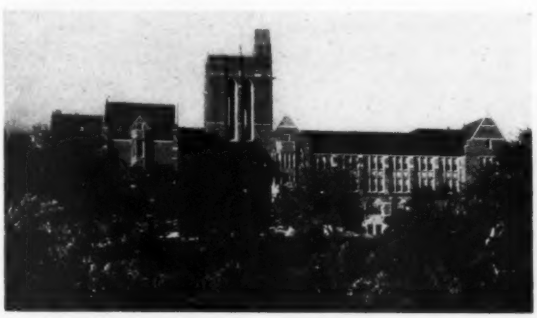
The Villa d'Este — From "The Architectural Review," London

REVIEW OF RECENT ARCHITECTURAL MAGAZINES

BY EGERTON SWARTWOUT, F.A.I.A.

IN this year of grace 1923 there will occur, or has occurred, I'm uncertain which, the bicentenary of the death of Sir Christopher Wren, and the architectural papers, American as well as English, have devoted entire issues to histories of the man, lists of his work, pictures of it, of all sorts and descriptions from old prints to etchings by Brangwyn; essays that are not essays at all, but extracts from the Encyclopedia Brittanica; critiques that are not critical, and quotations from the Parentalia and from his own writings; also there are portraits by the score, and some busts, which show him to have been a rather severe looking gentleman with a large wig and a big white choker, with a scroll and a compass in his hand usually, and St. Paul's in the background peeping out from behind a velvet curtain: in fact quite as an architect of two hundred years ago should look, I suppose, but yet in some ways strangely out of keeping with St. Paul's or Chelsea or Greenwich. Out of keeping, to me at least, because I never could imagine the architecture of Wren's time or of the later Georgian period, built or designed by men in velvet and chokers and wigs, or peopled by them either. I can imagine slim brown Egyptians in green and red and white robes or in no robes at all, sliding around through the columns at Karnak, always appearing in silhouette and holding out their hands in stiff conventional gestures; I can imagine the Greeks as they must have looked in the Acropolis; I can imagine medieval castles tenanted by men in armor and women with tall pointed hats just as Viollet le Duc used to draw them, and I can easily imagine the elegance and lace at Versailles, but I can't imagine that elegance and lace in St. James, in St. Paul's or in any English buildings of that period. Nor over here can I picture the Father of his Country in silk knee breeches and a wig in Mt. Vernon. To me it all seems more nineteenth than eighteenth or late seventeenth century. It is too simple, too substantial, too smug sometimes, for elegance and lace. And yet that contrast was there, and the pictures are there to prove that Wren did wear a wig and a big one at that. In his drafting room he took it off, I suppose, and wore the traditional green shade that all good architects are supposed to, but never do,

From "The Architectural Record"



Notre Dame Academy, Boston, Mass.
Maginnis & Walsh, Architects

wear. Anyway, wig or no wig he was a great architect and a great man, and the profession honors itself in honoring him.

Of all the magazines that celebrate this bicentenary, by far the best is the February number of *Architecture,* London. Brangwyn publishes two new etchings; there are reviews by S. D. Adshead, A. Tristram Edwards and Charles Marriott, and articles by Sir Lawrence Weaver, Professor Reilly and others, the article of Professor Reilly being especially interesting, as he writes of Wren as a Baroque Architect. I had never thought of Wren quite in that light, but Professor Reilly points out that "incorrect as a great deal of his work was according to all the rules of the game, coarse as a great deal of his detail undoubtedly is, with faults of taste and inconsistencies of scale, there was something very rotund, full-blooded, almost

From "The Journal of the A. I. A."

The Parthenon, Columns at East End

Falstaffian, in a great deal of it, which makes us give him an affection we give to no other master. In comparison that of the later men, especially the Neo-Grec ones, seems hard, even spiky. It is all very well for the historians to tell us of Wren's mathematical genius and the consequent sublimity of his conceptions. That, I beg leave to say, is, as regards his architecture—with the possible exception of Greenwich—what is vulgarly called 'eye-wash.' The dome of St. Paul's is a paltry affair compared to the dome of St. Peter's; only insular prejudice would say otherwise. Its tricks of construction are no doubt evidence of mechanical ability, but they are not architecture. Internally, with its muddle of unequal supporting arches or externally, with its tight unmodelled surface, it is very inferior to its great prototype. Yet the lovable quality of the work remains, especially in that part which is nearer the eye. Think of the Dean's door under the great recessed arch of the window on the side of the North tower, or that other lovable doorway, with its oval window and fat cherubs, also under a recessed arch in the tower of St. Mary-le-Bow. What comfortable happy invention! What richly curved surfaces! What cheery display, designed, one may be sure, with sheer enjoyment!" And again "To give the picturesque its grandest scope and yet subdue it to architectural law"—what better description could we have of Wren's towers? "The baroque is not afraid to startle and arrest." Think of the sturdy chapel of Emmanuel College swaggering

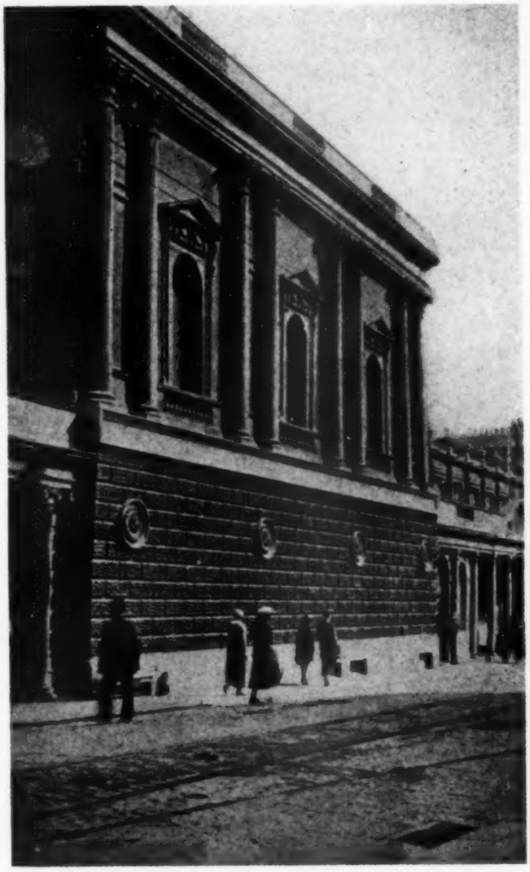
From "The Journal of the A. I. A."

The Parthenon, Columns at the Northeast Corner. These are the best preserved columns of the building

with its big Corinthian order, its boldly broken pediment and its upstanding cupola, among the timidities of Tudor Gothic. "It enlarged the classic formula by developing within it the principle of movement." Think of the barrel vaults and saucer domes in the chapels and aisles of St. Paul's or the gay little Temple Bar neatly striding across the Strand. "Baroque buildings are fit for permanence. They have a massive finality of thought."

Now, I can't say that I'm wildly enamored of Baroque architecture in its most extravagant manifestations, nor can I think that Baroque is exactly the term to apply to Wren, but nevertheless there is a certain bold, human, swaggering sort of feeling to his work which gives it a compelling interest where other contemporary work is stiff and pedantic, and I can't help feeling that a little more of that swagger would be beneficial nowadays in our own public buildings. A long, unbroken colonnade is a fine thing and a big thing, but in the way it is generally done it is elementary, and often banal. It is not a fact accomplished by the mere saying, nor is it a work of art when a draftsman copies a column out of Vignola and multiplies it by twenty; nor can even a good colonnade, like Charity, cover a multitude of sins behind it. A colonnade, especially if it is big enough, is a fine competition stunt, but simplicity can be overdone; the façade of the Pennsylvania Station, for example, is much finer than the Post Office behind it. I fully agree with Professor Reilly that the queer, bold and unusual things that are so frequent in Wren's work are really the things that give it the undeniable charm that it has. There is a freedom from conventionality, and a feeling of originality in all that he did that makes his work

From "The Journal of the A. I. A"



The Pump Room, Bath

stand out pre-eminently above the work of his successors. His architecture was real and not paper architecture, and it seems to me peculiar and unfortunate that the modern English architect is not more influenced by his work.

London is filled with fine old stuff, most of it good, and most of it original; almost every city and town has at least a few charming old examples, and yet, surrounded by fine buildings, there spring up modernities that are simply appalling in their crudeness, in their lack of imagination, in their lack of study, and disappointing in their general effect. It almost seems as if the

From "The Journal of the A. I. A."

The Circus and Royal Crescent, Bath

architects themselves did not want to be architects, that they had nothing but a most perfunctory interest in their work, and that they hurried through with it in the easiest and quickest way they could; a dreary task, and an ill paid one and so let's get it over with; approaching their design much as the parson who has been pitchforked into the church must approach his weekly sermon.

And yet, all this cannot be due to the individual; it must be due to the times. Undoubtedly there are just as many good designers in England now as there ever were, probably more; that is to say, potentially as good. Certainly the incentive should be there; more work is certainly done now in the aggregate than ever was, and the competition to get it must be even keener than it ever was. What is the trouble? To answer my own question I should say it was first, the curse of modern construction, and second, the lack of appreciation by the general public. For, in the first place, how can a man design when there is no basis for his design; what incentive is there to make a rational plan when the engineer makes rationality a non-essential; how can there help being a general stagnation when all architecture of any size is merely a cloak over steel or concrete framework; and secondly there is a terrible strain on the incentive to do good work when there is not a general recognition of good work on the part of the public, that is to say, the clients. In Wren's time and later it was different. The artist, the sculptor, the architect who had achieved distinction was looked up to as an artist. He did not make much money out of it very probably, except in a few cases, but he did get a recognition which was more to him than any material success. Commissions were given him because he was a good artist, and not because he was a good business man or a good solicitor.

From "The Architectural Forum"

Moonlight view of facade of Morgan Library, New York
McKim, Mead & White, Architects

Nowadays the painter and the sculptor generally do get recognition on their merit, but the architect rarely. Occasionally a man makes a success of a certain type of work; it may be country houses or it may be church work. His buildings are published; people like his houses and come to him because they are really vitally interested in their own prospective house and they want the best. Committees in charge of new churches feel their responsibility and come hat in hand, figuratively of course, to the celebrated church architect, because there are few who know the Gothic or can do it; but, when a large and really lucrative proposition, a real job, which is called commercial but which should not be, comes along, what happens? The men in charge of this are business men and, being business men, go about it in a most unbusinesslike way, forgetting every principle they daily apply in other and smaller matters. The same men who, when threatened with a lawsuit involving millions, would unhesitatingly go to the best, and by the same token the most expensive, lawyer they could find, or who, when threatened with appendicitis, would take the first train to Minnesota, these same shrewd business men go to the first architect they happen to think of, or to a cousin of their wife's aunt or to a firm of builders, and without a thought of qualifications and often of experience will blindly embark on an enterprise running up into the millions.

When this is generally the case, and unfortunately it generally is the case, what becomes of the incentive to do good work? If you have gotten a job in this lazy way and can get away with everything short of murder in the production of the designs, why worry about doing good work? And it is almost as bad in monumental work. One good church may, and often does, lead to another, and one good house, if it is well advertised, may lead to many, but one monumental building rarely leads anywhere. It does sometimes lead to an invitation to enter a competition for another monumental building where the chance of winning is equal generally to that in the old algebra example, in which B is always playing games of chance with the apparently astute A, and his chance of winning is usually as x is to y, no doubt ridiculously small.

Now, all that I've written applies to this country as well as to England; in point of fact perhaps more, but I do think things are improving. It does seem as if the general public, that is to say prospective clients, are taking up architecture in a more serious way, and when once these gentlemen realize that by taking a little more interest, or a great deal more, they are not doing merely a gracious act of patronage to an artistic but impractical lot of men, but are really conserving their own interest and their own dollars, then the lack of incentive will fly out of the window and we will have architecture in earnest.

DEPARTMENT OF ECONOMICS

Economic Factors Which Underlie Construction Activity Prepared for THE AMERICAN ARCHITECT by the American Chamber of Economics, Incorporated*

TANGIBLE and definite demonstrations of early activity in the building and construction industry are undeniably auspicious and suggestive of a great year. The F. W. Dodge Corporation's February returns of contracts awarded show that month to have been the best February on record with the value of awarded contracts 16 per cent greater than January, and 33 per cent heavier than February a year ago. Contemplated new work continues to pile up heavy totals. The trend of activity within the industry suggests a maintenance of the present movement in the March reports yet unannounced.

COST OF BUILDING MATERIALS
Department of Labor Index
(1913=100)

	1918	1919	1920	1921	1922	1923
Jan.	161	176	274	192	157	183
Feb.	161	173	293	280	156	
Mar.	164	171	297	173	155	
Apr.	169	169	300	167	156	
May	170	173	293	165	160	
June	172	189	275	163	167	
July	177	209	269	160	170	
Aug.	179	226	265	156	172	
Sept.	179	229	255	156	180	
Oct.	177	229	240	159	183	
Nov.	177	232	215	163	185	
Dec.	177	248	204	158	185	

In recently published statements, the Copper and Brass Research Association of New York estimated the total construction requirement in the country as $7,800 million as of January 1, 1923. Total annual building expenditure last year, according to the Association was nearly $5,000 million, and for 1923 the opinion is ventured that total construction expenditure will approach $6,000 million. If 1923 does round up such a record total, the building shortage, which the Association believes was approximately $4,000 million at the close of 1922, will have been reduced to $1,500 as of December 31 this year. The Association expects a normal market averaging between $2,500 million and $3,000 million in 1925, feeling that it will take two years, 1923 and 1924, to wipe out completely the construction shortage, which was permitted to accumulate between 1914 and 1921.

The portentious and extraordinarily early start which the year has made, is an inspiration of no mean impetus to a $6,000 million building year, to be sure. Such estimates as these published by the Association are exceedingly interesting, as they give to a more or less vague and abstract situation a distinct element of palpability and definiteness. Their source is a reliable one.

Attaining this record of $6,000 million expenditure for construction lies largely in the power and patronage of four or five variables: (1) the evasion of another European war, and the avoidance of increasing the stress and strain upon seriously warped and distorted economic structures, which already exist abroad; (2) the preservation of the constructive movement of the basic forces that unmistakably underlie industrial enterprise today; such as, the growth of confidence, the sustenance of a reasonable degree of speculative activity, the advance of individual and corporate earning power, and the reassuring presence of relatively easy money; (3) the elusion of costly labor disagreements and difficulties; and (4) the retention of building materials prices and labor costs well within the range of the average trend and movement of general wages and commodities.

A foreign war, or an unusual pressure growing out of force, fear or misunderstanding and focused upon the unwieldy and exhausted economic structure of the countries of Central Europe would not, in all probability, influence the building situation directly, for the architect's and the contractor's market, their labor and their material are all here at home. But there is no denying the fact that the effect of a dark and discouraging foreign situation upon the confidence, earning power and purchasing ability of the architect's clients would be so depressive as to make the contingency of such a catastrophe a very obvious signal of danger. A foreign war seems an utter impossibility, yet the economic effects of war may be born of a peace of force and discontentment. Since the first of the year the trend of economic events in Central Europe has been sidewise and downward. No

**The American Chamber of Economics conducts a consultation and educational service for executives, in economic principles. Its Supervising Director is George E. Roberts, Vice President of the National City Bank of New York. Co-operating with the Chamber are James B. Forgan, Chairman of the Board of First National Bank, Chicago; Frank A. Vanderlip, Financier and Economist, New York; Samuel Insull, President, Commonwealth Edison Company, Chicago; Joseph H. Defrees, Ex-President, United States Chamber of Commerce; Henry S. Pritchett, President, Carnegie Foundation; Edward J. Nally, Managing Director, International Relations, Radio Corporation of America.*

solution to the difficulties over there has been found. It may be reasonably supposed that the situation will be worse before it is better.

Barring the consideration of tragic European developments, the coming six or nine months look exceedingly bright for domestic industry. Cotton, wool, iron, steel, automobile, equipment, petroleum, building materials, copper, rubber, and a host of minor industries, report remarkably good business. Production in many centers is approaching high levels. In some lines the volume of output has established records. The trend of commodity prices and the labor shortage—but particularly the latter—intimate rather strongly that consumption is distancing production, but the pronounced bull movement in many commodities undoubtedly reflects an increasing speculative interests in those markets. Confidence is advancing. Speculative ardor is beaming—a little too brightly, perhaps. The effect of the precautionary signal displayed by the Federal Reserve banks in the rise of their rediscount rate has been recognized and understood—but not altogether heeded. Business approaches the slope of inflation at an increasing speed. As to the actual ascent, lessons learned two or three years ago may be relied upon somewhat as a guide. For this time of year, industry is extraordinarily active and the prospect is for an extension of the present movement. Therein lies the danger.

WAGES NEW YORK FACTORY WORKERS
(average weekly earnings)
(Department of Labor Reports of New York State)

	1918	1919	1920	1921	1922	1923
Jan.	$16.81	$23.03	$26.52	$27.61	$24.43	$26.22*
Feb.	17.66	22.07	26.47	26.77	24.17	
Mar.	18.71	22.20	27.87	26.96	24.57	
Apr.	19.25	22.11	27.80	26.20	24.15	
May	19.91	22.23	28.45	25.86	24.59	
June	20.44	22.51	28.77	25.71	24.89	
July	20.78	23.10	28.49	25.26	24.77	
Aug.	21.23	23.85	28.71	25.43	25.10	
Sept.	22.31	24.83	28.73	25.07	25.72	
Oct.	22.34	24.41	28.93	24.53	25.59	
Nov.	21.60	25.37	28.70	24.32	26.04	
Dec.	23.18	26.32	28.35	24.91	26.39	

*Tentative.

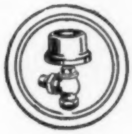
One of the most noticeable effects of this pronounced activity of production, manufacture and consumption, which must be considered along with exalted confidence as to future business, increasing speculative interest in various commodities, and the relatively abundant supply of comparatively easy money, has been an advance in prices. Prices since December, 1921, have risen, according to the Bureau of Labor Statistics, from 140 to 156 or 16 per cent, using 1913 as a base. The lumber and building materials group has led that advance, scoring a gain of some 30 points. The metal group was second with a 25 point increase, and farm products third with 23 points in their favor. The accretions thus far have not been equitably distributed, and the gross maladjustment between the purchasing power of the various commodity groups is still uncorrected. The fuel, cloth and clothing, and the lumber and building materials groups flourish at the expense of the metals, chemicals and dyes, and a diverse miscellany, including hemp, rubber, leather and paper.

The Bureau's combined index advanced 16 points on the average, and in light of this movement, a gain of 30 points by building materials seems to be a little out of line. It benefits neither general industry nor this specific trade. To the one it denies new buildings; to the other new business. It is a mistaken impression to gather that the situation is getting out of hand; we mean to point here only to the direction in which the trade is headed. The difficulty of correcting this trend will be seen farther along.

The only all powerful corrective of price trends in the present scheme of things economic has been the course of interest rates. High money rates have dampened advances in the past, and are likely to throw a more serious cast upon what now seems to be a light and care-free situation. The total effect of the recent rise in rediscount rates has not been material. Undoubtedly commercial demands for accommodation, which are increasing, will bring a heavier pressure to bear upon the money market, and undoubtedly stiffer interest rates will be the immediate outcome—particularly, if the improvement in industry is accompanied by an unusual degree of speculative activity. Higher market and rediscount rates are in prospect, and the remoteness of these rises will be lessened in direct proportion to the increase in the volume of business.

Not only has the constructive turn in the business cycle aided the manufacturer, but it is bringing around again a combination of economic factors highly favorable to labor. More than that, the flow of the advantage is from the employer to his organized employee. Expanding and extending business has resulted in such a high state of employment that shortages of both skilled and unskilled labor are reported in many manufacturing centers. Restricted immigration has more or less stabilized the supply. Wages have been steadily rising, and upward revisions of the wage scales in the building and construction industries have exceeded the reductions. The shortage of both plasterers and bricklayers is a serious menace to expanding programs.

Thus far there have been no developments indicative of strained employee relationships. Nevertheless, the expansion of industrial enter-



prise, the increasing labor deficit, rising commodity prices and advancing living costs, are all a combination of factors enhancing, in their cumulative effect, the strength and power of organized labor. They harken back to a similar period, not long since removed, when a similar trend of events begot no such agreeable relationships as obtain today. Agreements between the contractors and the councils for 1923 are being drawn up in many localities and the architect should follow closely the indications of contentment or dissension. From them he may learn which way the local labor wind is blowing.

The final variable, which may make or mar a $6,000 million building year, concerns itself with the retention of building costs well within the range of the average movement of the price of commodities and wages. Considerable latitude must of necessity be allowed the variable on account of expanding and prospering business, and the $4,000 million building shortage, which was estimated to exist December 31, 1922. Wages will move comparatively slowly, and their levels will be determined to a large degree by agreement. Not so with building materials. The rate of their upward movement gives indication of being determined by factors extraneous to the building industry and over whose potency the trade has little control.

We refer to the railroad situation. The ability of these carriers to bring building materials in sufficient quantities to remote and removed localities where an abnormal building program is in contemplation is a problem which is giving the market some real concern. The shortage of cars, of which there was a daily average of 133 thousand in November, 82 thousand in December, and 73 thousand in January, was reported as approximately 73 thousand in February. The deficit one year ago was but 600 cars. With the output of industry increasing, the car shortage within the next three months can hardly be expected to improve. The building materials trade sees ahead a Spring of unusual activity, a period of heavy demand; they realize that stocks are low, and if the prospective car deficit materializes, shortages in materials will be a certainty in those localities removed from the source of supply. Prices will stiffen in spite of a conscientious effort to restrain them.

To canvass the trade is to be assured of the sincere wish of manufacturers and wholesalers of the desirability of avoiding inordinate jumps in prices. It is the genuine wish that the advance in quotations be a slow, gradual one—particularly among "the large fellows." Unfortunately, there are those in the trade who regard it good business to increase the margin of profit every time the occasion offers.

In addition to the car shortage, and the trade's disposition toward an unusual situation, there are two other factors governing the trend of prices: namely, short stocks available to the contractor, an early and extraordinary demand, and the delay in production occasioned by bad weather.

While the production of pig iron dropped from 3,230,000 tons in January to 2,994,000 tons in February, the average daily output in February exceeded the January turnover by some 2,000 tons. Prices have been unusually buoyant. A similar movement has taken place in steel. The volume of new business on the books of the United States Steel Corporation at the close of February surpassed the January record by approximately 300,000 tons. Steel has been at a minimum of $2.25 (March 1) f.o.b. mills, compared with $2.10 last month. Small car lots and immediate business, if accepted, command a premium. Mills are heavily booked and are running at about 90 per cent capacity. Production is handicapped by car and labor shortages. The immediate outlook is for firm to advancing prices.

The short stocks available to builders, the inability of the railroads to make prompt shipments, the bad weather conditions and the unusual building program in contemplation are factors underlying the present advance in lumber prices. Yellow pine, Douglas fir, hemlock and spruce have all been active participants in the forward movement. The outlook is for a strong to advancing market as Spring business materializes. Orders have been running about 10 per cent ahead of shipments, and 30 per cent ahead of production, according to the February reports of the National Lumber Manufacturers' Association. Mills report the heaviest bookings since 1916. Immediate business is either turned down or accepted at a premium. The market is general in its activity and all varieties are in good demand.

Cement plants the country over are expecting a record year. Early indications have revealed an unusual demand. Prospects of a shortage are looming up in the Middle West, where prices have been rising. A buoyant wave is expected in Eastern markets soon. Some localities removed from the source of immediate supply are confident that they will not be able to get all the cement they need. Production during January and February has been seasonally low, although in excess of corresponding months last year. Wet process plants were unable to operate because of cold weather and other producers were shut down for repairs. As Spring advances the market is expected to grow exceedingly active and unless shipments are unusually prompt, prices are bound to rise.

Chicago and New York brick markets are comparatively easy, the former much more so than the latter. Chicago is reported to have used 10 million face brick during January compared to 5 million odd in January, 1922. This increase is considered ominous by the materials trade and

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they are wondering where the supply of brick for the Spring trade is coming from. Production and shipments of face brick have declined, while orders and stocks have increased, the orders piling up faster than inventories. Open weather is expected to release a reserve of brick which closed navigation has detained, and warmer days will undoubtedly speed up production. The short stocks, heavy demand, and delayed shipments, however, indicate stronger prices later in the year.

The supply of sand and gravel is receding for production in Winter months is usually at a low ebb, and all shipments are made, as a rule, from stocks. Early and heavy demands have reduced these reserves and prices may undergo sharp advances if the producers are not favored with clement weather and cars. Prices are stronger, and if the car deficit increases, higher quotations may be expected.

In all the materials markets there appears this formidable collusion: (1) early and heavy demand; (2) short stocks; (3) production delayed by bad weather; and (4) a shortage of cars. A scarcity of many materials threatens. All conditions favor rising prices. The architect and builder cannot afford to neglect these underlying forces.

PERSONALS

Johannes Prip Moller, architect, East Suburb, Moukden, Manchuria, a subscriber, writes: "I am badly in need of catalogs and would be obliged if American firms, interested in trading in the Far East, would send me theirs."

H. R. Temple, architect, announces that on January 1 last, F. E. Berger became associated with him for the practice of architecture under the firm name of Temple & Berger, 304-305 Lincoln Building, Champaign, Ill.

Announcement is made that George H. Levy and Benjamin Schreyer have formed a partnership under the firm name of Levy & Schreyer, architects, with offices at 17 West Forty-second Street, New York City. They desire to receive manufacturers' samples and catalogs.

John Pickering Thomas, A. I. A., announces that he will continue the practice of Poor and Thomas, architects, that he has associated with him Murray Crosman Binford and Albert Cyprian Hobbs, C. E., and that the organization is to be known as the office of John P. Thomas, Architect, 537 Congress Street, Portland, Maine.

The offices of the representatives for I. P. Frink, Inc., in Cleveland and Cincinnati, Ohio, have been changed. The Cleveland office is now located at 992 The Arcade, and the Cincinnati office at 601 Second National Bank Building. A new office has also been established in Buffalo, N. Y., with an address at 310 Mutual Life Building.

Announcement is made that Leo Strelka, architect, has opened an office for the general practice of architecture at 660 Rush Street, Chicago, Ill. Mr. Strelka was with E. H. Bennett for the past ten years, and before that served six years in the late D. H. Burnham's office. Manufacturers' catalogs and samples are requested.

Golden-Storrs & Company, architects and engineers, wish to announce the opening of their offices in the City Bank & Trust Building, Hartford, Conn., for the practice of architecture and engineering. Mr. Storrs enjoys a long and varied experience, having been connected with architects in Worcester, Mass., and in Hartford for the past eighteen years. Mr. Golden is a civil engineer and was formerly with Lockwood, Greene & Company of Boston. He has a broad experience in the design of reinforced concrete and steel structures of various types.

Chas. C. Wilson, architect, has taken into partnership with him G. R. Berryman, the manager of his office at Wilson, N. C., and hereafter the practice will be conducted under the firm name of Wilson & Berryman, with offices in Columbia, S. C., Gastonia, N. C. and Wilson, N. C. Before joining Mr. Wilson three years ago, Mr. Berryman was connected with the offices of the Supervising Architect of the U. S. Treasury Department, as Supervising Superintendent of Construction, with headquarters in Atlanta, and with jurisdiction over all Post Offices, Custom Houses, and U. S. Court Houses of the South from Washington to Texas. Mr. Berryman will now have general charge of all field work of the firm, covering its entire territory.

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Publishers, THE AMERICAN ARCHITECT AND THE ARCHITECTURAL REVIEW.

TENTATIVE SPECIFICATIONS FOR WOOD PILE FOUNDATIONS

Bulletin No. 26. Serial No. 9.10. Wood Pile Foundations. Feb. 15, 1923, Page 1

(The form of this bulletin conforms to the arrangements of Elements of a Specification as given in Bulletin No. 5, ANALYSIS OF A SPECIFICATION, Revised Jan. 20, 1923.)

I. CONTRACT AND LEGAL

1. Parties:
2. Drawings:
3. Agreement:
4. Terms of Payment:
5. General Conditions:
6. Regulations and Codes:

II. ECONOMIC

SCOPE OF CONTRACT:

7. Work Included:
8. Work Not Included:

METHODS OF ANALYSIS AND COMPARISON OF BIDS:

9. Method:
10. Basis:
11. Conditional Payments:

III. GENERAL DESCRIPTIVE

12. Conditions at Site:
13. Working Limitations:

IV. PRELIMINARY PREPARATION

14. Field Measurements:
15. Preliminary Tests:

V. MATERIALS

16. Kinds of Woods:
17. Quality:
18. Selection:
19. Shape and Size:

VI. CONSTRUCTION

20. Excavation:
21. Driving Piles:
22. Cut-Off:
23. Safe Load:

VII. SCHEDULES

24. Field Operations:
25. Shipment and Delivery:

VIII. RESULTS

26. Inspection:
27. Guarantees:
28. Tests:
29. Rejection:

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CAMPANILE OF THE BASILICA OF ST. PAUL, ROME